8 ECOLOGY

8.1 Introduction

8.1.1 This chapter provides an assessment of the potential effects upon important ecological features in relation to the construction, operation and decommissioning of the Proposed Development. The 'site' comprises the 'turbine area' and 'the access area'.

8.1.2 The chapter is supported by **Figures 8.1** to **8.7** presented in **Volume 3** and the following technical appendices presented in in **Volume 2**:

- **Appendix 8.1** – Habitats and Vegetation;
- **Appendix 8.2** – Terrestrial Mammals;
- **Appendix 8.3** – Fisheries;
- **Appendix 8.4** – Bats; and
- **Appendix 8.5** – Outline Habitat Management Plan.

8.2 Legislation, Policy and Guidance

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

European

- Conservation of Habitats and Species Regulations 2017, as amended in Scotland by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 (collectively 'the Habitats Regulations').

National

- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- The Wildlife and Countryside Act 1981 (as amended);
- The Wildlife and Natural Environment (Scotland) Act 2011;
- The Nature Conservation (Scotland) Act 2004;
- The National Planning Policy Framework 3 (2014);
- Scottish Planning Policy (2014);
- Protection of Badgers Act 1992 (as amended in Scotland);
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003;
- General pre-application and scoping advice for onshore wind farms (NatureScot, 2020a[61]);
- Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018[62]);

[61] NatureScot (2020a). https://www.nature.scot/doc/general-pre-application-and-scoping-advice-onshore-wind-farms (Accessed 18th November 2021).

[62] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. September 2018.

- Assessing the Cumulative Impact of Onshore Wind Energy Developments (SNH, 2012[63]);
- Standing Advice for Planning Consultations – Protected Species: Badger (NatureScot, 2020b[64]);
- Standing Advice for Planning Consultations – Protected Species: Otter (NatureScot, 2020c[65]);
- Standing Advice for Planning Consultations – Protected Species: Pine Marten (NatureScot, 2020d[66]);
- Standing Advice for Planning Consultations – Protected Species: Red Squirrel (NatureScot, 2020e[67]);
- Standing Advice for Planning Consultations – Protected Species: Water Vole (NatureScot, 2020f[68]);
- Standing Advice for Planning Consultations – Protected Species: Wildcat (NatureScot, 2020g[69]);
- Standing Advice for Planning Consultations – Protected Species: Bats (NatureScot, 2020h[70]);
- Standing Advice for Planning Consultations – Protected Species: Freshwater Pearl Mussel (NatureScot, 2020i[71]);
- Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (SNH, 2019a[72]);
- Good Practice During Wind Farm Construction (SNH, 2019b[73]);
- Bat surveys: Good Practice Guidance 2nd edition (Hundt, 2012[74]);
- Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition (Collins, 2016[75]);
- Scottish Biodiversity List (SBL) 2020[76];

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[63] SNH (2012). Assessing the cumulative impact of onshore wind energy developments. SNH, Inverness.

[64] NatureScot (2020b). https://www.nature.scot/doc/standing-advice-planning-consultations-badgers (Accessed 18th November 2021).

[65] NatureScot (2020c). https://www.nature.scot/doc/standing-advice-planning-consultations-otters (Accessed 18th November 2021).

[66] NatureScot (2020d). https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens (Accessed 18th November 2021).

[67] NatureScot (2020e). https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels (Accessed 18th November 2021).

[68] NatureScot (2020f). https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles (Accessed 18th November 2021).

[69] NatureScot (2020g). https://www.nature.scot/doc/standing-advice-planning-consultations-wildcats (Accessed 18th November 2021).

[70] NatureScot (2020h). https://www.nature.scot/doc/standing-advice-planning-consultations-bats (Accessed 18th November 2021).

[71] NatureScot (2020i). https://www.nature.scot/doc/standing-advice-planning-consultations-freshwater-pearl-mussels (Accessed 18th November 2021).

[72] SNH (2019a). https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation (Accessed 18th November 2021).

[73] SNH (2019b). https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction (Accessed 18th November 2021).

[74] Hundt, L. (2012). Bat Surveys: Good Practice Guidelines 2nd edition. Bat Conservation Trust, London.

[75] Collins, J. (ed) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines 3rd edition. Bat Conservation Trust, London.

[76] https://www.nature.scot/doc/scottish-biodiversity-list (Accessed 18th November 2021).

- Carbon and Peatland map (SNH, 2016[77]); and
- Land use planning system SEPA guidance Note 31 SEPA (2017[78]).

Local

- Sutherland Local Biodiversity Action Plan (LBAP); and
- Highland Biodiversity Action Plan.

8.2.2 Local planning policies of relevance to this assessment are provided in **Chapter 5: Planning Policy Context**.

8.3 Scope of Assessment

8.3.1 Assessment has been undertaken in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidelines 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine' (CIEEM, 2018) and considers the following four main potential impacts upon ecological features associated with wind farm developments:

- Designated Sites - potential indirect effects upon designated sites for nature conservation;
- Habitat Loss / Deterioration - direct and indirect loss and deterioration of habitats;
- Mortality / Injury - 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.

8.3.2 The potential for effects are considered as a result of the Proposed Development alone and cumulatively, in-combination with other wind farm developments.

8.4 Assessment Methodology

8.4.1 Assessment has been undertaken in accordance with CIEEM guidelines (2018) and includes the following stages:

- determination and evaluation of important ecological features;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant impacts;
- assessment of the significance of any residual effects after such measures; and
- identification of appropriate compensation measures to offset significant residual effects.

Determining Importance

8.4.2 Relevant European, national and local guidance has been referred to in order to determine the importance of ecological features.

[77] SNH (2016). https://map.environment.gov.scot/Soil_maps/?layer=10 (Accessed 18th November 2021).

[78] SEPA (2017). https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf (Accessed 18th November 2021).

8.4.3 In addition, importance has also been determined using professional judgement and taking account of the results of baseline surveys, desk study and the importance of features within the context of an appropriate geographic scale.

8.4.4 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 in **Table 8.1.**

8.4.5 It should be noted that 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, rarity of species or the geographical location of species relative to their known range.

8.4.6 Similarly, whilst a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of "International" importance.

Table 8.1 Geographic Scale of Ecological Feature Importance

Importance	Definition
International	An internationally designated site i.e. Special Area of Conservation (SAC) and/or Ramsar site or candidate site (or cSAC). 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. A regularly occurring, nationally significant population of any internationally important species, listed under Annex II or Annex IV of the Habitats Directive.
National	A nationally designated site e.g. Site of Special Scientific Interest (SSSI), or area meeting criteria for national level designations. Significant extents of a priority habitat identified in the UK Biodiversity Action Plan (BAP) / Scottish Biodiversity List (SBL), or smaller areas which are essential to maintain the viability of that ecological resource. A regularly occurring, regionally significant population of any nationally important species listed as a UK BAP / SBL 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.
Regional	Viable areas of key semi-natural habitat identified in the UKBAP. A regularly occurring, locally significant population of any nationally important species listed as a UK BAP / SBL priority species and Species listed under Schedule 5 of the Wildlife and Countryside Act or Annex II or Annex IV of the Habitats Directive. Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including extensive areas of semi-natural woodland.
Local	Nature conservation sites selected on local authority criteria. Other species of conservation concern, including species listed under the LBAP. Areas of habitat or species considered to appreciably enrich the ecological resource within the local context e.g. species-rich flushes or hedgerows.

	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 low ecological value.

Characterising Impacts

8.4.7 Once identified, potential effects are described making reference to the following characteristics as appropriate:

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

8.4.8 The assessment only makes reference to those characteristics relevant to understanding the nature of an effect and determining its significance. For the purposes of this assessment the temporal nature of potential effects is described as follows:

- negligible: of inconsequential duration;
- short-term: for 1 to 5 years;
- medium-term: for 5 to 10 years;
- long-term: >10 to 30 years; and
- permanent: >30 years.

8.4.9 The likelihood or probability that an effect will occur is also described as far as possible based on best available information and where relevant. The likelihood of an impact occurring is referred to using the following terms: ‘certain’, ‘likely’, ‘unlikely’ or ‘highly unlikely’, where appropriate.

8.4.10 The criteria used to determine the magnitude of impact are set out in **Table 8.2**.

Table 8.2 Impact Magnitude

Magnitude	Definition
Very High	The impact (either on its own or in-combination with other proposals) may result in the permanent total or almost complete loss of a site and/or species status or productivity.
High	The impact (either on its own or with other proposals) may adversely 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 affected, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term.

Magnitude	Definition
Low	None of the above applies, but some minor adverse effect is evident on a temporary basis or affects extent of habitat/species abundance in the local area.
Negligible	No observable adverse effect.
Beneficial	The impact is considered to be beneficial to a species or sites nature conservation status.

Determining Significance

8.4.11 For the purposes of assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important features' or for biodiversity in general.

8.4.12 Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution) and are identified on the basis of magnitude, professional judgment and best available evidence.

8.4.13 CIEEM guidelines (2018) 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 have been lawfully permitted following EIA procedures."

8.4.14 The term 'integrity' is used here to refer to the maintenance of the conservation status of a population of a species at a specific location or geographical scale.

8.4.15 For the purposes of this assessment, significant effects are primarily expressed with reference to an appropriate geographical scale.

8.4.16 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.

8.4.17 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.

8.4.18 CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIA Report Chapters to determine 'significant' and 'non-significant' effects. For the purposes of this assessment presented herein, **Table 8.3** sets out adapted CIEEM terminology and equivalent in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

8.4.19 Major and moderate effects are considered significant in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017.

Table 8.3 Effect Significance

Effect (EIA Significance)		
Not significant	Negligible or Low Adverse/ Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ecological feature, typically at a site level or below.
Not significant	Minor Adverse / Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a regional level or below.
Significant	Moderate Adverse / Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ecological feature at a regional level or above.
Significant	Major Adverse / Beneficial	A medium or high, medium-term or long-term adverse or beneficial effect upon the integrity of an ecological feature at a national (Scottish) or international level.

Assessment of Cumulative Effects

8.4.20 Potentially significant cumulative effects can result from individually not significant but collectively significant actions taking place over a period of time or concentrated in a location.

8.4.21 For aquatic features, potential cumulative effects are likely to be significant only for other developments located relatively close (e.g., within 2 km) and within the same hydrological sub-catchments.

8.4.22 For (non-avian) species potentially significant cumulative effects are only likely where other developments are located within the regular range of more mobile species (e.g., bats). Cumulative impacts have therefore been assessed with reference to NatureScot guidance (SNH, 2019a) for bats within 10 km of the Proposed Development. Furthermore, following RSPB's request (see **Table 8.4**) the potential for cumulative effects on Annex I habitats within 10 km of the Proposed Development are also considered.

8.4.23 The potential for cumulative impacts have therefore been assessed with reference to SNH guidance (2012), and encompass the effects of the proposal in-combination with relevant:

- existing developments, either built or under construction;
- approved developments, awaiting implementation; and
- proposals awaiting determination within the planning process with design information in the public domain.

8.4.24 Those developments which have been withdrawn and/or refused are not considered, unless an appeal is currently in progress and information is available.

8.4.25 Whilst single or small-scale wind turbine developments (three turbines or less) may contribute to cumulative effects, these have been scoped out of assessment as applications for such developments do not generally consider the potential for impacts upon ecological features in sufficient detail.

8.5 Consultation undertaken

8.5.1 Consultation with statutory and non-statutory advisors, together with species specialist groups has been undertaken to inform the approach to and undertaking of assessment.

8.5.2 A summary of consultations undertaken, responses received and how they have been considered is provided in **Table 8.4**.

Table 8.4: Summary of Consultations

Consultee, Date & Type of Consultation	Response Received	Action Taken
NatureScot, 7th November 2019, Pre-Scoping	Overall satisfied with the scope of ecological assessment. Welcome the proposed approach to protected species surveys. In addition to the species listed within the scoping letter, advised that consideration should be given to freshwater pearl mussel in any potentially suitable watercourses for this species which could be impacted by the Proposed Development. For further advice regarding protected species, refer to NatureScot's 'standing advice'.	The potential for freshwater pearl mussel to be present was considered during fish habitat surveys and within the EIA Report (see **Section 8.7** and **Appendix 8.3**). NatureScot's standing advice on protected species has been considered.
Kyle of Sutherland District Salmon Fishery Board (KSDSFB) & Kyle of Sutherland Fisheries Trust (KSFT), 30th March 2020, Formal Scoping	Surveys of those watercourses that could potentially be impacted should include: Fish habitat surveys; Fish presence, distribution and abundance surveys; Macro-invertebrate surveys; Freshwater pearl mussel presence, distribution and abundance surveys; and Water quality/hydrology surveys. Pollution and run-off from works associated with the Proposed Development should be considered, including impacts on drainage channels which could facilitate the flow of pollution/run-off into watercourses.	Fish habitat surveys have been undertaken and have informed the assessment. A 50 m buffer is proposed between works and watercourses. Furthermore, watercourse crossings will be sensitively designed to allow the continued movement of wildlife, so impacts on watercourses by the Proposed Development can be mitigated by design (see **Section 8.9**). Subsequently additional surveys were considered unnecessary for assessment purposes. Monitoring to assess the effectiveness of

Consultee, Date & Type of Consultation	Response Received	Action Taken
		mitigation measures including for fish with input from KSDSFB and KSFT are detailed in **Section 8.9**.
NatureScot, 9th April 2020, Formal Scoping	Welcomed proposed protected species surveys. Advised that if any protected species are identified, suitable mitigation should be adopted and included within a species protection plan, as detailed in the EIAR. Stated that deer management should be considered in the assessment.	Baseline surveys have been undertaken to identify protected species. Mitigation is detailed in the EIA Report (see **Section 8.11**). Deer are currently managed by the landowner (Dalnessie Estate). As such, there will be commitment to liaise with Dalnessie Estate to ensure that ongoing deer management activities account for the construction and operation phases of the Proposed Development (see **Table 8.9**).
RSPB, 9th April 2020, Formal Scoping	Cumulative impacts on non-avian features, such as Annex I habitats (particularly blanket bog) should be considered.	Cumulative impacts on non-avian features are considered in **Section 8.12.**
Marine Scotland, 22nd April 2020, Formal Scoping	Surveys of water quality and fish populations within, and downstream of, the site should be undertaken so the full impact of the Proposed Development on fish populations (especially those of conservation value/ species listed on the European Habitats Directive) can be assessed. Results should be presented in assessment, with any mitigation and monitoring (before, during and after construction) presented. Cumulative impacts should be considered with other wind farm developments (and hydro schemes).	Fish habitat surveys have been undertaken and have informed the assessment. Mitigation is considered in the EIA Report (see **Sections 8.9** and **8.11**). Cumulative impacts on non-avian features (incl. fish) have been considered, where relevant, in **Section 8.12.**
The Highland Council, 27th April 2020,	Should provide baseline survey of animals and habitats (particularly those that are rare and threatened) to be considered in the EIAR.	Baseline surveys for animals and habitats have been undertaken and those most

Consultee, Date & Type of Consultation	Response Received	Action Taken
Formal Scoping	Habitat enhancement measures, particularly in relation to blanket bog (but also native tree planting) should be detailed. Impact of the Proposed Development on designated sites in vicinity of the site should be considered, and any mitigation required to avoid impacts/ or reduce to a non-significant level detailed. Assessment should consider impacts on local watercourses, including those downstream, through siltation, pollution, run-off and disturbance to important fish habitats (like spawning areas). EIAR should include consultation input from local fishery board(s), where relevant. If wild deer present, they should be considered in the assessment, including impacts on deer welfare and habitats. Within the assessment, effects on groundwater dependent terrestrial ecosystems (GWDTEs) should be considered and the Scottish Environment Protection Agency (SEPA) should be sought for advice.	ecologically important features have been identified. Habitat enhancement measures will be provided in a Habitat Management Plan (summarised in **Section 8.13** and provided as **Appendix 8.5**). Impacts on all designated sites and watercourses have been considered in the assessment. Input from the local fishery board(s) is considered in the assessment, and monitoring is proposed with input from KSDSFB and KSFT (see **Section 8.9**). Wild deer are managed by the landowner (Dalnessie Estate). As such, there will be commitment to liaise with Dalnessie Estate to ensure that ongoing deer management activities account for the construction and operation phases of the Proposed Development (see **Table 8.9**). Impacts on GWDTEs are considered in **Chapter 10: Geology, Hydrogeology, Hydrology and Peat**.
SEPA, 18th March 2020, Formal Scoping	Welcome the 50 m buffer to be adopted between Proposed Development and watercourses. Welcome the use of existing track where possible, while appreciating that access routes are likely to need some upgrading, such as re-widening.	Although some reference is made to peat, watercourses and GWDTEs in this chapter, impacts on these are considered in detail in **Chapter**

Consultee, Date & Type of Consultation	Response Received	Action Taken
	State that all watercourse crossings should be traditional style bridges or bottomless arched culverts. Peat probing should be sufficient so that deeper areas of peat can be identified (and avoided). GWDTEs to be mapped and these should be >100 m from excavations shallower than 1m, and >250 m from excavations deeper than 1 m. Welcome the consideration of habitat enhancement opportunities, which may include riparian tree planting and removal of any redundant watercourse engineering structures, such as old dams.	**10: Geology, Hydrogeology, Hydrology and Peat.**

8.5.3 No consultation responses were received from:

- Scottish Wildlife Trust;
- Brora District Salmon Fishery Board; and
- Fisheries Management Scotland.

8.6 Baseline Methodology

8.6.1 Baseline information to inform the design and assessment of the Proposed Development has been collated through desk study and field surveys.

Desk Study

8.6.2 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 in proximity to the Proposed Development.

8.6.3 The following key sources were consulted:

- NatureScot's Sitelink (https://sitelink.nature.scot/home);
- Saving Scotland's Red Squirrels (https://scottishsquirrels.org.uk/squirrel-sightings/);
- Highland Biological Recording Group (HBRG); and
- Brora District Salmon Fisheries Board (https://brora.dsfb.org.uk/).

8.6.4 A review of publicly available EIA documentation for the withdrawn Dalnessie Wind Farm[79] and currently in planning Strath Tirry Wind Farm[80] has also been undertaken.

8.6.5 Full details and results of the desk study undertaken are provided in **Appendices 8.1** to **8.4**.

[79] ECU Reference: EC00003171.

[80] THC Reference Number: 20/05067/FUL.

Field Surveys

8.6.6 Detailed knowledge of habitats and the presence or likely presence of protected and notable species has been derived from field surveys.

8.6.7 The following field surveys have been completed:

- Phase 1 habitat survey;
- National Vegetation Classification (NVC) survey;
- Terrestrial mammal surveys;
- Fish habitat survey;
- Bat activity surveys; and
- Bat roost assessment.

8.6.8 **Table 8.5** provides a summary of field survey methodologies followed. Full details are provided in **Appendices 8.1** to **8.4**.

8.6.9 All field surveys have been undertaken within the most recently available 18-month survey window prior to submission, as per NatureScot guidance (2020a).

Table 8.5: Field Survey Methodologies

Ecological Feature	Methodology
Habitats and Vegetation	A Phase 1 habitat survey was undertaken on 9th July 2020. The survey was undertaken in accordance the UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010[81]), extended to include the additional recording of specific features indicating the presence, or likely presence, of protected or notable species. A National Vegetation Classification (NVC) survey was subsequently undertaken on 27th August 2020 following the guiding principles detailed in the National Vegetation Classification: Users' handbook (Rodwell, 2006[82]). The study area comprised all habitats within the turbine area and within at least 250 m of the turbine area as access allowed. A Phase 1 habitat survey and NVC survey were undertaken on the 1st and 2nd October 2021, respectively of the access area. The study area comprised all habitats within the access area. Full details are provided in **Appendix 8.1**.

[81] JNCC (2010) Handbook for Phase 1 Habitat Survey - a technique for environmental audit.

[82] Rodwell, J. (2006). National Vegetation Community Users' Handbook.

Ecological Feature	Methodology
Other Terrestrial Mammals	Targeted surveys for terrestrial mammals were undertaken in August 2020, using walkover surveys. Target species for survey were otter *Lutra lutra*, water vole *Arvicola amphibius*, pine marten *Martes martes*, badger *Meles meles,* red squirrel *Sciurus vulgaris* and wildcat *Felis silvestris*. The study area has comprised all suitable habitats for target species within the turbine area and out to at least 200 m for otter, 100 m for water vole, 250 m for pine marten, 100 m for badger and 200 m for wildcat as access allowed. Surveys have been undertaken in accordance with NatureScot guidance (NatureScot, 2020b- 2020g). A terrestrial mammal survey was also carried out on the 1st October 2021 along the access area. Full details are provided in **Appendix 8.2**.
Fish	A fish habitat survey to identify any areas of important fish habitats (i.e. spawning, nursery areas, juvenile and adult holding areas) potentially impacted by the Proposed Development was completed in July 2020 following the Scottish Fisheries Co-ordination Centre methodology (SFCC, 2007[83]). The survey included gradient analysis, habitat mapping and classification and searches for evidence of, and potential for, fish species (and freshwater pearl mussel *Margaritifera margaritifera*). The study area comprised all watercourses within and intersecting the turbine area and adjacent sections of the River Brora. Full details are provided in **Appendix 8.3**.
Bats	Bat activity surveys were undertaken adopting a seasonal effort, over the consecutive seasons; 2020 Summer and Autumn and 2021 Spring activity periods, in accordance with NatureScot guidance (SNH, 2019a). Surveys consisted of automated monitoring, whereby 14 static detectors were deployed to survey the 16-turbine Proposed Development. Detectors were located close to proposed turbine locations. Every season, each static detector was deployed for a minimum of ten nights. Those nights which were considered as unsuitable for bats (following criteria in NatureScot guidance; SNH, 2019a) and when no bats were recorded, were omitted from analysis. A weather station was deployed during the surveys to record weather conditions. A preliminary ground level roost assessment of trees within the study area has also been undertaken, in conjunction with the Phase 1 habitat survey in July 2020 and October 2021. The study area was the proposed turbine locations (and out to 281.5 m; representing 200 m plus rotor radius),

[83] SFCC (2007). Habitat Surveys – Training Course Manual. Revised August 2007.

Ecological Feature	Methodology
	in accordance with NatureScot guidance (SNH, 2019a) and along the access area. Full details are provided in **Appendix 8.4**.

Additional surveys

8.6.10 As per NatureScot guidance (2020a), there are some species that with standard mitigation are unlikely to experience significant effects as a result of the development of onshore wind farms (e.g. invertebrates, reptiles and amphibians) and as such, do not require surveys to inform an EIA.

8.6.11 On this basis, baseline surveys for invertebrates, reptiles and amphibians have not been undertaken to inform the design and assessment of the Proposed Development. Mitigation measures to avoid or where otherwise reduce adverse effects and ensure legislative compliance (where applicable) have however, been outlined.

Assessment Limitations

8.6.12 During the bat activity surveys, malfunctioning detectors and adverse weather meant that seven detectors failed to record for a total of 30 nights over the three season survey period.

8.6.13 Low temperatures were typically the criterion which meant the night was appraised as unsuitable (in accordance with guidance; SNH, 2019). Bat activity was however still recorded during some nights identified as 'unsuitable' and given the activity recorded, these nights were included in the analysis.

8.6.14 The weather station malfunctioned, and as a result weather conditions were taken instead from trusted sources (SEPA and the World Weather Online[84]).

8.6.15 Furthermore, a review of weather conditions of the locality of the Proposed Development from the Met Office website[85] reveals that temperatures during October, April and May typically fall <8°C criteria which constitutes 'unsuitable' weather for bats (in accordance with SNH, 2019). The low temperatures and associated lack of bat activity are therefore likely to be representative for the turbine area.

8.6.16 A higher number of static detectors were deployed (14) than the 12 required in accordance with guidance (SNH, 2019) which provides some compensation for those nights of omitted survey data due to unsuitable weather conditions. Despite the reduction in the number of suitable survey nights at some detectors, given the considerations stated above, adequate bat survey data has been gathered for the purpose of assessment.

[84] https://www.worldweatheronline.com/ (Accessed 23rd November 2021).

[85] https://www.metoffice.gov.uk/research/climate/maps-and-data/uk-climate-averages/gfkgdgj2j (Accessed 12th October 2021).

8.6.17 No limitations to baseline information gathering and subsequent assessment presented herein are identified.

8.7 Existing Environment

8.7.1 This section provides a summary of baseline ecological conditions in relation to:

- Designated sites of nature conservation;
- Habitats and vegetation;
- Protected and notable species;
    - Terrestrial mammals;
    - Fisheries;
    - Bats; and
- Additional species.

8.7.2 Detailed information regarding desk study records and field survey results is presented in **Appendices 8.1** to **8.4** where relevant, and also as relevant within the "Predicted impacts" with regards important ecological features.

Designated Sites for Nature Conservation

8.7.3 This section should be read with reference to **Figure 8.1**.

8.7.4 **Table 8.6** provides a summary of statutory designated sites for nature conservation located within 10 km of the turbine area.

8.7.5 The distances specified within **Table 8.6** are from the turbine area to the designation boundary at its nearest point.

8.7.6 There are no nationally or internationally designated sites with ecological qualifying interests located within 5 km of the turbine area. There are no non-statutory (local) designated sites located within 2 km of the turbine area.

8.7.7 Sites designated for ornithological features only are addressed separately in **Chapter 9: Ornithology**.

Table 8.6: Statutory Designated Sites for Nature Conservation

Site	Distance and Direction	Qualifying Interests
Ben Klibreck SSSI	5.5 km, north	Habitats, including alpine heath and blanket bog.
River Naver SAC	6.5 km, north	Freshwater pearl mussel. Atlantic salmon
Skinsdale Peatlands SSSI (part of Caithness and Sutherland Peatlands SAC)	8.3 km, north-east	Blanket bog; and Vascular plant assemblage.
Caithness and Sutherland Peatlands SAC	8.3 km, east	Habitats incl. blanket bog, natural dystrophic lakes and ponds and transition mires and quaking bogs; and Marsh saxifrage.
Cnoc an Alaskie SSSI (part of Caithness and Sutherland Peatlands SAC)	8.6 km, north-west	Blanket bog.
Grudie Peatlands SSSI (part of Caithness and Sutherland Peatlands SAC)	10 km, south-west	Blanket bog.

Habitats and Vegetation

8.7.8 A summary of habitats recorded within the site is summarised below and in **Table 8.7**. Habitats are discussed with reference to both the Phase 1 habitat and NVC survey findings.

8.7.9 Detailed survey results are provided in **Appendix 8.1** and illustrated on **Figures 8.2** and **8.3.**

8.7.10 The turbine area comprises predominantly of blanket bog (E.1.6.1) and wet dwarf heath (D2), with the blanket bog characterised by a variety of abundant bog-mosses, interspersed with bog pools and bog-moss hollows. There are areas of dry modified bog (E1.8) in the north and centre of the turbine area, and wet modified bog (E1.7) along the eastern boundary of the turbine area. There are areas of acid grassland (B1)/ marshy grassland (B5) mosaic in the north of the turbine area, and unimproved acid grassland (B1.1)/ wet modified bog (E1.7) mosaic in the southern part of the turbine area. Dystrophic running water (G1.4) is present with heavily peat-stained waters flowing down the Allt nan Con-uisge Burn through the turbine area, and into the River Brora to the south-east of the turbine area. Coniferous plantation woodland (A1.2.2) adjoins the western boundary of the turbine area.

8.7.11 Along the access area, blanket bog (E1.6.1) and wet modified bog (E1.7) are extensive, with blanket bog found in flat or gently sloping areas where the peat is deep. The wet

modified bog is typically drier than the blanket bog, and is dominated by purple moor-grass *Molinia caerulea*. Wet dwarf shrub heath (D2) is most commonly in the eastern part of the access area, and it is dominated by deergrass *Trichophorum germanicum*.

8.7.12 The wet dwarf shrub heath and blanket bog habitats correspond to Habitats Directive Annex I habitats H4010 Northern Atlantic wet heaths with *Erica tetralix* and H7130 Blanket bog respectively. The habitat types also comprise SBL and Highland Biodiversity Action Plan habitats.

8.7.13 No protected plant species were recorded within the site. Dwarf birch *Betula nana*, a nationally scarce species in Scotland, is however present within the turbine area where it grows within the bog habitat in the west of the turbine area.

Table 8.7: Key Habitat Summary

Site	NVC Community Description
Blanket bog	The best community match for most of the blanket bog within the turbine area is M17a *Trichophorum germanicum – Eriophorum vaginatum mire, Drosera rotundifolia – Sphagnum* spp. sub-community. The peat is often over 2 m deep, on flat basins or gentle slopes and usually transitions with adjacent M25 or M15 communities. It is dominated by deergrass and hare's-tail cottongrass *Eriophorum vaginatum*, with lower cover of cross-leaved heath *Erica tetralix,* common cottongrass *Eriophorum angustifolium* and common heather *Calluna vulgaris.* Acute-leaved bog-moss *Sphagnum capillifolium* is an abundant throughout with a diverse range of other bog-moss species present. M2 - *Sphagnum cuspidatum* bog pool community and M3 – *Eriophorum angustifolium* bog pool community are present, with M2 community scattered throughout the M17a, and M3 community more isolated and present in fewer localities typically around the edges of the M17a and M15 communities. The M20 – *Eriophorum vaginatum* blanket mire community is present on the southern slopes of Sròn Leathad Chleansaid, where it transitions into M17a and M15 communities. The M25 – *Molinia caerulea – Potentilla erecta* mire community is present within the turbine area and along the access area, and is notably drier than the M17a, dominated by purple moor-grass, which forms a dense sward with large tussocks. Other plant species diversity is quite low, but tormentil *Potentilla erecta* is constant.
Wet heath	The best community match for wet heath within the site is M15 *Trichophorum cespitosum-Erica tetralix* wet heath. This is a ubiquitous community over much of the north and west of Scotland. The community is heavily dominated by deergrass, and common heather in varying quantities, with cross-leaved heath and some bog specialists, including bog-mosses *Sphagnum* spp., bog asphodel *Narthecium ossifragum* and sundews *Drosera* spp. The sub-community of M15 present is M15c *Cladonia* sub-community, which has varying proportions of cup lichens *Cladonia* spp. and hoary rock moss *Racomitrium lanuginosum* present.
Mire	The best match for small areas of mire occurring within the site is M6 *Carex echinata – Sphagnum fallax/ denticulatum* mire. The community type is present on the southern slopes of Sròn Leathad Chleansaid, consisting of spring-fed flushes over stones and shallow peat, and at one location

Site	NVC Community Description
	along the access area. The community comprises star sedge *Carex echinata* and carnation sedge *Carex panicea*, with frequent bulbous rush *Juncus bulbosus*, butterwort *Pinguicula vulgaris* and bogmosses, including cow-horn bogmoss *Sphagnum denticulatum*.

Terrestrial Mammals

8.7.14 Full details of terrestrial mammal surveys are provided in **Appendix 8.2**, and **Figures 8.4** and **8.5**.

8.7.15 Baseline terrestrial mammal conditions are summarised in **Table 8.8**.

Table 8.8: Summary of Baseline Terrestrial Mammal Conditions

Ecological Feature	Summary
Otter	No existing records of otter were returned by the HBRG. Surveys for the Strath Tirry Wind Farm application identified otter spraint and a potential couch site associated with the Feith Osdail. No signs identifying the use of watercourse sections within the site by otter were recorded during surveys. However, watercourses within the turbine area (Allt nan Con-uisge) and the River Brora to the south-east of the turbine area may provide some commuting opportunities for otter, as part of their wider territories. No otter holts were recorded during baseline surveys, and no suitable areas for the establishment of a holt were identified in the study area.
Badger	No existing records of badger were returned by the HBRG. No signs of badger were recorded within the study area during surveys. The open moorland habitats of the turbine area are of sub-optimal interest to badgers, providing little sheltered foraging opportunities, or conditions for sett creation. The species is considered unlikely to use the study area.
Pine marten	No existing records of pine marten were returned by the HBRG. Surveys for the Strath Tirry Wind Farm application identified pine marten scat (although locations were not disclosed). No signs of pine marten were recorded within the study area during surveys. Although the open moorland habitat of the turbine area is considered largely unsuitable for pine marten, use of the coniferous plantation woodland to the west of the turbine area and along the access area by the species cannot be discounted.
Water vole	Three records of water vole were returned by the HBRG, with records south-west or south-east of the turbine area (see **Figure 8.4**). During the surveys evidence of water vole was recorded at two locations in the north-west of the turbine area, and at one location along the access area (see **Figure 8.5**). Signs at the two locations within the turbine area were water vole droppings and runs, while water vole signs at the one location along the access area were droppings, burrow and a sighting of a water vole.
Red squirrel	No existing records of red squirrel were returned by the HBRG.

Ecological Feature	Summary
	The nearest red squirrel record according to Saving Scotland's Red Squirrels website is >20 km from the turbine area, near the village of Golspie. No signs of red squirrel were recorded within the study area during surveys. Given the isolation from other suitable woodland habitats, disturbance (extensive clear-felling) of the forestry adjacent to the turbine area, and lack of desk study records, red squirrel are considered unlikely to be present.
Wildcat	No existing records of wildcat were returned by the HBRG, and the site is approximately 40 km from "Strathpeffer", which is the nearest wildcat priority area (as defined by Scottish Wildcat Action[86]). No evidence of wildcat was recorded within the study area during surveys. Wildcat are considered to be absent from the study area, with a lack of suitable den sites (and lack of records from desk study sources).

Fisheries

8.7.16 The turbine area is located within the River Brora and River Tirry Catchments, with Allt nan Con-uisge (and associated tributaries) flowing through the turbine area before joining the River Brora to the south. There is one watercourse in the north-west of the turbine area which is a headwater of the River Tirry and it flows in a westerly direction (named as Abhainn Sgeamhaidh), before joining the River Tirry near Rhian, to the south-west of the turbine area. The condition of watercourses within the turbine area is detailed in the North Highland Area Fishery Management Plan: Catchment Summaries (2010[87]), with further information into the overall condition of the watercourses taken from SEPA's River Basin Management Plan[88].

8.7.17 The overall condition of the River Brora is classified by SEPA as 'Good Ecological Status/High Access for Fish Migration', with all other watercourses surveyed, unclassified.

8.7.18 The North Highland Area Fishery Management Plan states that the stretch of the River Brora that passes adjacent to the turbine area (Balnacoil to source) is heavily modified as it is impounded and abstracted at Dalnessie, and is also used to supply the Shin Hydropower scheme. There is no fish pass at the impoundment and habitat upstream of the impoundment is largely unsuitable for migratory fish, but the watercourse is still considered in the North Highland Area Fishery Management Plan to have good ecological potential.

[86] https://www.scottishwildcataction.org/latest-news/2015/august/have-you-seen-this-cat-six-wildcat-priority-areas-to-watch-out-for/ (Accessed 29th November 2021).

[87] https://www.sepa.org.uk/media/75570/doc-21-nh-catchment-summaries-caithness-and-sutherland.pdf (Accessed 24th November 2021).

[88] https://www.sepa.org.uk/data-visualisation/water-environment-hub (Accessed 24th November 2021).

Fish habitat

8.7.19 The watercourses surveyed are shown in **Figure 8.6**, and full details of fish surveys are provided in **Appendix 8.3.**

8.7.20 Watercourses within the study area are typically not suitable for migratory fish species, given the impoundment on the River Brora at Dalnessie (and lack of a fish pass) which will prevent fish from moving upstream. The watercourses are likely to support non-migratory fish, including brown trout *Salmo trutta* which were recorded in the River Brora adjacent to the turbine area (upstream from the impoundment) and the Allt nan Con-uisge which flows through the turbine area. No optimal freshwater pearl mussel habitat was recorded within the study area.

Bats

8.7.21 Full details of bat survey results are provided in **Appendix 8.4**, and **Figure 8.7**.

8.7.22 No existing bat records were returned by the HBRG.

8.7.23 The habitats within the turbine area are considered to be of low habitat risk for bats, in accordance with criteria presented in NatureScot guidelines (SNH, 2019).

8.7.24 The predominantly open habitats of the turbine area provide relatively poor foraging opportunities for bat species; however the ditches and burns present within the open habitats offer more suitable foraging opportunities and also connectivity with potentially higher value habitats outside the site.

8.7.25 Potential bat roost features within the site were absent; the turbine area is dominated by open grassland, heath and blanket bog which offers negligible roost opportunities and so is unlikely to support maternity or significant hibernation roosts. Furthermore, the coniferous plantation, which adjoins the western boundary of the turbine area and lies adjacent to the access area, is considered to offer negligible roosting potential for bats.

Baseline activity surveys

8.7.26 Baseline activity surveys in 2020-21 identified calls with the characteristics of the following bat species:

- Common pipistrelle *Pipistrellus pipistrellus*;
- Soprano pipistrelle *Pipistrellus pygmaeus*;
- Noctule *Nyctalus noctula*;
- Brown long-eared *Plecotus auritus*; and
- *Myotis* species.

8.7.27 The turbine area was assessed as having an overall ‘Low/Lowest Site Risk’, as per guidance (SNH, 2019). For those high collision risk species recorded (common and soprano pipistrelle and noctule) the overall risk assessment for common pipistrelle and noctule is ‘Low/Medium Site Risk’ and ‘Low Site Risk’ for soprano pipistrelle.

8.7.28 The number of nights when the static detectors successfully functioned was respectively 195, 189 and 79 during the summer, autumn and spring survey periods. When considering that the average number of static detectors that would be required for a 16-turbine development is 12 (in accordance with NatureScot guidance; SNH, 2019), this

equates to an average of respectively 16, 9 and 7 successful recording nights per detector during the summer, autumn and spring survey periods.

8.7.29 Overall bat activity recorded during surveys was very low, likely due to limited suitable habitat combined with the location and typical weather conditions making the turbine area of low suitability for bats. No favoured foraging areas or commuting routes were identified and it is considered that the habitats within the study area are of low importance for local bat populations.

Additional Species

8.7.30 The presence of common lizard was confirmed during Phase 1 habitat survey and is likely to be present throughout the site and outside the site.

8.7.31 A herd of approximately 40 red deer *Cervus elaphus* was recorded during the terrestrial mammal surveys and deer are actively managed on the Dalnessie Estate (including within the turbine area).

8.7.32 No other species are considered as having the potential for significant effects as a result of the Proposed Development.

8.8 Future Baseline

8.8.1 In the absence of the Proposed Development, or assuming a gap between baseline surveys and the commencement of the Proposed Development construction, changes in baseline ecology conditions (i.e. distributions and populations) are most likely to result from habitat modifications within or surrounding the site due to land management practices.

8.8.2 In the absence of the Proposed Development, the habitats within the site are considered to largely remain under the existing management regime. This comprises grazing by small numbers of livestock and deer.

8.8.3 Commercial forestry operations within adjacent plantation forestry, such as felling, may also alter the distribution of faunal species recorded during baseline surveys; however, it is highly unlikely this would be in such a way as to substantially alter the baseline reported here.

8.8.4 The site is not subject to any other development pressures or management which would affect the habitats or species in such a way that the present baseline conditions presented here would become substantively different.

8.8.5 Whilst short-term and small-scale variability in populations and distributions may occur, and revisions to conservation statuses and designations are possible, such changes would be unlikely to qualitatively alter the conclusion of the assessment presented within and have been accounted for through application of a precautionary approach and appropriate mitigation.

8.9 Design Considerations

8.9.1 The following design considerations have been incorporated to specifically reduce and/or otherwise avoid adverse impacts upon ecological features.

8.9.2 Full details of the scheme design evolution and embedded mitigation measures are detailed in **Chapter 2: Proposed Development.**

Land-Take

8.9.3 Proposed turbine locations, proposed access tracks and infrastructure have been designed to minimise the requirement for land-take, impacts on areas of deeper peat and the number of water crossings, reducing the loss of moorland habitats and potentially sensitive fish habitats.

Watercourse Buffers

8.9.4 A minimum 50 m buffer between Proposed Development infrastructure was applied around all watercourses in so far as possible, with the requirement for watercourse crossings also minimised in so far as possible.

Construction Environmental Management Plan

8.9.5 A Construction Environmental Management Plan (CEMP) will be in place during the construction phase of the Proposed Development. The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the Proposed Development in line with current industry and mandatory statutory guidance and as detailed within **Chapter 2 Proposed Development**.

8.9.6 The CEMP will also include Habitat Specific Protection Plans (HSPPs) detailing good practice measures for construction works within wet dwarf shrub heath and blanket bog habitats. HSPPs will detail measures required to manage construction works within these sensitive habitats and include habitat restoration measures.

8.9.7 The CEMP will be submitted to NatureScot for approval prior to the commencement of construction works, in consultation with The Highland Council (THC) and the Scottish Environment Protection Agency (SEPA).

Habitat Management Plan

8.9.8 In addition to the CEMP which will be produced to protect environmental receptors during the construction phase of the Proposed Development, an Outline Habitat Management Plan (OHMP) has been produced (see **Appendix 8.5**). The OHMP includes restoration measures of the most sensitive habitats within the turbine area, and subsequent monitoring which will measure the effectiveness of restoration works, with restoration works adaptable in response to monitoring outcomes.

Watercourse Crossings

8.9.9 The majority of main watercourse will comprise bottomless arched culverts in accordance with current SEPA guidance (2010[89]). This will maintain the existing bed substrate, hydraulic connectivity and passage for fish and other wildlife, such as water vole.

[89] SEPA (2010) Engineering in the water environment: good practice guide. River Crossings. Second Edition, November 2010.

8.9.10 There is one unregulated crossing with circular culvert proposed and a bridge to be built beside an existing bridge (which will be retained). See **Appendix 10.5** for further details into the watercourse crossings.

8.9.11 Post-construction checks for water vole prior to works at locations of all culverts (and the replacement bridge) are required to ensure that water voles are not using the banks at this location (determined through the presence or absence of burrows, and evidence of use).

8.9.12 The proposed water crossings 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).

8.9.13 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 Proposed Development.

8.9.14 A monitoring plan will also be established and incorporated into the CEMP in consultation and agreement with SEPA, the KSDSFB and the KSFT. The aim of the monitoring plan would be to characterise baseline conditions prior to construction works commencing and to continue throughout the construction phase to confirm that the mitigation measures with respect to water quality and maintenance of potential fish passages are performing.

8.9.15 The monitoring plan would also include details of response and remediation measures in the event mitigation measures are found not to be performing.

Bat Habitat Features

8.9.16 A minimum 50 m buffer (from blade tip) was applied to main watercourses and woodland edges, in so far as possible, to protect potential bat flight lines and foraging areas associated with these habitats.

8.9.17 Given all proposed turbines are located within open habitats, no key-holing or clear-felling of woodland is proposed.

8.10 Predicted Impacts

8.10.1 This section presents an assessment of effects upon important ecological features, in the absence of non-embedded design mitigation both as a result of the Proposed Development alone and cumulatively in-combination with other wind farm developments.

8.10.2 The Proposed Development has been assessed for an operational life of 35 years.

Important Ecological Features

8.10.3 A summary of important ecological features is provided in **Table 8.9**. The level of importance assigned to each feature is based upon baseline survey results and professional judgement.

8.10.4 Features which are unlikely to be affected 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'.

8.10.5 Mitigation measures are however outlined as appropriate to ensure legislative compliance.

Table 8.9: Summary of Important Ecological Features

Ecological feature	Importance	Justification
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 10: Geology, Hydrogeology, Hydrology and Peat**) 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 and Vegetation	Blanket bog and Wet Heath – Regional	Habitat loss as a result of the Proposed Development has been minimised through a sensitive scheme design. Direct land-take resulting in some loss of Annex I habitat types will however be unavoidable given their widespread nature throughout the turbine area. Such habitats are also widespread locally. Additional temporary habitat losses are also anticipated to occur during the construction and decommissioning phases of the Proposed Development. The potential for indirect effects on adjoining/nearby habitats for example through local changes to hydrology are also considered. **Scoped in to detailed assessment.**
All other habitats and vegetation	Local	Dwarf birch is present on the bog habitat in one location in the west of the turbine area. The species is present on the site, but outside the development footprint of the Proposed Development so will not be impacted. All other on-site habitats and vegetation are common, widespread, outside the development footprint of the Proposed Development and/or of low ecological value. **Scoped out of detailed assessment.**
Otter	Local	No designated site for nature conservation, designated by virtue of its terrestrial mammal (otter) interests, is located within 5 km of the turbine area. Records of otter were identified from surveys for the Strath Tirry Wind Farm application, but no otter records were returned from the HBRG. No field signs of otter were recorded in the study area during surveys, but watercourses (particularly the River Brora and Allt nan Con-uisge have potential to be used by foraging and commuting otter as part of their wider territory. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in **Section 8.9**) are considered adequate to avoid any potentially significant adverse effects upon otter.

Ecological feature	Importance	Justification
		Scoped out of detailed assessment.
Pine marten	Local	No designated site for nature conservation, designated by virtue of its terrestrial mammal (pine marten) interests, is located within 10 km of the turbine area. Records of pine marten were identified from surveys for the Strath Tirry Wind Farm application, but no pine marten records were returned from the HBRG. No field signs of pine marten were recorded in the study area during surveys and much of the site is considered unsuitable for the species. However, the potential for pine marten to use forestry adjacent to the turbine area cannot be discounted. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in **Section 8.9**) are considered adequate to avoid any potentially significant adverse effects upon pine marten. **Scoped out of detailed assessment.**
Water vole	Regional	Water vole presence has been established within several water courses within and adjacent to the site, through surveys and desk study records. It is also assumed that the species will utilise minor burns and issues 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. **Scoped in to detailed assessment.**
Badger	Local	No evidence of badger presence was recorded within the site or within the study area during surveys or from desk study records and the species is considered unlikely to use the study area. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in **Section 8.9**) are considered adequate to avoid any potentially significant adverse effects upon badger. **Scoped out of detailed assessment.**
Red squirrel	Local	No evidence of red squirrel presence was recorded within the site or within the study area during surveys or from desk study records. Given the isolation from other suitable woodland habitats, disturbance (extensive clear-felling) of the forestry adjacent to the study area, and lack of desk study records, red squirrel are considered unlikely to be present. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in **Section 8.9**) are considered adequate to avoid any potentially significant adverse effects upon red squirrel. **Scoped out of detailed assessment.**

Ecological feature	Importance	Justification
Wildcat	Local	No evidence of wildcat presence was recorded within the site or within the study area during surveys or from desk study records. Furthermore, the site is approximately 40 km from the nearest wildcat priority area. Overall habitats within the study area are sub-optimal for the species, with a lack of potential den sites. Embedded mitigation, including the implementation of good practice construction measures and pre-construction surveys (as detailed in **Section 8.9**) are considered adequate to avoid any potentially significant adverse effects upon wildcat. **Scoped out of detailed assessment.**
Deer	Local	Deer are present within the study area and a herd of approximately 40 red deer was recorded during the terrestrial mammal surveys. The habitats in the study area are optimal for deer. Red deer are managed in the locale. Consultation with the Dalnessie Estate will be undertaken to ensure works associated with the Proposed Development do not affect deer management protocols in place. Deer do not therefore constitute an important ecological feature and are not considered to be at risk from the Proposed Development. **Scoped out of detailed assessment.**
Fish	Regional	No designated site for nature conservation, designated by virtue of its fisheries interests, is located within 5 km of the turbine area. No records of fish were returned from the HBRG. The Dalnessie impoundment on the River Brora (and lack of fish pass) has meant that the watercourses in the Brora catchment within the study area will not be used by migratory fish, and only resident fish populations will be present. A minor channel in the north of the turbine area which is a headwater of the River Tirry was appraised as only being suitable for small numbers of non-migratory fish given the characteristics (shallow and ephemeral) and presence of brash creating an obstacle to any fish movements within the watercourse, The River Brora which adjoins the turbine area to the south-east, and the Allt nan Con-uisge which flows through the turbine area in the south and west provides the highest quality fish habitat, and brown trout were recorded in both watercourses. There is potential for indirect effects upon fish populations downstream of the Proposed Development, where unmitigated works could result in sedimentation or the escape of other pollutants. Embedded mitigation, including the adoption of culverts which allow free passage (and monitoring to ensure the effectiveness of such measures), together with good practice construction measures and pollution prevention controls (as detailed within **Chapter 10: Geology, Hydrogeology, Hydrology and Peat**) are considered

Ecological feature	Importance	Justification
		adequate to avoid any potentially significant adverse effects upon local fish populations. **Scoped out of detailed assessment.**
Bats - roosting	Local	No designated site for nature conservation, designated by virtue of its bat interests, is located within 10 km of the turbine area, and no records of bat species were returned from the HBRG. No structures suitable for roosting bats were identified within the study area. **Scoped out of detailed assessment.**
Bats - foraging	Local	No designated site for nature conservation, designated by virtue of its bat interests, is located within 10 km of the turbine area, and no records of bat species were returned from the HBRG. Common pipistrelle, soprano pipistrelle, noctule, brown long-eared and *Myotis* bat species were recorded during the bat activity surveys. Overall, very low levels of bat activity were recorded, which is considered representative of the low value of habitats within the turbine area for bats and immediate surrounding area. **Scoped in to detailed assessment.**
Additional species	Local	Habitats within the study area do provide some suitability for reptile species, with common lizard recorded during baseline surveys. Overall the predominant habitats within the study area to be impacted by the Proposed Development, comprising open heathland, bog and grassland provide sub-optimal habitats for reptiles and are extensive outside the site. Significant adverse effects upon reptile species are not predicted. Watercourses within the study area were appraised as sub-optimal for freshwater pearl mussel. Furthermore, good practice construction measures and pollution prevention controls (as detailed within **Chapter 10: Geology, Hydrogeology, Hydrology and Peat**) are considered adequate to avoid any potentially significant adverse effects on freshwater pearl mussel in the event that they are present within connected watercourses downstream of the study area. **Scoped out of detailed assessment.** Given the protection afforded to individual reptiles against international or reckless killing and injuring reptiles are considered for mitigation (as detailed in **Section 8.11**) to ensure legislative compliance during the construction and decommissioning phases of the Proposed Development.

Potential Effects in the Absence of Mitigation

8.10.6 This section identifies the potential effects upon habitats (wet heath and blanket bog), foraging bats and water vole in the absence of non-embedded design mitigation in relation to the construction and operational phases of the Proposed Development.

8.10.7 Impacts arising from the decommissioning phase of the Proposed Development have not been presented in detail because they are considered to be of a similar nature to the construction issues identified but of a potentially 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 the construction phase, and with all infrastructure removed and habitats reinstated to pre-development conditions.

Habitats and Vegetation

8.10.8 There are three main ways by which habitat features may be affected during the construction phase of the Proposed Development:

- Direct loss – to accommodate the Proposed Development. 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 loss – calculated for blanket bog and wet dwarf shrub habitats which are located within 10 m of direct habitat loss areas, to account for potential changes in habitat vegetation structure due to drying effects as a result of construction works.

8.10.9 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 10: Geology, Hydrogeology, Hydrology and Peat**.

8.10.10 Overall potential effects upon the aquatic environment are considered to be highly localised and can be mitigated through sensitive scheme design, standard best practice construction methods and pollution prevention controls in accordance with current guidance, and are therefore not discussed further within this assessment.

Construction Effects

8.10.11 For the purposes of assessment, a precautionary approach has been taken which assumes that direct habitat loss and indirect loss of habitats represents a permanent, irreversible adverse effect (due to for example, drying out of bog and wet heath habitats within 10 m of works). In practice it is highly likely that some areas indirectly/temporarily affected will be able to be restored i.e., during habitat reinstatement following construction in accordance with the OHMP and Peat Management Plan (see **Appendices 8.5** and **10.2**) and in accordance with a CEMP prepared for the project prior to construction, so more weight is given to direct habitat loss in the assessment. No habitat losses are attributed to the two mobilisation compounds proposed (located shown on **Figure 8.2**),

given these will only be short-term (present during the construction phase and decommissioned once the Proposed Development is constructed), and will be temporarily located on terram material and imported stone.

8.10.12 **Table 8.10** details the estimated direct and indirect/ temporary habitat losses as a result of the construction of the Proposed Development, and potential effects on blanket bog and wet heath communities. Some areas of the site comprise a mix of habitats which are too complex to separate into defined habitat types. For those mosaic habitats comprising of bog and wet heath habitats, these are included in the habitat loss calculations and are shown in **Table 8.10**. Where bog and/or wet heath habitats are part of a mosaic habitat with other non-Annex I habitats, including marshy grassland and acid grassland, the extent of bog and wet heath habitats within these are considered inconsequential, so are not included in **Table 8.10**. All habitats, including those mosaic habitats are shown on **Figures 8.2** and **8.3**.

8.10.13 Total direct habitat loss for the Proposed Development will be 17.62 ha (calculated from MapInfo using NVC habitat base mapping) of which 16.74 ha are accounted for in **Table 8.10**. The remaining 0.88 ha of habitats to be directly lost comprise marshy grassland and mosaic habitat which have been scoped out of the assessment, with regards to ecology. Those habitats identified as GWDTEs are however considered in the assessment in **Chapter 10: Geology, Hydrogeology, Hydrology and Peat.**

8.10.14 There will be a 3.80 % direct relative coverage loss of blanket bog habitat, 3.68 % direct relative coverage loss of wet heath habitat and 4.94 % direct relative coverage loss of blanket bog/wet heath mosaic, of the respective habitat areas present in the site, from the Proposed Development. When combined with indirect losses the total permanent habitat losses will be 12.64 %, 14.96 % and 27.97 % for blanket bog, wet heath and blanket bog/wet heath mosaic, respectively from the Proposed Development.

Table 8.10: Permanent Habitat Losses

Phase 1 Habitat Type	NVC Community/ Sub-community	Total Area Within Site Boundary (ha)	Habitat Losses (ha)			Direct Relative Coverage Lost (%)	Total Relative Coverage Lost (%)
			Direct	Indirect	Total		
Blanket bogs (E1.6.1), wet modified bogs (E1.7) and dry modified bogs (E1.8)	M17a, M20 and M25	317.45	12.05	28.07	40.12	3.80	12.64
Wet dwarf shrub heath (D2)	M15, M15b and M15c	114.62	4.22	12.93	17.15	3.68	14.96
Blanket bogs (E1.6.1),	M17a/M15c and M25/M15c	9.51	0.47	2.19	2.66	4.94	27.97

wet modified bogs (E1.7) and wet dwarf shrub heath (D2) mosaic							

8.10.15 The **permanent**[90] direct and indirect loss of the above habitats is considered to constitute an impact of **Low/Medium adverse magnitude**, resulting in an effect of **Minor adverse significance**, and which is **Not significant** in the context of the EIA Regulations.

Operational Effe***cts***

8.10.16 During the operational phase there will be a small increased risk of runoff and pollution however, this is considered to be mitigated through scheme design and the implementation of pollution prevention measures during any maintenance works.

8.10.17 Any effect is considered to be **permanent**, but of **Negligible magnitude,** resulting in an effect of **Negligible adverse significance,** and which is **Not significant** in the context of the EIA Regulations.

Decommissioning Effects

8.10.18 The potential decommissioning effects are considered to be of a similar nature as temporary direct and indirect habitat losses incurred during the construction phase, and as such will be **Low/Medium adverse magnitude**, resulting in an effect of **Minor adverse significance**, and which is **Not significant** in the context of the EIA Regulations.

Water Vole

8.10.19 The presence of water vole has been established at several locations along watercourses within the study area, including the site. It is also likely the species will utilise additional issues and burns to disperse between watercourses within the site.

Construction Effects

8.10.20 The construction of the Proposed Development has the potential to impact upon water voles as a result of:

- Habitat loss and deterioration;
- Habitat fragmentation;
- Incidental mortality and disturbance; and
- Pollution.

8.10.21 The spatial extent over which construction works associated with the Proposed Development will be highly localised, restricted to five main watercourse crossings and

[90] >30 years for the purpose of assessment.

as such is only likely to impact upon a small number of individual water vole territories within or overlapping with the study area.

8.10.22 The construction of each watercourse crossing will require the permanent loss of approximately 10 m of watercourse bank habitat (5 m assumed either side) available for potential use by the established local water vole population within and surrounding the study area.

8.10.23 In the context of remaining available and suitable habitat for water voles within the study area and outside the study area, although **permanent**, this is considered to represent no more than an impact of **Low magnitude**, resulting in an effect of **Minor adverse significance**, and which will not affect the favourable conservation status of the species. As such the effect will be **Not significant** in the context of the EIA Regulations.

8.10.24 The design of main watercourse crossings will retain free passage of water voles and other wildlife beneath and as such, given the small number of watercourse crossings required, little severance or fragmentation of water vole habitat within the study area will occur.

8.10.25 The construction of watercourse crossings has the potential to result in the damage or destruction of water vole burrows and/or killing or injuring of individual water voles. Construction works at watercourse crossings will however, be restricted to defined working areas and together with the mobility of the species allowing for escape, is highly unlikely to result in the death or injury of individual water voles.

8.10.26 Noise and visual disturbances are also generally considered unlikely to have any significant impacts upon water voles (Dean *et al*., 2016[91]) 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).

8.10.27 Mitigation measures are therefore outlined to ensure legislative compliance during the construction phase of the Proposed Development.

Operational Effects

8.10.28 No potentially significant effects to water voles during the operational phase of the Proposed Development are anticipated.

Decommissioning Effects

8.10.29 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 be no more than an impact of **Low magnitude**, resulting in an effect of **Minor adverse significance**, and which will not affect the favourable conservation status of the species. As such the effect will be **Not significant** in the context of the EIA Regulations.

8.10.30 Mitigation measures are however required and are outlined in **Section 8.12** to ensure legislative compliance.

[91] Dean, M., Strachan, R., Gow, D. & Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series). Eds. Fiona Matthews and Paul Chanin. The Mammal Society, London.

Bats

8.10.31 Bat activity surveys have demonstrated that the turbine area of the Proposed Development is subject to very low levels of bat usage and by a narrow range of bat species. The habitats across the turbine area are predominantly open grassland and wetland areas which have lower value to foraging and commuting bats in comparison to areas of woodland and woodland edge habitats outside the site. Furthermore, no suitable features that could potentially be used by roosting bats were recorded within the turbine area.

Construction Effects

8.10.32 Overall habitat losses for bats as a result of the Proposed Development are considered small relative to their suitability for bats and the availability of comparable habitats remaining within the site and outside the site. Potential impacts are therefore, although **permanent**, are considered to be of **Negligible magnitude,** resulting in an effect of **Negligible adverse significance**, and which is **Not significant** in the context of the EIA Regulations..

8.10.33 Noise, lighting and dust generation during the construction period could potentially result in disturbance and reduced foraging opportunities for bats, particularly if night-time work is undertaken. Extensive night-time working is not anticipated during the core bat activity period, April to September, due to available daytime working hours.

8.10.34 Good practice construction measures will limit the potential for dust and contaminant generation within suitable bat habitats adjacent to construction areas. As such, any impact of disturbance to bat species within the site are considered to be of **Negligible magnitude**, resulting in an effect of **Negligible significance**, and which is **Not significant** in the context of the EIA Regulations.

Operational Effects

8.10.35 NatureScot guidance (SNH, 2019a) states that operational wind farms can affect bats in three ways:

- Death or physical injury caused by interaction with operational wind turbines (e.g., collision or barotrauma);
- Loss of, or damage to, commuting and foraging habitat; and
- Displacement of individuals or populations from the area.

8.10.36 The assessment of operational effects is restricted to noctule, common and soprano pipistrelle species only, as they are categorised as of 'high risk' of collision from wind turbine developments (SNH, 2019a) and were the three most commonly recorded species accounting for 91 % of all bat recordings.

8.10.37 Operational impacts on bats are difficult to characterise due to the limited evidence base; bat mortality in the UK is poorly understood and this prohibits mortality risks from being accurately quantified and predicted. Assessments are therefore undertaken based on current guidance (SNH, 2019a).

8.10.38 NatureScot guidance (SNH, 2019a) requires a two-stage site assessment approach, as follows:

- Stage 1 - gives an indication of the potential risk level of a site, based on consideration of habitat and development-related features; and
- Stage 2 – uses the output of Stage 1 (i.e., the potential risk level of a site) to provide an overall risk assessment based on the activity level of high collision risk species.

8.10.39 Following the Site Risk Level matrix presented in Table 3a of the NatureScot (2019a) guidance for Stage 1, the Proposed Development is assessed as being of Low/Lowest Site Risk (Low Habitat Risk and Medium Project Size).

8.10.40 Stage 2 of the assessment process has been informed by the output from Ecobat which provides a numerical comparative interpretation of bat activity at development sites (Lintott *et al*., 2018[92]).

8.10.41 The evaluation of bat activity for Stage 2 is presented within **Appendix 8.4**.

8.10.42 The Overall Risk Assessment for common pipistrelle and noctule is considered to fall under “Low/Medium Site Risk” and under “Low Site Risk” for soprano pipistrelle.

8.10.43 No maternity roosts and/or significant swarming or hibernation roosts for any bat species were confirmed within the site, and no potential for these to be present was identified. However, based on output from Ecobat analysis it is possible that a noctule and *Myotis* daytime roost supporting low numbers of bats may be present outside the site.

8.10.44 NatureScot guidance (SNH, 2019a) advises that to reduce potential impacts upon bats, resulting from operational wind turbine development, a 50 m 'stand-off' distance should be maintained around bat habitat features, into which no part of the turbine intrudes. The guidance provides a formula for calculating this 'stand-off' distance.

8.10.45 The layout of the Proposed Development has adopted a minimum of 93 m and 57 m buffer distances between proposed turbine locations (turbines T1 to T11 and turbine T16) and the bat habitat features woodland and watercourses (respectively), to maintain an appropriate stand-off distance in accordance with NatureScot guidance (SNH, 2019a). The required buffers were based on an 81.5 m blade length and 118.5 m hub height, and 25 m woodland feature. For turbines T12 to T15, a minimum of 109 m and 87 m buffer distances between proposed turbine locations and bat habitat features woodland and watercourses (respectively) were adopted, given the reduced hub height (98.5 m) of these four proposed turbines.

8.10.46 The bat population on the site has been valued at a local level due to the species recorded being widespread and common. Based on activity levels recorded and subsequent analysis as outlined, mortality or injury levels for bat species are considered to be low. The Proposed Development is not considered to represent a site of concern for bat collision risks following the approach to assessment set out in NatureScot guidance (SNH, 2019a). It is however, acknowledged that low risk sites can still result in bat casualties, but for which embedded ‘stand-off’ distances from habitat features in accordance with NatureScot guidance (SNH, 2019a) are considered adequate mitigation to avoid potentially significant operational mortality risks to bats at most low-risk locations.

[92] Lintott, P.R., Davison, S., van Breda, J., Kubasiewicz, L., Dowse, D., Daisley, J., Haddy, E. and Mathews, F., 2018. *Ecobat*: An online resource to facilitate transparent, evidence-based interpretation of bat activity data. Ecology and evolution, 8(2), pp.935-941.

8.10.47 Impacts of bat collision risk mortality are subsequently considered to be a **permanent** impact of **Low magnitude**, resulting in an effect of **Minor adverse significance,** and which is **Not significant** in the context of the EIA Regulations.

Decommissioning Effects

8.10.48 Decommissioning phase effects upon bats as a result of habitat loss, deterioration and disturbance are considered to be largely consistent with construction phase impacts and would be of **Negligible magnitude**, resulting in an effect of **Negligible adverse significance**, and which would be **Not significant** in the context of the EIA Regulations.

8.11 Cumulative Effects

8.11.1 In accordance with SNH guidance (2012), a cumulative impact assessment need only be sought where it is considered that a proposal could result in significant cumulative impacts.

8.11.2 The only wind farm within 10 km of the turbine area is the proposed Strath Tirry Wind Farm (THC Planning ref: 20/05067/FUL), which is a 4-turbine scheme approximately 4 km south-west of the turbine area, and located on land adjacent to the access area.

Construction Effects

8.11.3 Construction effects could be the loss, or degradation, of suitable bat foraging habitat and effects of dust, light and noise distance on foraging bats if works were to be undertaken at night. Potential for cumulative construction effects on bats are considered highly unlikely to occur in recognition of the implementation of the 50 m buffer between blade tip and key bat features (woodland edge and main watercourses), which is a key component in the design of both the Proposed Development and proposed Strath Tirry Wind Farm, and lack of potential bat roost features identified at both schemes. Furthermore, there is no requirement for the removal of any trees with bat roost features and there are no proposals for extensive night-time works during the core bat active period (April to September). The effect on bats during construction of the Proposed Development is therefore considered to be of **Negligible magnitude**, resulting in an effect of **Negligible adverse significance**, and which is **Not significant** in the context of the EIA Regulations, when considered cumulatively with other relevant wind farms.

8.11.4 In terms of loss and modification of Annex I habitats, the proposed Strath Tirry Wind Farm EIA Report, considers losses to wet heath (NVC community M15c), blanket bog (M17a), bog woodland (W4c) and potential GWDTEs to be a significant adverse effect. However, with the implementation of a HMP, to include habitat reinstatement, restoration and enhancement, the residual effects on these Annex I habitats would be non-significant, beneficial. Effects on Annex I habitats wet heath and blanket bog for the Proposed Development were determined to be of **Low/medium adverse magnitude**, resulting in an effect of **Minor adverse significance** and which is **Not significant** in the context of the EIA Regulations.

8.11.5 Given the adoption of a HMP to restore and enhance Annex I habitats is fundamental for the Proposed Development, construction cumulative effects with the proposed Strath Tirry Wind Farm on Annex I habitats is considered highly unlikely. Therefore, the effects on Annex I habitats during the construction phase of the Proposed Development are

considered to be **Low/medium adverse magnitude**, resulting in an effect of **Minor adverse significance** and which is **Not significant** in the context of the EIA Regulations, when considered cumulatively with other relevant wind farms.

8.11.6 No further potential cumulative effects are considered (for example on watercourses) given the adoption of embedded mitigation as detailed in **Section 8.9**.

Operational Effects

8.11.7 Cumulative operational effects are considered in relation to bats only.

8.11.8 Bat collision or barotrauma impacts have been minimised through the sensitive and considered design of the Proposed Development and by implementation of standard good practice measures regarding buffer distances of turbines from woodland edges, commuting corridors and other bat features in order to minimise the potential for impacts on commuting and foraging bats and therefore the likelihood of cumulative operational impacts.

8.11.9 The implementation at the proposed Strath Tirry Wind Farm of standard good practice measures regarding buffer distances of turbines from forestry edges (and other key bat features) to minimise impacts on commuting and foraging bats, further minimises the likelihood of cumulative operational impacts.

8.11.10 Cumulative operational impacts on bats are therefore considered to be no more than a **permanent** impact of **Low magnitude**, resulting in an effect of **Minor adverse significance,** and which is **Not significant** in the context of the EIA Regulations when considered cumulatively with other relevant wind farms.

Decommissioning Effects

8.11.11 Cumulative decommissioning phase effects upon ecological features are considered to be consistent with cumulative construction phase impacts and for bats would therefore be of **Negligible magnitude**, resulting in an effect of **Negligible adverse significance**, and which is **Not significant** at a local level. when considered cumulatively with other relevant wind farms. For Annex I habitats such effects would be of **Low/medium adverse magnitude**, resulting in an effect of **Minor adverse significance** and which is **Not significant** in the context of the EIA Regulations, when considered cumulatively with other relevant wind farms.

8.12 Mitigation

8.12.1 No significant adverse effects upon ecological features will occur as a result of the Proposed Development.

8.12.2 Mitigation measures are however, outlined below to ensure legislative compliance with regards protected species during the course of construction and decommissioning works.

Environmental Clerk of Works

8.12.3 A suitably qualified and experienced Environmental Clerk of Works (ECoW) will be appointed prior to the commencement of construction and decommissioning activities and through whom appropriate ecological advice will be provided throughout.

8.12.4 The ECoW will be responsible for undertaking and/or co-ordinating checks for protected species before construction and decommissioning activities commence. The ECoW (or appointed 'clerks' on behalf of the ECoW) will also maintain a watching brief as necessary throughout the construction and decommissioning phases to ensure compliance with relevant legislation.

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

Protected Species

8.12.6 Pre-construction and pre-decommissioning surveys for protected mammal species (including otter, badger, pine marten, red squirrel and wildcat) will be undertaken no more than six months before the commencement of activities. Surveys will be undertaken in accordance with current survey guidance and will aim to identify the presence or likely presence of protected mammals within working areas and appropriate buffers.

8.12.7 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.

8.12.8 SPPs will be designed to provide the appointed contractor and ECoW with approved methodologies and mitigation measures for carrying out certain activities and will be agreed in consultation with NatureScot.

Water Vole

8.12.9 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.

8.12.10 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 main watercourses within the turbine area and the requirement for watercourse crossings.

8.12.11 Five main watercourse crossings are however required to facilitate the Proposed Development and may result in the damage or destruction of individual burrows and/or disturbance of water voles within their burrows.

8.12.12 A water vole SPP will be prepared for the Proposed Development in accordance with Dean *et al.* (2016) and NatureScot (2020f) guidance, with an appropriate licence obtained from NatureScot, if required.

8.12.13 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 NatureScot following a pre-construction water vole survey undertaken in accordance with current guidance.

Reptiles

8.12.14 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.

8.12.15 Common lizard and potentially 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.

8.12.16 A SPP will be prepared for reptiles 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 Proposed Development.

8.12.17 The SPP will be agreed in consultation with NatureScot and will detail emergency procedures to be implemented by site workers in the event reptiles are encountered during works.

Residual Effects

8.12.18 No significant adverse residual effects upon ecological figures will occur as a result of the Proposed Development (alone or in combination with any other wind farm development).

8.13 Ecological Enhancement Measures

8.13.1 An Outline Habitat Management Plan has been provided as **Appendix 8.5** and details outline habitat enhancement principles to be implemented as part of the Proposed Development.

8.13.2 The Outline Habitat Management Plan will be agreed in consultation with NatureScot and seek to enhance habitats for a variety of animals, including black grouse, fish, water vole and general moorland biodiversity through targeted species management measures and best practice moorland management.

8.14 Summary of Effects

8.14.1 A summary of ecological effects is provided in **Table 8.11**. Cumulative effects on bats and Annex I habitats have been considered at the construction (and decommissioning) phase, with such effects on bats also considered at the operational phase of the Proposed Development. Given no significant cumulative effects are identified on these ecological features, the details provided in **Table 8.11** are also applicable for impacts of the Proposed Development in the context of cumulative effects.

Table 8.11: Summary Table of Impacts 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 and confidence level (following mitigation)
Habitats and Vegetation	Direct and indirect loss, to include disturbance (construction)	Low/medium magnitude, some temporary loss to be reinstated	Minor adverse, not significant	Not required. However, avoidance of main areas of Annex I habitats via design, and protect Annex I habitats through good practice measures, such as pollution control measures and habitat restoration. HMP to include peat/bog restoration which will enhance bog habitats on-site.	Not significant
	Disturbance (runoff/ pollution during operation)	Negligible	Negligible adverse, not significant	Not required.	Not significant
	Disturbance (runoff/ pollution during decommissioning)	Low/medium magnitude	Minor adverse, not significant	Not required. However, good practice measures included (such as production of a CEMP to prevent run-off/pollution).	Not significant
Water vole	Direct loss of habitat (construction)	Low magnitude	Minor adverse, not significant	Not required but precautionary measures included.	Not significant
	Mortality (construction)	Low magnitude	Minor adverse, not significant	Not required but precautionary measures included.	Not significant
	Displacement (noise/visual during construction)	Low magnitude	Minor adverse, not significant	Not required but precautionary measures included.	Not significant

Feature	Proposed Activity	Characterisation of unmitigated impact upon feature	Significance without mitigation and confidence level	Mitigation and Enhancement	Residual significance and confidence level (following mitigation)
Bats	Disturbance/ displacement/ habitat loss (construction and decommissioning)	Negligible	Negligible adverse, not significant	Not required. However, mitigation by design included (buffers from bat features).	Not significant
	Collision mortality (operational)	Low magnitude	Minor adverse, not significant	Not required. However, mitigation by design included (buffers from bat features).	Not significant

8.15 References

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