Contents

8.0 Ecology and Biodiversity 1
8.1 Introduction 1
8.2 Scope and Consultation 1
8.2.1 Scoping Responses 1
8.2.2 Additional Consultation 5
8.2.3 Effects Scoped Out 6
8.3 Approach and Methodology 7
8.3.1 Study Area 7
8.3.2 Information and Data Sources 7
8.3.3 Field Survey 8
8.3.4 Assessment Methods 10
8.3.5 Assumptions, Limitations and Confidence 14
8.4 Environmental Baseline and Potential Sources of Impact 15
8.4.1 Current Baseline 15
8.4.2 Vegetation Baseline 19
8.4.3 Faunal Baseline 22
8.4.4 Evaluation of Faunal Receptors 26
8.4.5 Cumulative Assessment 32
8.4.6 Future Baseline 32
8.5 Assessment of Potential Effects 32
8.5.1 Embedded Measures 33
8.5.2 Good Practice Measures 33
8.5.3 Identification of Potential Effects 34
8.5.4 Construction Effects 35
8.5.5 Operational Effects 41
8.5.6 Decommissioning Effects 44
8.6 Mitigation, Compensation and Enhancement 44
8.6.1 Construction 44
8.6.2 Operation 47
8.7 Assessment of Cumulative Effects 48
8.7.1 Construction Phase 48
8.7.2 Operational Phase 52
8.7.3 Decommissioning Effects 54
8.8 Residual Effects 54
8.8.1 Construction 54
8.8.2 Operation 56

8.9 Further Survey Requirements and Monitoring 56
8.9.1 Habitat Monitoring 56
8.9.2 Species Monitoring 56
8.9.3 Hydrological Monitoring 56
8.10 Summary of Predicted Effects 56
8.10.1 Proposed Development 56
8.10.2 Cumulative Effects 63
8.11 References 63

8.0 Ecology and Biodiversity

8.1 Introduction

This Chapter considers the current non-avian nature conservation interest of the Site and surrounding area. It goes on to assess the potential effects of the proposed development on important habitats and species and, where necessary, to describe proposed mitigation, compensation and enhancement measures. This Chapter considers habitats, plants and animals other than birds only. Likely significant effects on birds are considered separately in **Chapter 9: Ornithology**. Together **Chapters 8 and 9** provide an assessment of the likely significant effects of the proposed development on biodiversity.

The specific objectives of the Chapter are to:

- Describe the ecological baseline;
- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the likely significant effects, including direct, indirect and cumulative effects;
- Describe the mitigation and compensation measures proposed to address likely significant effects; and
- Assess the residual significant effects following the implementation of mitigation and compensation and identify biodiversity enhancements.

This Chapter is supported by the following Technical Appendices:

- **Technical Appendix 8.1: Ecology Desk Study Report;**
- **Technical Appendix 8.2: Vegetation Survey and Habitat Mapping Report;**
- **Technical Appendix 8.3: Protected Mammal Survey Report (Confidential Badger Report Appendix provided with restricted access);**
- **Technical Appendix 8.4: Bat Survey Report;**
- **Technical Appendix 8.5: Fish Habitat Survey Report;**
- **Technical Appendix 8.6: Outline Biodiversity Enhancement and Restoration Plan; and**
- **Technical Appendix 8.7: Shadow Habitats Regulations Appraisal Screening Report.**

8.2 Scope and Consultation

8.2.1 Scoping Responses

A Scoping Report (SLR, 2021) was submitted to the Energy Consents Unit (ECU) in November 2021. Scoping responses containing comments related to non-avian ecology and nature conservation were received from the following organisations:

- ECU in consultation with Moray Council;
- NatureScot;
- Marine Science Scotland;
- Scottish Environment Protection Agency (SEPA);
- River Deveron District Salmon Fishery Board; and
- RSPB Scotland.

No responses were received (that may have been of relevance to non-avian ecology) from Fisheries Management Scotland, John Muir Trust, River Spey Fishery Board (note no connectivity of Site to this catchment) and Scottish Wildlife Trust.

A summary of the key points from the relevant scoping responses and details of how comments have been addressed in the EIA report are provided in **Table 8-1.**

Table 8-1: Scoping Key Issues

Consultee	Issue Raised	Response/Action Taken
NatureScot	Protected areas: NatureScot (NS) focus on avoidance of adverse effects to protected areas. Agree with list of sites provided in scoping report for assessment. Request that a Habitat Regulations Appraisal be provided to address Moray Firth Special Protection Area (SPA), Moray and Nairn Coast SPA, Tips of Corsemaul and Tom Mor SPA and Loch Spynie SPA. The proposed survey/assessment methodology deemed sufficient to inform EcIA and HRA. Note there was no request to assess sites of relevance to non-avian ecology.	**Technical Appendix 8.7**: Shadow Habitats Regulations Appraisal addresses all listed protected areas within the consultation response and extends to include for Moray and Nairn Coast Ramsar and Loch Spynie Ramsar. The conclusions screen out need for further assessment at Step 3 (Assessment of Likely Significant Effects). Follow up consultation with Senior Planning Officer (Development Management) of Moray Council, confirmed on 3rd August 2023 that Moray Council '*...accept the conclusions as set out in Section 5 of the Stage 1 report*'.
	Biodiversity: NS recommend liaising with Forestry and Land Scotland (FLS) with regard to felling and restocking plan following Storm Arwen.	Forestry Commission Scotland's (FCS is now operating as FLS) *Summary of Forest Design Plan Proposals* (2013) has been taken into account to inform the Outline Biodiversity Enhancement and Restoration Plan (OBERP; refer to **Technical Appendix 8.6**) that supports this impact assessment. FLS manage the forest on behalf of Scottish Ministers and have been fully engaged throughout the EIA process, and discussions have been held relating to Storm Arwen, although no updates were made to the existing forestry management plan as it has now expired and new one is being developed (outwith the wind farm process).
	A comment is made that it is '*unusual not to detect evidence of badger activity*' and note that mitigation will be included that '*should safeguard this species in any case*'.	Badger setts have been historically identified within the Site boundary and surrounding 2km buffer. Furthermore, follow up surveys of Site identified badger setts and activity (see **Technical Appendix 8.3, Confidential Appendix 02** for further details).
	Peatland and carbon rich soil: NS highlight the potential to investigate peatland restoration at 'Broken Moan' as part of the project.	Broken Moan was surveyed as part of the habitat surveys. Detail of this is provided in **Technical Appendix 8.2** and was taken forward in an early draft of an Outline Habitat

Consultee	Issue Raised	Response/Action Taken
		Management Plan (OHMP). With the publication of NPF4, the approach has widened to provide an Outline BERP (**Appendix 8.6,** which replaces the OHMP) and Broken Moan is considered herein as a potential option for restoration of degraded peatland habitats on the Site.
	NS requested for the project team to follow pre-app and scoping advice for onshore wind farms including a checklist to complete.	SLR have made reference to these documents throughout survey planning, execution and assessment. The completed NatureScot scoping has been followed. A checklist responding to Annex 1: Assessing the Impacts of Development on Peatland, Carbon-Rich Soil and Priority Peatland Habitats is provided in **Appendix 02** of the Habitat Report (**Technical Appendix 8.2**). SLR conducted surveys for habitats, protected mammals, bat foraging/commuting, fish habitat/electro-fishing and assessment of habitat suitability for other protected/priority species. The details of these surveys are provided in **Technical Appendices 8.2 to 8.5.** A summary of proposed mitigation relating to non-avian ecology is detailed in Section 8.6.
SEPA	SEPA referred to their 'generic scoping advice for windfarms which covers all the relevant issues'. SEPA shared their agreement with all the factors proposed to be scoped out of further study; whilst, providing the following project-specific advice relevant to non-avian ecology:	This document has been referred to within the survey planning, execution and assessment.
	Final location of infrastructure should avoid deep peat (>1m).	SLR undertook a UK Habitat Classification (UKHab) and NVC survey of the Site. These details are provided i**n Table 8-4** and in **Technical Appendix 8.2.** Details of potential GWDTE noted during these surveys are provided within Section 8.4.2. Full assessment of GWDTE is provided in **Chapter 10: Geology Hydrology, and Hydrogeology.**
	Welcomed the proposed approach to assessing the impact on GWDTE.	Refer to above.
	Encouraged proposals for peatland restoration (offsite locations should considered if limited onsite opportunities	Details of proposed restoration can be found in Section 8.6.

Consultee	Issue Raised	Response/Action Taken
	exist and any other ecological improvements that can be delivered).	An Outline Biodiversity Enhancement and Restoration Plan (OBERP)) is provided within **Technical Appendix 8.6**. **Figure 8.6.1** within **Technical Appendix 8.6** shows areas with the potential to be restored.
	Welcomed direct developer engagement if thought beneficial once NVC and Phase 2 peat probing has been carried out and initials thoughts on tracks and other supporting infrastructure has been formulated.	Noted.
ECU	At the end of operational life, a Decommissioning and Restoration Plan to be submitted to the Planning Authority for approval.	It is anticipated that the requirement to action this recommendation will form a condition of the projects consent.
	Request review of Marine Scotland's generic scoping guidelines for both onshore wind farm and overhead line development which outline how fish populations can be impacted during construction, operation and decommissioning of a wind farm development[1]. Request to identify the main watercourses and water bodies within and downstream of the proposed development area plus, at an early stage, identify and consider Special Areas of Conservation (SACs) where fish are a qualifying feature (reference to felling operations in acid sensitive areas).	A fish habitat assessment of the Site and further fish habitat assessment/ electro-fishing surveys were conducted outside of the Site (where survey conditions were suited). The results are detailed in Section 3 and in full in **Technical Appendix 8.5.** A fish monitoring plan has been provided for the construction and operational phases (with the need to plan and design monitoring at decommissioning stage). Fish habitat surveys covered the main watercourse and tributaries within and close to the Site, a desk-based search for protected areas with fisheries interests within 2km of the Site was undertaken. Results provided within Section 3 of **Technical Appendix 8.5.** **Water quality is detailed in Chapter 10 Geology, Hydrology, Hydrogeology.** The guidance has influenced the assessment of proposed development design and footprint with no discernible effect predicted to fish populations of the SACs (**Technical Appendix 8.5**.
	Request to provide checklist, provided in Annex 1 of the standing advice, to ensure the EcIA provides sufficient information.	The checklist will be provided with the application to the ECU.
	Scottish Ministers advise that the Company liaise with NatureScot regarding deeper peat called Broken Moan in the area of the development and to investigate peatland restoration.	Broken Moan was surveyed as part of the habitat surveys. Detail of this is provided in **Technical Appendix 8.2** and was taken forward in an early draft of an Outline Habitat Management Plan (OHMP). With the publication of NPF4, the

[1] https://www.gov.scot/publications/onshore-renewables-interactions/

Consultee	Issue Raised	Response/Action Taken
		approach has widened to provide an Outline BERP (**Appendix 8.6**) and Broken Moan is considered herein as a potential option for restoration of degraded peatland habitats on the Site. Post-consent (assumed consented) consultation will be a timely opportunity when details of the Development are defined.
River Deveron District Salmon Fishery Board	The Aultmore and Isla support productive populations of salmon and trout and baseline electrofishing and habitat surveys should be conducted in advance of construction as part of the EIA and then continued during and post construction for 2 years to ensure there is no impact from the development. This should be further accompanied by water quality monitoring before, during and after construction to monitor for any changes that would not otherwise be detected by electrofishing surveys.	Refer to above response to ECU. The need for a water quality monitoring plan is addressed in the **Chapter 10: Geology, Hydrology, and Hydrogeology.**
	It is essential that the peat across this entire area is not only protected but restored. All turbines, access tracks and cable trenches should be located and routed to areas with minimal depth (<0.5m peat) and all peat should be reinstated post construction. Furthermore, it would be desirable if the development proposal could include a peat restoration plan to restore the peatland across the entire forest area. This should include the blocking of existing peat drainage ditches, removal of commercial forestry as appropriate and riparian planting with native deciduous trees.	Infrastructure has been sited to avoid deeper peat as far as practical. See **Chapter 10: Geology, Hydrology and Hydrogeology**. An Outline BERP has been provided **Technical Appendix 8.6**. This includes Restoration of degraded peatland and heathland habitats, enhancement of riparian corridors and woodland restoration/ enhancement measures.
RSPB Scotland	…we are satisfied with the scope of the EIA as presented…	We are pleased that RSPB are satisfied with the scope of the EIA as presented in the scoping report.

8.2.2 Additional Consultation

Moray Council Senior Planning Officer, was consulted on 20 June 2022 to follow up on the original scoping response provided; with particular reference to protected areas and HRA. Various emails between that time and 03 August 2023 confirmed that Moray Council were satisfied that the project provided a Shadow HRA which was used to inform their determination of whether full Appropriate Assessment was required. Moray Council confirmed they '*accept the conclusions as set out in Section 5 of the Stage 1 report*' (as detailed in **Table 8 1**). In terms of non-avian ecology, note the following relevant conclusion to Shadow HRA Screening:

'The River Spey SAC runs approximately 5.3km west of the Site and the Lower River Spey - Spey Bay SAC is 6.2km north-west. There is no hydrological connection between these European sites and the proposal Site, and they were therefore screened out of the appraisal.'

FLS were contacted on 29th August 2023 to provide deer data to inform our assessments and to provide justification for screening out certain surveys/assessment (e.g., Deer Management Plan).

NatureScot, Moray Council and SEPA responded to Gatecheck Stage 1, no further comments were made in relation to any ecological elements.

8.2.3 Effects Scoped Out

This assessment concentrates on the effects of construction and operation of the proposed development upon important ecological receptors.

Ecological receptors have been scoped out of further assessment where there is no potential for significant effects upon that ecological receptor, the ecological receptor is less than Local importance (See **Table 8-4** and **Table 8-6**) or is not a Groundwater Dependent Terrestrial Ecosystem (GWDTE) and is not subject to legal protection.

Sites designated specifically for birds, which are considered separately in **Chapter 9 - Ornithology**, and designated sites located over 2km from the Site and which are not hydrologically connected to the Site (see **Table 7.1 of Scoping Report**[2]) have been scoped out from the assessment as effects on such sites either do not have non-avian designated features or there is no clear route to potential impacts.

Based on the desk study (see Section 3 of **Technical Appendix 8.1**) and consideration of the extent and nature of the proposed development, the need for surveys to assess the following species or species groups have been scoped out of the assessment. For more information on each species/group, please refer to **Table 8-4** and **Table 8-7.** Note that, where relevant, mitigation measures are still provided for.

- Invertebrates and reptiles: In accordance with current NatureScot (2020) guidance (NatureScot, 2020), surveys for invertebrates and reptiles (plus any other species not mentioned in our proposed approach) are not considered necessary to inform the EIA (note that the guidance states: '*…with standard mitigation, [amphibians] are unlikely to experience any significant environmental effects*' and will ' *not normally require surveys to inform the EIA, unless they are European Protected Species (EPS) or qualifying features of protected areas*'. No records of great crested newt *Triturus cristatus* (an EPS) are known within 30km of Site. Surveys in 2007 (Hyder)[3] did not record great crested newts or their eggs (torch surveys and egg searches). The desk study returned no records of this species **Technical Appendix 8.1**). No Habitat Suitability Index or activity surveys were considered necessary. As defined in the scoping report, the NatureScot guidance will be followed '*to apply mitigation during construction to minimise impacts and avoid committing an offence*' in this chapter. A habitat-based assessment has been undertaken and will inform the assessment of potential impacts and the need for mitigation measures during construction.
- Bats: No at-height bat detector surveys were proposed in the Scoping Report. Excluding at-height surveys is considered to be appropriate in this situation, as there was no supporting evidence (i.e., from the desk study or preliminary habitat suitability assessment) that suggested a high level of bat activity was likely, that the species diversity would be significantly different[4]; therefore, a sufficiently robust assessment of predicted impacts was possible with 'lower height' setting of static detectors and surveys at height were not justified.
- Deer: A separate deer management plan has been scoped out, based on it being unlikely that wild deer are present in significant numbers. A request for deer numbers to FLS has been made on 29th August 2023 with a response as yet not received. A previous request for fauna records made to FLS in June 2023 did not return any deer records. Section 5.7 of the current FLS (previously Forestry Commission Scotland, 2013) Forest Management Plan sets the objective of '*deer culling in an exemplary and humane way…to slow down expansion of deer species…to manage deer density…likely to be at a density level of 5 to 7 individuals per 100Ha*'. Since the Forest Management Plan is due for renewal (in progress) and will include updated deer management measures for the Aultmore Forest site, a separate deer management plan remains scoped out.
- Marine species: Impacts on marine species have been scoped out given the distance between the Site and the connected coastline (c. 5km downstream) with no impacts predicted. Embedded

[2] SLR (2021) Proposed Aultmore Wind Farm – Scoping Report.

[3] Hyder. (2007). *Aultmore Wind Farm Environmental Statement: Ecology Chapter.*

[4] Collins, J. (2009) Differences in Bat Activity in Relation to Bat Detector Height: Implications for Bat Surveys at Proposed Windfarm Sites. *Acta Chiropterologica*: 11(2): 343-350.

pollution prevention mitigation, described in Section 8.5.1 and 8.5.2, and **Chapter 10: Geology, Hydrology and Hydrogeology**, are considered appropriate to prevent impacts to the marine water environment.

8.3 Approach and Methodology

This Chapter takes an appropriate and topic-specific approach to assessment of the proposed development within the parameters identified in **Table 3-1** of **Chapter 3: Site Selection and Design Evolution.** This Chapter provides a worst-case assessment for non-avian ecology and aims to present enough information for consultees and the decision makers to comment on and determine the application within the parameters of the proposed development.

8.3.1 Study Area

The study area used for the Ecological Impact Assessment varies according to the ecological receptor in question, based on relevant good practice guidance.

The study area used for habitats and vegetation is shown on **Figure 8.2.1** within **Technical Appendix 8.2** and includes all areas within the Site where development is proposed and an associated buffer zone that ensures coverage of wetland habitats within 250m of all proposed turbines and borrow pits and 100m from all other proposed infrastructure, including the access track from the B9016. SEPA guidelines (SEPA, 2017) stipulate survey of a 250m buffer from excavations deeper than 1m, and a 100m buffer for excavations of less than 1m.

Habitat and vegetation surveys were completed across the study area, with the exception of parts of the required study area around two of the borrow pit search areas (BP 1 and BP4). The lack of survey here was due to extremely dense young conifer plantation making access not possible. Both these areas are existing borrow pits used by FLS.

The study areas for relevant faunal species are summarised in the 'Field Survey Methodology' Section below and are described in more detail within **Technical Appendices 8.3 – 8.5**. For ease of reference the study areas included all suitable habitat within the Site, as well as watercourses within 250m of proposed infrastructure (where this lies outside of the application boundary) for mammals (excluding bats and the fish habitat/fish electro-fishing assessments that were at defined, targeted locations).

Bat activity static survey took place at key locations on the Site (see **Figure 8.4.1** within **Technical Appendix 8.4).**

Fish habitat assessment and electro-fishing surveys were conducted at key locations on and off Site (see **Figure 8.5.1** within **Technical Appendix 8.5).**

8.3.2 Information and Data Sources

An ecological desk study was undertaken to collate available ecological information in relation to the proposed development and surrounding environment (see Sections 2 and 3 of **Technical Appendix 8.1)**. Desk study data relating to protected and priority species were acquired from the following sources:

- North East Scotland Biological Records Centre (NESBReC) was commissioned in June 2023 to provide data relating to records of protected, priority and other notable species within the Site and 10km of it for all bat species, and a 2km radius for all other protected/notable species and for non-statutory designated sites.
- Forestry and Land Scotland (FLS) provided records of protected, priority and other notable species within 2km of Aultmore Forest in June 2023.

- Multi-Agency Geographic Information for the Countryside (MAGIC)[5] and NatureScot Sitelink[6]: Information relating to statutory designated nature conservation sites within an approximate 10km radius of the Site.
- Ancient Woodland Inventory Scotland: A search was made for woodlands listed on the Ancient Woodland Inventory within a 10km radius of Site.
- The NatureScot Carbon and Peatland 2016 Map (SNH, 2016a) was reviewed. This provided a value indicating the likely presence of carbon-rich soils, deep peat and priority peatland habitat for each individually mapped area, at a coarse scale across Scotland.

Additionally, EIA reports and any post consent/construction information for wind farms and other developments within 2km of the Site (where available) were sought, including:

- Aultmore Wind Farm Environmental Statement: Ecology Chapter (Hyder, 2007) that also summarises relevant information from a previous Environmental Impact Assessment (AMEC, 2003);
- Lurg Hill Wind Farm Environmental Statement (Volume 1) Chapter 13: Ecology and Ornithology (Vento Ludens, 2017), and subsequent 2022 Environmental Appraisal; and
- Myreton Crossroads 2 Phase 1 Habitat Survey (RSK, 2009).

Correspondence with the North East Scotland Bat Group in June 2021 confirmed that '*NESBReC holds all* [the bat group] *data so this the mechanism* [that consultants] *should use for a data search*'.

8.3.3 Field Survey

Field surveys were carried out in 2021 and 2022. The survey area in 2022 encompassed the proposed access track into Aultmore Forest and is denoted by the blue dashed line in **Figure 8.2.2** The 2021 survey area covered the majority of the Site and is denoted by the purple hashed line in **Figure 8.2.2** These survey areas as shown in **Figure 8.2.2** will be referred to as the '2021 Survey Area' and '2022 Survey Area' in the following text.

A UKHab and NVC survey was undertaken on all developable land (Land identified as being potentially suitable for wind farm development based on early constraint plans) within the Site boundary and that which lay within 250m buffer from key infrastructure and 100m from new access tracks. All areas for temporary works were included within the survey. The area surveyed equates to c. 1570 hectares (ha). A small additional area to the west of the Site was surveyed in August 2022 which covered the proposed access route (**Figure 8.2.2** of **Technical Appendix 8.2).**

A walkover survey to assess the potential of the Site to support protected and priority species was undertaken in August – September 2021 in the same area as the UKHab and NVC surveys. The proposed access track was surveyed in August 2022 (**Figure 8.3.2** of **Technical Appendix 8.3)**.

Bat surveys included a habitat appraisal and deployment of a suite of automated full spectrum detectors at 12 of the 16 proposed turbine locations, at ground level. An assessment of the suitability of the Site, to support roosting bats was undertaken in August-September 2021, though in-depth Preliminary Roost Assessment (PRA) was not undertaken of all trees within the coniferous plantations. A PRA of the access route was undertaken along the access track in August 2022 with a return visit in September 2023. No at height monitoring was undertaken and no walked transects were undertaken. Full details are provided in **Technical Appendix 8.4.**

A fish habitat survey was undertaken by Mhor Environmental Ltd in September 2021 (locations on and off the Site) and in 2022.The survey was undertaken at twenty-six locations with reference to Scottish Fisheries Coordination Centre (SFCC, 2007) methods. An updated fish habitat survey and electrofishing

[5] https://magic.defra.gov.uk/

[6] https://sitelink.nature.scot/map

survey was undertaken in August 2023 at ten locations on and off Site. Further details can be found in **Technical Appendix 8.5.**

The scope of the surveys described in paragraphs above was agreed with NatureScot as part of the Scoping process. The methodologies for the survey work are briefly outlined below, for full methodologies please refer to **Technical Appendices 8.2-8.5.**

8.3.3.1 UK Habitat Classification Survey

A UKHab (Butcher *et al.,* 2020) survey of the Turbine Developable Area was undertaken in 2021 and 2022.

8.3.3.2 National Vegetation Classification (NVC) Survey

An NVC survey of all habitats was undertaken simultaneously within the UKHab survey. The NVC survey was undertaken on semi-natural habitats using the NVC system (Rodwell 1991 et seq., 5 volumes) and in accordance with NVC guidelines (Rodwell, 2006) (see **Technical Appendix 8.2**).

Following the NVC survey, potential GWDTEs were identified in terms of their high, moderate or low potential groundwater dependence, based on SEPA (2017). A more detailed assessment of the likely groundwater dependence of these communities was then undertaken as part of the hydrogeology assessment (**Chapter 10: Geology, Hydrology and Hydrogeology**) that has identified high and moderate GWDTE on the Site.

8.3.3.3 Mammal Survey

A survey for protected and priority species of terrestrial mammal (excluding bats) was undertaken in August and September 2021 and in August 2022 (see **Technical Appendix 8.3).** The species specifically targeted (badger *Meles meles,* otter *Lutra lutra*, water vole *Arvicola amphibius,* pine marten *Martes martes*, wildcat *Felis silvestris* and red squirrel *Sciurus vulgaris)* were based on the likelihood of occurrence, ascertained from known species distribution and habitat suitability.

Surveys followed standard methodologies in place at the time of survey, e.g., Chanin (2003a & b), Ward *et al.* (1994), Cresswell (2012), Gurnell & Pepper (2001), Strachan *et al.* (2011), Balharry *et al.* (2008) and Neal and Cheesman (2006). The survey area encompassed potentially suitable habitats accessible within the Site as well as watercourses within 250m of potential infrastructure locations in line with relevant guidance (e.g., SNH, 2016b).

8.3.3.4 Bat Survey

Static detector units (SM2, SM2+ initially then repeated surveys with solely SM4, Wildlife Acoustics) were deployed at the twelve of the sixteen proposed turbine locations, in line with NatureScot guidelines. Detectors were deployed on three occasions between June and September 2021 for a period of 15 nights, to collect data on bat activity in the spring, summer, and autumn periods. Further details and a map showing static detector locations are provided in **Technical Appendix 8.4.**

Aerial images were consulted to identify features that could support maternity roosts and significant hibernation and/or swarming sites within 200m plus rotor radius of the turbines. No onsite survey to assess this Site usage was deemed required as no suitable areas of significant hibernation/swarming habitat were identified on aerial images or during surveys.

During the 2021 surveys a bat roost potential survey was carried out to give an overview of roosting potential within a 50m buffer area of planned infrastructure, where accessible to the surveyor.

The suitably of the Site to support foraging and commuting bats was assessed following BCT guidelines (Collins 2016). in order to assign a 'level' of commuting and foraging suitability (i.e., High, Moderate, or Low).

A preliminary roost assessment (PRA) of the '2022 Survey Area' to assess any tree or structure with bat roost potential was carried out in August 2022.

Six trees identified during the PRA survey along the access track, were subject to follow up bat surveys with detailed endoscopic inspection of these trees carried out on the 8th of September 2023. Results are provided in **Technical Appendix 8.4.**

8.3.3.5 Fish Habitat Assessment

To assess the potential for fish species of conservation concern (e.g., salmonids and European eel *Anguilla anguilla*) to be present in watercourses within the study area, a fish habitat survey was undertaken by Mhor Environmental Ltd in September 2021 and 2022. The survey also included an assessment for habitat suitability for freshwater pearl mussels *Margaritifera margaritifera* (FWPM). An updated fish habitat survey and electrofishing survey was undertaken in August 2023 at ten locations on and off Site. Further details can be found in **Technical Appendix 8.5.**

More specifically in line with the SFCC methodology, a combination of methods developed by Hendry and Cragg-Hine (1997) and those developed for the river/fisheries habitat surveying (Environment Agency, 2003) were adopted. During the field survey, each watercourse and surrounding habitats were characterised and assessed according to the following criteria:

- Predominant channel substrate and flow-types;
- Habitat features;
- Modifications to the channel and banks;
- Channel vegetation types;
- Vegetation structure of the banks and banktop; and
- Land-use.

Results are provided in **Technical Appendix 8.5.**

8.3.3.6 Electrofishing

Electrofishing surveys were conducted across three days from 21st to 23rd August 2023. Survey locations were determined prior to revisiting the Site using data collected and reported by Mhor Environmental Ltd (**Technical Appendix 8.5**) and adjusted accordingly owing to Site conditions (access restrictions and water flow).

Fully quantitative methods were adopted; fully quantitative surveys use a multiple run approach (3 runs) and estimates of fish abundance were based on fish depletion during successive runs. Fully quantitative surveys are area based and calculate the number of fish per 100m² as per SFCC guidelines, the data collected can then be compared to other data collected year on year.

Full results are provided in **Technical Appendix 8.5.**

8.3.3.7 Incidental Sightings

During all ecological surveys, incidental sightings of other notable flora and fauna were also recorded.

8.3.4 Assessment Methods

CIEEM *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (CIEEM, 2018 updated 2022) (henceforth referred to as the CIEEM guidelines) form the basis of the impact assessment presented in this Chapter. The CIEEM guidelines have been endorsed by NatureScot.

8.3.4.1 Sensitivity of Receptor

In accordance with the CIEEM guidelines, only ecological receptors (habitats, species populations, ecosystems and their functions/processes) which are considered to be important and potentially affected by the proposed development should be subject to detailed assessment. It is not necessary to carry out detailed assessment of receptors that are sufficiently widespread, unthreatened, and resilient to impacts from the proposed development and will remain viable and sustainable. For this assessment, effects have been considered for receptors of Local value or greater, plus any additional receptors subject to legal protection.

Ecological receptors should be considered within a defined geographical context. For this assessment the following geographic frame of reference has been used:

- **International and 'European'**
  - Habitats or species that form part of the cited interest within an internationally protected site or candidate site (for example SAC, SPA, or Ramsar site). This includes European protected habitats and species, and internationally important wetlands.
  - A habitat or species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being an area or population of the highest quality example in an international/national context that the site is likely to be designated as an SAC/SPA.
- **National (i.e., Scotland)**
  - Habitats or species that form part of the cited interest within a nationally designated site (for example, a SSSI or a National Nature Reserve (NNR).
  - A habitat which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being one of the highest quality examples in a national context for which the Site could potentially be designated as an SSSI. This includes Annex 1 habitats and UK priority habitats.
  - A population of a species which is either unique or sufficiently unusual (in terms of distribution and/or abundance) to be considered as being of nature conservation value at up to a country context. This includes European protected species, Wildlife and Countryside Act Schedule 5 species, 'Nationally Scarce' species (i.e. occurring in between 16 and 100 10km OS grid squares, and priority UK species).
- **Regional (i.e., North-East Scotland)**
  - Viable areas of internationally or nationally important habitats (i.e. Annex I habitats and priority UK habitats) present in quality and extent at a regional (e.g. biogeoclimatic zone as partially defined by the SNH Natural Heritage Futures) level of importance.
  - Sites supporting a regularly occurring, regionally significant number of internationally or nationally important species. This includes European protected species, 'Nationally Scarce' species and priority UK species.
- **County (i.e., Moray)**
  - Sites that are a Local Nature Reserve (LNR) or Wildlife Site (including those that are provisionally designated).
  - Sites containing viable area(s) of any priority UK habitat or presence of species identified in the UK Biodiversity Action Plan (UK BAP) or Local Biodiversity Action Plan (LBAP).
  - Sites supporting viable breeding populations of species known to be Scottish Local Authority rarities and/or supplying critical elements of their habitat requirements.
  - Habitats which provide locally important semi-natural habitats.
  - Populations of any species of conservation importance in the context of the county.

- **River basin district (i.e., River Deveron catchment)**
  - Habitats which are not considered extensive and/or of good enough quality to qualify for non-statutory designation but which provide locally important aquatic or wetland habitats within the River Deveron catchment.
  - Populations of aquatic/riverine species of conservation importance in the context of the River Deveron catchment (e.g. otter and fish species).
- **Local (i.e., within approximately 5km)**
  - Habitats which are not considered extensive and/or of good enough quality to qualify for non-statutory designation but which provide locally important semi-natural habitats such as species-rich hedgerows or small ponds within an approximate radius of 5km from the Site.
  - Populations of any species of conservation importance in the context of the local area within an approximate radius of 5km from the Site.
- **Less than local**
  - Habitats which are not considered to qualify for non-statutory designation but which provide locally-important semi-natural habitats in the context of the immediate surrounding area.
  - Populations of any species of conservation importance in the context of the immediate surrounding area.
- **Negligible**
  - Commonplace habitat or species with little or no significance, the loss of which would not be seen as detrimental to the ecology of the area.

In accordance with CIEEM guidelines the value of habitats has been measured against published selection criteria and other relevant data where available. Examples of relevant criteria include Annex 1 of the Habitats Directive[7], the Scottish Biodiversity List (SBL)[8], and North East Scotland Biodiversity Partnership Local Biodiversity Action Plan (NELBAP)[9].

In assigning a level of value to a species population, it is necessary to consider the species' distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive); species of principal importance for biodiversity in Scotland as listed on the SBL (i.e. priority species); national and local population estimates where available, studies on distribution and territory sizes of specific species and local priority species listed by the North-East Scotland Biodiversity Partnership.

8.3.4.2 Magnitude of Impact

The ecological impact assessment process involves the following steps:

- Identifying and characterising impacts;
- Incorporating measures to avoid and mitigate (reduce) these impacts;
- Assessing the significance of any residual effects after mitigation;
- Identifying appropriate compensation measures to offset significant residual effects (if required); and
- Identifying opportunities for ecological enhancement.

[7] The Habitats Directive. Available online at https://environment.ec.europa.eu/topics/nature-and-biodiversity/habitats-directive_en

[8] The Scottish Biodiversity List. Available online at https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list

[9] https://www.nesbiodiversity.org.uk/our-biodiversity-in-the-north-east-of-scotland/

When describing ecological impacts, reference has been made to the following characteristics, as appropriate:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

Both direct and indirect impacts are considered. Direct ecological impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or receptor, e.g., the creation of access tracks which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of adjacent peatland habitats.

8.3.4.3 Significance of Effect

For the purposes of this assessment, in accordance with CIEEM guidelines, a 'significant effect' is defined as '*one that is sufficiently important to require assessment and reporting so that the decision-maker is adequately informed as to the environmental consequences of permitting the project*.' Effects can be considered significant at a wide range of scales from international to local. For example, a significant effect on a SSSI is likely to be of national significance whilst a significant effect on a regionally important population of a species is likely to be of regional significance.

8.3.4.4 Avoidance, Mitigation, Compensation and Enhancement

A sequential process has been adopted to avoid, mitigate, and compensate for ecological impacts. This is often referred to as the 'mitigation hierarchy'.

It is important for the EIA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ;
- Compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

8.3.4.5 Cumulative Effects

Cumulative effects can result from individually not significant but collectively significant actions taking place over a period of time or concentrated in a particular location. The potential for cumulative effects with other development proposals has been assessed here.

For aquatic receptors potential cumulative effects are only likely to be significant for other developments located relatively close by (i.e., within 5km) and within the same hydrological sub-catchments (as is common practice for hydrological/ ecological assessment of similar schemes in Scotland).

For (non-avian) terrestrial receptors potential cumulative effects are only likely within 10km of Annex 1, SBL, and NELBAP habitats and where other developments are located within the regular range of more mobile species, e.g., bats and wildcat. For example, cumulative effects on bats are likely to be limited to

other wind farm developments and as such, for bats, the cumulative assessment has been restricted to other developments within 10km. The assessment includes operational projects, projects under construction, consented projects which are not yet under construction, and projects for which planning applications have been submitted.

8.3.5 Assumptions, Limitations and Confidence

Presented here is a summary of limitations detected during the surveys, further details are presented in **Technical Appendices 8.2-8.5**. It should be noted that none of these limitations are considered likely to significantly affect the assessment.

The baseline data collated to inform the assessment is considered to accurately represent the key habitats and species present and is sufficiently detailed and current to allow a realistic and reliable assessment of effects. Although it should be noted that there is the potential for the baseline situation to change with time, particularly in the context of the commercial conifer plantation where clear-felling inevitably results in rapid changes in habitat types and therefore suitability for certain protected species (e.g., bats, pine marten, wildcat). Also, in the absence of evidence of a species (particularly rare and elusive species such as wildcat), it cannot be assumed, where suitable habitat is present, that the species is entirely absent or that the use of the area could not change in the future.

During the UK Hab and NVC surveys, many of the rides between the forest blocks were overgrown, making them impassable, therefore they have not been delineated during the mapping process and have been included as part of the forest blocks. This is not considered to have presented a constraint to the identification of the vegetation communities present within the survey area.

The Site survey area, as defined on **Figure 8.2.2** and in **Technical Appendix 8.2**, included occasions where a full 250m buffer area from turbine locations had not been subject to survey and mapping, due to the land lying outside of the Site boundary where landowner permissions to access were not made available. As shown in **Figure 8.2.1** infrastructure within the middle part of the Site was surveyed within 10m distance for habitats, this area contains approximately 2km of track, a potential substation location and two potential borrow pit locations. The habitat within these areas were photographed with less accessible areas classified from aerial imagery. NVC surveys were carried out on sensitive habitat types within these areas in 2022 giving confidence to habitat structure and predicted species assembly. Given professional judgement, we are confident that this did not impact the results and is not likely to significantly affect the assessment.

For mammal surveys carried out during 2021, access was only possible within the Site boundary with the exception of extended surveys within the riparian habitats, focussed on the survey area as shown in **Technical Appendix 8.3 – Figure 8.3.2**. As shown in this Figure the middle section of the Site was largely not surveyed for protected mammals, this area contains approximately 2km of existing access track, a potential substation location and a potential borrow pit location. Therefore, any species field signs outwith of the survey area shown on Figure 8.3.2 may not have been recorded (except for otter and water vole as fish surveys were extensive beyond the Site and any incidental records made were incorporated into reporting and assessment). In addition, the dense nature of the forestry within the Site made accessing small streams and other features very difficult. It is however considered that sufficient locations were visited to provide sufficient evidence on which to base a presence/ likely absence conclusion for each species considered herein.

An occasional heavy rain shower may have obscured evidence of some riparian mammal activity on the first mammal survey visit in 2021; however, this was not considered to be a limitation since the freshwater areas were resurveyed in September 2021 in favourable weather conditions. Vegetation cover surrounding Burn of Ryeriggs was tall and very dense at the time of the 2022 survey. While a thorough check for otter and water vole field signs was carried out, potential for missed field sign observations exists due to the overgrown nature of surrounding vegetation.

Although the limitations detailed above may mean some signs of otter weren't recorded (e.g., sprainting sites), it is unlikely that these limitations led to the under recording of natal holts due to the unsuitability of the habitat that was unable to be surveyed. Additionally, we have reviewed the previous otter survey

results undertaken to inform nearby windfarms (Vento Ludens 2017) along with previous surveys carried out on the Site (Hyders, 2007) and conclude that the assessment contained in this Chapter is valid.

Active harvesting operations within mature coniferous woodland habitat in eastern section of the 250m survey area buffer (**Technical Appendix 8.3 – Figure 8.3.2)** prevented survey access to certain areas during the 2022 mammal survey of the access track. It has however been assumed that protected species pre-felling checks would have been carried out under the responsibility of Forestry and Land Scotland (FLS) prior to felling works commencing and therefore potential constraints relating to protected and/ or priority species within felling areas are considered unlikely.

In relation to wildcat, as is the case for most terrestrial mammals (excluding bats), there is uncertainty around the potential long-term effects of wind farm development on the species. This is due to lack of published monitoring studies that have considered the issue in any detail. As a 'critically endangered' species in Scotland, a precautionary approach has been taken in both the assessment of effects and in determining the proposed suite of mitigation measures. The assessment has been informed by a review of available literature and all available wildcat data for the wider study area.

In spring, there were some issues with the SM2 model bat detectors where they failed to record at some point during the monitoring period. During spring the static detector at location 1 failed to record throughout the survey period. For more detail refer to Table 2-4 in **Technical Appendix 8.4**.

During the update fish habitat assessments in 2023 forest works were under way making it difficult to gain access to water courses. Only two watercourses within the redline boundary contained water, the rest were dry or no defined watercourses were present. During the electrofishing assessments in 2023 watercourses identified by Mhor Environmental Ltd (**Technical Appendix 8.5**) such as AM05, AM09, AM10, AM11, AM13 and AM14 were not suitable for electrofishing due to the dense vegetation and in some circumstances limited to no water available. Updated surveys in 2023 provided a more detailed and robust assessment of watercourses on and off site to evidence potential to support and presence / likely absence of specific species

No sampling for aquatic invertebrates was undertaken as part of the baseline surveys. Pre-construction surveys will be undertaken to inform the baseline of monitoring works carried over the course of the development.

An ecological survey provides only a 'snapshot' of the conditions prevailing at the time of survey. Whilst it is considered unlikely that any significant evidence of protected or otherwise notable species were overlooked during the survey work, due to the nature of the subjects of ecological surveys, it is feasible that species that use the Site may not have been recorded by virtue of their seasonality, cryptic behaviour, habit, or random chance. This is a standard limitation that is common to all ecological survey work. It is considered unlikely, however, that additional surveys of the Site would materially alter the conclusions of the baseline survey work.

8.4 Environmental Baseline and Potential Sources of Impact

8.4.1 Current Baseline

8.4.1.1 Desk Study

Statutory Designated Sites

There are no ecologically designated sites within the Site boundary. There are 13 designated sites located within 10km of the Site boundary, including one Ramsar, nine Sites of Scientific Interest (SSSIs), two Special Areas of Conservation (SACs), and one Marine Protected Area (MPA), excluding Special Protection Areas which are designated for birds. These are detailed in **Table-8-2** and illustrated on **Figure 8.1.1** in **Technical Appendix 8.1.**

Table-8-2: Statutory Designated Sites within 10km

Site Name	Designation	Approximate Distance and Direction from Site	Reason for Designation	Evaluation
Mill Wood	Site of Special Scientific Interest (SSSI)	4.56km, S	Upland birch woodland.	National
River Spey	Special Area of Conservation (SAC)	5.21km, SW	Atlantic salmon *Salmo salar*; otter; freshwater pearl mussel and sea lamprey *Petromyzon marinus*.	European
Spey Bay	SSSI	5.47km, WNW	Dingy skipper butterfly *Erynnis tages*; small blue butterfly *Cupido minimus;* Hydromorphological mire range; saltmarsh; shingle; vascular plant assemblage; and wet woodland.	National
River Spey	SSSI	6.11km, WSW	Fresh water and riparian habitats, and Atlantic salmon, otter, freshwater pearl mussel, and sea lamprey.	National
Moray and Nairn Coast	Ramsar	6.15km, WNW	The Site supports a variety of important wetland features, including particularly good examples of intertidal flats, saltmarsh and floodplain alder *Alnus glutinosa* woodland. At least six nationally scarce aquatic and coastal plants are present, sea centaury *Centaurium littorale*, Baltic rush *Juncus balticus*, oysterplant *Mertensia maritima* and the eelgrasses *Zostera noltei*, *Z. angustifolia* and *Z. marina*. The British Red Data Book invertebrates, *Ochthebius lenensis* (a small water beetle) and *Tetanocera freyi* (a snail-killing fly) are also found.	International
Lower River Spey	SSSI	6.15km, WNW	River shingle/sand; and wet woodland.	National
Lower River Spey Bay	SAC	6.16km, WNW	Alder woodland on floodplains; and coastal shingle vegetation outside the reach of the waves.	European
Shiel Wood Pastures	SSSI	6.21km, ESE	Fen meadow; lowland acid grassland; lowland calcareous grassland; and lowland neutral grassland.	National
Cullen to Stake Ness Coast	SSSI	6.79km, NNE	Lowland dry heath; saltmarsh; shingle; and springs (including flushes).	National

Site Name	Designation	Approximate Distance and Direction from Site	Reason for Designation	Evaluation
Southern Trench	MPA	6.81km, ENE	Borrowed mud; fronts; shelf deeps; and minke whale *Balaenoptera acutorostrata.*	European
Moss of Crombie	SSSI	9.03km, ESE	Intermediate bog (blanket).	National
Den of Pitlurg	SSSI	9.75km, S	Upland birch woodland; and valley fen.	National
Whitehill	SSSI	9.90km, SE	Fen meadow; lowland acid grassland; lowland calcareous grassland; lowland neutral grassland; and valley fen.	National

Four of the sites are hydrologically connected to the Site. The Deskford Burn (Burn of Cullen) which is connected to the Site via Tack Burn discharges at Cullen where Cullen to Stake Ness Coast SSSI and Moray Firth SPA is located. Spey Bay SSSI and Southern Trench MPA are connected through the Burn of Tynet which is connected to the Site boundary.

Non-statutory Sites

Non-statutory sites are valued locally and have been selected by the local planning authority.

One Site of Environmentally Sensitive Area (SESA) Botany is located c. 0.8km east of the Site; the Craibstone Quarry SESA Botany site is a disused flooded limestone quarry with an adjacent area of mixed woodland and a section of the Deskford Burn.

A Wildcat Priority Area, c. 9km south of Site, is located at Strathbogie.

NESBReC indicated that there were no ancient woodland sites within 2km of the Site. However, a desk study search of NatureScot SiteLink evidenced various areas of ancient woodland; including three areas of ancient woodland within the Site boundary (Figure 8.1.1 – **Technical Appendix 8.1**) around the Hill of Stonyslacks, Corsekell Moss and Millstone Hill in the northwest of the Site (note that no ancient woodland was recorded on the Site during surveys, but it is noted that 3 areas of ancient woodland designation are found on the Site).

Existing Records of Protected and Priority Species

Table-8-3 provides a summary of the results of the protected and priority species search (excluding birds) (**Section 3**, **Technical Appendix 8.1**) within a 2km radius of the Site.

No records of fish or aquatic invertebrates were returned as part of the desk study.

Table-8-3: Existing Records of Protected and Priority Non-Avian Species

Species	Status*	Notes
Herpetofauna		
Common lizard *Zootoca vivipara*	WCA Sch5	Records within 10km square (NESBReC, Hyder 2007)
Palmate newt *Lissotriton helveticus*	WCA Sch5	Low populations identified in two non-acidic ponds on the Site (Hyder, 2007).
Smooth newt *L. vulgaris*	WCA Sch5	Low populations identified in two non-acidic ponds on the Site (Hyder, 2007).

Species	Status*	Notes
Mammals		
Otter *Lutra lutra*	HR Sch2, WCA Sch5, SBL	Otter desk study record 261m south of the Site in 2000. Otters are known to reside at Spey Bay (hydrologically connected). No otter were recorded during survey in 2003 (AMEC), 2007 (Hyder) or 2015 (Vento Ludens).
European water vole *Arvicola amphibius*	WCA Sch5, SBL.	No water vole were recorded during survey in 2003 (AMEC), 2007 (Hyder) or 2015 (Vento Ludens). Historical water vole desk study record 261m south of Site in 1968. (NESBReC)
Badger *Meles meles*	PBA 1992	FLS provided data indicating the presence of badger within the Site boundary. This information cannot be released in the public domain though has been provided as a confidential appendix to relevant interested parties (See Confidential Appendix 02, in **Technical Appendix 8.3: Protected Species**. Lurg Hill EIA Report (Vento Ludens, 2017) noted badger activity on the Site. No setts were identified.
Pine marten *Martes martes*	WCA, SBL	Record on eastern Site boundary noted in data request from 2016 (Hyder, 2007). The 2003 ES noted a single record of pine marten, in the northern part of the forest, provided by the then Forestry Commission Scotland (FCS). Two additional sightings in 2004 were provided by FCS to inform the Aultmore Wind Farm ES (Hyder, 2007). No pine martens were recorded during the 2003 surveys. A pine marten was observed, adjacent to a sheep pass on the existing Site road, in June 2007, close to the location of the FCS record provided in 2004. A pine marten scat was also identified on the existing road in 2007. This was verified by DNA analysis. Lurg Hill EIA Report (Vento Ludens, 2017) two separate sightings of an individual.
Wildcat *Felis sylvestris*	HR Sch2, WCA Sch5, SBL	Record of adult observed on western Site boundary in 2015 was returned from the data request from FLS..
Brown hare *Lepus europaeus*	SBL	Most recent record 2016. (NESBReC, Hyder 2007).
Eurasian red squirrel *Sciurus vulgaris*	WCA Sch5, SBL.	Most recent record 2017. (NESBReC, Hyder 2007). No evidence of red squirrel activity was noted during the 2007 habitat or transect line surveys nor in a more detailed search in April 2003. FLS returned data confirming five red squirrel dreys are known to be present within the Site boundary, with an additional known drey present within 2km of the Site boundary.
Mountain hare *Lepus timidus*	WCA Sch5, SBL.	Historical record (1968) 261m south of Site.
West European hedgehog *Erinaceus europaeus*	SBL	Historical record 1969 observed 261m south of Site.
Roe deer *Capreolus capreolus*	Deer Act 1991	A number of roe deer were observed on Myreton Wind Farm.
Brown long-eared bat *Plecotus auritus*	HR Sch2, WCA Sch5, SBL	Recorded and seen 510m NW of the site in 2019 (NESBReC).
Bats		
Common pipistrelle *Pipistrellus pipistrellus*	HR Sch2, WCA Sch5, SBL	1-3 common pipistrelle recorded in 2015 (Vento Ludens). Most recent record 2019 (NESBReC).
Soprano pipistrelle *Pipistrellus pygmaeus*	HR Sch2, WCA Sch5, SBL	Most recent record 2019, 200m south of Site. (NESBReC).

Species	Status*	Notes
Daubenton's bat *Myotis daubentonii*	HR Sch2, WCA Sch5, SBL	Most recent record 1994, 4.2km south-west of Site (NESBReC).
Noctule bat *Nyctalus noctula*	HR Sch2, WCA Sch5, SBL	Most recent record 2012, 5.8km north-east of Site. (NESBReC).

*Table Key: Status

HR Sch2 = Included on Schedule 2 of the Conservation (Natural Habitats &c) Regulations 1994 (as amended in Scotland)

WCA = Protected under the Wildlife and Countryside Act 1981 (as amended in Scotland)

WCA Sch5 = Listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland)

PBA 1992 = Protection of Badgers Act 1992.

SBL = listed on Scottish Biodiversity List (SBL) (Scottish Government, 2013)

8.4.2 Vegetation Baseline

8.4.2.1 Evaluation of Vegetation Receptors

The Carbon and Peatland 2016 (NatureScot, 2016a) indicated the majority of the Site is located outside areas designated as a peatland habitat. There are some small areas in the centre and north of the Site which are classified as Class 1 and 2 priority peatland habitats, which are described as 'nationally important carbon-rich soils, deep peat and priority peatland habitat and areas likely to be of high conservation value'. Site specific information relating to carbon-rich soils and deep peat (including a peat depth survey) is contained in **Chapter 10: Geology, Hydrology, and Hydrogeology**. The peat depth survey found that 90% of all peat probes recorded a peat depth of less than 1m. GWDTE were shown not to be sustained by groundwater but by surface water. A description and evaluation of the habitats present on the Site is contained within **Table 8-4**.

Habitats identified under the UKHab classification and NVC communities within the study area are shown in **Table 8-4** along with the equivalent EUNIS habitats. More detailed habitat descriptions and quadrat data provided in **Technical Appendix 8.2**. The mapped results are shown on **Figures 8.2.2 and 8.2.3** also within **Technical Appendix 8.2** (with proposed infrastructure locations overlain). Equivalent EUNIS habitats are based on NatureScot's Manual of terrestrial EUNIS habitats in Scotland – correspondence tables and UKHab correspondence tables (Strachan, 2017).

Table 8-4 also summarises the conservation status for each habitat/community and evaluates the importance of each habitat/community within the study area. For habitats recorded in mosaic, the mosaics have been evaluated based on their floristic composition, underlying substrate and occurrence within the study area.

Technical Appendix 8.1: Ecology Desk Study Report -**Appendix 8.1** detailed 25 species of plant. None of these plant species are listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended). Invasive giant hogweed (*Heracleum mantegazzianum*), under the under the Wildlife and Natural Environment (Scotland) Act 2011 (as amended) exists within the 2km study area.

Table 8-4: Evaluation of UKHab Habitats, NVC Communities and Invasive Flora Present within the Study Area

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
g1b Upland acid grassland	1.54	-	E1.72	U4 *Festuca ovina – Agrostis capillaris – Galium saxatile* grassland	No	This community was present in small patches across the Site, especially where thin well-draining soils exist between forestry blocks, or on tracksides. Given the small and fragmented nature of this habitat, and the lack of significant species associated with them, this habitat is considered to be less than local value.	Less than local value
g1c Bracken	2.03	-	E5.31	U20 *Pteridium aquilinum – Gallium saxatile* community	No	Small areas of this habitat were scattered across the Site, the largest of which is located adjacent to the Corsekell burn. This community type tends to grow on similar habitats to the U4 and is often underlain by U4 grassland. Given the lack of species diversity associated with this habitat and as it is common and widespread habitat in Scotland, this habitat is considered to be less than local value.	Less than local value
g3c Other Neutral Grassland	0.66	-	E3.44	*MG10 Holcus lanatus – Juncus effusus* rush-pasture	Moderate*	A small area of this community is present on the Site between the east and west forestry blocks, and in the very west of the Site. Given the small size of this habitat, the lack of species diversity and the fact that this habitat type is common across Scotland, it is therefore considered to be less than local value.	Less than local value

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
g3c7 – Deschampsia neutral grassland	7.38		E3.44	MG9 – *Holcus lanatus – Deschampsia cespitosa* grassland	No	These habitats were recorded in the '2022 Survey Area' were noted across sloping agricultural fields and lining small watercourses. This habitat lacks species diversity and is widespread in Scotland therefore it is considered to be of less than local value.	Less than local value
			E3.41	MG9/M23 – *Holcus lanatus – Deschampsia cespitosa* grassland/ *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture	High		
g3c8 - Holcus-Juncus neutral grassland	0.74	-	E3.44	*MG10 Holcus lanatus – Juncus effusus* rush-pasture	Moderate*	A small area of this habitat is present in the east of the Site. No notable species were recorded, and this habitat is common in Scotland. It is considered to be less than local value.	Less than local value.
g4 – modified grassland	0.07	-	E2.112	*MG6 Lolium perenne – Cynosurus cristatus grassland*	No	This community was characterised by a short, recently mown, grass-dominated sward. These areas have been assessed as having less than local value.	Less than local value
w2c Other coniferous woodland	1606.1	-	G3.F	N/A	No	This habitat is the most common on the Site. It consists of a monoculture of trees with little structural diversity or differences in age. It has, therefore been assessed as less than local value.	Less than local value

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
h1b Upland Heathlands	5.79	Annex 1, SBL.	F4.11	*M15 Trichophorum germanicum – Erica tetralix* wet heath	Moderate*	There is an estimated 462,000ha of wet dwarf shrub heath in the UK (JNCC, 2011). This M15 community was found to be present on wet areas of shallower peat, in the western part of the Site. One of the main areas recorded lies on a now overgrown ride, on the eastern boundary of the Site. This habitat is only sparsely represented on the Site. However much of this habitat is in moderate condition, with most indicator species consistently present across the Site. Naturally regenerating heathland communities were also noted on the Site (H12) in recently felled/replanted areas where shallower, free-draining peaty soils were present. This community has the potential to recover on current/future clear fell and may offer compensation opportunities to habitat restoration on the Site. These habitats were assessed as having local value (dry heath) and county value (wet heath).	Local value – Dry Heath County Value – Wet Heath
			F4.21	*H12 Calluna vulgaris – Vaccinium myrtillus heath*	No		
h3 – Dense scrub	12.94	-	F9.21	W1/2 - *Salix cinerea – Galium palustre* woodland/ *Salix cinerea – Betula pubescens – Phragmites*	Moderate*	Only small areas of these communities were present on the Site. Given the small size of these habitats and the lack of species diversity, they are considered to be less than local value.	Less than local value

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
				australis woodland			
			F3.14	*W23 Ulex europaeus – Rubus fruticosus* scrub	No		
h3e Gorse scrub	0.12	-	F3.14	W23 *Ulex europeaus - Rubus fruiticosus* scrub	No	Present along boundary lines and as patches along an old railway embankment. Due to its limited extent and non-exceptional species assemblage on the Site, it has been assessed as having less than local value.	Less than local value
f1a5 – Blanket bog	0.29	Annex 1, SBL	D1.22	M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	No	One area of blanket bog is present in an old ride within Broken Moan. This habitat is surrounded by deep peat across Broken Moan which has been historically planted and recently felled and therefore does not fall within the f1a bog category. There is an estimated 2.2 million ha of blanket bog in the UK (BARS, 2012), with 1.8 million ha located in Scotland, representing an estimated 23% of the Scottish land area (Bruneau and Johnson, 2014). Blanket bog is a rare habitat globally, and Scotland holds a significant proportion of the world resource (Bruneau and Johnson, 2014). Potential for bog restoration is high within this habitat and its surroundings and due to the relative rarity of this	County value

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
						habitat in Moray this habitat is valued as being of county value. This habitats is not considered to be groundwater dependent, as assessed in **Chapter 10: Geology, Hydrology, Hydrogeology.**	
f1a6 Degraded Blanket Bog	28.71	Annex 1, SBL	D1.21	M15** *Trichophorum germanicum – Erica tetralix* wet heath	Moderate*	One of the main areas of M15** community lies on a now overgrown ride, on the eastern boundary of the Site. Small pockets of M19 were present within the Site, where the peat was deep and permanently waterlogged. One of the larger areas of M19 is located on Old Fir Hill in the east of the Site. Limited areas of the M20 community were found between the forested areas. Although no peat depth measurements were taken during the survey, it is estimated that the majority of the M20 community is based on peat, with a depth of 0.5m or more, Blanket bog on the Site is in a degraded condition largely due to widespread disruption, usually by people, to the structure and/or function of the peat body, so that the bogs are not actively peat forming. It is considered that the bogs are likely to be capable of natural regeneration, that is, could be repaired and there is a reasonable expectation of re-establishing vegetation with peat-forming capability within 30 years. NatureScot consider M19 as	County value
			D1.22	M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire	No		
			D1.22	M20 - *Eriophorum vaginatum* blanket and raised mire	No		

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
						'*communities likely to be considered as priority peatland*'. M15 and M20 are '*unlikely*'. In considering evaluation it is taken into account that the habitats are degrading (not actively forming). This habitat has been assessed as having county value as it has the potential for restoration. These habitats are not considered to be groundwater dependent, as assessed in **Chapter 10: Geology, Hydrology, Hydrogeology.**	
f2b Purple moor grass and rush pasture	7.77	SBL	E3.41	M23 *Juncus effusus/ acutiflorus – Galium palustre* rush pasture	High	On the Site the M23 community was found to be generally limited to less acid soils adjacent to watercourses or track edges. A mosaic of M23/MG9 was commonly noted along the '2022 Survey Area' Due to its limited extent and non-exceptional species assemblage on the Site, it has been assessed as having less than local value. These habitats are not considered to be groundwater dependent, as assessed in **Chapter 10: Geology, Hydrology, Hydrogeology.**	Less than local value
			E3.512	M25 *Molinia carulea – Potentilla erecta mire*	Moderate*		
			E3.41	M23/MG9 *Holcus lanatus – Deschampsia cespitosa* grassland/ *Juncus effusus/ acutiflorus – Galium palustre* rush-pasture	High		

UKHab Habitat Type/Receptor	Area (ha)	Conservation Status*	EUNIS Community	NVC Community Name	Likely Groundwater Dependency	Description and Reason for Evaluation	Evaluation
f2c Upland flushes, fens and swamps	0.14	SBL	D2.22	M6 *Carex 22chinate – Sphagnum fallax/ denticulatum* mire	High	The M6 community was noted in areas where the slope on the deeper M19 mire, or forested areas changed, either becoming more or less steep, resulting in a seepage line forming. Additional areas of M6 are also present where forestry drains flow in to M19/M20 blanket bog areas, as the flow slows, and the drain ends, an M6 community often occurs in M15. These flush communities are common throughout the Scottish uplands and have been assessed as having local value. These habitats are not considered to be groundwater dependent, as assessed in **Chapter 10: Geology, Hydrology, Hydrogeology**.	County value
Invasive flora (giant hogweed)	0	Invasive species of conservation concern	-	-	-	Invasive species noted within wider desk study, not found to be present in surveys yet risk of spread.	Not applicable.

Annex 1 – Wildlife and Countryside Act 1981

SBL – Scottish Biodiversity List

Communities marked with a yellow asterisk (*) may be moderately dependant on groundwater flow, depending on the hydrological setting.

M15** refers to degraded blanket bog habitat where dewatering and/or peat extraction has resulted in a decrease in the abundance of species characteristic of blanket mire and/or a reduction in peat depth.

8.4.3 Faunal Baseline

A summary of the protected or otherwise priority non-avian species recorded within the relevant study areas during the various ecological surveys and/or for which records were provided during the desk study is provided below. Further details are provided in **Technical Appendices 8.3 to 8.5.**

8.4.3.1 Otter

No evidence of otter was recorded on the Site during previous surveys carried out in 2003 and 2007 (Hyder, 2007), no evidence of otter was noted at the nearby Lurg Hill Wind Farm (Vento Ludens 2017) and no evidence of otter was noted during the surveys undertaken within the '2022 Survey Area'. However, evidence of otter was found during the 2021 surveys of '2021 Survey Area' and surrounding watercourses, with one otter hover (above ground resting site) found along the Burn of Letterfourie, approximately 2.2km north of the Site.

Ten spraints, three potential otter pathways and one otter slide were found in the 2021 survey along various watercourses both within the Site boundary and in the vicinity of the Site. These signs were located on the Burn of Tynet (1 spraint), Ardmachie Burn (1 spraint) unnamed burn in the west of Site (1 spraint), Burn of Fernking (1 spraint), Burn of Aultmore (2 spraints and 1 potential pathway), Burn of Letterfourie (2 spraints), Tack Burn (1 spraint), Corsekell Burn (1 potential pathway), Rumbling Burn (1 potential pathway), and Black Burn (1 spraint and slide). See **Figure 8.3.2** of **Technical Appendix 8.3.**

Burns within the Site are largely characterised as narrow (1m wide or less), and shallow, less than 20 cm deep. Otter will make use of these watercourses for activities such as commuting and opportunistic foraging, but these smaller streams are considered sub-optimal habitat and are likely used infrequently by otter. The most suitable habitat within the Site boundary was located along the Burn of Aultmore in the east of Site as it a larger watercourse, with deeper pools and areas of scrub along some of its bank. Shaded banks are also present which could provide suitable habitat for holts or lie-ups.

Habitat surrounding the proposed access track to the Site comprised a mosaic of neutral grassland and rush pasture and supported a narrow watercourse. This watercourse was considered suitable for otter commuting and foraging purposes, while the long, unmanaged grassland and rush pasture habitat may serve to provide sheltered locations for otter couch (daytime resting places for otter) creation.

8.4.3.2 Water vole

No evidence of water vole was noted on the Site, or on the nearby Lurg Hill Wind Farm during previous surveys carried out in 2003, 2007 and 2017 (Hyder, 2007, Vento Ludens 2017) and no evidence of water vole was found during the 2021 or the 2022 mammal surveys.

The majority of the Site is unsuitable for water vole as it has been heavily modified by forestry operations, resulting in heavy shading of the water courses by mature conifer trees. Many of the streams have dense rush pasture along their banks which provides limited foraging for water vole. However, suitable habitat was noted, albeit sub-optimal, along the Corsekell Burn, Burn of Fernking, Sheil Burn, Tack Burn and Milk Burn. These water courses have some areas of open habitat, with slower flowing section, and a greater diversity of grass and sedge species which provide forage for water vole. See **Figure 8.3.2** of **Technical Appendix 8.3.**

8.4.3.3 Badger

In order to protect badgers in the area, and to comply with legislation, the results of the desk and field surveys are not discussed within the EIA Report chapter. Full details of the badger survey are held within a confidential appendix to **Technical Appendix 8.3** which have been considered in full within this assessment and will be available to relevant parties.

8.4.3.4 Pine Marten

Pine marten was noted on the Site in 2007 with scat and a live individual recorded. Desk records received by FCS also confirmed pine marten on the Site with two sightings in 2004 (Hyders, 2007). Two separate sightings of individual pine martens were made at Lurg Hill (Vento Ludens 2017).

One potential pine marten scat was recorded during the 2021 surveys in the west of the Site close to Little Millstone Hill. However, without DNA testing of the scat it is not possible to confirm pine marten presence.

The majority of the Site provides suitable habitat for pine marten, which is a woodland species. The sections of immature forestry are less favoured by pine marten as they would have limited denning opportunities, though they will make use of this habitat for foraging. Areas of wind throw with upturned root bases may provide some denning opportunities for pine marten within the plantations. The more mature conifer trees present within Aultmore Forest likely provides the highest quality habitat for pine marten within the Site Boundary.

8.4.3.5 Wildcat

No evidence of wildcat was found during the 2021 or 2022 field surveys; however, this species is extremely elusive and there is a record of an adult wildcat in 2015 along the western Site boundary. As this was a sighting only it cannot be confirmed as to whether this individual was a pure wildcat or a hybrid.

The Site provides some suitable habitat for wildcat which prefers to live and hunt along woodland edges. The conifer plantation provides good cover for wildcat though areas of dense coverage may be more limited in the prey resources available. Areas of windthrow and clear fell provide open areas which are more suited to small mammals which would provide more prey resources, while brash piles may also provide suitable denning habitat. The baseline disturbance of the working forestry operations likely reduces the suitability of the habitat to support this species that actively avoids human activities.

8.4.3.6 Red Squirrel

Red squirrel was not recorded on the Site during the 2003 and 2007 field surveys (Hyders, 2007) and no evidence of red squirrel was noted during 2021 and 2022 mammal surveys. However, desk study records indicate that red squirrel is present on the Site and the Site provides suitable habitat, particularly in areas of more mature forestry. Areas of clear fell and open habitats within the Site are unlikely to be used by red squirrels.

8.4.3.7 Bats

Historical records of bats were returned within 10km of the Site during the desk study data search and included common pipistrelle, soprano pipistrelle, Daubenton's bat, brown long-eared and Noctule.

There are no buildings, structures, or underground features such as mine entrances, which could be used by roosting bats within the '2021 Survey Area.'. During the assessment of roosting habitat potential within the '2021 Survey Area', it was found to offer limited suitability for roosting bats as there are minimal mature trees on the Site, trees are planted very close together resulting in thin, long stems with less likelihood of Potential Roost Features (PRFs). Though it is noted that, coniferous trees can provide some roosting potential where there is flaking bark, damage to the trunk/limbs and not all trees could be assessed during the surveys.

The ground-based PRA within the '2022 Survey Area' identified a total of six trees with suitability to support roosting bats. All trees were broadleaved species. These six trees were subject to further survey by two Scottish bat licenced ecologists in September 2023. Features with suitability for roosting bat were surveyed with an endoscope and given an updated roosting assessment. Four of the trees were allocated low roosting potential and the two others were considered to be of negligible potential for roosting bats.

According to criteria presented in the guidelines (NatureScot *et al*, 2021), the habitats on the Site are considered to be of moderate value for bats, because:

- There are Buildings, trees or other structure with moderate-high potential as roost sites near the Site. (The Site itself does not provide many roosting opportunities, though there may be potential within farm buildings which surround the Site).
- The habitat could be used extensively by foraging bats; and
- The Site is connected to the wider landscape by linear features such as scrub, tree lines and streams.

Three species and one additional species group were recorded during the static bat detector surveys – common pipistrelle, soprano pipistrelle, brown long-eared, and Myotis sp.

Common pipistrelle was recorded across the Site and all seasons (**Table 8-5**), with peaks in autumn and high pipistrelle activity at sample location 8. The level of activity most frequently represents 'moderate-high' bat activity levels when compared against records from a similar date and geographic location in Ecobat.

Common pipistrelle is classified within current guidelines (NatureScot et al., 2021) as being of high collision risk, but because it is a relatively common species, its overall population vulnerability is classified as medium (refer to Appendix 1 in **Technical Appendix 8.4** for the collision risk, relative abundance and overall population vulnerability of bat species in Scotland).

Table 8-5 Overview of Common Pipistrelle Activity on the Site

Season	Nights of Survey Data	Total Bat Passes	Mean Passes per Night	Median Passes per night
Spring	10	3508	31.8	5
Summer	10	4990	41.5	4
Autumn	10	11659	97.16	23

Soprano pipistrelle was recorded across the Site and all seasons (**Table 8-6**), with peaks in autumn and high activity at sample location 8. The level of bat activity most frequently represents 'moderate' when compared against records from similar date and geographic location in *Ecobat*.

Soprano pipistrelle is classified within current guidelines (NatureScot et al., 2021) as being of high collision risk, but because it is a relatively common species, its overall population vulnerability is classified as medium.

Table 8-6 Overview of Soprano Pipistrelle Activity on the Site

Season	Nights of Survey Data	Total Bat Passes	Mean Passes per Night	Median Passes per night
Spring	10	787	7.2	0
Summer	10	1551	12.9	2
Autumn	10	5618	46.8	16.5

Brown long-eared bat was recorded across the Site, though were absent from sample locations 13 and 15 which are within coniferous plantation edge/ride habitat. A total of 47 passes were recorded across all locations during the surveys. The level of bat activity most frequently represents 'low' when compared against records from similar date and geographic location in *Ecobat.* Brown long eared bats are considered to be of low collision risk according to current guidelines (NatureScot *et al.*, 2021).

Mouse-eared or *Myotis* bats are recorded in small numbers across the Site with a total of 196 passes recorded during the surveys. The level of myotis activity most commonly represents 'low' when compared against similar geographic locations and dates in *Ecobat*. Myotis bats are considered to be of low collision risk according to current guidelines (NatureScot *et al.*, 2021).

8.4.3.8 Fish

An assessment of habitat suitability for fish species of conservation importance is provided in **Technical Appendix 8.5.**

It should be noted that little of the survey work for fish habitats or electrofishing was conducted within the Site boundary as watercourses on the Site were largely unsuitable for fish. Surveys were conducted on watercourses connected to the Site. The 2021/22 and 2023 fish habitat and electrofishing surveys concluded that:

- Salmonids: Historical data regarding Atlantic salmon and trout within the catchment is limited. Habitat quality of the on and offsite sampling locations was variable in terms of supporting salmonid populations. The majority of sampling locations afforded combinations of flow types, depths and variable substrates that provided moderate to good habitat for juvenile salmonids. Eight sampling locations were poorer in quality and considered to be unsuitable in terms of fish utilisation potential and fisheries habitat (Small Burn AM03, Back Burn AM10, Lornach Burn AM11, Tarryfeuch Burn AM15, Stripe of Gateshead AM20, White Stripe AM22, Burn of Ryeriggs AM24 and Tributary of the Burn of Ryeriggs AM25). Seventeen out of twenty-six sampling locations were identified as being suitable to hold salmonid populations. Based on the substrate and flow regimes found during the 2023 electrofishing surveys, only three sites were deemed to be of optimal salmon spawning potential (Burn of Letterfourie AM07, Tack Burn AM12, Burn of Aultmore AM 9). See **Figure 8.5.3** in Appendix C **Technical Appendix 8.5**. Overall, habitat suitability to support fish and fish spawning with the highest fish utilisation potential and best fish habitat quality located on the Burn of Tynet AM2/ AM26, Burn of Letterfourie AM07, Tack Burn AM12, Burn of Aultmore AM16 and Garral Burn AM 21. These watercourses were predominantly of a size more likely to support brown/sea trout populations. In some instances, these are likely to be residential brown trout *Salmo trutta* populations due to habitat characteristics. Nevertheless, no locations within the Site boundary support suitable spawning habitat for salmonids. Both Atlantic salmon fry (0+) and parr (1++) were not recorded at any of the surveyed locations. Results from the offsite fish surveys in August 2023 indicate that salmon were absent across all surveyed sites. Previous electrofishing data along the Burn of Aultmore has highlighted both fry (0+) and parr (1++) classifications to be of either very low- moderate (near Keith) or absent when recorded in 2021, thus it is unsurprising no salmon were recorded in August 2023 electrofishing surveys. Trout parr (1++) were present across all electrofishing surveyed locations, though fry (0+) were absent from several locations (Milk Burn AM06, Burn of Fernking AM08, Corsekell Burn AM01).
- European eel: It was considered possible that there may be a small population of European eel and cyprinids (such as common minnow (*Phoxinus phoxinus*)), across the sampling locations in the 2021/22 surveys. In 2023, Eel habitat was found at Burn of Aultmore (AM16) where rocks along the left bank were found to provide substantial cover for both eel and trout parr (1++). No other site was found to have great rock formation which would provide substantial cover for eels.
- Lamprey: No substantial lamprey habitat was found across any of the survey locations, though sand and shallow gravel bed were present in sections at Stripe of Gateside AM02, Burn of Fernking AM08, Burn of Aultmore AM16/AM9, and Garral Burn AM21. No survey locations within the Site boundary are considered suitable spawning habitat for lamprey. No lamprey were recorded at the time of the 2023 surveys.
- Freshwater Pearl Mussel (FWPM): Limited suitable habitat for FWPM was identified during the habitat survey of sampled watercourses. It was considered unlikely that freshwater pearl mussel is present in the surveyed catchment.

8.4.3.9 Reptiles and Amphibians

Three species of reptiles and amphibians; namely, palmate newt *Lissotriton helveticus*, common newt L*issotriton vulgari*s and common lizard *Zootoca vivipara*, were recorded in the desk study. Of these, only common frog was observed on the Site (**Technical Appendix 8.3**). However, no surveys targeted at reptiles or amphibians were conducted and based on habitat suitability it is considered that both other species are likely to be present at, at least low density.

8.4.3.10 Deer

During the 2022 survey roe deer *Capreolus capreolus* were sighted on three occasions. Signs of grazing and droppings from roe deer and indeterminate deer species were also noted.

In additional the Site provides good habitat for deer species including Sika deer *Cervus nippon* and red deer *Cervus elaphus*.

Section 5.7 of the current FLS (previously Forestry Commission Scotland, 2013) Forest Management Plan sets the objective of '*deer culling in an exemplary and humane way…to slow down expansion of deer species…to manage deer density…likely to be at a density level of 5 to 7 individuals per 100Ha*'. Since the Forest Management Plan is due for renewal (in progress) and will include updated deer management measures for the Aultmore Forest, a separate deer management plan remains scoped out. Additional data on current numbers has been requested to inform the future full BERP.

8.4.4 Evaluation of Faunal Receptors

An evaluation of the non-avian faunal receptors which are either known to be present or considered likely to be present within the study area, is provided in **Table 8-7.**

Table 8-7 Evaluation of Non-Avian Faunal Receptors within the Study Area

Receptor	Legal / Conservation Status*	Reason for Evaluation	Evaluation
Otter	HR Sch2, WCA Sch5, SBL	This species is Near threatened on the IUCN Red List; however, otters are of a lesser conservation concern regionally and in Scotland, as are widespread having retained or reoccupied most if not all catchments previously lost within its range. Two historical records of otter exist within 2km of Site; including, one in 2022 from the Burn of Aultmore (261m south of Site boundary). An otter 'hover' (partially covered/exposed shelter structure) was identified during the July 2021 fish surveys; located approximately 2km outwith of the Site boundary. Otter were not previously recorded on the Site until four spraints were identified during the July 2021 surveys within the Site and in the wider area. No otter evidence was found during the 2022 surveys of the access track or fish habitat surveys. The larger watercourses within the Site, including the Burn of Aultmore and Burn of Fernking, provide suitable shelter opportunities, commuting and foraging habitat. Other watercourses on the Site provide some habitat suitable for commuting and foraging but with limited opportunity for shelter creation. The national population for otter in Scotland is estimated at 8000 and otter cover large home ranges 32km for males and 20km females.[10] The Site contains predominantly sub-optimal habitat for otter and may comprise part of the home range for one or two individuals. Otter population has been assessed as being of local value.	Local value
Water vole	WCA Sch5, SBL	One historic (1968) record was provided in the desk study; considered too aged to validly inform this assessment. Furthermore, previous surveys on the Site in 2003 and 2007 did not identify any evidence of water voles. Water voles are the UK's most rapidly declining mammal. In Scotland, water voles are largely restricted to upland areas, as lowland populations have suffered the greatest declines, particularly in the north-east of Scotland. Though no national survey has been undertaken of water voles since 1998. No signs of water vole were identified during the surveys in 2021 and 2022 and habitat suitability on the Site is considered to be low, with only sub-optimal habitat identified along parts of the Corsekell Burn, Burn of Fernking, Tack Burn and Milk Burn. Given these reasons, water vole population are likely absent from Site.	Negligible

[10] https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter

Receptor	Legal / Conservation Status*	Reason for Evaluation	Evaluation
Badger	PBA 1992	Badger is not currently a species of conservation concern in the region, with the north-east of Scotland being one of the strongholds for this species in Scotland (protection pertains to safeguarding against cruelty). The Scottish badger population is approximately 50,000.[11] Considering the survey results the badger population is considered to be of local value.	Local value
Pine marten	WCA Sch5, SBL	Seventeen desk study records between 2010 and 2016 indicate the regional population of pine marten is likely to be stable or decreasing (no recent records; although, this may be attributed to under-recording). One potential pine marten scat was identified during the 2021 survey. Previous surveys on the Site recorded three live sightings of individuals in 2004 and 2007. The Scottish population of pine marten is estimated at 3,700 adults and territories range from 5-15km^2 for females and up to 25km^2 for males.[12][13] Pine marten distribution is expanding and have recolonised parts of their former range including Moray (Croose *et al.* 2013). The majority of the Site provides habitat for pine marten with a variety of structure and age between the woodland blocks, areas of clear-fell would also provide good foraging habitat with the brash pile. Given the size of the Site and the amount of suitable habitat it provides in the local area, the pine marten population is assessed as being of local value.	Local value
Wildcat	HR Sch2, WCA Sch5, SBL	The Scottish wildcat population is considered to 'critically endangered' and at risk of genetic extinction due to the pervasive effects of hybridisation with domestic and feral cats. Due to their rarity (potential 200-400 remaining), large enough areas of suitable habitat supporting/or potentially supporting wildcats are potentially of national importance. A Wildcat Priority Area is located approximately 9km south of the Site at Strathbogie. Habitat quality is variable within Site. Dense pockets of conifer plantation dominated by Sitka spruce and lodgepole pine with some larch exist. These pockets provide limited foraging opportunities, although this habitat can provide good cover for wildcat, particularly areas of windthrow. Better quality foraging habitat is associated with the main riparian corridors and along woodland and grassland edge habitat. Areas of clearfell can support a relatively high density of small mammal prey, with brash piles and old undisturbed log-stacks offer denning opportunities. No evidence of wildcat was found during the 2021 or 2022 surveys, though one record of an adult on the Site in 2015 was returned in the desk study. The wildcat population is considered to be of regional value.	Regional value

[11] https://www.scottishbadgers.org.uk/

[12] https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/pine-marten#:~:text=Scotland's%20population%20is%20estimated%20at%203%2C700%20adult%20pine%20martens.

[13] https://www.mammal.org.uk/species-hub/full-species-hub/discover-mammals/species-pine-marten/#:~:text=Martens%20have%20territories%20that%20vary,about%205%2D15%20square%20kilometres.

Receptor	Legal / Conservation Status*	Reason for Evaluation	Evaluation
Red squirrel	WCA Sch5, SBL	Red squirrel is present in many areas of suitable woodland habitat throughout north east Scotland. The current status of the regional population of red squirrel is known to be threatened by the spread of grey squirrels across the region. It is unknown whether the population locally is likely to be stable. The red squirrel population is approximately 120,000 in Scotland. The Site is within a red squirrel stronghold with no grey squirrel reported within Moray. The population appears to be widespread across the county within areas of suitable habitat.[14] No evidence of red squirrel was noted during the surveys on the Site, though desk records indicate dreys are present on the Site and within the wider 2km study area (5 records). Given the presence of large areas of suitable habitat within the Site, the red squirrel population is considered to be of local value.	Local value
Bats	HR Sch2, WCA Sch5, SBL	Common pipistrelle and soprano pipistrelle are common and widespread species, with an estimated Scottish population of 875,000 and 1,210,000 respectively. In Scotland common pipistrelle are showing a stable trend, while soprano pipistrelle appears to be increasing. Brown long-eared bats are widespread in the UK, though less common than pipistrelle species, with an estimated Scottish population of 230,000 which appears stable. Myotis species was also recorded during the static surveys and given the location of the Site it is likely that these bats were Daubenton's bat *Myotis daubentonii* though Natterer's bat *Myotis nattereri* has a patchy distribution in the NE of Scotland too. The population of both species appears to be stable with populations of 235,000 and 41,000 respectively in Scotland (Bat Conservation Trust, 2023). Moderate to high foraging activity was recorded across Site over the 2021 season by pipistrelle species. While low – moderate foraging activity was noted for brown long-eared and myotis species and they were less widespread across the Site. Roosting habitat quality is poor within the Site and only four trees with bat roost potential noted along the access track. Given the high levels of foraging identified in the static detector surveys, the bat population is considered to be of local value.	Local value
Fish: Brown trout, Atlantic salmon, European eel, lamprey, freshwater pearl mussel (FWPM)	SBL, SFF	The sampling points (with the exception of one location) were outwith of the Site. The majority of sampling locations afforded combinations of flow types, depths and variable substrates that provided moderate to good habitat for juvenile salmonids. Eight sampling locations were poorer in quality and considered to be unsuitable in terms of fish utilisation potential and fisheries habitat. Trout populations ranged from very poor to Excellent. Trout parr (1++) were present across all electrofishing surveyed locations in 2023, though fry (0+) were absent from several locations (Milk Burn AM06, Burn of Fernking AM08, Corsekell Burn AM01).	Local value (brown trout) Less than local value (Atlantic Salmon & European eel) Negligible (FWPN & lamprey)

[14] https://scottishsquirrels.org.uk/

Receptor	Legal / Conservation Status*	Reason for Evaluation	Evaluation
		Due to the presence of brown trout within the tributaries surrounding the Site, the brown trout population was assessed as being of local value. Results from the fish surveys in August 2023 indicate that salmon were absent across all surveyed sites and no sites surveyed in 2023 were identified to provide suitable salmon spawning habitat. Previous electrofishing data along the Burn of Aultmore has highlighted both fry (0+) and parr (1++) classifications to be of either very low- moderate (near Keith) or absent when recorded in 2021. Salmon fry and parr were not recorded and salmon were deemed likely absent across all sampled sites in 2023 electro-fishing surveys. As it was noted that salmon may be present within the main tributaries surrounding the Site, the Atlantic salmon population is considered to be of less than local value, The Site was considered not suited to support FWPM owing to likely absence of salmon and lack of fast-flowing streams. Due to the lack of suitable FWPN recorded on the surveys the FWPN population is considered to be negligible. It was considered possible that there may be a small population of European eel, across the sampling locations in the 2021/22 surveys. One location along the Burn of Aultmore was found to provide eel habitat. Due to the small amounts of habitat surrounding the Site, the European eel population is considered to be of less than local value. No survey locations within the Site are considered suitable spawning habitat for lamprey. No lamprey were recorded at the time of the 2023 surveys. Due to the lack of suitable habitat, the lamprey population is considered to be of negligible value. The substantial afforestation of conifers may be acting to acidify watercourses and depress the aquatic macroinvertebrate assemblage that would reduce prey species to fish – even where habitats offer suitability and access is available in flows suited to migration or movement within the freshwater network (Nisbet & Evans, 2014).	
Reptiles		Common lizard is described as being widespread throughout Scotland (with the exception of the Central Lowlands and the Northern Isles). No sightings of common lizard were noted during the 2021 and 2022 surveys; however, areas of suitable habitat were present on the Site particularly in eastern half. This includes the naturally regenerating heathland and areas of bog, acid grassland, and regenerating/replanted conifer woodland in areas of clearfell which have heathland understorey. Areas of clearfell would also provide shelter for common lizard in brash and log piles. It is also possible that adder occur on the Site, although there are no recorded sightings. Adder is described as being widespread across the Scottish mainland. Given the widespread nature of these reptile species and the fact that no records were noted during the surveys, the reptile population was assessed to be of local value, should they be present.	Local value
Deer	-	The abundance of deer on the Site is likely low with no data returned from FLS or NESBReC (additional request made to update records has not been responded to at time of writing). Two roe deer were sighted on the Site on one occasion and there is suitable habitat present on the Site to support deer species.	Less than local value

Receptor	Legal / Conservation Status*	Reason for Evaluation	Evaluation
		However, given the widespread and abundant nature of this species, and the abundance of suitable habitat within the wider area, the Site is assessed as being of less than local value for this species.	

**Table Key: Status*
HR Sch2 = Included on Schedule 2 of the Conservation (Natural Habitats &c) Regulations 1994 (as amended in Scotland)
WCA Sch5 = Listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended in Scotland)
SFF = Salmon spawning beds protected under the Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003
SBL = listed on Scottish Biodiversity List (SBL) (Scottish Government, 2013)

8.4.5 Cumulative Assessment

When undertaking the cumulative effects assessment, it is important to consider only those projects which could potentially contribute to significant cumulative effects with the proposed development. The potential cumulative effects have been assessed for the following receptors and developments:

- Cumulative effects on aquatic receptors within 5km and within the same sub-catchments that the projects could potentially impact upon
- Cumulative effects are only likely within 10km of Annex 1, SBL and NELBAP habitats;

Cumulative effects on mobile species that are at risk of direct mortality from the proposed Development (e.g., bat populations) which are possible in combination with other wind farms within a 10km radius of the Turbine Developable Area. Other projects considered for inclusion in the cumulative effects assessment are detailed in **Table-8-8**. These include all other developments within the relevant study areas which are either operational, under construction, consented or for which a planning application has been submitted.

Table-8-8: Other Projects Considered in Cumulative Effects Assessment within 10km

Project	Status	Distance from Site (km)	Number of Turbines
Followsters	Operational	2.1	1
Balnamoon	Operational	2.2	1
Netherton of Windyhills	Operational	2.3	2
Lurg Hill	Consented	2.9	5
Myreton Crossroads	Operational	2.7	2
Newton of Edingight	Operational	5.6	1
Muirake	Operational	8.6	2
Edintore	Operational	9.4	6
Hill of Towie	Operational	9.8	21

8.4.6 Future Baseline

In the absence of the proposed development, the Site is likely to remain as an existing commercial forestry, undergoing forestry management such as felling and replanting regimes.

In the absence of the proposed development, a similar distribution of existing broad habitat types and presence/ likely absence/ largely low densities of protected/ priority species populations would exist to the current baseline.

Climate change is predicted to result in complex changes to biodiversity. This may result in changes to the vegetation present or the potential for new species to colonise the Site, which potentially includes non-native species, although the extent of any such changes cannot be accurately predicted at this time. In the absence of any detailed, quantifiable information it has been assumed that in the absence of the proposed development the ecological condition of the Site is unlikely to change significantly over the next 35 years with potential for negative trends in habitat loss/degradation (particularly of peatland habitats) and species declines.

8.5 Assessment of Potential Effects

The assessment of effects is based on the information outlined in **Chapter 2: Proposed Development Description.**

8.5.1 Embedded Measures

The proposed development has been subject to a number of design iterations and evolution in response to the constraints identified as part of the baseline studies, to reduce environmental effects (see **Chapter 2: Proposed Development Description** and **Chapter 3: Site Selection and Design Alternatives).** With respect to ecology the following changes have been incorporated to avoid or minimise negative effects:

- The layout has been designed to avoid areas of deeper peat as much as possible - this has reduced the habitat loss of more sensitive higher quality habitats such as blanket bog.
- The access track layout has been designed in order to maximise the use and upgrade of existing tracks as far as reasonably practicable. Where the levels of peat exceed 1m in depth, the access tracks would be "floated" over the peat.
- New watercourse and ditch crossings have been avoided in the design of the access track layout as far as possible; however, there are four new watercourse crossings and three upgraded watercourse crossings required for the proposed development.
- The layout has been designed to avoid areas of Annex 1 and priority habitat, in so far as possible, including a 30m buffer where possible. Turbines and infrastructure have been relocated to avoid any impact on these areas.
- The layout has been designed to avoid badger setts as far as possible - all setts found during the baseline surveys have been avoided by a minimum 100m buffer and all but one sett identified during the desk study has been avoided. The one sett noted is within 80m though its status is unknown and is still at a considerable distance from the proposed works.
- Following guidance outlined by (NatureScot, 2021) calculations on the buffer size between turbine blade tip and the nearest woodland were estimated to be 95m. The following measurements were used in the below equation which gave this figure and are as follows; blade length (bl) =85m, hub height (hh) = 115m and feature height (fh) ((woodland)) = 25m. This buffer should be maintained around the turbine locations.

$$b = \sqrt{(50+bl)^2 - (hh - fh)^2}$$

- A 100m micrositing tolerance for turbines and all other infrastructure would be applied to the proposed development enabling impacts on higher quality areas of habitat to be reduced or avoided.

8.5.2 Good Practice Measures

8.5.2.1 Good Practice Mitigation Measures

Full details of construction mitigation measures would be provided in a Construction Environmental Management Plan (CEMP). An outline CEMP is included as **Technical Appendix 2.1: Outline CEMP**. Good practice measures in relation to pollution risk, sediment management and containment, control and management of invasive species (not currently identified on Site) will act to prevent spread from plant and machinery entering site) be adopted during the construction and operation phases are also set out in **Chapter 10: Geology, Hydrology and Hydrogeology**. During the construction phase, good practice techniques with respect to peatland environments, as contained within '*Advising on peatland, carbon-rich soils and priority peatland habitats in development management*' (NatureScot, 2023)[15] and '*Good Practice during Windfarm Construction*' (SNH, 2019)[16], would be implemented as is prescribed within the Outline Biodiversity Enhancement and Restoration Plan (OBERP) provided in **Technical Appendix 8.6: OBERP**. Further details on peat and

[15] https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management

[16] https://www.nature.scot/doc/guidance-good-practice-during-wind-farm-construction

water management during construction are provided in **Chapter 10: Geology, Hydrology and Hydrogeology, Technical Appendix 2.1: Outline CEMP** and **Technical Appendix 10.2: Peat Management Plan**.

Good practice measures to protect retained habitats during the construction phase would be implemented, to be overseen by the Environmental Clerk of Works (EnvCoW); an Outline CEMP has been provided and further details will be provided in the detailed CEMP to be developed post consent. Good practice techniques for vegetation and habitat reinstatement would be adopted and implemented on areas subject to disturbance during construction as soon as is practicable as per guidance in the '*Good Practice during Windfarm Construction*'.

8.5.2.2 General Mitigation for Protected Species

During construction, Site speed limits of 15mph would reduce the likelihood of accidental direct/ indirect injury/ killing of animals or unplanned indirect effects of habitat loss/degradation by construction traffic.

All potentially dangerous substance or materials within the temporary construction compound would be carefully stored to prevent then causing any harm to any nocturnal animals which may enter the compound at night.

During construction all excavations greater than 1m depth would either be covered at night or designed to include a ramp to allow animals a means of escape should they fall in.

A procedure should be in place during the construction phase which outlines what to do if any protected species or its resting place is encountered during works.

8.5.2.3 Environmental Clerks of Work (EnvCoW)

A suitably qualified EnvCoW would be employed for the duration of the construction and reinstatement periods, to ensure natural heritage interests are safeguarded, although this may not necessarily be a full-time role throughout the programme of works. The role of the EnvCoW would require to be fully defined post-consent and will include the following tasks:

- To give toolbox talks to all staff onsite, e.g., an ecological induction, so staff are aware of the ecological sensitivities on the Site and the legal implications of not complying with agreed working practices;
- To undertake pre-construction checks for protected species and advise on ecological issues where required; and
- To carry out pre-construction inspections of areas to provide updated baseline of protected/ notable habitat and species followed by advice/prescribed appropriate avoidance and mitigation measures plus proportionate supervision of works, where required.

The EnvCoW would also undertake additional roles such as assisting with hydrological measures or checking for nesting birds (refer to **Chapter 9: Ornithology** and **Chapter 10: Geology, Hydrology and Hydrogeology**).

8.5.3 Identification of Potential Effects

Sections 8.5.4 - 8.6.7 consider the potential for likely non-significant and likely significant effects on habitats of nature conservation importance and non-avian protected species as a result of the proposed development during the construction, operational and decommissioning phases.

Whilst the operational phase of the proposed development may be associated with fewer adverse impacts on ecological receptors, there are specific potential effects that require consideration such as the risk to bats from the operating wind farm and potential disturbance and displacement of other protected species such as wildcat.

Potential adverse effects that might occur during the decommissioning phase are considered similar as those that might occur during the construction phase; yet, are usually smaller in potential

magnitude. Since technologies and practices are expected to transform during the passage of time to reach the end of life of the project, the potential effects are considered to be the same as the construction phase for the purposes of the assessment.

8.5.4 Construction Effects

8.5.4.1 Potential Effects

Potential effects are addressed for each receptor below. Effects have been assessed only for important ecological receptors (i.e., designated sites, Annex I (of the Habitats Directive) habitats, priority (SBL and NELBAP) habitats, and those with a value of Local level or above, potential GWDTEs and Annex II (of the Habitats Directive) species and legally protected and priority (SBL and NELBAP) species, and populations of local or higher value). These comprise:

- Blanket bog, degraded blanket bog, upland flushes, fens and swamps, dry and wet heath, purple moor grass and rush pasture, and the water environment.
- Populations of otter, badger, pine marten, wildcat, red squirrel, bats, reptiles, and fish (i.e., brown trout that are present on and downstream of Site in the potential zone of influence yet Atlantic salmon (Annex II), lamprey and European eel (SBL) may also be identified as present in advance of or during construction phase).

Designated Sites

The potential effects on designated sites are considered within **Technical Appendix 8.7: Shadow Habitats Regulations Appraisal Screening Report**.

Habitats

Impacts on habitats are categorised as follows:

- Direct habitat loss – this includes habitats present under the footprint of the proposed development and includes areas which would be subject to cut and fill, grading and potential cable laying. **Technical Appendix 2.2: Forestry** provides details on the amount of forestry to be felled.
- Indirect/temporary habitat loss- indirect loss has been calculated for peatland habitats which lie within 30m of the direct habitat loss areas; the allowance of 30m is to allow for drying effects and vegetation changes due to construction works[17]. With the exception of where drainage will be amended; in such case, Nature Scot guidance recommends that the indirect impacts should include a 30m buffer of an artificial or natural drain[18]. For other habitats an allowance for temporary loss of 5m is included to allow for possible temporary loss due to damage during construction.

For the purposes of the assessment a precautionary approach has been taken which assumes that direct habitat loss and indirect loss of peatland habitats represents a permanent, irreversible negative effect, although in practice some areas indirectly affected may be able to be restored, e.g., during reinstatement following construction.

Table-8-9 details the estimated direct and indirect/temporary land take for habitats present on the Site, and potential GWDTE communities.* An estimation for the direct and indirect loss of water environment habitat has been provided, however, as design of the watercourse crossings has not been decided upon, these figures only provide a rough estimate.

[17] This figure is in line with similar assessments for other projects, and although arbitrary, is considered precautionary based on experience at other sites.

[18] It should be noted that topography, drain size and depth, and the presence of other drainage factors can have an influence on the impact. As detailed within Nature Scot (2023) *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. Available online: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management#Assessing+the+Impacts+of+Development+on+Peatland,+Carbon-Rich+Soil+and+Priority+Peatland+Habitats [accessed 11.09.23].

Table-8-9: Summary of Habitat Loss by UKHab Type

UK Hab Type	Total recorded on Site (ha)	Evaluation & Value	Direct Habitat Loss (ha)	Indirect or Temporary Habitat Loss (ha)	Total Loss (ha)
Water Environment (rivers and streams)	-	Local Value	0.01	0.02	0.03
Upland acid grassland (g1b)	1.54	Less than local value	0	0	0
Bracken (g1c)	2.03	Less than local value	0	0	0
Other neutral grassland (g3c)*	0.66	Less than local value	0.02	0.08	0.1
Deschampsia neutral grassland (g3c7)	7.38	Less than local value	0.3	0.3	0.6
Holcus-Juncus neutral grassland (g3c8)	0.74	Less than local value	0	0	0
Modified grassland (g4)	0.07	Less than local value	0	0	0
Other coniferous woodland (w2c)	1516.8	Less than local value	149.2	9.9	159.1
Upland heathlands (h1b) -including wet and dry heath.	5.79	Local and county value. Annex 1 & SBL	0	0	0
Dense scrub (h3)*	12.9	Less than local value	0.2	0.1	0.3
Gorse scrub (h3e)	0.12	Less than local value	0	0	0
Blanket bog (f1a5)	0.29	County Value Annex 1 & SBL	0	0	0
Degraded Blanket Bog (f1a6)*	28.7	County Value Annex 1 & SBL	0.04	1.4	1.44
Purple moor grass and rush pasture (f2b)*	7.77	Less than local SBL	0.1	0.1	0.2
f2c Upland flushes, fens and swamps*	0.14	County Value SBL	0.02	0.2	0.22
TOTAL			**149.89**	**12.1**	**49.5**

The proposed development would result in the potential maximum loss of habitat as follows:

- Water environment direct habitat loss of 0.01ha and indirect loss of 0.02ha;
- Deschampsia neutral grassland: direct loss 0.3ha and indirect loss of 0.3ha;
- Other neutral grassland: direct loss 0.02ha and indirect loss of 0.08ha;
- Other coniferous woodland: total loss of 159.1a;
- Dense scrub: direct loss of 0.2ha and indirect loss of 0.1ha;
- Degraded blanket bog: direct loss of 0.04ha and indirect loss of 1.4ha;
- Purple moor grass and rush pasture: direct loss of 0.1ha and indirect loss of 01.ha; and
- Upland flushes, fens and swamps: direct loss of 0.02ha and indirect loss of 0.2ha.

Neutral grassland, deschampsia neutral grassland, coniferous woodland and dense scrub habitats have no legal protection and were considered to be of less than local values, therefore they are not accessed, as per the methods outline in Section 8.3.

Degraded blanket bog is a semi-natural habitat that is not common in the local landscape and complex to replace/restore; therefore, despite the loss of degraded blanket bog being small scale in context of the wider Site, it is still considered to be **a significant negative effect at a local level.**

Species diversity within the purple moor grass and rush pasture was poor and lacked the floral diversity for which this habitat is noted for. This species poor version of this habitat type is common throughout Scotland and the comparatively small loss of habitat associated with the proposed development is **not significant**.

The direct loss of upland flushes, fens and swamps is very small and a small area may be impacted by indirect habitat loss. No notable species were recorded within this habitat, and it is not considered to be peat forming. The loss of this habitat is **not significant.**

As no dry or wet heath will be directly or indirectly lost from the proposed development therefore no impact is expected, with **no significant effect.**

No blanket bog will be directly or indirectly lost from the proposed development therefore no impact is expected, with **no significant effect**.

All infrastructure is situated a minimum of 50m away from watercourses, with exception of (see **Chapter 2: Proposed Development Description** for full details):

- Four new and three upgraded watercourse crossings.

The estimated direct habitat loss of 0.01ha and indirect loss of 0.02ha is small scale in relation to the amount of watercourses present on the Site. Assuming that best practice pollution prevention measures are adopted, no **significant effect** is predicted on the running water environment. An assessment of effects specific to fish habitats is assessed separately (below).

GWDTE Communities

Table-8-9 shows the habitat loss (direct and indirect/temporary) for all potential GWDTE communities. The communities marked with an asterisk in **Table-8-9** have potential to have a high or moderate groundwater dependency (based on SEPA (2017) guidance). For a detailed assessment of the groundwater dependency of these habitats, please refer to **Chapter 10: Geology, Hydrology and Hydrogeology.** In summary, the GWDTE assessment presented in **Chapter 10: Geology, Hydrology and Hydrogeology** concludes that all areas of potential GWDTE are sustained by surface water rather than groundwater. Measures required to sustain existing surface water flow paths to these habitats is outlined in **Chapter 10; Geology, Hydrology and Hydrogeology.** As such, there are no GWDTEs present and therefore none will be impacted by the proposed development, therefore **no significant effects** are expected.

Otter

The death or injury of an individual otter during construction could potentially have a significant effect on the conservation status of this species in the local area (considering that two records of historical otter records known from the desk study, no resting areas or holts were identified on the Site during surveys and low levels of otter activity were identified on the Site (four spraints)). It remains possible yet a low likelihood that otter will to be encountered during construction phase, particularly since most infrastructure will not be within 50m of watercourses (with exception of four existing and three newly created access track/ watercourse crossings). There is a low risk to otter from vehicle collision along access tracks, particularly near watercourse crossings, or entrapment in Site equipment or excavations. Without mitigation the risk of otter mortality during construction is considered **significant at local level**.

No appreciable loss of otter habitat (currently estimated at 0.01ha of direct habitat loss, see **Table-8-9**) is anticipated from the proposed development. Any major freshwater pollution incidents arising from the construction works, including silt and acidification arising from felling, have the potential to impact food resource for otter (such as fish and amphibians) within the watercourses on the Site. However, the baseline surveys suggest that otter occur infrequently within the Site, therefore, without mitigation, the loss of habitat and food resource from the proposed development is considered to be **not significant** for the otter population.

Construction activities have some potential to cause temporary disturbance to otters which may use some of the watercourses on the Site. This disturbance will likely be via noise and human presence. However, there is a 50m minimum stand off to infrastructure to watercourses, other than at three new crossing points and four upgrades, and the Site is currently managed for forestry, meaning that the Site may be subject to periods of moderate levels of disturbance already. Otters have large home ranges and are able to adapt to a certain level of human disturbance (Chanin, 2003) and as such, the likelihood of potential disturbance to otter without mitigation is low, and **no significant effects** are predicted.

Badger

Potential effects on badgers are discussed in the Confidential Annex to **Technical Appendix 8.3: Protected Species.**

The risk of badger mortality during felling/construction is considered to be **significant at Site level**.

The direct loss of grassland and woodland habitats as a result of the felling and construction of the proposed wind farm is considered to be **not significant,** in terms of badger foraging resource, as plentiful similar habitat will be retained on the Site and is present in the locality (wider agricultural landscape).

The risk of disturbance to badger during felling/construction is considered to be **significant at Site level**.

Pine Marten

No denning sites for pine marten were identified during the surveys. Female pine martens with young would be at greater risk then independent adults, as they are less mobile in reacting to threats. No natal denning sites were located and habitat suitability for such denning sites is considered low, though cannot be fully discounted. There is a low risk that felling works may destroy a denning site or injure a pine marten and further risks to pine marten mortality would be vehicle collision or entrapment. As such, without mitigation, the construction phase could have a **significant effect at local level** on pine marten mortality**.**

During the construction phase there will be clearing of forestry habitat which provides foraging and commuting habitat to pine marten. The quality of this habitat is considered to be sub-optimal due to conifer tree species and structure. It is acknowledged that this species does not solely use woodland habitats yet they require this primarily for shelter. The majority of the forestry on the Site will not be impacted from the proposed works, and there is other suitable, connected habitat for pine marten on the Site and within 5km of the Site boundary. Felling activities may increase prey abundance for

pine marten, with brash piles and woodland edge habitats creating more habitat for small mammal species. The loss of coniferous woodland habitat due to the proposed works is considered to be of low level, resulting in a **non-significant** effect.

Pine marten are highly mobile and can move away from sources of disturbance associated with construction works. The effects of short-term disturbance are unlikely to affect population size and distribution and no denning habitat/features were identified within 100m of the proposed development. However, if a natal site was disturbed during the breeding season this could impact the breeding success of the species. Without mitigation the effect of disturbance from the construction phase is considered to be **significant at local level.**

Wildcat

Construction activities have some potential to cause temporary disturbance to wildcat which may use some of the tracks and watercourses on and around the Site for commuting. This disturbance will likely be via noise and human presence. There is little published data available that has attempted to quantify behavioural reactions of wildcats to disturbance. Studies that have considered the effects of roads and traffic on wildcat movements have indicated that use of a zone up to 200m from a road and up to 900m from settlements may be affected, although this is dependent on the type of adjacent habitat (Klar, 2010). The Site is actively managed for forestry and wildcats within this area may be used to human presence due to ongoing management. However, if the proposed development disturbed a breeding wildcat site this could lead to abandonment and a **significant effect at regional level.**

The death or injury of an individual wildcat during construction could potentially have a significant effect on the conservation status of this species at a regional level. The felling and clearance of trees, the removal of brash piles, and the proposed development construction works have the potential to kill or injure wildcats. Considering that wildcat avoid areas of human disturbance, the direct mortality risk is considered to be Low during the construction phase. Like most species, the young are of particular risk, as they are less mobile. Taking into account the scarcity of this species locally, the baseline levels of disturbance in an active forestry site, the introduction of construction disturbance and the risk of death/injury to wildcat without mitigation is considered to be low, but would be **significant at regional level.**

Direct loss of habitat, that may provide potentially suitable resting, foraging and commuting opportunities, will result in the construction phase.

The loss of coniferous plantation and woodland edge habitat that may be used by wildcat for foraging and commuting is considered to be **not significant** for the wildcat population due to the relatively small area (relative to wildcat territory sizes, which vary between 6km^2 for a female and 19-27km^2 for a male (Breitenmoser *et al,* 2019)) of habitat that will be lost, its apparent sub-optimal quality (most notably due to disturbance impacts), the availability of other similar, less-disturbed habitats in the surrounding area (i.e., Strathbogie c. 9km from Site), the potential for felling to increase the availability of suitable foraging/commuting woodland edge habitat for wildcat (by increasing woodland edge habitats and the creation of brash piles serving to potentially increase the small mammal prey available for wildcat and improve foraging opportunities).

In relation to potentially suitable resting/shelter-creation habitat for wildcat, no evidence was identified during the baseline surveys which confirmed wildcat resting areas on the Site. Areas of clear fell are common on the Site, which provide shelter features such as brash piles, root plates and log piles. The felling works associated with the construction of the development will likely result in the creation of similar shelter features, providing additional potentially suitable rest areas for wildcat. The effect of the construction phase on wildcat habitat in terms of shelter is considered to be **not significant**.

Red Squirrel

Adult red squirrels are highly mobile and can move away from sources of disturbance associated with construction works, reducing the risk of direct mortality from the works (albeit their young are less mobile and associated with dreys). Felling operations will be required during the construction

phase, which may result in the destruction of red squirrel dreys. This may pose a potential direct mortality risk, especially to breeding females and their kits as they may be unable to move away. Red squirrel is also at risk of vehicle collision.. The risk of red squirrel mortality during felling/construction is considered to be moderate, resulting in a **significant effect at local level.**

Conifer woodland can support between 0.1-1.2 red squirrel per hectare (Gurnell & Pepper, 1991, Forestry and Land Scotland[19]). The loss of 158.8ha could result in the loss of habitat supporting between 16-190 red squirrels. No evidence of red squirrel was identified on the Site during the recent surveys in 2022 or 2021, and prior to this in 2003 and 2007, which suggests that the squirrel population within the forest may be closer to lower density estimate of 0.1 squirrels per hectare. This represents 0.01% of the current Scottish population. The woodland on the Site provides suitable habitat, though it should be noted that the forestry operations on the Site is a source of disturbance for red squirrel. Furthermore, from aerial images approximately two thirds of the turbines are located within recently felled, or recently planted young conifer plantations. Young conifers would provide significantly less foraging resource for red squirrel as the conifer species present can take up to 25-30 years to provide a good seed crop.[20] Without mitigation the loss and fragmentation of habitat resulting from the proposed development is considered to have an overall effect level of moderate for the red squirrel population, resulting in a potential **significant effect at local level.**

Red squirrel is a mobile species and will adapt their behaviour to avoid humans where possible. Indications on the Site are of a low-density population, with availability of alternative coniferous plantation woodland areas remaining on the Site and in the wider connected landscape. Without mitigation the effects of short-term disturbance associated with the construction works may impact important red squirrel sites, such as breeding dreys which could result in breeding failure. As such the risk of disturbance associated with the construction phase on red squirrel is considered to be low, though would be a **significant effect at Site level.**

Bats

The proposed development will result in the felling of 30ha of conifer plantation and the direct loss of approximately 0.6ha ha of other habitats (see **Table-8-9**). Given the scale of the Site and the relatively small scale of the habitat loss, it is not anticipated that that clearance works associated with the construction phase will result in a significant loss of commuting and foraging habitat. Moreover, the locations of highest bat activity recorded during the static surveys were located beside areas of existing clearfell. The clearing of forestry would open up more woodland edge habitats as coupes which could be exploited by foraging bat species. The loss of habitat is considered **not significant**.

Four trees with low bat roost potential were identified within 50m of the access track. No PRA surveys were undertaken elsewhere on the Site as the main body of the Site was considered to have low potential for roosting bats given the structure of the plantation, tree species and tree age and access was problematic in dense areas of coniferous plantation woodland. The potential for additional roosts to be present in areas which could be directly impacted by the construction works is considered to be low. However, without mitigation it is possible that the construction phase could result in the loss of a tree with bat roost potential which would have a **significant effect at Site level.**

Increased noise and light levels associated with construction activities have the potential to indirectly disturb roosting bats during the construction phase, and any overnight lighting has the potential to impact foraging or commuting bats. There is limited bat roost potential on the Site and there is a low risk that the works will disturb roosting bats during the construction phase. However, if disturbance occurred it would be considered a **significant effect at Site level.**

[19] https://forestryandland.gov.scot/blog/forest-operations-and-red-squirrel-conservation

[20] https://cdn.forestresearch.gov.uk/2022/04/Understanding-the-provision-of-conifer-seed-for-woodland-species-min.pdf

Reptiles

No reptile species were recorded during the surveys (although, following NatureScot guidelines, no specific reptile surveys were conducted), though common lizard were noted in the desk study and there is suitable habitat present on the Site at woodland edge and scrub/grassland/peatland habitats. It is noted that the loss of coniferous woodland will increase the woodland edge habitat in coupes that may act to increase suitable reptile shelter (i.e., hibernacula), foraging, basking and commuting habitats. If reptiles are not 'warmed up', they can be slow in responding to human threats associated with the construction phase. Without considering further mitigation (following NatureScot guidance, precautionary working methods will be adopted), and notwithstanding the legal protection afforded to reptiles, the risk of reptile direct mortality and habitat loss during felling/construction is considered to be **not significant**.

Fish

Fish habitat and electro-fishing surveys of watercourse sections on the Site and sections downstream (within the potential zone of influence of the project), indicated the main watercourses within the Site supported trout populations (ranging from poor to excellent habitat quality). Trout parr (1++) were present across all electrofishing surveyed locations, though fry (0+) were absent from several locations (Milk Burn AM06, Burn of Fernking AM08, Corsekell Burn AM01). Watercourse were not found to have salmon present (fry and parr classifications very low to moderate or absent along Burn of Aultmore). One location along Burn of Aultmore providing suitable eel habitat (site not considered suitable for FWPM).

During the construction phase potential impacts include siltation from ground disturbance, accelerated or exacerbated erosion, hydrological changes, pollution, and the blocking or hindering of the upstream/downstream migration of fish (where present, most likely trout).

These potential effects could all impact on the surrounding fish populations by causing direct mortality of juveniles and adults, direct habitat loss (damage of instream and riparian habitats), direct and indirect habitat severance (emanating from fish avoidance behaviour and blocking of migration routes to spawning beds resulting in unused habitat), direct and indirect habitat degradation (for example, resulting from pollution impacts) and indirect effects via changes in food availability (from the above pressures).

The likelihood of effects to fish and aquatic invertebrates downstream in the absence of avoidance and mitigation measures is considered to be **significant to trout** (and potentially other fish species that may be present).

8.5.5 Operational Effects

8.5.5.1 Potential Effects

Operational effects (assuming that the stated good practice mitigation measures, as set out in **Chapter 10: Geology, Hydrology and Hydrogeology**, are implemented), are addressed for relevant receptors below.

Habitats and Water Environment

During the operational phase, **no significant effects** on retained habitats are predicted. Infrastructure would be in place and only occasional service vehicles would be present on the Site, with the potential for incidents and spillages affecting sensitive habitats would be very low. In addition to this, good practice measures would be implemented further reducing the risk of an incident occurring.

General Considerations for Mammal Species

During the operational phase, human activity associated with wind farm maintenance would be limited to the permanent infrastructure areas. Traffic levels would be much lower during this phase

and subject to similar speed limits to those in place during construction. This is applicable to all faunal receptors, reducing the risk of mortality, disturbance, and displacement to each.

General maintenance will be required on the wind farm infrastructure during the operational phase. Method statements for all potential maintenance and emergency maintenance works would be developed in accordance with best practice for both terrestrial and freshwater habitats and therefore protected species.

Badger

Details of the operational effects on badgers are contained in the Confidential Annex to **Technical Appendix 8.3: Protected Species.**

It is considered the risk level to badgers is negligible and **no significant effects** are likely to occur.

Otter

It is considered that otter presence, within the areas of permanent infrastructure, would only be occasional as the majority of the footprint is ouwith 50m of watercourses. Therefore, the potential for otter to be disturbed or displaced during wind farm operation is low.

In comparison to the construction phase, the risk of pollution incidents is greatly reduced during the operational phase, therefore the risk to otter is inherently lower. No long-term storage of hazardous chemicals is anticipated during the operational phase, and any hazardous chemicals present during maintenance events would be subject to standard pollution prevention protocols. Excavation activities would have ceased during this phase which would eliminate the risk of mortality to otter through inadvertently trapping them.

Based on the above, assuming that all stated good practice measures are implemented, **no significant effects** on otter are likely during the operational phase.

Pine Marten

No felling operations due to the development are anticipated during the operational phase which will greatly reduce the disturbance and displacement risk to pine marten. Human levels of disturbance will be likely be similar to present levels of disturbance which occur from forestry activities on the Site. No long-term disturbance to pine marten is anticipated **and no significant effect** is expected.

Wildcat

The Site is currently actively managed for forestry with recent large-scale felling and re-planting activities occurring. Any potential wildcat on the Site would have experienced this high level of recent disturbance. These activities will likely continue during the operational phase of the wind farm. This phase will also see additional vehicle and human movements on the Site due to maintenance works. These activities will, however, largely take place during the daytime when wildcats are less active. Furthermore, the Site is not known to be a core area for wildcat.

Based on the above, assuming that all stated good practice measures are implemented, **no significant effects** on wildcat are likely during the operational phase.

Red Squirrel

No felling operations due to the development are anticipated during the operational phase which will greatly reduce the disturbance and displacement risk to red squirrel. It is considered therefore the effect on red squirrels is **not significant** during the operational phase.

Bats

Operational wind turbines can affect bats in a number of ways, although the main concerns relate to collision mortality, barotrauma and other injuries resulting from collision with, or flying in very close proximity to, moving turbine blades (NatureScot *et al.*, 2021). Due to the long lifespan and slow

reproductive rate of bats, a possible increase in mortality due to wind turbines has the potential to have a significant effect on local populations.

A study on bat mortality at wind farm sites in the UK found fatality rates to range from 0-5.25 bats per turbine per month (Mathews *et al.* 2016). Understanding of the key factors which result in some wind farms posing a high risk of collision to bats is incomplete. Though, a number of elements were highlighted in a review of the interactions of bats with wind farms (Arnett *et al.* 2008) which may influence the risk to bat populations.

- Bats are more likely killed on nights with warm air temperatures and low wind speed.
- Most bat fatalities occur in late summer/early autumn.
- Mitigation for bat collision should be applied to the wind farm as a whole and not at individual turbine locations.
- There may be an attraction between bats/or their insect prey, and wind turbines which would not be captured during pre-construction surveys.

Given that the habitat present is of medium suitability for bats, and the fact that the project is of a 'medium' size under the NatureScot guidelines (2021), the proposed development constitutes as 'medium risk' for bat collisions with turbines (see Table 3a in NatureScot et *al*., 2021). During the 2021 static surveys the Site was dominated by conifer plantation with a varied structure including mature forestry, clear fell, with areas of newly planted trees. As forestry operations are expected to continue on the Site, this varied structure is likely to be maintained, though perhaps with lower levels of mature forestry, though this is not known.

Bat species, which are more vulnerable to collision mortality, are species which are adapted to fly in uncluttered air space, (i.e., away from vegetation). This includes both soprano and common pipistrelle and the survey noted moderate levels of activity for soprano pipistrelle and moderate - high levels for common pipistrelle.

Following the assessment methodology included in current (Scottish Natural Heritage, et al., 2019) *Myotis* bat species and brown long-eared are considered low collision risk species and were not included in the collision risk assessment. They are considered low risk as they are more heavily associated with wooded habitats and are reluctant to cross open habitat. A distance of at least 95m between turbine blade tip and the nearest woodland will be established during the construction phase of the proposed development and maintained as per current bat guidance (NatureScot, 2021, see Section 8.5.1). It is not expected that **brown long-eared and *Myotis* sp.** will be impacted, and **no significant effect** is considered likely.

Pipistrellus species are high risk species, and they were assessed to be of moderate to high risk of collision across the Site. Additional analysis carried out by SPR (Scottish Power Renewables) also predicts that without mitigation there is potential for fatality rates to be high for both *Pipistrellus* species. Therefore, without mitigation, the risk of bat mortality during the operation phase is considered **to be significant** at the **local level** for both **pipistrellus species** (common and soprano).

Mitigation will therefore be implemented during the operational phase to reduce the risk of turbine-related bat mortality and is outlined below in Section 8.6.

Fish

During the operational phase, maintenance traffic would be minimal. No hazardous chemicals would be stored on the Site during the operational phase. During major maintenance events, temporary storage of hazardous chemicals could occur on the Site, but would be subject to implementation of standard pollution prevention control measures. Systematic annual monitoring of fish populations is proposed prior to following construction of the proposed development in Year 1 & Year 2.

A post-construction water quality monitoring programme will carried out as part of an ongoing assessment of potential impacts on fish, which may occur due to the proposed Development. Several of the watercourses that occur on the Site have the potential for fish however there is a 50m standoff between infrastructure and watercourse (other than the instances listed in Section

8.5.1 as a result there would be limited mechanisms for causing water pollution, and as such **no significant effects** upon fish are predicted.

Reptiles

During the operation of the wind farm, only minimal maintenance traffic would be present on the Site and this would be restricted to driving along on the Site access tracks only, with an applied speed limit. As a result of this, **no significant** effects upon reptiles are predicted.

8.5.6 Decommissioning Effects

Effects during decommissioning are expected to be similar to those during construction, however no additional loss of habitat would be expected, and habitat would be reinstated following removal of any infrastructure as appropriate. Embedded mitigation would be the same as during construction. Therefore, no significant effects are anticipated during decommissioning.

8.6 Mitigation, Compensation and Enhancement

Embedded mitigation and good practice measures are detailed in Section 8.5.1 and 8.5.2, as well as in **Chapter 10: Geology, Hydrology and Hydrogeology**. Further mitigation measures are outlined below to mitigate against potentially significant effects upon important ecological receptors during construction. A Biodiversity Enhancement and Restoration Plan (BERP) will be produced and agreed with FLS and Moray Council post consent. This would detail measures to compensate for the significant residual effects of habitat loss, where possible, associated with the proposed development and provide significant biodiversity enhancement, in accordance with the fourth National Planning Framework (NPF4). An Outline BERP is provided in **Technical Appendix 8.6**.

A total of 14.4ha of peatland restoration is needed to adhere to NatureScot's 'Advising on peatland, carbon-rich soils and priority peatland habitats in development management[21]' guidance that recommends a ratio of 1:10 of peatland restoration to achieve offsetting. Any other restoration of peatland as part of the proposed development would be considered biodiversity enhancement. The outline BERP identifies areas within the Site where bog restoration works could be undertaken which covers a total area of 34ha.

General mitigation set out in Section 8.5.1 and 8.5.2 will help mitigate the risk of direct mortality to protected species by mitigating threats such as vehicle collisions, entrapment, and contact with harmful chemicals.

To further mitigate the effects of the construction phase on badger, otter, pine marten, wildcat, red squirrel and bats, pre-construction surveys and a combined species protection plan are proposed. These measures will help to identify important habitat and resting sites of these protected species and will ensure that the most robust measures are in place to avoid any impacts on these species.

8.6.1 Construction

8.6.1.1 Pre-construction Surveys

Due to the time that will have elapsed since the last surveys and the possibility that protected species activity could have changed in the intervening period, a pre-construction survey for badger, pine marten, otter, wildcat, red squirrel, and bats will be undertaken. This would cover all watercourses within 250m of wind farm infrastructure and 100m for terrestrial mammals, extending up to 200m for wildcat where habitat looks suitable. The results of the pre-construction survey would inform the need for further mitigation (if required) in respect of working practices, or consultation with NatureScot, if required.

[21] Nature Scot (2023) *Advising on peatland, carbon-rich soils and priority peatland habitats in development management*. Available online: https://www.nature.scot/doc/advising-peatland-carbon-rich-soils-and-priority-peatland-habitats-development-management#Assessing+the+Impacts+of+Development+on+Peatland,+Carbon-Rich+Soil+and+Priority+Peatland+Habitats [accessed August 2023].

8.6.1.2 Species Protection Plan (SPP)

A Species Protection Plan (SPP) would be developed by a suitably experienced ecologist, and agreed in consultation with NatureScot, in advance of works commencing on the Site. The SPP would set out in sufficient detail the measures and procedures that would be followed to ensure the protection of sensitive species as well as legally protected species during construction.

The SPP would detail the pre-works survey methods for each species. To ensure that the baseline information for all potentially-affected protected species is up-to-date, surveys would be undertaken not more than 8-12 months (timing will in effect be seasonally dependent) prior to the commencement of works (including felling). The pre-works surveys would be completed in all areas of suitable habitat up to 250m around proposed turbine locations, felling areas, access tracks and other wind farm infrastructure.

The SPP would also detail the measures, as outlined below for each species, to ensure that the effects of felling/construction works are avoided, or minimised as far as is practically possible, and that the works proceed lawfully with respect to the legislation protecting the species.

8.6.1.3 Reptiles

Mitigation would be employed to reduce the chances of inadvertently killing or injuring individual reptiles during construction works. Pre-construction surveys for reptiles will not be required though pre-works check by the EnvCoW in areas of suitable habitat will be carried out. Proposed mitigation therefore would involve identification/removal of potential refugia and hibernacula within areas of suitable habitat, if present. Where appropriate and safe to do so, during the active season (typically April to October) all potential refuges within construction working areas will be removed, and construction works will employ a 'soft start' to allow any individuals to exit the area. Outwith the active season, checks and removal of hibernacula will be conducted. These checks will be conducted under the guidance of the EnvCoW.

8.6.1.4 Fish

The proposed development has been designed to minimise the number of watercourse crossing points and that other Site infrastructure is sufficiently distant (>50m) from watercourses. With the implementation of good practice pollution prevention measures (**Chapter 10: Geology, Hydrology, and Hydrogeology**) the likelihood of a pollution event affecting fish within downstream watercourses is considered to be low.

In addition to embedded mitigation and good working practices referred to above in this assessment, it is recommended that:

- Pollution prevention measures should be employed during the construction process and a suitable water quality programme established to ensure that the construction phase does not impact on the fish habitats.
- Construction fish fauna monitoring programme is carried out utilising the same ten (control site included) fish fauna sites as part of an ongoing assessment of potential impacts which may occur due to the proposed development. The suggested monitoring schedules are as follows: Fish fauna surveys annually during construction (summer/early autumn).
- Macroinvertebrate sampling is recommended to be conducted at all ten survey locations. The purpose of this macroinvertebrate data is to provide a longer-term water quality monitoring that can be compared and monitored over the duration of the project and to demonstrate biodiversity recovery post construction. Baseline ecological condition for watercourses will be used as an indicator of overall watercourse health over time.
- A pre-construction and construction water quality monitoring programme is carried out as part of an ongoing assessment of potential impacts, which may occur due to the proposed development. This will help to protect the aquatic assemblage throughout the proposed development and in the long term, highlighting where impacts may be occurring, and mitigation can be designed to address accordingly. It will also provide evidence of the scale

of impact on the surrounding watercourses from any pollution incidents which may or may not be directly related to the proposed development.

- A suitably qualified / experienced Aquatic Ecological Clerk of Works (ECoW) should be on the Site, periodically, for the construction phase of the Development. This role will be provided should the EnvCoW be suitably qualified. Otherwise, an additional Aquatic EnvCoW can be present on the Site periodically to supervise works; particularly, works within 50m of watercourses (i.e., four new watercourse crossing and three existing watercourse crossings).
- Reconstruction of the river corridors are advised; options include blocking of a proportion of man-made land/forestry drainage channels within the forestry rides (not the watercourses) in order to encourage water retention on the Site for longer periods, water reaching the watercourses identified on the Figures and maintain flow of the watercourses for longer-periods. Selection of locations of conifer plantation to replace/ allow natural managed regeneration with broadleaved or alternative native floral species along the corridor route has the potential to reduce and slow down water transpiration from the soil. Such measures will be taken forward in the OBERP (**Technical Appendix 8.6**).

Therefore, **no significant effect** on salmonids, eel or other fish species of conservation concern is likely.

8.6.1.5 Biodiversity Enhancement and Restoration Plan

Peatland has been identified as a national conservation priority within Scotland's National Peatland Plan (SNPP), for its importance for biodiversity, water quality, and as a carbon store (SNH, 2015a). The SNPP states that peatland restoration is one of the priority projects highlighted in the Scottish Biodiversity Strategy Route Map towards meeting the European Union (EU) biodiversity target of restoring at least 15% of degraded ecosystems. The most extensive deepest peat soils occur under blanket bog and raised bogs, and these habitats are recognised as internationally important under the EU Habitats Directive (as priority habitats listed on Annex 1).

The broad principle aim of the Outline BERP is to outline the proposed habitat restoration and management measures in relation to the proposed development. It details the habitat management and monitoring that is proposed to compensate for the direct and indirect loss of sensitive natural/semi-natural habitats, notably degraded blanket bog, as result of construction of the wind farm and to provide significant biodiversity enhancements, in accordance with NPF4.

The focus of the Outline BERP is on features for which compensation is required due to potential impacts from the proposed development (e.g. habitat loss). However, consideration is also given to habitat enhancement for features with particularly high conservation value that occur on the Site, for example dry heathland, especially where declines may be anticipated in the absence of the BERP (see **Technical Appendix 8.6: Outline BERP** for further details).

The Outline BERP sets out the following objectives:

- restore and enhance degraded blanket bog and blanket bog habitats on the Site: via ditch blocking and tree removal to restore blanket bog in two areas on the Site;
- Enhance and encourage the natural regeneration of heathland habitats in appropriate areas through tree thinning and removal.
- enhance riparian habitat for aquatic species including spawning fish and otter: through the creation of 30m buffer strip with appropriate levels of native planting; and
- Enhancement woodland habitats through retention of mature conifer plantation, soft edging, native planting and the provision of suitable wildlife boxes for wildcat, pine marten and bats.

The success of the management objectives set out will be monitored through a variety of habitat and species monitoring methods, see **Technical Appendix 8.6** for full details.

8.6.2 Operation

8.6.2.1 Bats

Mitigation will be implemented during operation in order to reduce the risk of turbine-related bat mortality specifically for Pipistrellus species, though this will also further mitigate for the two low-risk species brown long-eared and Myotis *sp*. The mitigation measures will comprise of an initial phase of monitoring for three years and based on the results, curtailment of the operation of all wind turbines during certain weather conditions at certain times of year may be required. In the event the scheme is consented, a Bat Mitigation and Monitoring Plan will require to be provided pre-construction.

During construction a buffer of 100m will be cleared of trees (as outlined in Section 8.5.1) around each turbine. These buffer areas are proposed for heathland regeneration in the OBERP, and any conifer re-growth in these areas will be monitored and removed as part of the OBERP. Maintaining these areas as heathland and preventing tree re-growth will reduce the risk of collision as many bat species do not fly across open space.

Bat activity monitoring will be undertaken for at least three years after the proposed development becomes operational which will inform any curtailment required. Details on monitoring are described below though a Bat Mitigation and Monitoring Plan should be agreed beforehand with NatureScot. It should be noted that if initial results show high level of bat mortality, then curtailment options will be brought forward.

Bat Mitigation and Monitoring Plan

Monitoring would comprise measurement of bat activity and fatality rates and would be undertaken annually for the first three years of operation. Bat activity monitoring would comprise the use of static bat detectors (based at ground level) at six randomly selected wind turbines during July – September inclusive which is when most fatalities are found to occur. This represents a precautionary approach, because if bat fatality rates are sufficiently low during this period, they are unlikely to be greater at other times of year. The use of six turbines is considered to provide a representative sample (37.5%) of turbines to be sampled) and is coincident with the number of turbines which can reliably be searched by a dog team in a single day.

Carcass searching would be undertaken within a 50m radius at the same six turbines every two weeks from 1st July until end of September i.e., seven searches in total. The estimate of two weeks persistence of corpses, and therefore the intervals between search dates will be further confirmed by undertaking a carcass persistence trial at the Site prior to undertaking carcass searching. Carcass searching will be undertaken using dogs, so that an effective observer efficiency rate of 80% or more can be achieved.

Following each annual monitoring period, if the number of bat fatalities is greater than two bats per turbine per year, the operator shall be obligated to propose curtailment. Any curtailment proposed will be consulted on with NatureScot and implemented the following year with repeated monitoring using the methods described above unless otherwise varied (e.g., to investigate condition in which fatalities are occurring).

Based on work done at other operational windfarms in upland forested sites (in south-west Scotland), 90% of Pipistrellus bat activity occurs when wind speeds are below 5.5m/s and temperatures are above 11°C at nacelle height. The curtailment will therefore apply initially between 30 minutes pre and post-sunset and 40 minutes pre and post-sunrise and will be implemented at each turbine between 1st July – 31st September each year based on the results of the carcass search monitoring outlined above. The mitigation will be implemented for the lifetime of the proposed development, unless monitoring results necessitate a change in curtailment regime.

The implementation of the curtailment will be via software which will automatically send a 'pause' command to the relevant turbine, when the parameters are met, initiating a feathering of the blades. This will slow the rotation speed of the blades to below 1 RPM (i.e., slower than the second hand of a

clock). This is a tried and tested method, already being successfully applied on other wind farm sites in Scotland.

No other specific mitigation measures are required for the operational phase. However, compensation and enhancement measures provided as part of the outline BERP (**Technical Appendix 8.6)** would remain in place during the operational phase.

8.7 Assessment of Cumulative Effects

8.7.1 Construction Phase

Assessment of cumulative effects has been limited to the ecological features evaluated as local value or above for which there is significant or not significant effects and a clear route to cumulative impacts including:

- Cumulative effects on aquatic receptors (fish and priority aquatic invertebrates) within 5km and within the same sub-catchments; (River Deveron catchment);
- Cumulative effects on Annex 1 (of the Habitats Directive) and priority (SBL and NELBAP) habitats with 10km;
- Cumulative effects on mobile priority (as listed on Annexes II, IV and V of the Habitats Directive, species of principal importance for biodiversity in Scotland as listed on the SBL and NELBAP) species that are at risk of direct effects from the proposed Development (e.g., bat populations, which are possible in combination with other wind farms within a 10km radius of the Turbine Developable Area).

The cumulative effect on designated sites is considered within **Technical Appendix 8.7: Shadow Habitats Regulations Appraisal Screening Report**. No significant effects were identified.

GWTDE are not considered in the cumulative assessment as none were identified on the Site.

For the cumulative effects on aquatic receptors (i.e., fish and aquatic invertebrates) during construction, the potential for significant cumulative effects would be via the discharge of particulate matter into watercourses, or through a pollution incident.

Wind farms which are already operational are not likely to give rise to significant cumulative effects through operation; although, historical activity in the catchment and habitat lost will require to be taken into account in the assessment for historical construction activities.

There is one windfarm (Lurg Hill) within 5km of the Site which is consented. It is located 2.9km east of the Site and will consist of three turbines (turbine tip height 149.9m). The effects of disturbance between Lurg Hill Wind Farm and the proposed development will be reduced by timings of construction activities, especially tree felling. Construction at Lurg Hill Wind Farm is set to begin in 2024,[22] construction at the proposed development is targeted for 2028.

Four further wind farms are within 5km are operational (Followsters, 1 turbine, Balnamoon, 1 turbine; Netherton of Windyhill, 2 turbines, and Myreton Crossroads, 2 turbines). Four further operational wind farms are present within 10km of the Site; Newton of Edingight 1 turbine, Muirake, 2 turbines, Edintore, 6 turbines, and Hill of Towie, 21 turbines.

Table 8-10: Table Cumulative Effects during the Construction Phase

Receptor	Other Project (Construction Phase)	Screening Parameter & Reasoning	Assessment of Potential Cumulative Effect	Significance
Habitats	Lurg Hill (and constructed windfarms as	Within 10km	No sensitive habitats will be lost as a result of the Lurg Hill Wind Farm development (Vento Ludens, 2017).	**Not significant.**

[22] https://www.lurghillwindfarm.co.uk/faq/

Receptor	Other Project (Construction Phase)	Screening Parameter & Reasoning	Assessment of Potential Cumulative Effect	Significance
	outlined in Section 8.4.5 within screening parameter).		According to the Carbon and Peatland Map 2016 none of the historical windfarms were on areas of peatland soil, apart from Hill of Towie. There are two sections of Class 5 and Class 3 peat, though from aerials it does not appear that the development footprint is outwith these peatland areas. There is no other information available on habitats relating to these operational wind farms. Though given their small size it is not thought that significant habitat loss was associated with them.	
Water Environment	Lurg Hill ((and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 5km. Sufficient dilution beyond 5km that any effects would not be discernible.	The watercourses onsite fall into five water catchments; (for full details see **Chapter 10).** All of the other wind farms within 5km listed in **Table-8-8** are within the same catchments as the Site. However, the cumulative effect was considered to be not significant as detailed in **Chapter 10.** Furthermore, the small number of turbines leads to the conclusion that past construction is **not significant** in terms of cumulative effects on aquatic receptors.	**Not significant.**
Otter	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 10km. Otter home ranges between 20km and 50km in linear length[23][24] along watercourses. The buffer is considered sufficient due to the complexity/density of the watercourse environment within this buffer.	No information on smaller operational windfarm sites within 10km, though not thought that any significant amount of otter habitat was lost due to these smaller developments. From OS maps one or two water crossings associated with Hill of Towie and infrastructure is set back from water features. Only one watercourse crossing appears to be associated with Edintore (from OA maps), and infrastructure is set back from watercourses. Therefore, it is likely that little otter habitat was lost during construction. No evidence noted at Lurg Hill (GLM Ecology, 2014). There is habitat connectivity between both sites with streams, ditches and hedgerows connecting them. Without mitigation a **significant effect at the local level** on otter is expected.	**Significant**.
Badger	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5	Within 2km. Badger territories average 100ha (Roper, 2010).	No other projects identified within 2km.	**Not significant.**

[23] https://cieem.net/resource/ecology-of-the-european-otter

[24] https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter#:~:text=Otters%20that%20live%20in%20freshwater,including%20man%2Dmade%20ones

Receptor	Other Project (Construction Phase)	Screening Parameter & Reasoning	Assessment of Potential Cumulative Effect	Significance
	within screening parameter).			
Pine marten	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 10km Territory can range from 5-15km^2 for females and up to 25km^2 for males.[25][26] Though core territories are normally 5km^2.[27]	No information on smaller operational windfarm sites within 10km, though not thought that any significant amount of pine marten habitat was lost due to these smaller developments. Hill of Towie appears to be a heathland, not though that woodland was felled for development, and pine marten will continue to use the heathland in its current form. Edintore appears to be situated in a more arable setting with little obvious pine marten habitat nearby, Not thought that suitable habitat was lost due to this development. Live individuals recorded during surveys. Noted onsite short-term negative, non-significant effect on pine marten was concluded (Vento Ludens, 2017). The proposed development and Lurg Hill are connected and construction will reduce woodland cover. Though this is largely plantation with no denning features noted. Dense plantation does provide some foraging habitat, but food resources are not abundant. Without mitigation the cumulative impact is considered **significant at the local level.**	**Significant**.
Wildcat	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 10km. Large home territories which vary between 6km^2 for a female and 19-27km^2 for a male (Breitenmoser *et al,* 2019). Core territory used for assessment.	No information on smaller operational windfarm sites within 10km, though not thought that any significant amount of habitat was lost due to these smaller developments. Edintore and its surroundings appears to be unsuitable for wildcat and not thought that any habitat was lost. Hill of Towie is an open heathland and the edge of it, where it intersects with the woodland, may provide suitable habitat. No significant amount of habitat appears to have been lost due to its construction. Not recorded during surveys at Lurg Hill and therefore not considered in ES chapter. This species has a large territory and will move away from human disturbance. Habitat appears suboptimal for wildcat with dense plantation. The	**Significant**

[25] https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/pine-marten#:~:text=Scotland's%20population%20is%20estimated%20at%203%2C700%20adult%20pine%20martens.

[26] https://www.mammal.org.uk/species-hub/full-species-hub/discover-mammals/species-pine-marten/#:~:text=Martens%20have%20territories%20that%20vary,about%205%2D15%20square%20kilometres.

[27] O'Mahony, D., 2009. Pine marten (Martes martes) socio-spatial ecology and habitat selection in upland coniferous forests. Report to the Forest Service of the Department of Agriculture, Fisheries and Food (Ireland) and MTUK.

Receptor	Other Project (Construction Phase)	Screening Parameter & Reasoning	Assessment of Potential Cumulative Effect	Significance
			opening of woodland edge may create more opportunities for this species. There is habitat connectivity between both sites with streams, ditches and hedgerows connecting them. Without mitigation a **significant effect at the regional level** on wildcat is expected.	
Red squirrel	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 5km. Smaller home ranges. As considered of local value assessment is within 5km.	No information on smaller operational windfarm sites within 5km, though not thought that any significant amount of habitat was lost due to these smaller developments, mostly outwith of woodland habitats. Live individuals identified at Lurg Hill (GLM Ecology, 2014), though not considered in ES chapter. Loss of conifer woodland will reduce both foraging and drey building habitats and may lead to disturbance. Both wind farms are connected via treelines. The local area is quite arable so limited habitat to move into if disturbed and woodland lost due to the proposed developments would be able to support multiple individuals.	**Significant** at local level due to habitat loss.
Bats	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter).	Within 10km	No information on smaller operational windfarm sites within 10km, though not thought that any significant amount of habitat was lost due to these smaller developments, and no large areas of woodland or hedgerows seem to have been interfered with during construction. Very low usage recorded at Lurg Hill with only low levels of common pipistrelle. No roosting habitat or features noted (GLM Ecology, 2014). Construction works will lead to woodland reduction though dense plantation is not favoured, and woodland clearance may open up more edge habitats. However, without mitigation there is a risk of injury and disturbance to bats, and a **significant effect** is expected.	**Significant**.
Reptiles		Within 2km Less mobile than larger mammals.	No other projects identified within 2km.	**Not significant.**
Fish	Lurg Hill (and constructed windfarms as outlined in Section 8.4.5 within screening parameter)..	Within 5km Sufficient dilution beyond 5km that any effects would not be discernible.	Potential cumulative effects on fish may be direct habitat loss, habitat degradation, barriers to passage for migratory fish, pollution impacts. All of the wind farm sites are within the same catchment(s) as the Site. Without mitigation there is the potential for **significant effects at the local level.**	**Significant**.

As no windfarms are within the cumulative screening parameters for reptile and badgers, and no significant effect on habitats or the water environment was identified in **Table 8-10**, the cumulative

effect of the construction phase is considered to be non-significant and is not taken further in this assessment. Section **Error! Reference source not found.** considers the effects of the construction phase, both alone and in combination for the relevant species identified above. The residual effects are considered following mitigation which is outlined in Section 8.6).

8.7.2 Operational Phase

There are nine other windfarms within 10km of the Site boundary. The majority of these are small wind farms with 1-3 turbines. One windfarm (Edintore) with six turbines (92m diameter) is located 9.4km south of the Site boundary, and another wind farm (Hill of Towie) and with 21 turbines (93m diameter) is located 9.8km south. **Table 8-11** details the potential cumulative effects of these projects during the operational phase.

Table 8-11 Cumulative Effects During the Operational Phase

Receptor	Other Project (Operational Phase)	Screening Parameter & Reasoning *	Assessment of Potential Cumulative Effect	Significance
Habitats	All operational windfarms within parameter	Within 10km	No habitats will be lost during the operational phases. Restoration and enhancement work will be undertaken to improve habitats on the Site. It is not known if such works are associated with the other developments. No cumulative effect is expected.	**Not significant.**
Water Environment	All operational windfarms within parameter	Within 5km.	Less risk of pollution event as construction activities will be reduced. Though assumed any such activities would be undertaken following current guidelines and regulations. Monitoring water quality will be undertaken on the Site. Monitoring efforts are unknown at other wind farms. No cumulative effect is expected.	**Not significant.**
Otter	All operational windfarms within parameter	Within 10km.	Little disturbance during operational phase as less activity on wind farms. No loss of habitat is anticipated during this phase. No information on any improvements associated with other windfarms. The cumulative effect is considered not significant.	**Not significant**.
Badger	All operational windfarms within parameter	Within 2km.	No other projects identified within 2km.	**Not significant.**
Pine marten	All operational windfarms within parameter	Within 10km.	Little disturbance during operational phase as less activity on wind farms. No loss of habitat is anticipated during this phase. No information on any improvements associated with other windfarms. The cumulative effect is considered not significant.	**Not significant.**
Wildcat	All operational windfarms within parameter	Within 10km. .	Little disturbance during operational phase as less activity on wind farms. No loss of habitat is anticipated during this phase. No information on any improvements associated with other windfarms. The cumulative effect is considered not significant.	**Not significant.**
Red Squirrel	All operational windfarms within parameter	Within 5km.	Little disturbance during operational phase as less activity on wind farms. No loss of habitat is anticipated during this phase. No information on any improvements associated	**Not significant.**

Receptor	Other Project (Operational Phase)	Screening Parameter & Reasoning *	Assessment of Potential Cumulative Effect	Significance
			with other windfarms. The cumulative effect is considered not significant.	
Bat	All operational windfarms within parameter	Within 10km	The following descriptions of bat habitat and turbine positions at these two wind farms are based of aerial imagery from 2023. No information on either windfarm is available in the public domain. Hill of Towie is located on an open heathland with limited linear features which bats could use to access the wind farm for commuting or foraging purposes. The turbines are largely set back from the conifer plantations which are located at the edge of the existing development. Habitat for bats appears to be limited, and bat species are unlikely to cross the wind farm as it is largely exposed. Edintore is a smaller development located within large agricultural fields, though this wind farm appears to be more accessible to bat species as there is a greater mix of more enclosed habitat such as woodland and scrub. The bases of three of the turbines are approximately 50m from the closest woodland, one turbine is located right beside two small blocks of isolated conifer plantation, and the other turbine is in the middle of an arable field with no bat habitat within 200m. Followsters is located in a field, with the closest feature 50m. Balnamoon windfarm is located in the middle of an arable field with no features nearby. Netherton of Windyhill is located in fields over 160m from the nearest woodland. Myreton Crossroads is within woodland with the turbines close to woodland edges. Muirake is located in arable field with the closest feature 75m. Newton of Edingight is temporary closed. Aerial imagery suggest that bat habitat at these wind farms of low quality and the majority of turbines are located away from bat habitat. It is therefore considered unlikely that the cumulative impact of these projects will have a significant effect on bat species.	**Not significant.**
Reptiles	All operational windfarms within parameter	Within 2km	No other projects identified within 2km.	**Not significant.**
Fish	All operational windfarms within parameter	Within 5km	Less risk of pollution event as construction activities will be reduced. Though assumed any such activities would be undertaken following current guidelines and regulations.	**Not significant.**
*Reasoning for Screening Parameters as per **Table 8-10**				

8.7.3 Decommissioning Effects

Effects during decommissioning are expected to be similar to those during construction, however no additional loss of habitat would be expected, and habitat would be reinstated following removal of any infrastructure as appropriate. Embedded mitigation would be the same as during construction. Therefore, no significant effects are anticipated during decommissioning.

8.8 Residual Effects

8.8.1 Construction

During the construction phase, the permanent loss of up to 0.04ha and indirect loss of 1.4ha of degraded blanket bog would constitute a **significant negative effect at the local level**.

Peatland restoration will be undertaken on the Site (in agreement with FLS) and there is the potential for a **significant positive effect on the county level** in regards to peatland restoration.

Assuming the proposed good practice mitigation measures are implemented along with the following species-specific mitigation, **no significant** residual effects are likely upon other important ecological receptors during the construction phase for the project alone or in combination.

8.8.1.1 Otter

Pre-construction surveys in suitable otter habitat within the construction footprint plus appropriate buffers would be undertaken to identify otter activity and resting areas which may be impacted. Suitable areas or features identified during these surveys would undergo a pre-construction check by the EnvCoW. If works are within 30m of resting up site, or within 200m of a breeding holt, a NatureScot licence will be needed to carry out the works. With this mitigation in place, the effect of the construction phase on otter is considered to be **not significant**.

No significant cumulative effects on otter are expected.

8.8.1.2 Badger

Details of the residual effects on Badgers during the construction phase are found in the Confidential Annex of **Technical Appendix 8.3.**

It is concluded that with mitigation in place the effect of the construction phase on badger is considered to be **not significant**.

8.8.1.3 Pine marten

Pre-construction surveys would identify any denning sites, and appropriate measures would be implemented, such as buffers and timings of work, to ensure there that there would be no adverse effect on pine marten. With this mitigation in place, the effect of the construction phase on pine marten is considered to be **not significant**.

No significant cumulative effects on pine marten are expected.

8.8.1.4 Wildcat

Pre-construction surveys would identify any wildcat denning site close to the construction footprint, and pre-work checks of potential denning features should also be undertaken to ensure robust measures are in place. With this mitigation in place, the effect of the construction phase on wildcat is considered to be **not significant**.

No significant cumulative effects on wildcat are expected.

8.8.1.5 Red Squirrel

It is taken into account that the Site is an operating forest that is in a constant state of flux and red squirrel numbers may already be low in response to this factor. Pre-construction surveys would identify any dreys on the Site, and pre felling checks for dreys should also be undertaken by an EnvCoW to ensure that the proper procedures are adhered to and thereby reducing the mortality risk to red squirrels. With this mitigation in place, the effect of the construction phase for the project alone on red squirrel is considered to be **not significant**.

The combined loss of habitat for red squirrel from the proposed development and the nearby windfarms have the potential to have a significant effect on red squirrel through habitat loss and disturbance at a local level. It assumed that Lurg Hill Wind Farm will adopt a similar approach to mitigating for impacts on red squirrel (suitable buffers for dreys, pre-work checks etc). Further mitigation and compensation is outlined in the OBERP and includes habitat enhancement for red squirrel through the planting of favoured trees (Douglas fir *Pseudotsuga menziesii*, Scots pine, and Norway spruce *Picea abies*), the retention of an area of mature conifer woodland on the Site, and the installation of red squirrel boxes. Following these measures, no significant cumulative effect on red squirrel is expected.

Due to the conifer woodland loss (158.8Ha, representing 7.59% of total coniferous woodland habitat on the Site) and the timescales for replacement woodland planting to establish (i.e., any woodland planting takes approximately 20-25 years until it provides a good seed crop for red squirrel), mitigating this impact within a short period of time will require to be addressed via provision of alternative shelter and foraging habitat. Red squirrel boxes to avoid significant effects on the red squirrel population at a local level due to habitat loss, will in turn will minimise the significance of effects on red squirrel at a site level in terms of disturbance..

8.8.1.6 Bats

A pre-construction survey will need to be undertaken ahead of the proposed works to identify any potential bat roost near to the proposed development and appropriate buffers or working methods would be enforced by the EnvCoW to ensure no harm or disturbance to bat species.

Construction will mainly take place during daylight hours during the season when bats are most active (April to October, 0700 to 1900 hrs). If overnight lighting is required in any areas, such as the construction compound, this should be directional and light spill would be avoided to the surrounding suitable bat foraging habitat e.g., woodland edges, streams etc.

With this mitigation in place, the effect of the construction phase on bats is considered to be **not significant**.

No significant cumulative effects on bats are expected.

8.8.1.7 Fish

A pre-construction monitoring programme would be carried out utilising the same ten sampling areas as detailed in **Technical Appendix 8.5** to provide up-to-date assessment of fish populations.

Pre-construction electro-fishing surveys and fish rescues would be required in advance of watercourse crossing works and an Aquatic Ecological Clerk of Works (ECoW) would require monitoring works at all locations to supervise the appropriate working methods and advise on suitable working methods to protect fish habitat and avoid direct impacts to fish in the locale and indirect impacts downstream. Water monitoring pre-construction and during construction will be undertaken including for aquatic invertebrates. **No significant** effects are predicted.

No significant cumulative effects on fish are expected.

8.8.1.8 Reptiles

On the basis that the proposed mitigation measures are implemented, no significant effect on reptiles is predicted. **No significant** effects are predicted.

8.8.2 Operation

Following mitigation outlined above in Section 8.6 the risk to common and soprano pipistrelle bats is considered low and **no significant effect** is considered likely.

No significant residual effects are anticipated for any other ecological receptor during the operational phase.

No significant cumulative effects are anticipated during the operational phase.

8.9 Further Survey Requirements and Monitoring

8.9.1 Habitat Monitoring

Vegetation monitoring would be undertaken as part of the outline BERP, as detailed in **Technical Appendix 8.6**, summarised below:

- Habitat monitoring within restored peatland and heathland habitats.
- conifer regeneration monitoring; and
- woodland planting monitoring.

For full details of further monitoring proposed, see **Technical Appendix 8.6.**

8.9.2 Species Monitoring

Pre-construction surveys will be undertaken to take account of any changes in distribution of otter, badger, pine marten, wildcat, red squirrel, and bats.

Fish monitoring will take place preconstruction, throughout construction and post construction to monitor the effect of construction activities on fish populations on the Site.

Macroinvertebrate sampling is recommended to be conducted at ten survey locations.

Bat monitoring will continue during the operational phase as part of the proposed mitigation outlined in Section 8.6.

8.9.3 Hydrological Monitoring

Water quality monitoring will take place prior to construction and at regular intervals during construction to monitor pollutants and suspended soils. A regular water quality monitoring for a period post construction to determine potential long terms effects of the proposed development on water quality will also be undertaken. See **Chapter 10 Geology Hydrology, and Hydrogeology** for full details.

8.10 Summary of Predicted Effects

8.10.1 Proposed Development

Table 8-12 provides a summary of effects on important ecological receptors, mitigation, compensation and enhancement measures and residual effects.

Following the avoidance of important receptors during the project design where possible, and with the implementation of the proposed good practice measures and additional mitigation, impacts would be minimised as far as possible.

The proposed development would result in a significant negative effect for the loss of degraded blanket bog level at a local level. However, this habitat loss would be compensated by a significant positive effect through the peatland restoration proposed detailed in the outline BERP. The scale of the positive effect is dependent on how much restoration is actually undertaken, though there is potential for a positive effect at the county level.

With the implementation of continued good practice measures, species specific mitigation measures and the implementation of the outline BERP, no significant negative effects are predicted during the operational or construction phase.

Table 8-12: Summary of effects on important ecological receptors

Receptor	Potential Effect	Embedded Mitigation/Good Practice	Significance of Effect	Additional Mitigation/Compensation	Residual Effect
Construction Phase					
Degraded Blanket Bog	Permanent loss (direct and indirect) of up to 1.44ha of degraded blanket bog habitat.	Avoidance of degraded blanket bog where possible.	Significant at local level.	Compensation/restoration of degraded blanket bog loss (14.4ha per NaturesScot guidance) and enhancement of peatland habitats via the outline BERP (34ha identified).	Significant negative effect at a local level but offset through proposed habitat restoration and enhancement within the outline BERP. If all these measures are undertaken there will be a positive significant effect at county level.
Upland Flush	Permanent loss (direct and indirect) of up to 0.22ha.	Avoidance of sensitive habitats where possible.	Not significant.	None.	Not significant.
Purple moor grass and rush pasture	Permanent loss (direct and indirect) of up to 0.2ha.	Avoidance of sensitive habitats where possible.	Not significant.	None.	Not significant.
Water environment	Water quality impacts (running water), including impact on fish habitat within the Site and downstream of the Site.	Hydrological and pollution prevention measures (detailed in **Chapter 10)** including adherence to SEPA PPGs/GPPS.	Not significant.	50m watercourse buffer zone (other than at three new and four upgraded water crossings).	Not significant.
Otter	Inadvertent disturbance, loss of habitat, injury and/or death of otter.	50m watercourse buffer zone (other than at three crossing points). Covering/ramping of excavations.	Significant at local level (injury/death). Not significant (disturbance/habitat loss).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Species SPP. Habitat enhancement of riparian corridors/denning	Not significant (Mortality, disturbance, habitat loss/degradation).

Receptor	Potential Effect	Embedded Mitigation/Good Practice	Significance of Effect	Additional Mitigation/Compensation	Residual Effect
		Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.		feature creation in outline BERP. Buffers/appropriate working methods under EnvCoW supervision.	
Badger	Inadvertent disturbance, habitat loss, injury and/or death of badger.	Covering/ramping of excavations. Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.	Significant at Site level (injury/death/disturbance). Not significant (habitat loss).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Species SPP. Buffers/appropriate working methods under EnvCoW supervision.	Not significant (Mortality, disturbance, habitat loss/degradation).
Pine Marten	Inadvertent disturbance, habitat loss, injury and/ or death of pine marten.	Covering/ramping of excavations. Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.	Significant at local level (injury/death/disturbance). Not significant (habitat loss).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Species SPP. Recommendations within the outline BERP for installation of denning boxes and habitat improvements will increase habitat quality for foraging. Buffers/appropriate working methods under EnvCoW supervision.	Not significant (Mortality, disturbance, habitat loss/degradation).

Receptor	Potential Effect	Embedded Mitigation/Good Practice	Significance of Effect	Additional Mitigation/Compensation	Residual Effect
Wildcat	Inadvertent disturbance, habitat loss, injury and/ or death of wildcat.	Covering/ramping of excavations. Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.	Significant at regional level (injury/death/disturbance). Not significant (habitat loss).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Species SPP. Recommendations within the outline BERP for habitat creation (riparian and edge habitat) which will benefit this species Buffers/appropriate working methods under EnvCoW supervision.	Not significant (Mortality, disturbance, habitat loss/degradation).
Red squirrel	Inadvertent disturbance, habitat loss, injury and/ or death of red squirrel.	Covering/ramping of excavations. Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.	Significant at local level (injury/death/habitat loss). Significant at Site level (disturbance).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Species SPP.	Not significant (Mortality, disturbance, habitat loss/degradation),
Bats	Inadvertent disturbance, habitat loss, injury and/ or death of bats.	Covering/ramping of excavations. Site speed limit of 15mph. Suitable storage of materials. Emergency plan in place.	Significant at site level (injury/death/disturbance). Not significant (habitat loss).	Pre-construction surveys. Pre-work checks in suitable areas identified during pre-construction surveys. Appropriate siting of bat boxes/habitat enhancement in outline BERP. Species SPP.	Not significant (Mortality, disturbance, habitat loss/degradation).

Receptor	Potential Effect	Embedded Mitigation/Good Practice	Significance of Effect	Additional Mitigation/Compensation	Residual Effect
Reptile	Disturbance from construction.	Site speed limit of 15mph.	Not significant.	Pre-work checks in areas of suitable habitat by EnvCoW. Removal of hibernacula / 'soft start' construction activities. Heathland restoration in OBERP will increase habitat suitability.	Not significant.
Fish	Water quality impacts on fish habitat.	Hydrological and pollution prevention measures (detailed in Chapter 10) including adherence to SEPA PPGs/GPPS.	Not significant.	50m watercourse buffer zone (other than instances listed in Section 8.5.1). Fish and water quality monitoring plans preconstruction and during construction.	Not significant.
Operational Phase					
Habitats including water environment	Pollution event.	Hydrological and pollution prevention measures (detailed in Chapter 10) including adherence to SEPA PPGs/GPPS	Not significant.	None.	Not significant.
Bats	Collision with moving turbines/barotrauma.	Turbines sited away from woodland (50m plus turbine blade tip).	Not significant for Myotis *sp.* and brown long-eared. Significant at a Site level for common and soprano pipistrelle.	Bat Mitigation and Monitoring Plan. Bat activity monitoring. Carcass search.	Not significant for all species.

Receptor	Potential Effect	Embedded Mitigation/Good Practice	Significance of Effect	Additional Mitigation/Compensation	Residual Effect
				Curtailment will be considered based on monitoring results.	
Otter, badger, pine marten, wildcat, red squirrel and reptiles.	Damage to habitats and disturbance/ injury/killing.	Speed limit on the Site. Method statements for working on the Site.	Not significant	None	Not significant
Fish	Water quality impacts to fish habitat	Hydrological and pollution prevention measures (detailed in Chapter 10) including adherence to SEPA PPGs/GPPS	Not significant	Continuing of fish (Year 1 & 2) and water quality monitoring. Reconstruction of the river corridors are advised; options include blocking of a proportion of man-made land/forestry drainage channels within the forestry rides to improve fish habitat.	Not significant

8.10.2 Cumulative Effects

Cumulative effects during the construction phase are not considered to be significant. No significant effects are considered likely during the operational phase.

8.11 References

Arnett, E., Brown, W. K., Erickson, W.P., Fiedler, J.K., Hamilton, B.L., Henry, T.H., Jain, A., Johnson, G.D., Kerns, J., Koford, R.R., Nicholson, C.P., O'Connell, T.J., Piorkowski, M.D. and Tankersley, R.D. (2008). Patterns of Bat Fatalities at Wind Energy Facilities in North America. The Journal of Wildlife Management 72(1), pp 61-78.

AMEC (2003) Aultmore Wind Farm Environmental Impact Assessment.

Bat Conservation Trust, 2023. The National Bat Monitoring Programme Annual Report 2022. Bat Conservation Trust, London. Available at www.bats.org.uk/our-work/national-bat-monitoringprogramme/reports/nbmp-annual-report.)

Balharry, E., Jefferie, D.J., Birks, J.D.S. (2008) Pine marten in: Mammals of the British Isles: Handbook 4th Edition, 447-455. The Mammal Society, Southampton.

Breitenmoser, U., Lanz, T. & Breitenmoser-Würsten, C. (2019). Conservation of the wildcat (*Felis silvestris*) in Scotland: Review of the conservation status and assessment of conservation activities. International Union for Conservation of Nature, SSC Cat Specialist Group, February 2019.

Bruneau, P.M.C & Johnson, S.M. 2014. Scotland's peatland - definitions & information resources. Scottish Natural Heritage Commissioned Report No 701.

Butcher B., Carey P., Edmonds R,. Norton L and Treweek J. (2020) The UK Habitat Classification User Manual Version 1.1.

Chanin, P. (2003a) Ecology of the European Otter. Conserving Natura 2000 Rivers, Ecology Series No. 10. English Nature, Peterborough.

Chanin, P. (2003b) Monitoring of the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester. Version 1.2 - Updated April 2022.

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

Cresswell, W.J, Birks, J., Bullion, S & Dean, M. (2012) UK BAP Mammals Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society.

Croose, E., Birks, J.D.S., Schofield, H.W. & O'Reilly, C. 2014. Distribution of the pine marten (Martes martes) in southern Scotland in 2013. Scottish Natural Heritage Commissioned Report No. 740.

Environment Agency (2003) - River Habitat Survey in Britain and Ireland. Field Survey Guidance Manual: Environment Agency, Bristol.

Forestry Commission Scotland (2013) Summary of Forest Design Plan Proposals. Aultmore.

GLM Ecology (2014) – Ecology Update Lurg Hill.

Gurnell, J & Pepper, H.W. (1991) Conserving the Red Squirrel. Forestry Commission. Research Information Note 205.

Gurnell, J., Lurz, P. & Pepper, H. (2001) Practical Techniques for Surveying and Monitoring Squirrels.

Hendry K, Cragg-Hine D (1997) - A Guidance Manual. APEM Ltd, Fisheries Technical Manual 4, R & D Technical Report W44, Version 1.0/07-97. R & D Project 603.

Hyder. (2007). *Aultmore Wind Farm Environmental Statement: Ecology Chapter.*

Klar, N. (2010). Lebensraumzerschneidung und Wiedervernetzung – Ein Schutzkonzept für die Wildkatze in Deutschland Habitat fragmentation and (re-) connection – a conservation concept for the wildcat in Germany. Dissertation. Fachbereich Biologie, Chemie, Pharmazie, Freie Universität Berlin, Berlin.

Mathews, F., Richardson, S., Lintott, P., & Hosken, D. (2016). *Understanding the Risk to European Protected Species (bats) at Onshore Wind Turbine Sites to inform Risk Management. Final Report to Defra.*

NatureScot. (2020). *General pre-application and scoping advice for onshore wind farms.* Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/renewable-energy/onshore-wind-energy/advice-wind-farm-development

NatureScot (2021) Bats and onshore wind turbines – survey, assessment and mitigation. Available at: https://www.nature.scot/doc/bats-and-onshore-wind-turbines-survey-assessment-and-mitigation [Accessed August 2023].

NatureScot (2022) General pre-application and scoping advice for onshore wind farms. Available at: https://www.nature.scot/doc/general-pre-application-and-scoping-advice-onshore-wind-farms [Accessed August 2023].

Neal, E. & Chessman, C. (1996) Badgers. Poyser Natural History London.

Nisbet, T.R. & Evans, C.D (2014). Forestry and surface water acidification. Forestry Commission.

Rodwell J.S (Editor) (1991 et seq.) British Plant Communities. Cambridge University Press.

Rodwell, J.S, (2006), NVC Users' Handbook, 68 pages, ISBN 978 1 86107 574 1.Scottish Government (2013) Scottish Government Scottish Biodiversity List SBL [online] Available at:

http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL [Accessed in August 2023].

Roper, T.J (2010). Badger. Collins

RSK Group PLC. (2009). Myreton Crossroads 2 Phase 1 Habitat Survey.

Scottish Government (2013) Scottish Biodiversity List. Available at: https://www.nature.scot/doc/scottish-biodiversity-list [Accessed August 2023].

Scottish Fisheries Co-ordination Centre (SFCC) (2007) Introductory electrofishing training manual & electrofishing team leader training manual. Available at:

http://www.sfcc.co.uk/resources/electrofishing.html [Accessed in August 2023].

SEPA (2017). Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31 (LUPS – GN31). Version 3 Issued 11 September 2017.

SNH (2015a) Scotland's National Peatland Plan: Working for our future. [Online] Available at: https://www.nature.scot/sites/default/files/2017-07/A1697542%20-%20150730%20-%20peatland_plan.pdf [Accessed in August 2023]

SNH (2016a) Carbon and Peatland 2016 Map. Available at:

http://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016map/ [Accessed in August 2023].

SNH (2016b) Assessing the impacts of developments (otters) [On line] Available at:

http://www.snh.gov.uk/about-scotlands-nature/wildlife-and-you/otters/assessing/ [Accessed in August 2023].

SNH (2019) Good Practice during Wind Farm Construction, 4th Edition. Available at: https://www.nature.scot/guidance-good-practice-during-wind-farm-construction [Accessed in August 2023].

Strachan, I.M. 2017. Manual of terrestrial EUNIS habitats in Scotland. Version 2. Scottish Natural Heritage Commissioned Report No. 766.

Vento Ludens (2017). Lurg Hill Wind Farm Environmental Statement (Volume 1) Chapter 13: Ecology and Ornithology.

Ward D, Holmes N and José P (1994) The New Rivers and Wildlife Handbook. RSPB, Bedford