CLOICH FOREST WIND FARM

EIA Report – Volume 1 – EIA Report Text

Chapter 7

Ecology

ARCUS

7 ECOLOGY

7.1 INTRODUCTION

1. This Chapter of the Environmental Impact Assessment Report (EIA Report) evaluates the effects of the Cloich Forest Wind Farm ('the Development') on the ecological resource.

2. This assessment was undertaken by Arcus Consultancy Services Limited (Arcus).

3. This Chapter of the EIA Report is supported by the following figures provided in Volume 2a Figures excluding LVIA:

   - Figure 2.1: Ecological Designations;
   - Figure 7.1a-b: Habitat Survey Results;
   - Figure 7.2: Protected Species Survey Results; and
   - Figure 7.3: Remote Static Survey Locations.

4. This Chapter of the EIA Report is supported by the following Technical Appendix (TA) documents provided in Volume 3 Technical Appendices:

   - Technical Appendix A7.1: Habitat Surveys;
   - Technical Appendix A7.2: Protected Species Surveys;
     - Confidential Annex: Protected Species Surveys;
   - Technical Appendix A7.3: Bat Surveys; and
   - Technical Appendix A7.4: Fisheries Surveys.

5. This Chapter includes the following elements:

   - Legislation, Policy and Guidance;
   - Assessment Methodology and Significance Criteria;
   - Scoping Opinion and Consultation;
   - Baseline Methods;
   - Baseline Conditions;
   - Embedded Mitigation;
   - Determination of Ecological Importance;
   - Assessment of Potential Effects;
   - Assessment of Residual Effects;
   - Assessment of Cumulative Effects;
   - Summary of Effects; and
   - Statement of Significance.

7.2 LEGISLATION, POLICY AND GUIDANCE

6. The following sections outline the guidance, legislation, and information sources which have been considered in carrying out this assessment.

7.2.1 Legislation

- Council Directive 92/43/EEC ('the Habitats Directive')[1,2];
- Council Directive 2000/60/EC ('Water Framework Directive')[3,4];
- Wildlife and Countryside Act 1971 (as amended)[5];
- Conservation (Natural Habitats, & c) Regulations 1994 ('the Habitat Regulations')[6];
- Wildlife and Natural Environment (Scotland) Act 2011[7];
- Protection of Badgers Act 1992[8];
- Nature Conservation (Scotland) Act 2004[9];
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended)[10] ('the EIA Regulations'); and
- Salmon and Freshwater Fisheries Act 2003[11].

7.2.2 Policy and Guidance

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine[12];
- General Pre-application/ Scoping Advice to Developers of Onshore Wind Farms[13];

[1] European Commission (1992) Council Directive 92/43/EEC the Conservation of Natural Habitats and of Wild Fauna and Flora. [Online] Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN. (Accessed 04/02/2021).
[2] These Regulations were amended by the Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 to interpret the Habitats Directive in light of Brexit, in order to address failures of retained EU law to operate effectively. The Habitats Directive is retained and still applies in Scotland subject to the amending Regulations.
[3] European Commission (2000) Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 Establishing a Framework for Community Action in the Field of Water Policy [Online] Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:5c735afb-2ec6-4577-bdf7-756d3d694eeb.0004.02/DOC_1&format=PDF. (Accessed 04/02/2021).
[4] This legislation was amended by the Environment (EU Exit) (Scotland) (Amendment etc.) Regulations 2019 to interpret the Water Framework Directive in light of Brexit, in order to address failures of retained EU law to operate effectively. The Water Framework Directive is retained and still applies in Scotland subject to the amending Regulations.
[5] UK Government (1971) Wildlife and Countryside Act 1971, Chapter 69. Part 1. [Online] Available at: http://www.legislation.gov.uk/ukpga/1971/69/section/1. (Accessed 04/02/2021).
[6] Scottish Government (1994) The Conservation (Natural Habitats, &c.) Regulations 1994. [Online] Available at: http://www.legislation.gov.uk/uksi/1994/2716/contents/made. (Accessed 04/02/2021).
[7] Scottish Government (2011) Wildlife and Natural Environment (Scotland) Act 2011. [Online] Available at: http://www.legislation.gov.uk/asp/2011/6/contents/enacted. (Accessed 04/02/2021).
[8] UK Government (1992) Protection of Badger Act 1992. [Online] Available at: http://www.legislation.gov.uk/ukpga/1992/51/contents. (Accessed 04/02/2021).
[9] Scottish Government (2014) Nature Conservation (Scotland) Act 2004. [Online] Available at: http://www.legislation.gov.uk/asp/2004/6/contents. (Accessed 04/02/2021).
[10] The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 [Online] Available at: http://www.legislation.gov.uk/ssi/2017/101/contents/made. (Accessed 04/02/2021).
[11] Scottish Government (2003) Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003. [Online] Available at: http://www.legislation.gov.uk/asp/2003/15/contents. (Accessed 04/02/2021).
[12] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1 Chartered Institute of Ecology & Environmental Management, Winchester. [Online] Available at: https://cieem.net/wp-content/uploads/2017/07/ECIA-Guidelines-Sept-2019.pdf. (Accessed 04/02/2021).
[13] NatureScot (2020) General pre-application/ scoping advice to developers of onshore wind farms. [Online] Available at: https://www.nature.scot/general-pre-application-and-scoping-advice-onshore-wind-farms. (Accessed 04/02/2021).

- Decommissioning and Restoration Plans for wind farms[14];
- Good Practice During Wind Farm Construction[15];
- Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems[16],
- Planning Guidance on On-shore Windfarm Developments[17];
- Guidance on Advising on carbon-rich soils, deep peat and priority peatland habitat in development management[18];
- European Union (EU) Biodiversity Strategy[19];
- 2020 Challenge for Scotland's Biodiversity[20];
- Scottish Biodiversity List (SBL)[21]; and
- EU Exit: habitat regulations in Scotland[22].

7. In addition to the above, guidance relating to the ecology of species and habitats and to survey and assessment methods are cited in full, where appropriate, in the relevant parts of this Chapter and associated Technical Appendices. Work has been carried out in accordance with BS 42020:2013 Biodiversity – Code of Practice for Planning and Development[23] by ecologists working to the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct[24].

[14] NatureScot (2016) Decommissioning and Restoration Plans for Wind Farms. [Online] Available at: https://www.nature.scot/guidance-decommissioning-and-restoration-plans-wind-farms-february-2016. (Accessed 04/02/2021).
[15] Scottish Renewables, NatureScot, SEPA, Forestry Commission Scotland, Historic Environment Scotland (2019). Good Practice during Wind Farm Construction. [Online] Available at: https://www.nature.scot/guidance-good-practice-during-wind-farm-construction. (Accessed 04/02/2021).
[16] SEPA (2017) Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Land Use Planning System SEPA Guidance Note 31. Version 3. [Online] Available at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf. (Accessed 04/02/2021).
[17] SEPA (2014) Planning guidance on on-shore windfarm developments. Land Use Planning System SEPA Guidance Note 4. Version 9. [Online] Available at: https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf. (Accessed 04/02/2021).
[18] NatureScot (2020) Advising on carbon-rich soils, deep peat and priority peatland habitat in development management. [Online] Available at: https://www.nature.scot/advising-carbon-rich-soils-deep-peat-and-priority-peatland-habitat-development-management. (Accessed 04/02/2021).
[19] European Commission (2011) EU Biodiversity Strategy. [Online] Available at: http://ec.europa.eu/environment/nature/biodiversity/strategy/index_en.htm. (Accessed 04/02/2021).
[20] Scottish Government (2015) Scotland's Biodiversity, a Route Map to 2020. [Online] Available at: https://www.gov.scot/publications/scotlands-biodiversity-route-map-2020/ (Accessed 04/02/2021).
[21] Scottish Government (2013) Scottish Biodiversity List. [Online] Available at: https://www2.gov.scot/Topics/Environment/Wildlife-Habitats/16117/Biodiversitylist/SBL. Accessed on 4 February 2021.
[22] Scottish Government (2020) EU Exit: habitat regulations in Scotland. [Online] Available at: https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/. (Accessed 04/02/2021).
[23] BSI Group (2013). BS 42020:2013 – a code of practice for biodiversity in planning and development. BSI.
[24] CIEEM (2019). Code of Professional Conduct. [Online] Available at: https://cieem.net/resource/code-of-conduct/ (Accessed 04/02/2021).

7.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

7.3.1 Scoping Responses and Consultations

8. Consultation for this EIA was carried out with the organisations shown in Table 7.1.

9. A Scoping Request was submitted to the Scottish Government's Energy Consents Unit (ECU) in December 2019.

Table 7.1 Consultation Responses

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
NatureScot	Scoping Response – 21/11/2019	Content with the habitat and species surveys set out in the Ecology section of the scoping report.	Habitat and species survey methods, as detailed in scoping report are provided in Section 7.3.5.
Scottish Environmental Protection Agency (SEPA)	Scoping Response – 30/10/2019	A map demonstrating that all groundwater dependent terrestrial ecosystems (GWDTE) are outwith a 100m radius of all excavations shallower than 1m and outwith 250m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.	A GWDTE assessment was carried out during habitat surveys in accordance with SEPA guidance[25], as detailed in Section 7.3.5.1. Habitats with potential to be GWDTEs were identified, these were mainly along forestry rides and within low lying grassland in the southern section of the Site. These were almost all considered to be surface water fed. Section 10.4.5 of Chapter 10: Hydrology and Hydrogeology provides further detail on this as well as providing a map showing the location of potential GWDTEs in relation to Development infrastructure.
Scottish Borders Council (SBC)	Scoping Response – 15/11/2019	Advise National Vegetation Classification (NVC) surveys should also be carried out for priority habitats on the Scottish Biodiversity List (SBL). Clarification needed on risk level of site for bats – stated as low but medium might be more appropriate. The EIA should include the relevant information to inform the Appropriate Assessment for fisheries (in a separate section or report), such as details of mitigation proposed.	NVC surveys undertaken in accordance with SEPA guidance[25] and detailed in Section 7.4.2.1. Letter sent to SBC clarifying justification for site risk level on 15/04/2020. Also discussed in TA7.3. Section 7.7.7.1 provides information to inform an Appropriate Assessment for the River Tweed SAC, including fisheries.

[25] SEPA (2009) Land Use Planning Systems SEPA Guidance Note 4 Planning Guidance on on-shore windfarms developments. [Online] Available at: https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf (Accessed 04/02/2021).

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
		Otter surveys should follow the guidance[26] for large extensive development.	Otter surveys were undertaken following the guidance[26], with further information detailed in TA7.2.
Marine Scotland Science (MSS)	Scoping Response - 23/10/2019	Advise to carry out fisheries surveys, including fully quantitative electrofishing surveys. Advise to consider the potential cumulative impacts on the water quality and fish populations associated with adjacent developments (operational and consented). Advised to consider the potential impacts on the water quality and fish populations associated with any proposed felling operations. Advised to contact the Tweed Commission and the Tweed Foundation, if not already done so, for further information on local fish populations.	Fisheries surveys (including electrofishing) designed and undertaken by the Tweed Foundation, as detailed in TA7.4. Potential cumulative impacts assessed in Section 7.8. Potential effects of proposed felling operations of water quality and fish populations are discussed in Section 7.7.5 Tweed Commission were contacted and Tweed Foundation were consulted regarding suitability of surveys and also carried out the Fisheries Surveys (see Sections 7.3.5.6 and 7.4.2.4).
Fisheries Management Scotland (FMS)	Scoping Response - 25/10/2019	The proposed development falls within the district of the River Tweed Commission, and the catchments relating to the Tweed Foundation, so it is important that the proposals are conducted in full consultation with these organisations.	See comment above.

7.3.2 Scope of Assessment

10. This Chapter considers the effects of construction, operation, and decommissioning (including cumulative effects) of the Development upon those ecological features identified during the review of desk-based information and field surveys. Effects upon the following features are assessed:

- Designated sites: effects include direct (i.e. derived from land-take or disturbance to habitats or protected species) and indirect (i.e. changes caused by effects to supporting systems such as groundwater);
- Terrestrial habitats: effects include direct (i.e. derived from land-take) and indirect (i.e. changes caused by effects to supporting systems such as groundwater or overland flow);

[26] Scottish Borders Council (2017) Otters Technical Advice Note 2. [Online] Available online at; https://www.scotborders.gov.uk/downloads/file/2961/otters_technical_advice_note (Accessed 04/02/2021).

- Aquatic habitats: effects are limited to the ecological impacts of changes in water conditions through potential pollution effects; hydrological effects are considered in **Chapter 10: Hydrology and Hydrogeology**; and
- Protected species: effects considered include direct (i.e. loss of life as a result of the Development; loss of key habitat; displacement from key habitat; barrier effects preventing movement to/from key habitats; and general disturbance) and indirect (i.e. loss/changes of/to food resources; population fragmentation; degradation of key habitat e.g. as a result of pollution).

7.3.3 Elements Scoped Out of Assessment

11. On the basis of the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, generally common and widely distributed habitats or species have been scoped out, with the exception of those listed in the following categories:

- Habitats on Annex I or the Habitats Directive, species on Schedule 2 of the Habitats Regulations, and plant species on Schedule 4 Habitats Regulations;
- Scottish Biodiversity List (SBL) Priority Habitats; and
- Habitats or species protected by other legislation such as The Wildlife and Countryside Act 1981 (as amended), the Nature Conservation (Scotland) Act 2004 (as amended), or The Protection of Badgers Act 1992.

12. Further effects have subsequently been scoped out based on the result of the desk-based study and survey work undertaken for the Development. Details of ecological features scoped out post survey are provided in Section 7.6.1.

7.3.4 Desk Study Methods

13. A Desk Study was conducted in September 2019 and updated in February 2021 to obtain information about relevant designated nature conservation sites and records of habitats and species. The desk study searched for records of statutory and non-statutory sites of nature conservation, protected species, and priority habitats and species for nature conservation listed in the Scottish Biodiversity List (SBL)[21]. The Desk Study Area (DSA) comprised of a variety of areas surrounding the Site. Search distances were chosen based on the level of protection and/or ecological range of the different ecological receptors, detailed as follows:

- A radius of 5 km from the Site was searched for internationally and nationally designated statutory sites for nature conservation (e.g. a Special Area of Conservation (SAC) or Site of Special Scientific Interest (SSSI)). The search radius was extended to 10 km to include any Sites designated for mobile species (i.e. bats);
- A radius of 2 km from the Site was searched for non-statutory sites;
- A radius of 5 km (extending to 10 km for rare bat species) from the Site was searched for records of notable or protected species; and
- A radius of 2 km from the Site was searched for records of invasive, non-native species.

14. Information on the above was provided from The Wildlife Information Centre (TWIC). Additional information was obtained from publicly available sources[27] and is cited in the relevant parts of this Chapter and technical appendices.

[27] NBN Atlas. [Online] Available at: http://www.nbnatlas.org (Accessed 04/02/2021).

7.3.5 Baseline Survey Methods

15. Baseline ecology surveys were undertaken between September 2019 and October 2020. An overview of the survey methods is provided below and full details are presented in Technical Appendices A7.1 through A7.4.

7.3.5.1 Phase 1 Habitat Survey

16. A Phase 1 Habitat Survey of the Site was undertaken across several Site visits in September 2019 and June 2020, following standard Joint Nature Conservation Committee (JNCC) survey methods[28] (Technical Appendix A7.1). Phase 1 Habitat Survey is a standard method for classifying and mapping British habitats.

17. The Phase 1 Habitat Survey recorded habitats within 'the Habitat Survey Area' (HSA), an area covering the Infrastructure Layout with an additional 250 m surrounding buffer.

18. In addition, the Phase 1 Habitat Survey aimed to identify wetland habitats in accordance with the habitat's descriptions given in 'A Functional Wetland Typology for Scotland' guidance[29]. Where wetland habitats were identified, further detailed surveys were undertaken for identification of vegetation communities with potential groundwater dependency in accordance with Scottish Environment Protection Agency (SEPA) guidance[17].

Survey Limitations

19. Access was not permitted to some small pockets of land lying outside of the Site Boundary but within the HSA. These areas included land surrounding Kilrubie Hill and land surrounding the eastern access road. In such cases it was possible to assess the vegetation from the Site Boundary and thus was not considered to be a major limitation.

7.3.5.2 National Vegetation Classification Survey

20. A National Vegetation Classification (NVC) Survey was undertaken on all wetlands and habitats of conservation value recorded during the Phase 1 Habitat survey. The NVC Survey involved mapping distinct areas of homogenous vegetation within the HSA and recording detailed descriptions of the vegetation communities, with reference to published community descriptions[30,31,32]. Full methods are presented in Technical Appendix A7.1.

Survey Limitations

21. Access was not permitted to some small pockets of land lying outside of the Site Boundary but within the HSA. These areas included land surrounding Kilrubie Hill and land surrounding the eastern access road. In such cases it was possible to assess the vegetation from the Site Boundary and thus was not considered to be a major limitation.

[28] JNCC (2010) Handbook for Phase 1 Habitat Survey: A technique for environmental audit. 5th Edition
[29] SNIFFER (2009) WFD95: A Functional Wetland Typology for Scotland – Field Survey Manual. Version 1.
[30] Rodwell, J. S (ed.) (1991 *et seq.*). *British Plant Communities. Vol 1–5.* Cambridge University Press
[31] Elkington, T., Dayton, N., Jackson, D. L. and Strachan, I. M. (2001). *National Vegetation Classification: Field Guide to Mires and Heaths.* Joins Nature Conservation Committee, Peterborough
[32] Averis, B., Birks, J., Horsefield, D., Thompson, D. and Yeo, M. (2004). *An Illustrative Guide to British Upland Vegetation,* JNCC, Peterburgh

7.3.5.3 Protected Species Survey (excluding bats)

22. Protected Species Surveys were carried out between February and September 2020 (Technical Appendix A7.2). The Protected Species Surveys encompassed all land within the Site and extended up to a 250 m radius ('the Ecology Survey Area'), in line with NatureScot guidance[33]. The 250 m radius included suitable habitats for all protected species considered, but the area surveyed for each species varied depending on species-specific survey guidelines and best practice[33], as outlined below:

- Badger (*Meles meles*): Suitable habitats within the Site and extending up to 100 m from the Site Boundary;
- Pine marten (*Martes martes*): Suitable habitats within the Site and extending up to 250 m from the Site Boundary;
- Red squirrel (*Sciurus vulgaris*): Suitable habitats within the Site and extending up to 50 m from the Site Boundary;
- Otter (*Lutra lutra*): Suitable riparian habitats within the Site and extending up to 200 m up- and downstream of watercourses potentially impacted by the Development; and
- Water vole (*Arvicola amphibius*): Suitable riparian habitats within the Site and extending up to 50 m up- and downstream of watercourses potentially impacted by the Development.

7.3.5.4 Great Crested Newt Surveys

23. All suitable freshwater habitats within the Site and extending up to 500 m from the Site Boundary were surveyed for their potential to support great crested newt (*Triturus cristatus*).

Habitat Suitability Index

24. Five ponds were surveyed for their suitability for supporting great crested newt (GCN) in 2020. One pond was identified within 500 m of the Development from OS mapping prior to the survey for GCN taking place. Four additional ponds were recorded during the field survey visit, which looked to be recently established.

25. The suitability of the habitat provided for GCN at each pond was determined using the GCN Habitat Suitability Index (HSI). Details of the HSI methods is provided in Appendix A7.2, but in summary HSI allocates a score against various suitability factors, including geographic location, pond size, presence of fish, and availability of suitable terrestrial habitat. The HSI scores are calculated as the geometric mean of the ten individual habitat suitability scores, and lie between 0 and 1. These scores provide an indication as to the likelihood of a pond supporting GCN. In general, ponds with high scores are more likely to support GCN than those with low scores.

26. Ponds that scored average, good, or excellent, were then surveyed for GCN presence or absence using Environmental Deoxyribonucleic Acid (eDNA) Analysis.

eDNA Analysis

27. Water samples were taken for eDNA analysis on 18th June 2020 during the breeding season in accordance with NatureScot guidance[34]. Water samples were collected from the perimeter of the waterbodies in accordance with Department for Environment, Food

[33] NatureScot (2021) Protected Species Advice for Developers. Guidance on Planning and Protected Animals. [Online] Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-protected-species. (Accessed 14/02/2021).
[34] NatureScot (2021). Standing advice for planning consultations – Great Crested Newts. [Online] Available at: https://www.nature.scot/standing-advice-planning-consultations-great-crested-newts. (Accessed 21/02/2021).

and Rural Affairs (DEFRA) technical advice note[35] and were analysed by SureScreen Scientifics in accordance with eDNA analytical protocols.

7.3.5.5 Bats

28. Bat Surveys were carried out with reference to NatureScot guidelines published in 2019[36], between April and October 2020 ('the Bat Survey Season'), with all survey work undertaken by Arcus. The Development consists of 12 turbines which categorises the project size as 'Medium' in line with the guidance[36]. In terms of habitat quality for bats, the Site was suboptimal being relatively isolated and dominated by commercially stocked Sitka spruce (*Picea sitchensis*) conifer plantation. However, some features were identified with suitability for foraging (such as glades, burns and forestry edge), and commuting (burns). Furthermore, there were a small number of potential roost features, and those that were present were of low quality. Overall suitability of the Site for bats was assessed to fall within the 'Low' habitat risk category.

29. Survey methods reflected those recommended in the guidelines[36] for a low-risk site and is described in further detail below in the following sections, and fully detailed in Technical Appendix A7.3: Bat Surveys.

Automated Static Surveys

30. The Survey Season comprises of the following three seasonal Survey Sessions, which current NatureScot guidance[36] defines as follows:

- Survey Session 1: April/May (Spring);
- Survey Session 2: June-mid-August (Summer); and,
- Survey Session 3: Mid-August-October (Autumn).

31. A total of 10 full spectrum Anabat Swift bat detectors (hereafter referred to as 'Anabats'), were deployed at ground level (detectors secured to 1 m high posts) for a minimum of 10 consecutive nights across a range of habitat types, as per NatureScot guidance[36]. The Anabats were set to record from approximately half an hour before sunset until approximately half an hour after sunrise.

32. In order to collect comparative data, Anabats were deployed at the same 10 Remote Static Survey Locations across the three Survey Sessions, as shown in Figure 7.3:

- Survey Session 1: 30/04/2020 – 13/05/2020;
- Survey Session 2: 08/07/2020 – 22/07/2020; and
- Survey Session 3: 25/09/2020 – 09/10/2020.

Roost Surveys

33. Walkovers of the Ecology Survey Area (ESA) during Bat Surveys and Protected Species Surveys identified a very low number of features with suitability to support roosting bats within the ESA and Access Route, as detailed in Technical Appendix A7.3. These consisted largely of mature broadleaved trees.

Survey Limitations

34. Two Anabats were stolen from their Remote Static Survey Locations (RSSLs). One during Survey Session 1 (RSSL E) and one during Survey Session 2 (RSSL D). This resulted in a loss of data for these respective Survey Sessions at these RSSLs. The remaining nine

[35] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P, and Dunn F (2014) *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Freshwater Habitats Trust, Oxford.

[36] NatureScot, Natural England, Natural Resources Wales, Renewable UK, ScottishPower Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (2019): Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation. Version: January 2019.

Anabats were positioned to capture bat activity across a range of habitat types and so the loss of data from one Anabat from a single Survey Session is perceived to be a relatively minor limitation.

7.3.5.6 Fisheries Surveys

35. Fisheries Surveys were carried out by the Tweed Foundation (Scottish Fisheries Co-ordination Centre (SFCC) qualified surveyors) on 3rd October 2019.

Fish Habitat Assessment

36. Based on local knowledge and historical data, a fish habitat assessment of the Site (excluding eastern access road) was provided by the Tweed Foundation, detailing the suitability of watercourses to provide habitat for key fish species, as detailed below. Further detail is provided in Appendix A7.4.

Electro-fishing Survey

37. Based on local knowledge and historical data (electro-fishing and obstructions to fish migration), Fisheries Survey Sites (FSS) were located outside of the Site, in a watercourse where the following key species could be found: Atlantic salmon (*Salmo salar*), brown trout (*Salmo trutta*), brook lamprey (*Lampetra planeri*), river lamprey (*Lampetra fluviatilis*), sea lamprey (*Petromyzon marinus*) and European eel (*Anguilla anguilla*). Surveys were carried out across six FSS along the Flemington Burn. Further information, as well as detailed survey methods, are presented in Technical Appendix A7.4.

38. Following SFCC guidance[37] single run, semi-quantitative electro-fishing method was chosen as the most appropriate balance of attaining coverage and a reasonable level of accuracy. Sampling was carried out in fast-flowing, relatively shallow areas, which are the preferred habitat of juvenile salmon and trout. Juvenile salmon are usually more common in main channels while trout, by contrast, dominate the smaller burns where adult trout spawn. Patches of fine sediment, if present, were also sampled to assess the distribution and abundance of larval lamprey. Further information is presented in Technical Appendix A7.4.

7.3.6 Determining Importance

39. One of the key challenges in Ecological Impact Assessment (EcIA) is to decide which ecological features are sufficiently important to justify a detailed assessment. Such ecological features will be those that are considered to be most important and potentially affected by the project. Some examples of the criteria used to determine importance are defined in Table 7.2.

40. Habitats and species of nature conservation importance are identified through policies and legislation. For example, habitats and species of international importance are listed on Annex I of the Habitats Directive. Where these are considered of principal importance for biodiversity in Scotland, these features are also listed in the Nature Conservation (Scotland) Act. Other features of importance may be listed on the SBL or as Local Biodiversity Action Plan (LBAP) priorities. These elements provided a crucial starting point for the identification of IEFs requiring consideration in EcIA, however they did not solely determine the level of importance assigned (with the exception of internationally designated European sites).

41. Expert judgement was applied to determine the level of importance and to identify IEFs. When determining the importance in the context of EcIA, contextual information regarding distribution and abundance of a given species was essential, and included population trends based on historical records.

[37] SFCC (2007). *Electro-fishing team leader training manual. Fisheries management SVQ 3.* Manage electrofishing operations.

42. The scale within which importance is determined may also relate to a particular population and thus was considered when determining importance.

43. Additionally, in accordance with CIEEM guidance[12], where a legally protected species was present within the zone of influence and there is potential for a breach of legislation, such species was considered to be an IEF.

Table 7.2: Determination Criteria for Ecological Importance

Importance of Receptor	Determination Criteria Examples
International	The population has little or no ability to absorb change without fundamentally altering its present character (i.e. the population of a rare and sensitive species in significant decline). An internationally designated site (e.g. a SAC) or a site meeting criterion for international designations. Species present in internationally important numbers (>1% of biogeographic populations).
National (i.e. Scotland)	The population has low ability to absorb change without fundamentally altering its present character (i.e. the population of an uncommon or rare species in decline, or a common species in significant decline). A nationally designated site (e.g. a SSSI) or a site meeting criterion for national designations. Species present in nationally important numbers (>1% Scottish population). Large areas of priority habitats listed on Annex I of the Habitats Directive and smaller areas of such habitats that are essential to maintain the viability of that ecological resource.
Regional Importance (i.e. Scottish Borders)	The population has moderate capacity to absorb change without significantly altering its present character. (i.e. an uncommon or rare but stable species, or a common/widespread but declining species). Species present in regionally important numbers (>5% Scottish Borders population). Sites not meeting criteria for SSSI selection but of greater than the local criteria below. Priorities within the LBAP, where they occur in sufficient abundance to maintain the local resource.
Local Importance (i.e. within 10 km of the Site)	The population is tolerant of change without detriment to its character (a common/widespread species that is stable, or an uncommon species is improving). A species or habitat of low conservation value. Scottish Wildlife Trust (SWT) Reserves and Local Nature Reserves (LNRs). Areas of habitat or species considered to appreciably enrich the ecological resource within the area local to the Site.
Less than Local Importance (Site wide)	The population is resistant to change (any population that is improving its range and abundance). Population of little conservation value. Usually widespread and common habitats and species. Loss of such a species from the Site would not be detrimental to the ecology of the local area.

7.3.6.1 Characterisation of Potential Effects

44. In line with the CIEEM EcIA guidance12 where possible, consideration is given to the following characteristics when identifying potential effects of the Development on IEFs:

- **Nature of effect**: whether it is positive (beneficial) to IEFs, e.g. by increasing species diversity or extending habitat, or negative (detrimental), e.g. by loss of, or displacement from, suitable habitat;
- **Extent**: the spatial or geographical area over which the effect may occur;
- **Duration**: the duration of an effect as defined in relation to ecological characteristics (such as a species' life cycle) as well as human timeframes. Impacts may be described as short-, medium-, long-term, permanent or temporary;
- **Frequency**: the number of times an activity occurs may influence the resulting effect;
- **Timing**: this may result in an impact on an ecological feature if it coincides with critical life stages or seasons; and
- **Reversibility**: an irreversible impact is one from which recovery is not possible within a reasonable timescale, or there is no reasonable chance of action being taken to reverse it. A reversible impact is one from which spontaneous recovery is possible or which may be counteracted by mitigation.

7.3.7 Magnitude of Effect

45. The magnitude of potential effects will be identified through consideration of the above effect characteristics, to determine the degree of change to baseline conditions predicted as a result of the Development. The criteria for assessing the magnitude of an effect are presented in Table 7.3.

Table 7.3: Framework for Determining Magnitude of Effects

Magnitude of Effects	Definition
High	A fundamental change to the baseline condition of the asset, leading to total loss or major alteration of character.
Medium	A material, partial loss or alteration of character.
Low	A slight, detectable, alteration of the baseline condition of the asset.
Negligible	A barely distinguishable change from baseline conditions.

7.3.8 Significance of Effect

46. Significance is a concept related to the weight that should be attached to effects when decisions are made. A significant effect is simply an effect that is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused.

47. To determine significance in other chapters within this EIAR a matrix approach has been used. This is widely used in EIA to provide consistency across all the topics and clarity to decision makers. However, as CIEEM guidance[12] discourages the use of the matrix approach it has not been used within this chapter.

48. For the purposes of the EcIA, the significance of effect was defined as an effect that either supports or undermines biodiversity conservation objectives for IEFs, or for biodiversity in general. Conservation objectives may be specific, broad or wide-ranging; therefore, effects can be considered as significant at a wide range of scales from international (major) to local (negligible). Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems, and the conservation status of habitats and species, including their distribution and abundance.

49. The importance of the IEF and the magnitude of the predicted effects will be used as a guide, in addition to professional judgement, to predict the significance of the likely effects.

50. Where significant effects are identified they will be qualified with reference to an appropriate geographic scale. It is important to note that the scale of a significant effect, may not be the same as the geographic context in which the feature is considered important. This enables consistency in scale when determining appropriate mitigation or compensation solutions.

7.3.9 Cumulative Effects

51. Cumulative effects can result from individually not significant but collectively significant actions taking place over a period of time or concentrated in a location. Within EcIA, cumulative effects are particularly important as many ecological features are exposed to background levels of threat or pressure and may be close to reaching critical thresholds where further impact could cause irreversible decline. It is recognised that different actions can cause cumulative effects as follows:

- Additive/incremental effects: multiple activities/projects may give rise to a significant effect due to their proximity in time and space. These may be additive or synergistic effects; and
- Ancillary: ancillary developments may include different aspects of the project which may be authorised under different consent processes, these will be included as part of the cumulative assessment.

7.3.10 Residual Impacts

52. Following the assessment of effects, including incorporation of embedded mitigation and enhancement commitments, all attempts will be made to avoid and mitigate significant ecological impacts, through specific, applied mitigation, whereupon an assessment of residual effects will be undertaken to determine their significance.

7.4 BASELINE CONDITIONS

7.4.1 Desk Study Results

7.4.1.1 Statutory Designated Sites

53. Four statutory designated sites were recorded within the Desk Study Area. Information relating to these statutory designated sites is provided in Figure 2.1 of **Chapter 2: Site Selection and Design** and in Table 7.4 below.

Table 7.4: Statutory Designated Sites within Desk Study Area

Name	**Designation**	**Proximity to Site**	**Relevant Key Designated Features**
River Tweed	SAC	Adjacent to eastern access road. 0.4 km west of western Site Boundary.	• Atlantic salmon (*Salmo salar*) • Brook lamprey (*Lampetra planeri*) • River lamprey (*Lampetra fluviatilis*) • Sea lamprey (*Petromyzon marinus*) • Otter • Rivers with floating vegetation often dominated by water-crowfoot
	SSSI	5 km south	• Atlantic salmon • Brook lamprey • River lamprey • Sea lamprey • Otter • Beetle assemblage • Fly assemblage

Name	Designation	Proximity to Site	Relevant Key Designated Features
			• Vascular plant assemblage • Trophic range river/stream
Whim Bog	SSSI	2 km north	• Raised bog
Dundreich Plateau	SSSI	3.3 km east	• Blanket bog • Subalpine flushes
Auchencorth Moss	SSSI	3.4 km north	• Raised bog

7.4.1.2 Non-statutory Sites

54. Four non-statutory designated sites were recorded within 2 km of the Site, information relating to these is provided in Table 7.5 below.

Table 7.5: Non-Statutory Designated Sites within 2 km of the Site

Name	Designation	Proximity to Site	Relevant Key Features
Cloich Bog	Local Biodiversity Site (LBS)	Adjacent to eastern Site Boundary	• Modified bog, burns and marsh habitats • Small pearl-bordered fritillary (*Boloria selene*), small heath (*Coenonympha pamphilus*), Brown Hare (*Lepus europaeus*)
Shiphorn Quarry	LBS	0.3 km north-east	• Plantation woodland on former quarry pits. • Badger and common frog (*Rana temporaria*) named as notable species
Nether Stewarton Pools (Loch Potts)	LBS	0.6 km east	• Ponds, marsh and swamp habitats.
Portmore Birchwoods	LBS	1.2 km north-east	• Semi-natural, moderately species-rich birch woodland on the banks of Portmore Loch. • Several moss species named as notable; including Blunt-leaved Bog-moss (*Sphagnum palustre*), A Bog-moss (*Sphagnum recurvum*) and Lustrous Bog-moss (*Sphagnum subnitens*)

7.4.1.3 Protected and Notable Species Records

55. Table 7.6 provides a summary of recent (2000-2020) records of protected species within the DSA identified in the TWIC data and publicly available data resources. This included recent records of internationally protected species of conservation priority, as well as other notable, protected or invasive species.

Table 7.6: Recent Records of Protected and Notable Species within the DSA

Species	Conservation Status	Closest Record from Site	Year of Record(s)
Mammals			
Mountain Hare (*Lepus timidus*)	WCA[38], EPS[39], SBL[40]	3.6 km east	2013 - 2017 (3 records)
Brown Hare (*Lepus europaeus*)	WCA, EPS, SBL	0.2 km east	2000 - 2015 (31 records)
Red squirrel	WCA, SBL	2.4 km east	2004 -2013 (14 records)
Pine marten	HR[41], SBL	2.6 km east	2004 - 2013 (3 records)
Otter	HR, SB	0.3 km south	2002 – 2019 (27 records)
Badger	PBA[42]	In the centre of Site near Courhope	2000 – 2019 (272 records)
West European Hedgehog (*Erinaceus europaeus*)	SBL	Where the access road meets the A703	2001 – 2019 (30 records)
Amphibians and Reptiles			
Common Toad (*Bufo bufo*)	WCA, SBL	1.2 km east	2004 – 2015 (11 records)
Great Crested Newt	WCA, HR, SBL	Within 1 km north-west	2006 (1 record)
Common Lizard (*Zootoca vivipara*)	WCA, SBL	In the west of Site	2000 – 2016 (13 records)
Fish			
European Eel (*Anguilla Anguilla*)	SBL	River where the access road meets the A703	2000 – 2006 (17 records)
Atlantic Salmon	SBL	River where the access road meets the A703	2000 – 2012 (31 records)
Brown Trout (*Salmo trutta*)	SBL	In Shiplaw Burn in the north-east of Site	2000 -2006 (29 records)

[38] Wildlife and Countryside Act (1981). [Online] Available at http://www.legislation.gov.uk/ukpga/1981/69. (Accessed 04/02/2021).
[39] European Protected Species, Habitats Regulations (1994). [Online] Available at http://www.legislation.gov.uk/uksi/1994/2716/contents/made. (Accessed 04/02/2021).
[40] Scottish Biodiversity List. [Online] Available at http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL. (Accessed 04/02/2021).
[41] Habitats Regulations (1994). [Online] Available online at http://www.legislation.gov.uk/uksi/1994/2716/contents/made (Accessed 04/02/2021).
[42] Protection of Badgers Act (1992). [Online]. Available online at: https://www.legislation.gov.uk/ukpga/1992/51/contents (Accessed 04/02/2021).

Species	Conservation Status	Closest Record from Site	Year of Record(s)
Plants			
Juniper (*Juniperus communis*)	SBL	2.55 km north	2013 (2 records)
Black-grass (*Alopecurus myosuroides*)	SBL	3.1 km west	2013 (1 record)
Clustered Bellflower (*Campanula glomerata*)	SBL	1 km south	2006 (1 record)
Cornflower (*Centaurea cyanus*)	SBL	0.13 km from access road	2015 (1 record)
Greater Celandine (*Chelidonium majus*)	SBL	4.8 km west	2013 (1 record)
Sun Spurge (*Euphorbia helioscopia*)	SBL	0.5 km north-west	2009 – 2018 (7 records)
Black-bindweed (*Fallopia convolvulus*)	SBL	In north of Site	2009 – 2018 (15 records)
Purple Ramping-fumitory (*Fumaria purpurea*)	SBL	4 km south-east	2009 (1 record)
Large-flowered Hemp-nettle (*Galeopsis speciosa*)	SBL	0.95 km east	2009 – 2015 (5 records)
Field Gentian (*Gentianella campestris*)	SBL	2.1 km east	2003 – 2005 (4 records)
Corn Mint (*Mentha arvensis*)	SBL	4.4 km north	2017 (2 records)
Woolly Willow (*Salix lanata*)	SBL	5 km north-west	2017 (1 record)
White Mustard (*Sinapis alba*)	SBL	Within 1 km grid square overlapping access road	2009 – 2017 (5 records)
Charlock (*Sinapis arvensis*)	SBL	In north of Site	2009 – 2018 (15 records)
Wood Bitter-vetch (*Vicia orobus*)	SBL	0.8 km north-east	2005 – 2015 (4 records)
Wild Pansy (*Viola tricolor*)	SBL	0.23 km west	2011 – 2015 (2 records)
Insects			
Northern Brown Argus (*Aricia artaxerxes*)	SBL	0.54 km west	2000 – 2014 (10 records)
Small Pearl-bordered Fritillary (*Boloria selene*)	SBL	0.45 km east	2008 – 2016 (12 records)
Small Heath (*Coenonympha pamphilus*)	SBL	In the south-west of Site near Courhope	2000 – 2017 (63 records)
Large Heath (*Coenonympha tullia*)	SBL	3.2 km north-east	2001 – 2016 (15 records)
Bilberry Bumblebee (*Bombus monticola*)	SBL	1.7 km east	2016 (1 record)

Species	Conservation Status	Closest Record from Site	Year of Record(s)
Knot Grass (*Acronicta rumicis*)	SBL	3.3 km north	2003 – 2016 (5 records
Brown-spot Pinion (*Agrochola litura*)	SBL	1.8 km north-west	2010 – 2017 (8 records)
Green-brindled Crescent (*Allophyes oxyacanthae*)	SBL	4.9 km south-east	2010 (1 record)
Ear Moth (*Amphipoea oculea*)	SBL	1.8 km north-west	2011 (1 record)
Dusky Brocade (*Apamea remissa*)	SBL	1.75 km east	2010 – 2016 (3 records)
Garden Tiger (*Arctia caja*)	SBL	3.1 km west	2007 (2 records)
Centre-barred Sallow (*Atethmia centrago*)	SBL	1.8 km north-west	2010 – 2011 (2 records)
Haworth's Minor (*Celaena haworthii*)	SBL	1.8 km north-west	2011 – 2017 (3 records)
Broom Moth (*Ceramica pisi*)	SBL	1.8 km north-west	2016 – 2017 (4 records)
Latticed Heath (*Chiasmia clathrata*)	SBL	0.35 km south	2010 – 2018 (5 records)
Sallow (*Cirrhia icteritia*)	SBL	1.8 km north-west	2010 – 2017 3 records)
Small Square-spot (*Diarsia rubi*)	SBL	3.5 km south-east	2010 – 2012 (4 records)
Small Phoenix (*Ecliptopera silaceata*)	SBL	3.2 km north	2010 – 2018 (7 records)
Autumnal Rustic (*Eugnorisma glareosa*)	SBL	1.9 km north-west	2011 – 2017 (4 records)
Garden Dart (*Euxoa nigricans*)	SBL	2.5 km north-west	2016 (1 record)
Ghost Moth (*Hepialus humuli*)	SBL	0.5 km east	2007 – 2015 (3 records)
Rosy Rustic (*Hydraecia micacea*)	SBL	1.75 km north-west	2010 – 2017 (17 records)
Dark Brocade (*Mniotype adusta*)	SBL	3.3 km north	2016 (2 records)
Powdered Quaker (*Orthosia gracilis*)	SBL	3.6 km south-east	2011 – 2012 (5 records)
Shaded Broad-bar (*Scotopteryx chenopodiata*)	SBL	3.25 km north	2010 – 2018 (5 records)
Heath Rustic (*Xestia agathina*)	SBL	2.5 km north-west	2016 (3 records)
Neglected Rustic (*Xestia castanea*)	SBL	2.5 km north	2016 (2 records)
Lichens			

Species	Conservation Status	Closest Record from Site	Year of Record(s)
River jelly-lichen (*Collema dichotomum)*	WCA, SBL	5 km south	2004 (1 record)
Lecania cyrtella lichen	SBL	3.5 km north-west	2007 (1 record)
Ramalina fraxinea lichen	SBL	1.2 km south-east	2013 (1 record)
Invasive Species			
Eastern Grey Squirrel (*Sciurus carolinensis*)	INNS	1.4 km east	2011 – 2014 (4 records)
Sika Deer *(Cervus nippon)*	INNS	0.3 km east	2014 (1 record)
Fallow Deer *(Dama dama)*	INNS	0.2 km east	2001 – 2018 (16 records)
Rainbow Trout *(Oncorhynchus mykiss)*	INNS	1.9 km north-east in Portmore Reservoir	2002 (2 records)

Key:
EPS: European Protected Species
HR: The Conservation (Natural Habitats, &c.) Regulations 1994 (European Protected Species)
INNS: Invasive Non-native Species
PBA: Protection of Badgers Act 1992
SBL: Scottish Biodiversity List
WCA: Wildlife and Countryside Act 1981

7.4.2 Baseline Survey Results

7.4.2.1 Habitats & Botany

56. Full survey results and detailed, large-scale figures of Phase 1 habitats and NVC communities, are provided in Technical Appendix A7.1. A summary of the Habitat & Botany survey results is presented below in Table 7.7.

Table 7.7: Summary of the Phase 1 Habitats and their Areas within the Habitat Survey Area[43]

Phase 1 Code and Title	Summary Description	Associated NVC Communities	Area of Habitat (ha)
A1.2.2 Conifer Plantation Woodland	The majority of the Site is an actively managed conifer plantation where the dominant species is Sitka spruce (*Picea sitchensis*) with lesser amounts of Douglas fir (*Pseudotsuga menziesii*), Norway spruce (*Picea abies*), larch (*Larix* sp.), lodgepole pine (*Pinus contorta*) and Scots pine (*Pinus sylvestris*). The age structure of conifers varies throughout the Site as conifer blocks are clear-felled and replanted at different times and range in age from newly planted to mature. Beneath mature stands of conifer plantation there is generally an absence of ground flora due to lack of light penetration and the acidic conditions created by the conifers. A belt of coniferous woodland is also located to the north and south of the local road linking Whim to Shiplaw.	N/A	539.82
A3.1 Scattered Trees	The main area of scattered trees mapped along the access road runs parallel to the Whim to Shiplaw local road which leads off the main road A703. The line of mature broadleaved trees, which have been planted in the road verge and within the field boundary to the north, form two sheltered tree lines which run from the junction to the field boundary adjacent to Signal Cottage. Additional scattered mixed deciduous trees are located adjacent to the track running alongside Cloich Farm.	N/A	0.61
A4.2 Recently Felled Coniferous Plantation Woodland	A relatively large area of clearfell was present on Site, with the largest continuous area present in the south of the Site, south of Courhope. Other stands were noted in the northwest of the Site and buffer.	N/A	2.29
B1.2 Acid grassland – semi-improved	Semi-improved, species-poor grasslands were primarily found on the drier, sloped, well-drained areas around Courhope Farm, and included species such as heath bedstraw (*Galium saxatile*), sheep's fescue (*Festuca ovina*) and mat grass (*Nardus stricta*) in places, although many areas on flatter ground had been subject to some improvement.	U4b	31.19
B2.1 Neutral grassland - unimproved	A linear swathe of coarse, unmanaged neutral grassland sides the Eddleston Water north of the bridge at Signal Cottage. This was dominated by false-oat grass with some cock's foot. Viewing this from the bridge, the grassland lacked any bulky herbs that would have been flowering. This together with the even, homogenous sward indicated relatively recent origin. The riverside was more diverse with reed canary grass (*Phalaris arundinacea*),	N/A	0.78

[43] Note that this area includes the Site and a 250 m buffer.

Phase 1 Code and Title	Summary Description	Associated NVC Communities	Area of Habitat (ha)
	common valerian (*Valeriana officinalis*), meadowsweet (*Filipendula ulmeria*) and monkeyflower (*Mimulu guttatus*) readily identifiable.		
B2.2 Neutral grassland – semi-improved	This included stands of species-poor tufted hair-grass and soft rush with Yorkshire fog (*Holcus lanatus*), which occurred in the south of the Habitat Survey Area in the enclosed fields around Courhope Farm.	N/A	2.59
B4 Improved grassland	These grasslands comprised areas where the sward was species-poor and which lacked any indicator species of either acid or base-rich grassland. This habitat was present in fields used for grazing, located in the centre of the southern section of the Site. Further fields used for grazing sheep were located throughout the buffer of the access road and was botanically unremarkable.	MG6	48.73
B5 Marsh/marshy grassland	Marshy grassland was the commonest habitat of the open ground (such as rides) within the plantation. It varied from stands of species-rich rush-pasture (M23a), which supported a good range of herbs in with the sharp-flowered rush (*Juncus acutifloris*) including yellow pimpernel (*Lysimachia nemorum*), angelica (*Angelica archangelica*), meadowsweet, marsh thistle (*Cirsium palustre*), bugle (*Ajuga reptans*), devil's bit scabious (*Succisa pratensis*) and Grass of Parnassus (*Parnassia palustris*) to species-poor stands (M23b), dominated by soft rush (*Juncus effusus*), and purple moor-grass (*Molinia caerulea*) (M25) dominated areas by the Courhope Burn. The species-rich areas were often associated with watercourses although a large patch was present at Courhope. At Courhope, there were also large areas of species-poor M23a/b marshy grassland. Elsewhere, more disturbed stands which were dominated by soft rush with tufted hair-grass (*Deschampsia cespitosa*) and Yorkshire fog were mapped as marshy grassland. These were similar to the vegetation mapped as semi-improved neutral grassland except they were wetter underfoot and had more soft rush.	M23a, M23b, M25	22.32
C1.2 Tall herb and fern - bracken	There were several areas of either continuous or scattered bracken (*Pteridium aquilinium*) in several sections of the more open ground between forestry blocks.	U20	5.54
D1.1 Dry dwarf shrub heath - acid	This habitat was limited in extent, with relatively small stands found, sometimes merging into dry modified bog habitat.	H21, H12	0.06
E1.8 Dry modified bog	This vegetation was similar to the dry heath except that there was a greater cover of hare's-tail cottongrass (*Eriophorum vaginatum*) mixed in with the heather (*Calluna vulgaris*) and bilberry (*Vaccinium myrtillus*), with small areas of red bogmoss (*Sphagnum capillifolium*), heath rush (*Juncus squarrosus*), wavy hair grass (*Deschampsia flexuosa*) and purple moor grass.	M19	0.39

Phase 1 Code and Title	Summary Description	Associated NVC Communities	Area of Habitat (ha)
E2.1 Flush/spring – acid/neutral	Tiny areas of acid flush were found in the south of the Site near Courhope Farm. These were dominated by mixes of soft and sharp-flowered rushes with *Sphagnum*.	M6	0.12

7.4.2.2 Protected Species (excluding Bats)

57. A summary of the Protected Species Survey results is presented below. Full survey results are presented Technical Appendix A7.2.

Badger

58. Evidence of badger was recorded within the ESA, with three active setts recorded and numerous badger fields signs, including prints, fresh bedding, guard hairs, paths and latrines.

59. Habitats within the ESA varied in their suitability to support badger. Active setts were only recorded in a small pocket of woodland located adjacent to pasture. However, there are numerous opportunities for foraging provided by the surrounding farmland habitat and pockets of woodland located to the east of the ESA. There is also good habitat present for commuting between the ESA and the surrounding area.

60. The results of the badger survey are presented in a Confidential Annex to Appendix A7.2.

Pine marten

61. Numerous pine marten scats were recorded within the ESA, along forestry tracks and animal paths. No pine marten dens were recorded.

62. The ESA was dominated by mature and semi-mature Sitka spruce commercial forestry, and some scattered areas of younger broadleaved woodland which are well connected to wider swathes of forestry outwith the ESA, allowing for species dispersal. The woodland habitats within the ESA provide suitable resources for pine marten, which are associated with coniferous plantation woodland. Further, a mosaic of habitats is optimal for pine marten with mature forest providing cover and denning habitat with open areas of grassy vegetation providing habitat for small mammals, an important prey resource[44].

Red Squirrel

63. No evidence of red squirrel was recorded within the ESA.

64. Habitats within the ESA were considered suitable for red squirrel, having a mix of coniferous plantation of various ages offering good foraging, commuting and shelter to red squirrel.

Otter

65. Evidence of otter was recorded within the ESA, with several spraints recorded. Most of these were associated with the Flemington Burn, in the west of the ESA. A spraint was also recorded under a disused bridge, approximately 170 m from the proposed western access track adjacent to a pond and the upper reaches of the Cowieslinn Burn. Although potentially suitable, no evidence was present to indicate that this was in use as a holt.

66. The ESA therefore offers some suitable habitat for otters. Several of the watercourses within the ESA offered suitable foraging opportunities and the habitats in the surrounding area were suitable for supporting amphibian species and juvenile fish (see Section 7.4.2.4). The watercourses present on Site, however, offer less suitability, given their limited size. These watercourses increase in suitability as they flow downstream where they offer greater foraging and commuting potential. The watercourses on Site feed into the River Tweed SAC, which lists otter as a qualifying feature (see Section 7.4.1.).

[44] Caryl, F.M. (2008). *Pine marten diet and habitat use within a managed forest environment*. PhD Thesis, University of Stirling, Stirling.

Water vole

67. No evidence of water vole was recorded within the ESA.

68. Watercourses within the ESA varied in their suitability to support water vole. Most were fast-flowing and lacked vegetated banks associated with typical water vole habitat[45], however, there were some limited stretches that were considered to have a suitably flow rate and suitable bankside habitat that could provide suitable habitat to support water vole.

Great Crested Newt

69. HSI surveys were undertaken on all five ponds, four of which were found to have 'average' habitat suitability for GCN and one pond having 'good' suitability.

70. All five ponds were subsequently surveyed using eDNA analysis to determine presence, however no evidence of GCN was recorded.

Other species

71. Woodland edge, bracken-covered slopes and quarries were present throughout the ESA, all of which offer foraging, refuge and hibernation resources for reptiles, including adder (*Vipera berus*) and common lizard[46]. Despite this, no sightings of reptiles were recorded within the ESA. Several common frogs were recorded during the Protected Species Surveys, indicating that the ponds present within the ESA provide ample breeding habitat for common amphibian species, such as common frog and common toad (*Bufo bufo*)[47].

7.4.2.3 Bats

72. A summary of the Bat Survey results is presented below. Full survey results and supporting data are provided Technical Appendix A7.3.

73. The majority of the Site consisted of plantation forest – commercially stocked mature Sitka spruce interspersed with areas of clearfell. Sitka spruce does not typically produce gaps or cavities in its trunk or bark, features that would be used by roosting bats[48]. Studies have shown that all bat species tend to avoid dense stands of commercial plantation[49]. However, the extensive ride and forest track system provide woodland edge habitats and areas of clearfell provide open areas within the Site. Such habitats have been shown to be of higher value to a variety of bat species, with edge-adapted species (such as *Pipistrellus* sp.) favouring forest edge and open-adapted species (such as *Nyctalus* sp.) favouring recently felled plantation.

74. The numerous small watercourses may also provide commuting and foraging potential across the Site and provide some connectivity with the wider area. The majority of the forestry in the local area is commercial in nature, with only a scattering of stands of mixed woodland or broad leaf woodland habitats. The open farmland habitats are largely poor upland grazing with little potential for bats.

75. There were no known records of any hibernaculum (winter hibernation roosts) within the Site or the wider local area. Pipistrelle bats have a tendency to hibernate in trees and

[45] The Mammal Society. Water Vole Species Profile. [Online] Available at: https://www.mammal.org.uk/species-hub/full-species-hub/discover-mammals/species-water-vole/. (Accessed 27/02/2021).
[46] The Herpetological Conservation Trust (2007). National Amphibian and Reptile Recording Scheme, Habitat Recording Guide
[47] Joint Nature Conservation Committee (2014) Common Standards Monitoring Guidance for Reptiles and Amphibians, Version February 2004. JNCC, Peterborough.
[48] Andrews, H. (2018) Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals. Pelagic Publishing.
[49] Kirkpatrick L, Maher SJ, Lopez Z, Lintott PR, Bailey S, Dent D & Park K (2017) Bat use of commercial coniferous plantations at multiple spatial scales: Management and conservation Implications, Biological Conservation, 206, pp. 1-10.

buildings[50]. Roosting opportunities for bats within the Site were limited to mature broadleaved trees. In total, eight potential bat roost trees were identified, all of which were recorded as having low potential roost features. All of these potential bat roost trees are situated along the proposed access road to the east of the Site. No roost sites were recorded.

76. A total of 689 bat passes were recorded over a total of 3968.3 survey hours across the Survey Season, giving a total mean BAI of 0.17 passes per hour (pph) for the Site.

77. In total, three bat species and two genus classifications were recorded within the Site during the bat surveys. Species recorded were common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), and brown long-eared bat (*Plecotus auritus*). Bat registrations identified to genus level were *Nyctalus* spp. and *Myotis* spp.

78. High collision risk species recorded comprised common pipistrelle, soprano pipistrelle, and *Nyctalus* spp. All other bat species recorded are categorised as low collision risk (*Myotis* sp. and brown long-eared bat).

79. Of the activity recorded, the majority (85.62%) was attributed to soprano pipistrelle, with 11.18% attributed to common pipistrelle. *Nyctalus* sp. accounted for 1.45% of the total. *Myotis* sp. and brown long-eared were recorded infrequently, making up 0.73% and 0.15% of activity recorded, respectively. The remaining 0.87% was made up of calls of *Pipistrellus* sp. that could not be identified to species level.

80. Activity was recorded at all survey locations, however, notable spatial variation in the level of activity was evident. Approximately 78% of all bat passes were recorded at three locations situated within woodland edge habitat in close proximity to watercourses.

81. Ecobat[51] was used to gain estimates of relative bat activity recorded at the Site, as recommended per NatureScot Bat Survey guidance[36]. This guidance explains that "*The tool compares data entered by the user with bat survey information collected from similar areas at the same time of year. Ecobat generates a percentile rank for each night of activity and provides a numerical way of interpreting the levels of bat activity recorded at a site across regions in Britain*". Data from the Site was compared with data within a range of 100km of the Site and within 30 days of the survey date.

82. Based on Ecobat assessment[51], applied as per NatureScot guidance, activity recorded across all survey locations varied greatly between the low activity category (0-20th median percentiles and the moderate to high activity category (61st-80th median percentile). With the exception of common pipistrelle and soprano pipistrelle, all bat species fell within the low and low to moderate categories with respect to their relative activity levels. Both common pipistrelle and soprano pipistrelle fell within the category of moderate to high activity levels.

83. The risk assessment concluded a 'Medium' overall risk for common pipistrelle and soprano pipistrelle and a 'Low' overall risk for *Nyctalus spp*. However, at a finer scale this risk varies greatly by survey location, time of year and species, and this is highlighted in further detail in Appendix A7.3.

[50] Dietz, c & Keifer, A. (2016). Bats of Britain and Europe, Bloomsbury Publishing Plc, London ISBN: PB:977-1-4729-2202-1
[51] http://www.ecobat.org.uk/

7.4.2.4 Fisheries

84. Full details of the fish surveys are provided in Technical Appendix A7.4 with a summary provided below.

Habitat Assessment

85. Most of the watercourses within the Site Boundary were too small to contain fish and these are detailed within Technical Appendix A7.4. The watercourses of the Middle Burn and Cowieslinn Burn, located at the north of the Site are slightly larger near the Site Boundary but both have waterfalls located further downstream that are impassable to migratory fish. Due to the known absence of salmonids within the Site, sampling was undertaken outside of the Site, on the Flemington Burn, which is the principal tributary that flows along the western boundary of the Site and down into the Lyne Water.

Electro-fishing Survey

86. Salmon fry were present at five out of six FSS and parr were present at all of the FSS, albeit in relatively low numbers. Salmon fry densities were highest at the bottom of the Flemington Burn with 18 and 21 individuals per 100 m^2 recorded at FSS 1 and 2 respectively.

87. Relatively high numbers of trout fry were found at all FSS, with trout parr being much more variable, with results ranging from low to high with no obvious spatial pattern in abundance.

88. A single eel was found at three FSS and larval lamprey were detected at one FSS at the bottom of the Flemington Burn. There was no suitable habitat for sampling (fine sediment) in close proximity to any of the other FSS.

7.5 EMBEDDED MITIGATION

89. Application of the 'mitigation hierarchy' has been achieved throughout the Development design process, with the identification and incorporation of methods for the avoidance of impacts and application of embedded mitigation. Measures to avoid or reduce potential ecological effects have been incorporated into the design of the Development ('embedded mitigation'). This includes 'mitigation by design' whereby aspects of the Development have been re-designed to avoid or reduce ecological effects. This type of mitigation is particularly beneficial for ecological resources as there is greater certainty that it will be delivered.

90. Embedded mitigation also includes 'mitigation by practice' whereby mitigation is actively implemented during the Development process. Embedded mitigation is taken into consideration when undertaking the assessment of significant effects. If significant effects are predicted further mitigation is detailed.

7.5.1 Mitigation by Design

91. Ecological features have been considered at all stages of the Development design, from initial feasibility to final layout. This has helped to avoid or greatly reduce impacts on IEFs and other ecological features. A critical design consideration has been the avoidance of habitats with high conservation value or sensitivity, which has been largely achieved by siting the majority of the Development infrastructure in coniferous plantation and making use of existing forestry tracks. Furthermore, track design has largely avoided the need for felling mature deciduous trees (e.g. the scattered mixed deciduous trees adjacent to the track at Cloich Farm).

92. The sensitive designs (e.g. of watercourse crossing and culverts) presented in **Chapter 10: Hydrology and Hydrogeology** of this EIA Report have been developed to

safeguard the water environment, which will also help effectively mitigate construction-related direct and indirect impacts to fish and other aquatic features.

93. Good practice design mitigation measures will be adopted to minimise the risk of bats colliding with operational turbines, in accordance with NatureScot published guidance[36]. Turbines will have a 50 m separation distance between blade tips and high-value bat habitats, such as woodland, riparian habitats, and forest edges.

7.5.2 Mitigation by Practice: Construction

94. In addition to the incorporation of effective mitigation through Development design, the following Sections outline mitigation of Development impacts through practice, particularly with the aim of safeguarding of protected species during Development construction and operation and to restore and enhance peatland habitats.

7.5.2.1 Environmental Clerk of Works (ECoW)

95. A suitably qualified and experienced Environmental Clerk of Works (ECoW) will be appointed to provide appropriate ecological and environmental advice during construction, including the monitoring of compliance with conservation legislation, the recommendations of this EIA Report and any subsequent planning conditions.

96. Before construction begins, the ECoW and the project hydrologist will undertake a review of design and drainage plans to inform the requirement for micro-siting, to minimise the potential for effects to sensitive habitats such as mature broadleaved trees (e.g. at Cloich Farm), and to assist in the identification of appropriate locations for commencement of reinstatement works. Where possible, the ECoW will advise on the drainage design to minimise hydrological disruption and reduce the risk of scour and erosion. The ECoW will also monitor and advise on the implementation of pollution prevention and good working practices throughout construction, to protect both terrestrial and aquatic ecosystems from accidental pollution.

7.5.2.2 Mitigation for Protected Species

97. Pre-construction surveys for protected species, such as otter and badger, will be undertaken to provide up-to-date information about the distribution and abundance of the protected species identified in the baseline. The results of the surveys will inform the need for Species Protection Plans and associated mitigation and licencing requirements, all of which will be developed in line with NatureScot guidance.

7.5.2.3 Mitigation for Aquatic Habitats & Species

98. Mitigation presented with in **Chapter 10: Hydrology and Hydrogeology** of this EIA Report to safeguard the water environment, will also effectively mitigate construction-related impacts to fish such as the direct and indirect effect of pollution and sedimentation form instream works and surface water run- off.

7.5.3 Mitigation by Practice: Operation

99. To minimise the risk of bats colliding with operational turbines, the 50 m separation distance between blade tips and high-value bat habitats implemented during construction, will be maintained throughout the operational life of the Development by ensuring that tree regeneration does not encroach on the buffer.

7.5.4 Mitigation by Practice: Decommissioning

100. Decommissioning activities are anticipated to be of a similar character to those of Development construction and so the construction phase embedded mitigation outlined above is considered appropriate to the decommissioning phase.

7.5.5 Enhancement

7.5.5.1 Outline Habitat Management Plan

101. Habitat Management will be implemented in accordance with a Habitat Management Plan (HMP). A detailed HMP will be written and developed in full following consent, and in consultation with NatureScot, SBC, RSPB and the Tweed Forum, where relevant, however a high-level summary is outlined below.

102. Upon consent, the development of the HMP will be informed, where necessary, by further site appraisal to ensure the appropriate methods and plans are to be implemented.

103. Once developed, the HMP will remain an active document and will be reviewed on a regular basis by appropriate stakeholders.

Enhancement Measures for Bats

104. No bat roosts were identified during the bat surveys. However, it is probable that a small number of common and soprano pipistrelle are roosting nearby due to the activity recorded during the surveys.

105. In order to increase and enhance the bat roosting habitat, dead trees with suitable roost features will be retained where possible. Additionally, certain high-value areas (i.e. areas with broadleaved trees) will be enhanced with the provision of 15 bat boxes (i.e. three boxes on each of five trees).

106. It is important to strike a balance between potentially enhancing the value of the Site for bats and potentially increasing the risk to these bats due to turbine operation. Accordingly, the enhancement suggested above avoids attracting bats towards turbines with enhancement areas lying over 500 m from turbines.

107. Exact specifications will be provided in the HMP.

7.6 DETERMINATION OF ECOLOGICAL IMPORTANCE

Table 7.8 evaluates the importance of ecological features associated with Development, and determines which ecological features, based on both their intrinsic value and their potential to be affected by wind farm development, are considered to be IEFs. Each ecological feature has been assigned a level of importance in accordance with the geographical scale outlined in Table 7.2.

Features of Local or Less than Local value, and those to which impacts can be categorically ruled out, are scoped out of further assessment. However, if impacts to such features – even if not significant in terms of EcIA – may result in legal offences then suitable safeguards will be presented in Section 7.7.

Table 7.8: Evaluation of Ecological Importance

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Nationally and Internationally Designated Statutory Sites			
River Tweed SAC	• The eastern access road (an existing public road) crosses the Eddleston Water which is considered part of the River Tweed SAC; • Located 400 m west of the western Site Boundary where it is connected to the Site via the Flemington Burn. Also connected with the Site via the Harehope Burn along a 3 km pathway. • Otter was recorded within the Site so this feature of the SAC is also scoped in to the HRA. • The location of the SAC at the western boundary of the Site suggests a high degree of hydrological and ecological connectivity between the related habitats. • As this is an internationally designated site, it is considered of international importance, and therefore is scoped in for further assessment. • Furthermore, as a European site, a Habitat Regulations Appraisal (HRA) is required to determine if the development will have a ''likely significant effect' on the SAC), and whether an Appropriate Assessment (AA) is required to determine if the Development will result an 'adverse effect' in on the integrity of the SAC or its qualifying features (QFs).	**International**	**Yes.** **Scoped into assessment & HRA Screening.**
River Tweed SSSI	• Located 5 km south of the Site and connected via the Flemington Burn and Lyne Water along a 12 km pathway. • Otter was recorded within the Site, a notified natural feature of the SSSI.	**National**	**Yes.** **Scoped into assessment.**
Whim Bog SSSI	• Located 2 km north of the Site and designated for its raised bog habitats. • Water inputs into raised bog habitats tend to be from precipitation alone, therefore there is no perceived connectivity with the Site.	National	No. Scoped out of assessment.
Dundreich Plateau SSSI	• Located 3.3 km east of the Site and designated for its blanket bog subalpine flush habitats. • No perceived connectivity with the Site.	National	No. Scoped out of assessment.
Auchencorth Moss SSSI	• Located 3.4 km north of the Site and designated for its raised bog habitats. • Water inputs into raised bog habitats tend to be from precipitation alone. • There is no perceived connectivity with the Site.	National	No. Scoped out of assessment.
Cloich Bog LBS	• Directly adjacent to the eastern Site Boundary. • Noted for its modified bog, burns and marsh habitats. • Potential connectivity with the Site.	Local	No. Scoped out of assessment.

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Shiphorn Quarry LBS	• 0.26 km northeast of the Site Boundary. • Noted for its breeding birds. • No perceived connectivity with the Development.	Local	No. Scoped out of assessment.
Nether Stewarton Pools (Loch Potts) LBS	• 0.62 km east of the Site Boundary. • Noted for its ponds, marsh and swamp habitats which support breeding wetland birds. • No perceived connectivity with the Site.	Local	No. Scoped out of assessment.
Portmore Birchwoods LBS	• 1.15 km northeast of the Site Boundary. • Noted for its semi-natural, moderately species-rich birch woodland. • No perceived connectivity with the Site.	Local	No. Scoped out of assessment.
Phase 1 Habitats within the Site			
B1.2 Acid grassland – semi-improved	• Habitat included within the SBL. • Common and widespread habitat across Scotland. • Habitat on site species-poor and associated with grazing. • In light of the above, the habitat is considered of Less than Local Importance.	Less than Local	No. Scoped out of assessment.
B5 Marsh/marshy grassland	• Habitat included within the SBL. • Common and widespread habitat internationally to locally. • Associated with NVC communities with potential groundwater dependence. • Areas of purple moor grass rush pasture (M25) indicative of peat and could be equivalent to Annex I habitat. • In light of the above, the habitat is considered of Local Importance.	Local	No. Scoped out of assessment.
D1.1 Dry dwarf shrub heath – acid	• Habitat included within the SBL & Habitats Directive. • The habitat is widespread and common in Scotland, especially in the uplands where it dominates very large areas. • In light of the above, the habitat is considered of Local Importance.	Local	No. Scoped out of assessment.
E2.1 Flush and spring: acid/neutral	• Habitat included within the SBL. • Some of these habitats are listed as having high potential to be groundwater dependent, however, there were no floristic elements that suggested base-enrichment derived from groundwater and were all concluded to be fed by surface water.	Local	No. Scoped out of assessment.

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
GWDTEs	• As GWDTE designation is related to groundwater dependency and not nature conservation value, GWDTE status has not been used as criteria to determine a habitat's nature conservation value. There is however a statutory requirement to consider GWDTEs and the data gathered during the NVC surveys has been used to inform this assessment. • Several communities were identified with the potential to be GWDTEs: M6, M23 (both potentially highly groundwater dependent) and M25 (potentially moderately groundwater dependent). However, there were few floristic elements that suggested base-enrichment derived from groundwater and most were concluded to be fed by surface water. • One location at NT 20863 46105 has been treated as a GWDTE on a precautionary basis due to hydrogeological factors and its proximity to a private water supply. See **Chapter 10: Hydrology and Hydrogeology** for further detail.	Less than Local	No. Scoped out of assessment.
Protected and Notable Species within the Site			
Badger	• Badgers are present within the Site, as discussed in the Confidential Annex, Appendix A7.2. The badgers are not reliant on food resources or habitats associated with watercourses or other habitat deemed likely to experience the effects of pollution during construction. • This species is protected under the Protection of Badgers Act 1992. In Scotland, this legislation was updated by the Nature Conservation (Scotland) Act 2004. • The species is at risk of persecution but is not recognised as a high conservation priority. • Badger is a widespread species throughout the UK with a stable and inclining estimated population of 562,000. In Scotland, the population has shown a similar rate of increase. • The species is listed on the IUCN Red list as of 'Least Concern' in mainland UK. • In light of the above, badger therefore is considered of Local Importance.	**Regional**	**Yes** **Scoped into assessment.**
Pine marten	• Pine marten is legally protected under the Wildlife and Countryside Act 1971 (as amended). Pine marten is also a priority species in the SBL. • Although the status on the species in England and Wales in poor, in Scotland the species is favourable and can now be found in all regions of Scotland with the exception of the south east coast. • The species is listed on the IUCN Red list and 'Least Concern' in Scotland, but 'Critically Endangered' elsewhere in the mainland UK. • Scotland's population is estimated at 3,700 adult pine martens, which represent approximately 99% of the known UK population[52]. • Evidence of pine marten was found on Site. • In light of the above, the species is considered of Local Importance.	Local	No. Scoped out of assessment.

[52] Croose, E., Birks, J.D.S. & Schofield, H.W. 2013. Expansion zone survey of pine marten (Martes martes) distribution in Scotland. NatureScot Commissioned Report No. 520.

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Red squirrel	• Red squirrel is protected under the Wildlife and Countryside Act 1981 (as amended) and is a priority species on the SBL. • Although declining across the UK, the Scottish population is stable in most parts of Scotland[53]. • The species is listed on the IUCN Red list as 'Near Threatened' in Scotland, but 'Endangered' elsewhere in the mainland UK. • Although suitable habitat was recorded, no evidence of red squirrel was recorded. • In light of the above, the species is considered of Less than Local Importance	Local	No. Scoped out of assessment.
Otter	• Otter was recorded as active within the Site and associated watercourses, notably the Flemington Burn. • One potential resting site was found, however no confirmed active holts confirmed. • Habitat within the Site was generally • Otter is listed in Annex IV of the Habitats Directive and are on the Scottish Biodiversity List. • They are listed as a designated feature of the River Tweed SAC and River Tweed SSSI.	**Regional**	**Yes** **Scoped into assessment.**
Water vole	• Water vole is legally protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and is a priority species in the SBL. • Although the current UK population (132,000) is believed to have declined by 50% since 1998, and the species are in decline in both England and Wales, the Scottish population, which is largely genetically and phenotypically distinct, is in fact increasing in size with a stable range. • The species is listed on the IUCN Red list and 'near threated in Scotland, but 'endangered' elsewhere in the UK. • No water vole burrows or latrines were found within the Site, and riparian habitat largely provided limited opportunity for water vole burrow construction. • In light of the above, the species is considered of Less than Local Importance.	Less than Local	No. Scoped out of assessment.
Great crested newt	• Great crested newt, a European Protected Species, was not found during the baseline surveys and no recent records were identified during the Desk Study. • In light of the above, this species considered of Less than Local Importance.	Less than Local	No. Scoped out of assessment.
Reptiles	• Only common and widespread species are found on mainland Scotland. • Common reptiles' species; the common lizard, slow-worm (Anguis fragilis), and adder are protected under the Wildlife and Countryside Act 1981 (as amended) against intentional or reckless killing and injuring. The aforementioned reptile species are all included on the SBL. • No reptiles were recorded within the Site, although small pockets of habitat offering foraging, refuge and hibernation were identified within the Site. • In light of the above, reptiles are considered of Less than Local Importance.	Less than Local	No. Scoped out of assessment.

[53] Tipple, N., & Tonkin, M., 2019. Evaluation of Spring 2019 Squirrel Surveys. Saving Scotland's Red Squirrels, Scottish Wildlife Trust.

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Bats	• Overall bat activity on Site was moderate, however, activity levels were highly variable depending on species, location and time of year. • All Scottish bat species are listed in Annex II of the Habitats Directive and are listed as priority species on the Scottish Biodiversity List. • Common pipistrelle, soprano pipistrelle and *Nyctalus* spp. are classified as at high risk of collision with wind turbines. Myotis spp. and brown long-eared bat are classified as at low risk of collision[36]. • Myotis spp. and brown long-eared bat are classified as having low population vulnerability. Common pipistrelle and soprano pipistrelle are classified as having a medium population vulnerability. *Nyctalus spp*. are classified as having high population vulnerability[36].	**Regional**	**Yes** **Scoped into assessment.**

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Atlantic salmon	• Atlantic salmon is legally protected (in freshwater only) under the Schedule 3 of the Conservation (Natural Habitats, and c.) Regulations 1994 and is noted as a qualifying feature of the River Tweed SAC, River Tweed SSSI and listed on the SBL. • The Scottish salmon population has seen a decline in recent years as a result of numerous pressures, the key pressure being climate change which may affect both the marine and freshwater phases of the species[54]. In addition, the Scottish Government have published twelve high level pressure on the Scottish salmon population, six of which occur in the riparian (freshwater) environment, the remainder are marine based[55]. • When viewed in the context of long-term trends over several decades (1952-2019), the numbers of adult salmon returning to Scottish rivers have in fact slightly increased[56,57] , however the total reported rod catch (retained and released) for 2018 was the lowest since records began in 1952[58], and despite an improvement in 2019, declines since 2010 have been notable. • Watercourses within the Site are connected to the River Tweed, which under the Conservation of Salmon (Scotland) Regulations 2016, is categorised as a Grade 1 river. Within Grade 1 rivers exploitation is considered sustainable and no management action is currently required, as existing non-statutory local conservation management has been effective[5960]. • According to MSS it is not yet clear whether salmon population declines are part of a longer-term trend or a short-term fluctuation, however, it is understood that this long-term increase reflects an acknowledged decline in marine survival being offset by positive management measures, such as the significant reduction in the netting industry[61,]. • The Flemington Burn, adjacent to the western Site Boundary, was found to support juvenile and spawning salmonids (including salmon). • Salmonids are considered absent from the Site with barriers to migration noted further downstream. • Although the species is widespread, and the salmon population is historically high both across Scotland and locally, recent declines locally and nationally mean that the species should be considered of Regional Importance.	**Regional**	**Yes** **Scoped into assessment.**

[54] https://onlinelibrary.wiley.com/doi/abs/10.1002/9781444327755.ch16
[55] https://www2.gov.scot/Topics/marine/Salmon-Trout-Coarse/fishreform/licence/status/Pressures
[56] Marine Scotland Science Report 01/15 (2015): Status of Scottish Salmon and Sea Trout Stocks
[57] Marine Scotland. 2020. Salmon and Sea Trout fishery statistics: 2019 Season - reported catch and effort by method. DOI: 10.7489/12280-1
[58] https://www.gov.scot/publications/salmon-fishery-statistics-2018-season/
[59] Scottish Government (2016) The Conservation of Salmon (Scotland) Regulations 2016. [Online] Available at: https://www.legislation.gov.uk/ssi/2016/115/contents/made (Accessed 04/02/2021).
[60] Marine Scotland Science Data. [Online] Available at: https://scotland.shinyapps.io/sg-salmon-conservation/ (Accessed 04/02/2021).

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
Brown trout	• Neither form of trout (sea trout or brown trout) receives much protection within conservation legislation, however some protection exists in the form of exploitation controls exist within fisheries legislation, and the species is listed on the SBL. • Brown trout is a common, widespread and adaptable species found across a wide variety of watercourses, either as part as a resident population, or the migratory anadromous forms, however the species has been in decline across Scotland for many decades as result of numerous pressures such as changes in land use, and more recently climate change. • Based on rod catch data, catches across Scotland have declined by two thirds since recorded began in 1952, and the total reported rod catch (retained and released) of sea trout in Scotland for 2019 was the third lowest on record and 88% of the previous five year average[62]. • Although the species is widespread, notable national declines mean that the species should be considered of Regional Importance.	**Regional**	**Yes** **Scoped into assessment.**
Lamprey species	• Three lamprey species can be found using aquatic habitats in Scotland and the UK, these are; the brook lamprey, the river lamprey and the sea lamprey. • River lamprey are listed on Schedule 3 of the Conservation (Natural Habitats, and c.) Regulations 1994 (as amended). • All three species noted as qualifying features of the River Tweed SAC and River Tweed SSSI. • The Flemington Burn, adjacent to the western Site Boundary, was found to support juvenile lamprey. • Lamprey are considered absent from the Site with barriers to migration noted further downstream. • In light of the above, the species is considered of Regional Importance.	**Regional**	**Yes** **Scoped into assessment.**

[61] Todd, C.D., Hughes, S.L., Marshall, C.T., MacLean, J.C., Lonergan, M.E. and Biuw, E.M. (2008), Detrimental effects of recent ocean surface warming on growth condition of Atlantic salmon. Global Change Biology, 14: 958-970.
[62] https://www.gov.scot/publications/sea-trout-fishery-statistics-2019/

Ecological Feature	Evaluation Rationale	Scale of Importance	IEF/Action
European eel	• The European eel is widely distributed within European freshwaters and can be found in a wide variety of freshwater and estuarine habitats in the UK. The European eel hasn't been heavily exploited in Scotland, yet eel numbers in Scotland are thought to have fallen by more than 90% since the 1990s[63]. • The IUCN Red List now regards the species as 'Critically Endangered'. • Although not a protected species, the widespread decline in European eels has led the European Commission to develop an eel recovery plan, which has been incorporated in Scotland since 2008. • 17 records of European eel were identified in the Desk Study, and one was recorded during baselines surveys the species can potentially be found across a wide variety of aquatic habitat, including poor quality, polluted watercourses, so presence within the Site cannot be ruled out. • In light of the above, the species is considered of Local Importance.	Local	No. Scoped out of assessment.

[63] NatureScot. *European Eel Information Page*. [Online] Available at: https://www.nature.scot/plants-animals-and-fungi/fish/freshwater-fish/european-eel. (Accessed 04/02/2021).

7.6.1 Scoped Out of the Assessment of Potential Effect

108. Following the systematic evaluation of importance outlined in Table 7.8, the following ecological features are not considered to be IEFs, and therefore have been scoped out of inclusion with Section 7.7: Assessment of Potential Effects:

- Whim Bog SSSI;
- Dundreich Plateau SSSI;
- Auchencorth Moss SSSI;
- Cloich Bog LBS;
- Shiphorn Quarry LBS;
- Nether Stewarton Pools (Loch Potts) LBS;
- Portmore Birchwoods LBS;
- GWDTEs;
- Pine marten;
- Red squirrel;
- Water vole;
- Great crested newt;
- Reptiles; and
- European eel.

109. Although the above IEFs have been scoped out of further assessment within this Chapter, measures to mitigate or avoid potential effects on these IEFs have been included within Embedded Mitigation to help ensure legislative compliance of works as well as adherence to accept industry good practice (see Section 7.5).

7.6.2 Scoped into the Assessment of Potential Effect

110. Following the systematic evaluation of importance outlined in Table 7.8, the following ecological features are considered to be IEFs, and have therefore have been scoped in to Section 7.7: Assessment of Potential Effects:

- River Tweed SAC;
- River Tweed SSSI;
- Badger;
- Otter;
- Bats;
- Atlantic salmon;
- Brown trout; and
- Lamprey species.

7.7 ASSESSMENT OF POTENTIAL EFFECTS

7.7.1 Habitats

111. The construction of the Development will cause the loss of and disturbance to habitats during construction and the effects may be both permanent and temporary. Permanent losses are calculated based on the Development layout but estimates of temporary losses, such as those caused by construction activities (e.g. vehicle movements and stockpiling) in the areas surrounding built infrastructure, are more difficult to quantify. However, temporary losses will be relatively limited in extent, based on experience of the construction of similar developments, and so are assumed, on a precautionary principle, to equate to approximately 20% of the areas permanently lost.

112. In total, an estimated 71.48 ha of habitats will be lost, equating to 6.54% of the Site. Of this loss, the majority (98%) will consist of conifer plantation woodland. Further detail on habitat loss is presented in Table 7.9 below. No IEF habitats will be impacted by habitat loss and so habitats are scoped out of further assessment.

Table 7.9: Summary of Phase 1 Habitat Loss

Phase 1 Habitat Type recorded in Survey Area	Area Lost within Site (Ha)	% of Site Lost
A1.2.2 Conifer Plantation Woodland	70.6144	6.54
A3.1 Scattered Trees	0.0004	<0.01
B1.1 Acid grassland – unimproved	0.0019	<0.01
B4 Improved grassland	0.2356	0.02
B5 Marsh/marshy grassland	0.0056	<0.01
C1.2 Tall herb and fern - bracken	0.0019	<0.01
I2.1 Quarry	0.5217	0.05

7.7.2 Bats

7.7.2.1 Construction Phase Impacts

113. There is potential for displacement and/or disturbance to foraging and commuting bats during the construction of Development infrastructure and the forest felling required to accommodate the infrastructure.

114. Most turbines and infrastructure will be located within forested areas and will be in proximity to edge habitats such as forest rides. Felling for this infrastructure will take place. Despite the felling that will be undertaken, displacement or disturbance to foraging and commuting bats during construction is considered negligible given the abundance of edge habitats available within the Site that will remain unaffected. Linear watercourse features are also largely avoided due to the 50 m watercourse buffer for any infrastructure or construction activity, except where a minimal number of watercourse crossings and tracks are required.

115. Felling and the loss of habitat to the Development may marginally reduce the foraging and roosting opportunities within the Site; however, due to the abundance of these habitat types in the surrounding area and the small extent of their loss, it is not considered to be significant. Additionally, felling for infrastructure will create new edge habitats that may be utilised by bats within otherwise solid blocks of conifer forest, and thus overall, the abundance of edge habitat will increase. Forestry restocking will also create new habitats and edge features in the longer term.

116. No bat roosts were recorded during baseline surveys. However, standard embedded mitigation[64] requires that if felling and/or lopping of a tree with potential to support roosting bats is required, cavities must be checked prior to these activities taking place to ensure bats are not impacted. Several potential bat roost trees were recorded within 30 m of the proposed access road to the east of the Site (see Appendix A7.3), some of which are expected to be felled to allow vehicle access to the Site.

117. A pre-construction tree climbing survey of the trees identified to have low bat roost potential will be completed to locate any evidence of roosting bats. The tree climbing survey would ideally be complete during the active bat season from May to September which would increase the likelihood of finding bat signs. If a tree cannot be climbed then dusk and dawn bat roost activity surveys would be required to be carried out during the active bat season.

118. Although some bat foraging, commuting and roosting behaviour may be altered as a result of construction and forestry restructuring, this is likely to be of negligible spatial magnitude and short-term temporal magnitude.

[64] Collins, J. (ed.) (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd edn). The Bat Conservation Trust, London. ISBN-13 978-1-872745-96-1.

119. As a result, construction effects are considered to be negligible and therefore **not significant** in terms of the EIA Regulations.

7.7.2.2 Operational Impacts

120. During the operational phase, there is potential for collision to occur between commuting and foraging bat species and wind turbines, resulting in injury or mortality to individual bats. In addition, bats may be injured or killed by barotrauma when flying in close proximity of the turbine blades. For the purposes of this assessment, the potential effects from barotrauma are assumed to be the same as for turbine collision. This is due to the lack of published empirical evidence in causes of bat fatalities around wind farms and the difficulties in determining whether bat fatalities are due to collisions with turbines blades or barotrauma.

121. Further details on the conservation status of the high collision risk bat species recorded within the Site are provided below. Data for both noctule (*Nyctalus noctula*) and Leisler's bat (*Nyctalus leisleri*) are provided, however these bats were only recorded to genus level (i.e. *Nyctalus* spp.). The low population estimates for *Nyctalus* spp. in Scotland are likely due to under-recording and an underestimate of the population occurring here[65]. Both common and soprano pipistrelle are widespread in southern Scotland, with Leisler's bat distributed mainly in the south and west of the region and noctule mainly to the south and east of the region, with some scattered predicted occurrence to the west[65].

122. Population estimates of common pipistrelle in 2013 were 1,390,000 in the UK and 352,000 in Scotland[66]. In 2019, Article 17 of the UK Habitats Directive Report UK estimates the population range to be from 1,100,600 to 7,843,000[67], however a best single value has not been provided due to the uncertainty around the population estimate. Matthews *et al* (2018)[68] provided a UK estimate of 3,040,000 for common pipistrelle; population estimates for Scotland were not provided.

123. Population estimates of soprano pipistrelle in 2013 were 774,000 in the UK and 198,000 in Scotland[66]. In 2019, Article 17 of the UK Habitats Directive Report UK estimates the population range to be from 2,024,000 to 8,563,000[67], however, a best single value has not been provided due to the uncertainty around the population estimate. Matthews *et al* (2018)[68] provided a UK estimate of 4,670,000 for soprano pipistrelle; population estimates for Scotland were not provided.

124. Population estimates of Leisler's bat in 2013 were 28,000 in the UK and 250 in Scotland[66]. There is no recent population estimate available for this species in the UK[67], and there is limited accurate data on trends, and population changes, meaning that the population status of this species in the UK and Scotland is currently unknown.

125. Population estimates of noctule in 2013 were 50,000 in the UK and 250 in Scotland[66]. Current UK estimates for this species are unknown, but countrywide estimates provided by Matthews *et al* (2018)[68], and referred to in Article 17 of the UK Habitats Directive Report[67], with 565,000 individuals reported in England and 91,900 in Wales; there is no current estimate for Scotland.

126. Evaluating the overall site risk of a bat population to wind farms is based on two factors: Ecobat activity level recorded and initial site risk level. These factors are multiplied to generate an overall risk assessment score per species of either Low (0-4), Moderate (5-

[65] Newson, S.E., Evans, H.E., Gillings, S., Jarrett, D. & Wilson, M.W. 2017. A survey of high risk bat species across southern Scotland. NatureScot Commissioned Report No. 1008.
[66] JNCC (2013). Individual Species Reports - 3rd UK Habitats Directive Reporting 2013.
[67] https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019-species/#regularly-occurring-species-vertebrate-species-mammals-terrestrial
[68] Mathews F, Kubasiewicz LM, Gurnell J, Harrower CA, McDonald RA, Shore RF. (2018) A Review of the Population and Conservation Status of British Mammals: Technical Summary. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and NatureScot. Natural England, Peterborough.

12) or High (15 – 25)[36]. Appendix A8.3 presents the results of this risk assessment for each high collision risk species and provides detailed results of the Ecobat analysis. A summary is provided below to inform the assessment.

127. The following average site activity levels (median and maximum percentiles) were recorded for the following high collision risk bat species:

- Common pipistrelle: Moderate to High;
- Soprano pipistrelle: Moderate to High; and
- *Nyctalus* spp: Low to Moderate.

128. Due to having a 'high' collision risk and a 'common' population abundance rating, common and soprano pipistrelle are classified as having 'medium' population vulnerability.

129. *Nyctalus* spp. have a 'high' collision risk and the 'rarest' population abundance resulting in this species having a 'high' population vulnerability. The Site has been categorised as a 'Low' (level 2)[36] site risk to bats due to its 'Medium' project size and 'Low' habitat risk (see Technical Appendix A8.3). Although the Site has been categorised as having 'Low' habitat risk, it is acknowledged that small pockets of higher value habitat (such as broadleaved trees and riparian corridors) do exist within the Site, the presence of which has been taken into account in the following assessment.

130. The following risk assessment score for 'Median' and 'Maximum' percentiles was obtained for the following bat species.

- Common pipistrelle: Medium (6) to Medium (10);
- Soprano pipistrelle: Medium (6) to Medium (10); and
- *Nyctalus* spp: Low (2) to Medium (6).

131. The risk level varied between May and October with September and October being the months with the greatest bat activity across the Site (Technical Appendix A7.3). Further context on each high collision risk species is provided below.

Common pipistrelle

132. Using results from the Ecobat assessment, 'Moderate' or 'Moderate to High' levels of activity of common pipistrelle were recorded at two locations within the Site during the surveys, all of which were associated with forest edge habitats. Conifer plantation edges are known to offer suitable commuting and foraging habitat[49]. The remaining eight locations recorded 'Low' and 'Low to Moderate' levels of activity. The highest levels of activity at these locations were recorded in July, with activity levels dropping slightly into September and October. Very low activity levels were recorded during early May. Overall, the effect of this impact is considered to be of low magnitude for common pipistrelle.

Soprano pipistrelle

133. Using results from the Ecobat assessment, 'Moderate' or 'Moderate to 'High' levels of activity of soprano pipistrelle were recorded at four locations within the Site during the surveys, all of which were associated with conifer plantation edge habitats, known to offer suitable commuting and foraging habitat. The remaining six locations recorded 'Low to Moderate' levels of activity. The lowest levels of activity at these locations were recorded in May, rising into July, with September and October providing the highest activity levels. Overall, the effect of this impact is considered to be of low magnitude for soprano pipistrelle.

Nyctalus spp.

134. Using results from the Ecobat assessment, 'Low to Moderate' levels of activity were recorded for *Nyctalus* spp. at one location within the Site during the surveys, which was associated with conifer plantation edge habitats, known to offer suitable commuting and foraging habitat. Four other locations recorded 'Low' levels of activity with the remaining

five locations recording no activity. Activity was recorded during every survey month; however, the majority of activity was during July, September and October with very low activity recorded in May. Overall, the effect of this impact is considered to be of low magnitude for *Nyctalus* spp.

135. In accordance with the recent guidance[36], embedded mitigation (see Section 7.5) will ensure that a 50 m separation distance between high-value bat habitats (such as woodland edges) and blade tips is established. If micrositing of turbines is required during construction, the 50 m separation distance would be maintained accordingly. Furthermore, this off set buffer would also be sustained throughout operation via routine maintenance, if required.

136. To calculate the necessary stand-off distance between the centre of the turbine (the turbine location) guidance advises the use of the following equation:

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

137. Based on turbine parameters detailed in **Chapter 3: Project Description**, the calculation uses blade length (bl) and hub height (hh) alongside feature height (fh) to calculate a stand-off distance (b) from the base of the turbine within which no habitats that could encourage bat activity should be allowed to develop (i.e. trees). The equation assumed to represent a 'worst case' scenario of 40 m for the tree heights within the Site. Table 7.10 provides the values and stand-off distances required for the selected turbine model.

Table 7.10: Stand-off buffer required for bats

Turbine Model	Hub Height (m)	Blade Length (m)	Equation	Stand-off Distance Required (m)
Vestas 136	82	68	$b = \sqrt{(50+68)^2 - (82-40)^2}$	110

138. Therefore, based on the above equation the minimum turbine stand-off distance to be implemented during construction and maintained through operation for the turbines is 110 m.

139. Further to the above, the typical flight height for common pipistrelle and soprano pipistrelle (the dominant species recorded on site) is 2-10 m above the ground[69]. Therefore, with a minimum rotor sweep height of 14 m, the majority of bats continuing to utilise the Site are unlikely to fly at rotor height, and are therefore at less risk from turbine collision.

140. Bat activity was generally moderate across the Site with most activity localised to five locations. Where the risk of bat interaction with turbines currently exists, the risk of collision will be notably reduced through the implementation of embedded mitigation to ensure turbines are located outwith areas likely to be used by bats.

141. Due to the overall moderate levels of bat activity recorded, and the benefits of embedded mitigation recommendations, the magnitude of effects of turbine collision on the local bat population is likely to be minor. Despite this, due to the lack of data regarding bat interactions with turbines, impacts on low numbers of bats cannot be ruled out. As a result, operational effects are considered to be of low magnitude, and therefore **not significant** in terms of the EIA Regulations.

[69] Bat Conservation Trust: Species Factsheets. [Online] Available at: https://www.bats.org.uk/about-bats/what-are-bats/uk-bats. (Accessed 04/02/2021).

7.7.2.3 Decommissioning Phase Effects

142. Decommissioning activities are considered to be of a similar nature to those of Development construction; however, as no habitats used by bats are likely to be impacted, the potential for detrimental impact to bats is on a significantly notably smaller scale, and therefore effects are **not significant** in terms of the EIA Regulations.

7.7.3 Otter

143. Although otter was confirmed as being present within the Site, the level of activity was considered to be low with only one spraint located within the Site during surveys. Due to this, the watercourses on Site are likely to be of relatively low value to otter, used occasionally or seasonally.

7.7.3.1 Construction Phase Effects

Habitat Loss, Disturbance and Degradation.

144. During the construction phase there are potential impacts that may result from the occurrence of ground works in close proximity to watercourses and ponds used by otters. These include the detrimental impacts of habitats loss and disturbance, siltation, sedimentation and accidental pollution. These impacts could detrimentally affect the local otter population indirectly by reducing habitat suitability for prey species, thus reducing prey availability, or by directly damaging habitats used to otters for resting and commuting. Both effects could result in the displacement of otters from the Site, reduction of connectively to the wider local area, and a minor reduction of fitness in members of the otter population, due to decreased resources and the subsequent increase in completion for resources.

145. The overwhelming majority of construction will take place in woodland habitats of limited to no value to otter, and outwith close proximity to watercourses and ponds. However, there will be several watercourse crossings constructed as part of the Development. All watercourses and ditches are likely to be suitable for commuting otters.

146. Following the application of Embedded Mitigation measure outlined in Section 7.5, and construction phase pollution prevention measures (as detailed in **Chapter 10: Hydrology and Hydrogeology**) which will form part of Pollution Prevention Plan (PPP), it is anticipated the current low value of watercourses to otter will not be notably detrimentally impacted by construction activities and will be short-term, and so effects to critical prey resources and general habitat quality are unlikely.

147. The construction phase effects of habitat loss, disturbance and degradation are predicted to be adverse and temporary, and thus of low magnitude, and therefore are **not significant** in terms of the EIA Regulations.

Disturbance and Displacement

148. Under the Habitat Regulations (the Conservation (Natural Habitats, &c.) Regulations 1994) otter resting sites are protected from deliberate or reckless disturbance. Potential development related disturbance and displacement may result from an increase in noise, vibration, traffic and the presence of people, in close proximity to areas used by otter. In accordance with NatureScot guidance[70], disturbance is likely to constitute any construction activity taking place within 30 m of holts and shelters where otters are not breeding, but up to 200 m for breeding holts. Otters using freshwater habitats typically establish resting areas in close proximity to the riparian corridor, and therefore watercourses represent the areas of greatest risk to disturbance.

[70] NatureScot (2020) *Protected Species Advice for Developers: Otter.* [Online] Available at: https://www.nature.scot/species-planning-advice-otter. (Accessed 27/02/2021).

149. Otters typically breed in areas where there is access to an abundant food supply, where disturbance is minimal and where more than one resting area suitable to be used as a natal holt is already available[71]. As established above, habitats within the Site are largely of limited value to the species, and otter has only been recorded at one location, therefore the Site is considered to be unlikely to support a breeding holt. Although the presence of other future non-breeding holt or shelter cannot be ruled out, with the exception of the water crossings, the vast majority of Development is located no closer than 50 m to watercourses (and in many areas considerably further away), outwith the likely range of disturbance.

150. Based on the existing baseline, Development-related construction work will not impact any known resting area for otter. Although the likelihood of a resting area becoming established in the future ahead of construction within 30 m of the water crossing works is considered low, with adherence to embedded mitigation such as pre-construction surveys and ECoW supervision of works, the risk is considered to be negligible. As discussed, habitats within the Site are largely of limited value to the species, and the vast majority of works are outwith proximity of watercourses.

151. Through the implementation of embedded mitigation measures, including pre-works ECoW monitoring and surveys, the implementation of 50 m riparian buffers from working areas, and the adoption of best practice working practices and emergency procedures, the risk of detrimental effects of disturbance and displacement on both the existing and future baseline is negligible. Therefore, the effects of disturbance and displacement impacts are of low magnitude, and are therefore **not significant** in terms of the EIA Regulations.

Interaction with Construction Traffic and Plant

152. In addition to construction phase disturbance, the direct increase of traffic and plant movements and operation from Development construction have the potential to result in a temporary increase in the risk of accidental collisions and otter injury and fatality.

153. As otter are largely crepuscular and nocturnal, the risk is largely limited to periods when construction is taking place at night, or during low light levels during the winter months. Additionally, as habitats are largely of low value to otter and works will largely take place outwith proximity to watercourses, the risk is considered to be low.

154. This risk is likely to be further reduced through the implementation of embedded mitigation measures, such as pre-construction surveys, the implementation of good practice working measures, and monitoring of works by the ECoW. As a result, it is considered that a potential impact is of negligible risk. Therefore, the effect of this impact is of low magnitude, and is therefore **not significant** in terms of the EIA Regulations.

Entrapment in Construction Excavations.

155. Construction phase excavations if left uncovered and unattended have the potential to injure or entrap wildlife including otters which could result in injury or mortality. As habitats are largely of low value to otter, activity is limited to one watercourse within the Site and works will largely take place outwith proximity to watercourses, the risk is considered to be very low.

156. Through the implementation of embedded mitigation measures, such as the implementation of good practice working measures such as covering excavation or leaving a suitable means of escape when unattended, as well as monitoring of works by the ECoW, the potential impact is of negligible risk. Therefore, the effect of this impact is of low magnitude, and is therefore **not significant** in terms of the EIA Regulations.

[71] Liles G (2003). Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5. English Nature, Peterborough

7.7.3.2 Operation Phase Impacts

Interaction with Operational Traffic and Personnel Presence

157. Development maintenance is likely to result in occasional vehicle movements and personnel presence throughout the operation of the Development; however, this activity will be limited to the Development infrastructure, with no disturbance of the surrounding environment (including riparian habitats) expected. Due to the infrequency and localised nature of operational activities, and the low value and use of the Site by otters, the potential detrimental effect is of negligible magnitude, and is therefore **not significant** in terms of the EIA Regulations.

7.7.3.3 Decommissioning

158. Decommissioning activities are considered to be of a similar nature to those of Development construction, therefore potential exists for direct and indirect effects to otters, where decommissioning works may take place in close proximity to riparian habitats. Decommissioning activities may result in a localised increase in noise, vibration, traffic and presence of people, potentially causing disturbance to commuting and foraging otters. However, this effect of low magnitude and is therefore **not significant** in terms of the EIA Regulations.

7.7.4 Badger

7.7.4.1 Construction Phase Impacts

159. Construction activities have the potential to require the destruction of badger setts and badger foraging areas which could result in injury or death to badgers. Noise and human presence also have the potential to disturb badgers that are present within the Site.

Habitat Loss, Disturbance and Degradation.

160. There will be a loss of a maximum of 70.98 ha of potential foraging habitat for badgers as a result of Site Infrastructure construction, although it should be noted that most of this is currently Sitka spruce plantation, a habitat that is likely to provide little value for foraging. The habitats of most value to badgers for foraging and sett creation are broadleaved woodland and grassland habitats, of which 0.24 ha is predicted to be permanently lost. There is an abundance of similar habitat for badgers in the wider area and therefore the effect is of low magnitude and is therefore **not significant** in terms of the EIA Regulations.

161. No badger setts are predicted to be destroyed as a result of construction activities. Infrastructure has been sited away from active badger setts recorded on Site (in excess of 100 m from Site infrastructure). However, there remains the chance that newly formed setts will be excavated in close proximity to areas in which infrastructure is planned. The risk of disturbance to badgers using these setts will be minimised through the implementation of embedded mitigation measures, such as pre-construction surveys, the implementation of good practice working measures, and monitoring of works by the ECoW. As a result, it is considered that a potential impact is of low risk. Therefore, the effect of this impact is of low magnitude, and is therefore **not significant** in terms of the EIA Regulations.

Interaction with Construction Traffic and Plant

162. In addition to construction phase disturbance, the direct increase of traffic and plant movements and operation from Development construction have the potential to result in a temporary increase in the risk of accidental collisions and badger injury and fatality.

163. As badgers are largely crepuscular and nocturnal, the risk is largely limited to periods when construction is taking place at night, or during low light levels during the winter months. This risk will be minimised through the implementation of embedded mitigation

measures, such as pre-construction surveys, the implementation of good practice working measures, and monitoring of works by the ECoW. As a result, it is considered that a potential impact is of low risk. Therefore, the effect of this impact is of low magnitude, and is therefore **not significant** in terms of the EIA Regulations.

Entrapment in Construction Excavations.

164. Construction phase excavations if left uncovered and unattended have the potential to injure or entrap wildlife including badgers which could result in injury or mortality. However, through the implementation of embedded mitigation measures, such as the implementation of good practice working measures including covering excavations or leaving a suitable means of escape when unattended, as well as monitoring of works by the ECoW, the potential impact is of low risk. Therefore, the effect of this impact is of low magnitude, and is therefore **not significant** in terms of the EIA Regulations.

7.7.4.2 Operation Phase Impacts

Interaction with Operational Traffic and Personnel Presence

165. Development maintenance is likely to result in occasional vehicle movements and personnel presence throughout the operation of the Development; however, this activity will be limited to the Development infrastructure, with no disturbance of the surrounding environment expected. Due to the infrequency and localised nature of operational activities, the potential detrimental effect is of negligible magnitude, and is therefore **not significant** in terms of the EIA Regulations.

7.7.4.3 Decommissioning Phase Impacts

166. Decommissioning activities are considered to be of a similar nature to those of Development construction, therefore potential exists for direct and indirect effects to badgers, where decommissioning works may take place in close proximity to existing or newly established setts. Decommissioning activities may result in a localised increase in noise, vibration, traffic and presence of people, potentially causing disturbance to badgers. However, this effect is of low magnitude and is therefore **not significant** in terms of the EIA Regulations.

7.7.5 Salmonid Fish (Atlantic salmon/brown trout)

167. As discussed in Section 7.6, although trends in the Scottish salmonid (salmon and trout) population can fluctuate spatially and temporally, and declines are less marked on a long-term scale, it is important to acknowledge that recent salmonids populations across Scotland (and the wider North Atlantic) are in notable decline, and the reasons for this are not yet fully understood.

168. The Scottish salmon population has seen a decline in recent years which is likely to be the result of numerous marine and freshwater pressures. A key pressure is climate change, which is known to affect freshwater phases of salmon by increasing water temperatures. As a result of climate change, water temperatures are expected to rise, and may already be having consequences for Scotland's salmonid populations. In addition, the Scottish Government have identified further high-level pressures on the Scottish salmon population[72], these are:

- Changes in habitat and water quality as a result of acidification, point-source and diffuse pollution, changing rainfall patterns, eutrophication and oligotrophication;
- Changes in habitat and water quality as a result of abstraction, flow regulation, upland / agriculture land-use and drainage, and forestry drainage;

[72] Scottish Government (2019). *Conservation of wild salmon – High level pressures on Atlantic Salmon*. [Online] Available at: https://www.gov.scot/publications/conservation-of-wild-salmon/pages/high-level-pressures-on-atlantic-salmon/. (Accessed 27/02/2021).

- Changes to instream habitats as a result of over sedimentation or the loss of sediment transfer, canalisation and dredging;
- Loss of riparian habitat as a result of afforestation and habitat loss/change; and
- Prevention of upstream/downstream migration and the access to spawning habitats, due to man-made barriers such as dams or other river modifications.

169. The Development has the potential to, at least in the short term, negatively contribute to some of these pressures, particularly those related to changes in habitat and water quality.

7.7.5.1 Construction Phase Effects

Habitat Loss, Disturbance, Degradation and Contamination

170. During the construction phase, there are potential impacts that may result from the occurrence of ground works in close proximity to watercourses used by salmonids. These include the detrimental impacts such as spawning habitat loss and disturbance, siltation, sedimentation and accidental pollution, accelerated or exacerbated erosion, and hydrological changes. The effects of these impacts could detrimentally impact the local salmon population indirectly via the reduction of productivity by reducing the population's ability to utilise spawning areas, or directly through injury and mortality, which could also have an impact of population productivity.

171. Watercourses within the Site are connected to the River Tweed, which is categorised as a Grade 1 river (highest grade possible)[60], and thus salmonid populations present are likely to have more tolerance to detrimental effects than less sustainable populations, particularly if the effects are temporary.

172. Due to migration barriers further downstream, as confirmed by the Tweed Foundation (Technical Appendix A7.4), no watercourses within the Site Boundary are known to support salmonid populations. With the exception of an existing watercourse crossing on the eastern access road (a public road with no upgrade works required) which crosses the River Tweed SAC, there is no potential for direct impacts to occur, and all other watercourses are located at least 50 m outwith proximity of all Development related construction. As these potential impacts are likely to be relatively localised to their point source within the Site and their magnitude, and thus effects on salmonid fish, is likely to dissipate with increasing distance from source, the risk from direct and indirect effects are low.

173. As stated in Section 7.5, mitigation presented with in **Chapter 10: Hydrology and Hydrogeology** to safeguard the water environment, will also effectively mitigate construction-related impacts to fish such as the direct and indirect effect of pollution and sedimentation from surface water run-off. Furthermore, the sensitive design of watercourse crossings and culverts as presented in **Chapter 3: Project Description**, was developed to safeguard the water environment, which will be constructed in accordance with statutory regulations for instream works, further reducing the risk of construction-related direct and indirect impacts to fish and other aquatic features.

174. Through the implementation of embedded mitigation measures, such as the implementation of good practice pollution prevention measures and monitoring of works by the ECoW, the risk of detrimental impacts is low. Therefore, the effect of construction phase impact is of low magnitude, and is **not significant** in terms of the EIA Regulations.

7.7.5.2 Operational Phase

175. Operational impacts of onshore wind farms on salmonids are not widely held to be a cause of concern, and as such, consideration for operational effects is not included within any published statutory guidance or advice. Although MSS acknowledge in their published scoping advice[73], that onshore wind farm developments have the potential to adversely affect diadromous fish (such as Atlantic salmon and sea trout), the ecological impacts should be given consideration are related to effects resulting from the construction of turbine foundations and associated infrastructure, as assessed in Section 7.7.5.1 above. The only operational impact stated as having the potential to effect diadromous fish is physical obstruction to migration, which is not an impact associated with the Development. Therefore, the effect of operational phase impact is of negligible magnitude, and is therefore **not significant** in terms of the EIA Regulations.

7.7.5.3 Decommissioning

176. Decommissioning activities are considered to be of a similar nature to those of Development construction. Through the implementation of embedded mitigation measures, such as the implementation of good practice pollution prevention measures, adherence to statutory regulations for instream works and monitoring of works by the ECoW, the risk of detrimental impacts is low. Therefore, the effect of decommissioning phase impact is of negligible magnitude, and is **not significant** in terms of the EIA Regulations.

7.7.6 Lamprey Species

177. Although there are significant ecological differences among the three British species of lamprey, many of their ecological requirements and environmental sensitivities are very similar, so for the purposes of this assessment and to avoid repetition in the text, they have been grouped together.

178. There is a lack of data concerning the water quality requirements of lamprey, although they are recognised as being sensitive to water pollution[74]. Lampreys have declined in Britain over the last hundred years and, though not distinctly threatened, is in need of general conservation measures to restore populations to their former status. Similarly, to salmonids, the following pressures have been identified as negatively effecting lamprey populations[74]:

- Changes in habitat and water quality as a result of acidification, point-source and diffuse pollution, changing rainfall patterns, eutrophication and oligotrophication;
- Changes in habitat and water quality as a result of abstraction, flow regulation, upland / agriculture land-use and drainage, and forestry drainage;
- The increasing threat of climate change is likely to produce similar problems as point above, potentially increasing periods of heavy rain in the autumn and winter, and drought in the summer.
- Changes to instream habitats as a result of over sedimentation or the loss of sediment transfer, canalisation and dredging;
- Loss of riparian habitat as a result of afforestation and habitat loss/change; and
- Prevention of upstream/downstream migration and the access to spawning habitats, due to man-made barriers such as dams or other river modifications.

179. The Development has the potential to, at least in the short term, negatively contribute to some of these pressures, particularly those related to changes in habitat and water quality.

[73] MSS (2018) Scoping advice on information required in Environmental Impact Assessment reports in relation to assessing risk to freshwater and diadromous fish associated fisheries. April 2018
[74] Maitland PS (2003). *Ecology of the River, Brook and Sea Lamprey*. Conserving Natura 2000 Rivers Ecology Series 5. English Nature, Peterborough.

7.7.6.1 Construction Phase Effects

Habitat Loss, Disturbance, Degradation and Contamination

180. During the construction phase, there are potential impacts that may result from the occurrence of ground works in close proximity to watercourse used by lamprey. These include the detrimental impacts such as spawning habitat loss and disturbance, siltation, sedimentation and accidental pollution, accelerated or exacerbated erosion, and hydrological changes. The effects of these impacts could detrimentally impact the local lamprey population indirectly via the reduction of productivity by reducing the population's ability to utilise spawning areas, or directly through injury and mortality, which could also have an impact of population productivity.

181. Due to migration barriers further downstream, as confirmed by the Tweed Foundation (Technical Appendix A7.4), no watercourses within the Site Boundary are known to support lamprey populations. With the exception of an existing watercourse crossing on the eastern access road (a public road with no upgrade works required) which crosses the River Tweed SAC, there is no potential for direct impacts to occur, and all other watercourses are located at least 50 m outwith proximity of all Development related construction. As these potential impacts are likely to be relatively localised to their point source within the Site and their magnitude, and thus effects on lamprey, is likely to dissipate with increasing distance from source, the risk from direct and indirect effects are low.

182. As stated in Section 7.5, mitigation presented with in **Chapter 10: Hydrology and Hydrogeology** to safeguard the water environment, will also effectively mitigate construction-related impacts to fish such as the direct and indirect effect of pollution and sedimentation from surface water run-off. Furthermore, the sensitive design of watercourse crossings and culverts as presented in **Chapter 3: Project Description**, was developed to safeguard the water environment, which will be constructed in accordance with statutorily regulations for instream works, further reducing the risk of construction-related direct and indirect impacts to fish and other aquatic features.

183. Through the implementation of embedded mitigation measures, such as the implementation of good practice pollution prevention measures and monitoring of works by the ECoW, the risk of detrimental impacts is low. Therefore, the effect of construction phase impact is of low magnitude, and is **not significant** in terms of the EIA Regulations.

7.7.6.2 Operational Phase

184. Operational impacts of onshore wind farms on lamprey are considered of a very similar nature to impacts on salmonids, and are not widely held to be a cause of concern, and as such, consideration for operational effects is not included within any published statutory guidance or advice. Although MSS acknowledge in their published scoping advice[73], that onshore wind farm developments have the potential to adversely affect diadromous fish (such as river lamprey and sea lamprey), the ecological impacts that should be given consideration are related to effects resulting from the construction of turbine foundations and associated infrastructure, as assessed in Section 7.7.6.1 above. The only operational impact stated as having the potential to effect diadromous fish is physical obstruction to migration, which is not an impact associated with the Development. Therefore, the effect of operational phase impact is of negligible magnitude, and is therefore **not significant** in terms of the EIA Regulations.

7.7.6.3 Decommissioning

185. Decommissioning activities are considered to be of a similar nature to those of Development construction. Through the implementation of embedded mitigation measures, such as the implementation of good practice pollution prevention measures, adherence to statutory regulations for instream works and monitoring of works by the

ECoW, the risk of detrimental impacts is low. Therefore, the effect of decommissioning phase impact is of negligible magnitude, and is **not significant** in terms of the EIA Regulations.

7.7.7 Designated Sites

7.7.7.1 River Tweed SAC

Habitat Regulations Appraisal Screening

186. In accordance with the requirements of the Habitats Directives, where a project is likely to have a significant effect on an SAC (or any European Sites[75]), while not directly connected with, or necessary to the nature conservation management of the SAC, that project shall be subject to HRA. This identifies any implications for the SAC in the respect of its conservation objectives.

187. The Development is not associated with the management of the SAC, and therefore must undergo HRA screening. The intention of this screening is to assist the consenting authority in their assessment of the potential for likely significant effects on the integrity of the SAC. Should a likely significant effect be determined, the Development is statutorily required to be subject to an Appropriate Assessment (AA) by a relevant competent authority.

188. Part of HRA screening involves establishing the likely 'Zone of Influence' (ZoI) of the Development. The ZoI will vary depending on the nature of the project as well as the character and ecology of the Qualifying Features (QF). For floral and habitat QFs, given the fixed nature of these features, potential effects are likely to be limited to those associated with direct impacts, such as construction related habitat loss and pollution on habitats, on, directly adjacent, or with direct connectivity to the Site, for example hydrologically. In light of this, it is considered that the ZoI should be limited to land with the potential to be directly affected by the Development and therefore the ZoI is limited to within 2 km of the Site boundary.

189. The only European Site which falls within the ZoI of the Development is the River Tweed SAC. As a result, 'likely significant effects' on the SAC are predicted in the context of an HRA, and the SAC has been scoped into Stage 2 of the HRA process (AA).

190. As the River Tweed SAC is designated for a number of QFs, each of which have a different ZoI, an assessment of effects on each of these QFs has been carried out, and is presented in Table 7.11.

Table 7.11 Habitats Regulation Appraisal Screening Assessment

Qualifying Feature	Screening Assessment	Likely Significant Effect
Atlantic salmon	Atlantic salmon are present downstream of the Site, but not within the Site itself (TA 7.4). However, as they are present downstream of the Site, the Development is within the likely ZoI.	Yes
Brook lamprey	Larval lamprey were present downstream of the Site, but not within the Site itself (TA 7.4). However, as they are present downstream of the Site, the Development is within the likely ZoI.	Yes
River lamprey		
Sea lamprey		

[75] Previously termed "Natura Sites".

Qualifying Feature	Screening Assessment	Likely Significant Effect
Otter	Otter was recorded within the Site. In riparian environments otter can inhabit territories of between 20-32 km[76], so it is considered likely that otter utilising the Site comprise part of the River Tweed SAC population. Development within likely ZoI.	Yes
Rivers with floating vegetation often dominated by water-crowfoot	This habitat was not recorded onsite, although it is part of the River Tweed SAC designation, which indicates it is present downstream of the Site. Therefore, the Development lies within likely ZoI.	Yes

191. There is potential for likely significant effects on all QFs of the River Tweed SAC and, therefore, these have been scoped into the AA.

192. Although an AA must be carried out by a relevant competent authority, information to inform the AA (often referred to as a Shadow AA) has been provided below.

Shadow Appropriate Assessment

193. As established in Section 7.6, the only European Site which falls within the ZoI of the Development is the River Tweed SAC. The SAC lies approximately 400 m west of the western boundary of the Site, directly connected via the Flemington Burn at the nearest point. It is also connected to the Site via the Harehope Burn, lying approximately 3 km downstream of the Site Boundary. The eastern access road also crosses the SAC (the Eddleston Water) at an existing bridge on a public road. No works are proposed to this public road or bridge.

194. QFs to be scoped into the AA phase of the HRA are presented in Table 7.11 and, based on this, it is considered that detailed assessment of adverse effects will be required for all QFs of the River Tweed SAC, as detailed below.

Atlantic Salmon

195. As stated above, salmon were not present within the Site Boundary and so only indirect effects from the Development on salmon are considered. Section 7.7.3 provides a detailed assessment of all perceptible Development related effects, and no further effects are required to be assessed in the context of an AA.

196. Following the implementation of embedded mitigation and good practice measures, no adverse effects on the integrity on the River Tweed SAC salmon population are predicted.

Brook lamprey, river lamprey and sea lamprey

197. As stated above, lamprey species were not present within the Site Boundary and so only indirect effects are considered. Such indirect effects consist of potential siltation and/or pollution-related adverse effects, changes of flow regime and physical blockages to migration. However, with the adoption of detailed embedded mitigation and good practice measures, the magnitude of these effects is considered to be negligible, and no adverse effects on the integrity on the River Tweed SAC lamprey population are predicted.

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

Otter

198. As stated above, it is assumed that the otter utilising the Site are part of the SAC population. Section 7.7.3 provides a detailed assessment of all perceptible Development related effects, and no further effects are required to be assessed in the context of an AA.

199. Otter was only recorded on one watercourse within the Site, the Cowieslinn Burn, and although the species may potentially utilise other lower value watercourses within the Site, it is likely to only be on an occasional basis. Although very minor Development related effects on otter cannot be ruled out, the risk is very low, and given the limited value of the Site for otter, the extensive availability of more suitable habitats in the wider local area, and the large extent of the SAC boundary, no adverse effects on the integrity on the River Tweed SAC otter population are predicted.

Rivers with floating vegetation often dominated by water-crowfoot

200. As stated above, this habitat was not recorded within the Site Boundary and so only indirect effects are considered. Such indirect effects consist of potential siltation and/or pollution related adverse effects upon floating river vegetation and the change of flow regimes. Following the adoption of detailed embedded mitigation and good practice measures, no adverse effects on the integrity of this River Tweed SAC habitat are predicted.

Conclusion of Shadow Appropriate Assessment

No adverse effects are predicted for any of the QFs of the River Tweed SAC, therefore no adverse effects on the integrity of the River Tweed SAC are predicted, in the context of the HRA.

EIA Context of Assessment

201. In addition to the prediction of no adverse effects on the integrity of the River Tweed SAC in the context of the HRA, no significant effects (in terms of the EIA Regulation) on the SAC or its QFs in terms of the EIA regulations are predicted to occur from the Development.

7.7.7.2 River Tweed SSSI

202. The River Tweed SSSI is located 5 km south of the Site and is connected via the Flemington Burn and Lyne Water along a 12 km pathway.

203. It has been demonstrated in the preceding section that environmental measures incorporated into the scheme to protect water quality receptors will protect downstream water quality resulting in effects of negligible magnitude on the River Tweed SAC QFs, therefore it is also predicted that effects will be of negligible magnitude relating to the River Tweed SSSI QFs, and therefore, no significant effects in terms of the EIA Regulations are predicted.

7.7.7.3 Cloich Bog LBS

204. Cloich Bog LBS is located directly to the east of the Site. The nearest turbines (turbines 5 and 9) are located approximately 300 m from the edge of the LBS boundary. A borrow pit is planned to be adjacent to the southwestern boundary of the LBS. None of the five proposed watercourse crossings affect the watercourse flowing beside the LBS (i.e. the Early Burn). In consideration of the environmental measures incorporated into the Development to protect water quality receptors (as described in Section 7.7.7.1), it is predicted that effects will be of negligible magnitude, and therefore no significant effects in terms of the EIA Regulations are predicted.

7.8 CUMULATIVE EFFECT ASSESSMENT

205. The EIA Regulations require the cumulative effects of the Development with other relevant projects or plans to be assessed. In considering cumulative effects, it is necessary to identify any effects that may be not significant in isolation but that may be significant in combination with other developments.

206. This assessment considers that cumulative effects can result from effects that were individually assessed as non-significant, but in combination with effects or actions taking place over time, or across a wider spatial range (such as where the zone of influence of other developments or actions may overlap the with Development) non-significant effects may cumulatively be considered significant.

207. Cumulative effects are particularly important in EcIA as ecological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause irreversible decline.

208. The main projects likely to cause similar effects to those associated with the Development are other operational wind farms, those under construction or those consented.

209. Wind farm projects at scoping stage have been scoped out of the cumulative assessment because they generally do not have sufficient information on potential effects to be included, as the baseline survey period is ongoing, or results have not been published. Projects that have been refused or withdrawn have also been scoped out.

210. Small projects with three or fewer turbines have also been excluded from the cumulative assessment as often these projects are not subject to the same level of detail of assessment, and so there are no directly comparable data. Due to the small scale of such projects, effects are likely to be negligible on the IEFs assessed here.

211. Only one wind farm was considered within the cumulative effect assessments for IEFs below: Bowbeat Wind Farm, an operational 24-turbine wind farm with turbine heights of 80 m to tip, lying 8.6 km east of the Site.

7.8.1 Bats

212. Bats are most likely to be affected by cumulative wind farm development because of the foraging distances travelled by some species of bat and the cumulative risks to bat populations as a result of collision with wind turbines during operation.

213. Given the potential foraging and commuting range for bats; the Site lies within the ZoI of one wind farm: Bowbeat Wind Farm,

214. The implementation of standard good practice measures regarding buffer distances of turbines from forestry edges to minimise effects on commuting and foraging bats reduces the extent of cumulative effects (Section 7.7.2.2).

7.8.1.1 Common Pipistrelle and Soprano Pipistrelle

215. No information was available on the presence and activity levels of common and soprano pipistrelle for Bowbeat Wind Farm. However, both common pipistrelle and soprano pipistrelle are widespread in southern Scotland, with distributions of these species reaching into northern parts of Scotland. They are also common species with large population sizes and lower population sensitivity or population risk.

216. Taking into account the low risk assessment score at the Development for both species and considering their distribution, population size and sensitivity, whilst applying the precautionary principle, cumulative effects on common pipistrelle and soprano pipistrelle are of negligible magnitude and **not significant** in the context of the EIA Regulations.

7.8.1.2 Nyctalus spp.

217. With no information available on the activity levels of *Nyctalus* spp. at Bowbeat Wind Farm, and the lack of species population data in the UK and Scotland, information from the published report on high-risk bat species across southern Scotland[65] has been taken into account to provide additional data and context for a cumulative assessment.

218. The study examines the likelihood of *Nyctalus* species being present at wind farms in the region, using spatial modelling. The ranges occupied by these species in southern Scotland were found to be restricted with little overlap. For both noctule and Leisler's bat, occupancy and activity patterns were found to be particularly aggregated, indicating that smaller areas where the species are found may be of particular importance for the overall population. It was estimated that 16% to 24% of the populations of *Nyctalus* spp. are exposed to existing and approved wind farms. An analysis of spatial patterns of distribution and activity was undertaken to produce a map of core areas for these species, where they are likely to be at highest risk from wind farm development, with both the Development and Bowbeat Wind Farm falling outwith these core areas.

219. Taking into account the low to moderate risk assessment score at the Development for *Nyctalus* spp. and the currently available data on these species as detailed above, cumulative effects on *Nyctalus* spp. are of negligible magnitude and **not significant** in the context of the EIA Regulations.

7.8.2 Otter

220. Given the potential foraging and commuting range for otter; the Site lies within the ZoI of one wind farm: Bowbeat Wind Farm.

221. No information was available regarding otter for Bowbeat Wind Farm. However, extensive local habitat suitability outwith the Site exists for the species which is abundant and in an inclining status in Scotland. Therefore, due to the low magnitude of predicted non-significant effects, **no significant** cumulative effects in terms of the EIA Regulations are predicted.

7.8.3 Salmonid Fish (Atlantic salmon/brown trout)

222. No information was available regarding salmonid fish for Bowbeat Wind Farm. Furthermore, Bowbeat Wind Farm is located in a different catchment to the Development (see Section 10.8 of **Chapter 10: Hydrology and Hydrogeology**) and thus is not hydrologically connected. Therefore, no cumulative effects are predicted for Salmonid fish and due to the low magnitude of non-significant effects predicted for the Development alone, **no significant** cumulative effects in terms of the EIA Regulations are predicted.

7.8.4 Lamprey Species

223. No information was available regarding lamprey for Bowbeat Wind Farm. As stated in the section above, Bowbeat Wind Farm is located in a different catchment to the Development (see Section 10.8 of **Chapter 10: Hydrology and Hydrogeology**) and thus is not hydrologically connected. Therefore, no cumulative effects are predicted for lamprey and due to the low magnitude of non-significant effects predicted for the Development alone, **no significant** cumulative effects in terms of the EIA Regulations are predicted.

7.9 MITIGATION AND RESIDUAL EFFECTS

Embedded mitigation is described in Section 7.5. No significant effects were predicted and therefore no requirement for further mitigation is required.

No significant residual effects are predicted following the implementation of embedded mitigation.

7.10 SUMMARY OF EFFECTS

Table 7.12 provides a summary of the effects detailed within this chapter.

Table 7.12: Summary of Effects

Receptor	Potential Effect	Significance of Effect*	Mitigation Proposed**	Significance of Residual Effect
Construction Phase				
Bats	Habitat change.	Not Significant.	N/A	Not Significant.
	Roost loss.	Not Significant.	N/A	Not Significant.
Otter	Habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
	Disturbance and displacement of breeding otters.	Not Significant.	N/A	Not Significant.
	Interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant.
	Otter entrapment in excavations.	Not Significant.	N/A	Not Significant.
Badger	Habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
	Interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant.
	Badger entrapment in excavations.	Not Significant.	N/A	Not Significant.
Salmonid fish	Habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
Lamprey species	Habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
River Tweed SAC	Otter habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
	Disturbance and displacement of breeding otters.	Not Significant.	N/A	Not Significant.
	Otter interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant.

Receptor	Potential Effect	Significance of Effect*	Mitigation Proposed**	Significance of Residual Effect
	Otter entrapment in excavations.	Not Significant.	N/A	Not Significant.
	Atlantic salmon habitat loss, disturbance and degradation	Not Significant.	N/A	Not Significant.
	Lamprey species habitat loss, disturbance and degradation.	Not Significant.	N/A	Not Significant.
	Indirect effects of pollution, sedimentation and flow regime change on habitats with floating vegetation often dominated by water-crowfoot.	Not Significant.	N/A	Not Significant.
River Tweed SSSI	Potential effects identical to those stated above for the River Tweed SAC.	Not Significant.	N/A	Not Significant.
Cloich Bog LBS	Indirect effects of pollution and sedimentation of noted features such as bog and marsh habitats.	Not Significant.	N/A	Not Significant.
Operational Phase				
Bats	Turbine related mortality.	Not Significant.	N/A	Not Significant
Otter	Interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant
Badger	Interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant
Salmonid fish	Habitat degradation.	Not Significant.	N/A	Not Significant.
River Tweed SAC	Otter interaction with traffic, plant and personnel.	Not Significant.	N/A	Not Significant.
	Atlantic salmon habitat degradation.	Not Significant.	N/A	Not Significant.
	Lamprey species habitat degradation.	Not Significant.	N/A	Not Significant.

Receptor	Potential Effect	Significance of Effect*	Mitigation Proposed**	Significance of Residual Effect
	Degradation habitats with floating vegetation often dominated by water-crowfoot.	Not Significant.	N/A	Not Significant.
River Tweed SSSI	Potential effects identical to those stated above for the River Tweed SAC.	Not Significant.	N/A	Not Significant.
Decommissioning Phase				
Decommissioning activities are considered to be of a similar nature to those of Development construction.				
*The significance of effect assumes that the embedded mitigation described in Section 7.5 is fully implemented. **Where this is additional to the embedded mitigation described in Section 7.5.				

7.11 STATEMENT OF SIGNIFICANCE

No significant ecological effects have been identified for the Development on IEFs, either alone or in combination with other developments, and therefore these are **not significant** in relation to the EIA Regulations. Embedded Mitigation has been proposed to ensure the low or negligible magnitude of effects of the Development on IEFs and to reduce the likelihood of legal offences and comply with good practice.