

**CLOICH FOREST WIND FARM**  
**EIA Report – Volume 1 – EIA Report Text**

**Chapter 8**  
**Ornithology**



## 8 ORNITHOLOGY

### 8.1 INTRODUCTION

1. This Chapter of the Environmental Impact Assessment (EIA) Report evaluates the effects of the Cloich Forest Wind Farm ('the Development') on the Ornithology resource.
2. This assessment was undertaken by Arcus Consultancy Services Limited (Arcus).
3. This Chapter of the EIA Report is supported by the following Technical Appendix documents provided in Volume 3 Technical Appendices:
  - Appendix A8.1: Cloich Forest Wind Farm Baseline Ornithology Report 2019-20;
  - Appendix A8.2: Cloich Forest Wind Farm Baseline Ornithology Report 2019-20 – Confidential Annex;
  - Appendix A8.3: Cloich Forest Wind Farm Collision Risk Modelling;
  - Appendix A8.4: Cloich Forest Wind Farm Ornithology Consultation Report 2019; and
  - Appendix A8.5: Cloich Forest Wind Farm Ornithology Consultation Report 2020<sup>1</sup>.
4. This Chapter includes the following elements:
  - Legislation, Policy and Guidance;
  - Assessment Methodology and Significance Criteria;
  - Scoping Responses and Consultations;
  - Baseline Conditions;
  - Evaluation of Ornithological Features;
  - Assessment of Potential Effects;
  - Cumulative Effect Assessment;
  - Mitigation, Monitoring, and Residual Effects;
  - Summary of Effects; and
  - Statement of Significance.
5. English (British) vernacular and scientific names of bird species referred to in this report follow the British List maintained by the British Ornithologists' Union (BOU)<sup>2</sup>.

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<sup>1</sup> Appendix A8.5 Figures 4 and 5 are confidential.

<sup>2</sup> *British Ornithologists' Union. (2017) The British List: A Checklist of Birds of Britain (9<sup>th</sup> edition). Ibis 160, 190-240.*

## 8.2 LEGISLATION, POLICY AND GUIDANCE

6. The following key guidance, legislation and information sources have been considered in carrying out this assessment.

### 8.2.1 Legislation

- Directive 2009/147/EC on the Conservation of Wild Birds ('Birds Directive')<sup>3</sup>;
- The Conservation (Natural Habitats &c.) Regulations 1994 (as amended) (The Habitats Regulations)<sup>4</sup>;
- The Wildlife and Countryside Act 1981 (as amended)<sup>5</sup>;
- The Nature Conservation (Scotland) Act 2004 (as amended)<sup>6</sup>; and
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended)<sup>7</sup> (the EIA Regulations).

### 8.2.2 Planning Policy

- UK Post-2010 Biodiversity Framework (2012)<sup>8</sup>;
- Scottish Biodiversity Strategy: It's in Your Hands (2004)<sup>9</sup>/2020 Challenge for Scotland's Biodiversity (2013)<sup>10</sup>;
- PAN 60: Planning for Natural Heritage (Scottish Government 2000)<sup>11</sup>;
- Scottish Government (2017). Planning Advice Note 1/2013-Environmental Impact Assessment, Revision 1.0<sup>12</sup>;
- Scottish Borders Council Local Biodiversity Action Plan<sup>13</sup>; and
- Scottish Borders Council Local Development Plan (2016).

### 8.2.3 Guidance and Information

- Developing field and analytical methods to assess avian collision risk at wind farms (Band *et al.*, 2007)<sup>14</sup>;

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<sup>3</sup> European Parliament (2009) Directive 2009/147/EC [Online] Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN> (Accessed 12/03/21)

<sup>4</sup> European Parliament (1994) the Conservation (Natural Habitats, &c.) Regulations 1994 [Online] Available at: <http://www.legislation.gov.uk/ukxi/1994/2716/contents/made> (Accessed 12/03/21)

<sup>5</sup> UK Government (1981) The Wildlife and Countryside Act 1981 (as amended) [Online] Available at: <http://www.legislation.gov.uk/ukpga/1981/69> (Accessed 12/03/21)

<sup>6</sup> UK Government (2004) Nature Conservation (Scotland) Act 2004 [Online] Available at: <http://www.legislation.gov.uk/asp/2004/6/contents> (Accessed 12/03/21)

<sup>7</sup> The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 <http://www.legislation.gov.uk/ssi/2017/101/contents/made> (Accessed 12/03/21)

<sup>8</sup> Four Countries' Biodiversity Group (2010) UK Post-2010 Biodiversity Framework [Online] Available at: <http://data.jncc.gov.uk/data/587024ff-864f-4d1d-a669-f38cb448abdc/UK-Post2010-Biodiversity-Framework-2012.pdf> (Accessed 12/03/21)

<sup>9</sup> Scottish Executive (2004) Scotland's Biodiversity It's in your Hands [Online] Available at: <https://www.webarchive.org.uk/wayback/archive/20180515152802/http://www.gov.scot/Publications/2004/05/19366/37250> (Accessed 12/03/21)

<sup>10</sup> Scottish Government (2013) 2020 Challenge for Scotland's Biodiversity [Online] Available at: <https://www2.gov.scot/Resource/0042/00425276.pdf> (Accessed 12/03/21)

<sup>11</sup> Scottish Government (2000) PAN 60: Planning for Natural Heritage [Online] Available at: <https://www.webarchive.org.uk/wayback/archive/20150218224848/http://www.gov.scot/Publications/2000/08/pa60-root/pan60> (Accessed 12/03/2021)

<sup>12</sup> Scottish Government (2013) PAN 1/2013: EIA [Online] Available at: <https://www.gov.scot/publications/planning-advice-note-1-2013-environmental-impact-assessment/> (Accessed 12/03/2021)

<sup>13</sup> Scottish Borders Council Local Biodiversity Action Plan [https://www.scotborders.gov.uk/downloads/file/928/local\\_biodiversity\\_action\\_plan](https://www.scotborders.gov.uk/downloads/file/928/local_biodiversity_action_plan) (Accessed 21/03/2021)

<sup>14</sup> Band, W., Madders, M. & Whitfield, D.P. (2007) *Developing field and analytical methods to assess avian collision risk at wind farms*. In: de Lucas, M., Janss, G. & Ferrer, M. (eds.) *Birds and Wind Power*. Quercus, Madrid.

- Scottish Raptor Monitoring Scheme Report 2018 (Challis *et al.*, 2019)<sup>15</sup>;
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018)<sup>16</sup>;
- Birds of Conservation Concern (BoCC) 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man (Eaton *et al.*, 2015)<sup>17</sup>;
- Wind Energy Developments and Natura 2000 (European Commission, 2011)<sup>18</sup>;
- The Birds of Scotland (Forrester *et al.*, 2007)<sup>19</sup>;
- Bird Monitoring Methods (Gilbert *et al.*, 1998)<sup>20</sup>;
- Raptors: a field guide to survey and monitoring, 3rd edition (Hardey *et al.*, 2013)<sup>21</sup>;
- A Review of Disturbance Distances in Selected Bird Species (Ruddock & Whitfield, 2007)<sup>22</sup>;
- The Scottish Biodiversity List (SBL)<sup>23</sup>;
- Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. (NatureScot, 2000)<sup>24</sup>;
- Recommended bird survey methods to inform impact assessment of onshore wind farms (NatureScot, 2017)<sup>25</sup>;
- Assessing connectivity with Special Protection Areas (SPAs) (NatureScot, 2016a)<sup>26</sup>;
- Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees (NatureScot, 2016b)<sup>27</sup>;
- Wind farm proposals on afforested sites – advice on reducing suitability for hen harrier *Circus cyaneus*, merlin *Falco columbarius* and short-eared owl *Asio flammeus* (NatureScot, 2016c)<sup>28</sup>;
- Assessing significance of impacts from onshore wind farms on birds out with designated areas (NatureScot, 2018a)<sup>29</sup>;
- Assessing the cumulative impacts of onshore wind farms on birds (NatureScot, 2018b)<sup>30</sup>;

<sup>15</sup> Challis, A., Eaton, M., Wilson, M.W., Holling, M., Stevenson, A. & Stirling-Aird, P. (2019). *Scottish Raptor Monitoring Scheme Report 2018*. BTO Scotland, Stirling.

<sup>16</sup> CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

<sup>17</sup> Eaton M.A., Aebischer N.J., Brown A.F., Hearn R.D., Lock L., Musgrove A.J., Noble D.G., Stroud D.A. and Gregory R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. *British Birds* 108, 708–746.

<sup>18</sup> European Commission (2011). Natura 2000 Guidance Document 'Wind Energy Developments and Natura 2000'. European Commission, Brussels.

<sup>19</sup> Forrester, R.W., Andrews, I.J., McInerney, C.J., Murray, R.D., McGowan, R.Y., Zonfrillo, B., Betts, M.W., Jardine, D.C., & Grundy, D.S. (eds) (2007) *The Birds of Scotland*. The Scottish Ornithologists Club, Aberlady.

<sup>20</sup> Gilbert, G., Gibbons, D.W. & Evans, J. 1998. *Bird monitoring methods*. RSPB, Sandy.

<sup>21</sup> Hardey, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. (2013). *Raptors: a field guide to survey and monitoring*, 3<sup>rd</sup> edition. The Stationery Office, Edinburgh

<sup>22</sup> Ruddock, M. & Whitfield, D.P. (2007). *A Review of Disturbance Distances in Selected Bird Species*. A report from Natural Research (Projects) Ltd to NatureScot

<sup>23</sup> <https://www.webarchive.org.uk/wayback/archive/20160402063428/http://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL> (Accessed 21/03/2021)

<sup>24</sup> NatureScot (NS) (2000). Windfarms and birds: calculating a theoretical collision risk assuming no avoidance action. NS Guidance Note.

<sup>25</sup> NatureScot (2017). *Recommended bird survey methods to inform impact assessment of onshore wind farms*, Version 2.

<sup>26</sup> NatureScot (2016a). *Assessing connectivity with Special Protection Areas (SPAs)*, Version 3.

<sup>27</sup> SNH (2016b). *Environmental Statements and Annexes of Environmentally Sensitive Bird Information; Guidance for Developers, Consultants and Consultees*, Version 2.

<sup>28</sup> SNH (2016c). *Wind farm proposals on afforested sites – advice on reducing suitability for hen harrier, merlin and short-eared owl*.

<sup>29</sup> SNH (2018a). *Assessing significance of impacts from onshore wind farms on birds outwith designated areas*, Version 2.

<sup>30</sup> SNH (2018b). *Assessing the cumulative impacts of onshore wind farms on birds*. SNH Guidance Note.

- Environmental Impact Assessment Handbook (NatureScot, 2018c)<sup>31</sup>;
  - Natural Heritage Zone Bird Population Estimates (Wilson *et al.*, 2015)<sup>32</sup>.
7. Note that additional sources of information used only occasionally are referenced in the text where relevant.

### 8.3 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

#### 8.3.1 Scoping Responses and Consultations

8. Consultation for this EIA was carried out with the organisations shown in Table 8.1.
9. Two consultation reports were sent (Appendices A8.4 and A8.5) by Arcus to NatureScot (formally Scottish Natural Heritage) during ornithological surveys, to discuss ornithological sensitivities at the Site and the proposed survey scope.
10. A Scoping Request was submitted to the Scottish Government's Energy Consents Unit (ECU) in October 2019.

**Table 8.1 Consultation Responses**

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
NatureScot	Consultation Report 2019 Response, 12/03/19	NatureScot confirmed that they were satisfied with the survey approach in general, and agreed that the vantage points for the Flight Activity Surveys (FAS) are well located and that passerine surveys are not a requirement.  NatureScot commented that the Development is well within connectivity range of both the Westwater and Gladhouse SPAs and an Appropriate Assessment may be required.	Additional FAS effort during goose migration periods and targeted foraging goose surveys were undertaken, as detailed in Sections 8.3.5.1, 8.3.5.2, 8.4.2.1 and 8.4.2.2.  Further detail on survey methods and results is available in Appendix A8.1.
NatureScot	Consultation Report 2019 Response, 14/03/19	Due to the habitats and species known to be present, NatureScot advised that Moorland Breeding Bird Surveys (MBBS) should be carried out in the open parts of the study area. They stated there was no requirement to do this within the forested areas.	This was incorporated into the survey programme and is detailed in Sections 8.3.5.5 and 8.4.2.5.  Further detail on survey methods and results is available in Appendix A8.1.
Scottish Borders Council	Scoping Request Response, 15/11/19	Satisfied with the proposed updated surveys and updated impact assessment.	N/A
NatureScot	Scoping Request Response, 21/11/19	Advised that a second year of bird surveying would be required to inform the EIA.	N/A
NatureScot	Consultation Report 2020	Agreed that a second year of bird surveying would not be	N/A

<sup>31</sup> SNH (2018c). *Environmental Impact Assessment Handbook – Version 5: Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.*

<sup>32</sup> Wilson, M.W., Austin, G.E., Gillings S. & Wernham, C.V. (2015) *Natural Heritage Zone Bird Population Estimates*. SWBSG Commissioned report number SWBSG\_1504.

Consultee	Type and Date	Summary of Consultation Response	Response to Consultee
	Response, 15/04/20	required based on the results of the first year and records from previous surveys.	

### 8.3.2 Scope of Assessment

11. The key issues for the assessment of potential ornithological effects relating to the Development are:
- Direct loss of breeding, foraging and/or roosting habitat through construction of the Development;
  - Habitat modification due to the change in land use (e.g., forestry removal by keyholing) and consequent effects on bird populations and activity;
  - Displacement of birds through direct and indirect loss of habitat as a result of disturbance associated with construction or decommissioning activity, turbine operation and maintenance, or visitor disturbance;
  - Death or injury through collision with turbine blades or other types of infrastructure associated with the Development; and
  - Cumulative effects on Natural Heritage Zone (NHZ) populations, resulting from construction, operation and decommissioning of the Development in conjunction with other developments that may also impact on the same populations.

### 8.3.3 Study Area / Survey Area

12. The Ornithology Survey Areas are defined in Section 8.3.5 and shown in Figure 8.1.1 of Appendix A8.1.

### 8.3.4 Desk Study Methods

13. A Desk Study was undertaken to provide information on the ornithological interest of the Site and its surrounds. This included identifying statutory sites designated for ornithological interests with potential connectivity to the Site and existing records of ornithological features.

#### 8.3.4.1 Statutory Sites

14. A search was completed for the following statutory protected nature conservation sites designated for ornithological features:
- Sites of international importance (SPAs and Ramsar sites) within 20 km of the Site; and
  - Sites of national importance (Sites of Special Scientific Interest [SSSIs] and National Nature Reserves [NNRs]) within 10 km of the Site.
15. Information on statutory designated sites was obtained from the NatureScot SiteLink<sup>33</sup> website.

#### 8.3.4.2 Existing Records

16. Ornithology surveys were carried out at the Site between 2011 and 2012 to inform the 2012 Environmental Statement<sup>34</sup> for the consented Cloich Forest Wind Farm ('the Consented Scheme') as follows:

<sup>33</sup> <https://sitelink.nature.scot/home> (Accessed on 19/02/2021)

<sup>34</sup> Partnerships for Renewables. (2012). Cloich Forest Wind Farm Environmental Statement. Planning application reference 12/01283/S36. Available on the Scottish Borders Council planning application search page: <https://eplanning.scotborders.gov.uk/online-applications/>

- Flight Activity Surveys (FAS);
  - Black Grouse Surveys;
  - Breeding Bird Territory Mapping Surveys;
  - Breeding Season Point Count Surveys;
  - Breeding Raptor Surveys;
  - Non-breeding Season Point Count Surveys;
  - Car Transect Surveys for Foraging Geese; and
  - Westwater Reservoir SPA Goose Roost Surveys.
17. The results of previous surveys were used to refine the scope of 2019/20 ornithology surveys, which comprised the following:
- FAS;
  - Black Grouse Surveys;
  - Foraging Goose Surveys;
  - Breeding Raptor Surveys; and
  - Moorland Breeding Bird Surveys (MBBS).
18. A request for the following data, recorded within 2 km of the Site in the last ten years, was made to The Wildlife Information Centre in March 2021, including records of
- All protected bird species (i.e. species listed on Schedule 1 of the Wildlife and Countryside Act 1981<sup>5</sup> (as amended) and/or Annex I of the Birds Directive<sup>3</sup> including locations of nest/roost sites where possible;
  - Red-listed and Amber-listed species<sup>17</sup>, including recording period (breeding or non-breeding season) and breeding status if known; and
  - Local Biodiversity Action Plan (LBAP)<sup>13</sup> priority species.
19. A request was also made to the Lothian and Borders Raptor Study Group for any records of nest/roost sites of protected raptor species within 2 km of the Site.

### **8.3.5 Baseline Survey Methodology**

20. Baseline Ornithology Surveys were completed over a year-long period between March 2019 and February 2020 (inclusive). Details of ornithology survey methods and Survey Areas are provided in Appendix A8.1.
21. During each survey, signs and observations of the relevant species were recorded in the field on large-scale maps. An overview of the methods followed for each survey is provided below; further details are included in Appendix A8.1.

#### **8.3.5.1 Flight Activity Surveys**

22. Flight Activity Surveys (FAS) were carried out between March 2019 and February 2020, using a series of watches from four VPs overlooking the Site, to record flight activity of target bird species and allow collision risk to be estimated.

##### *VP Locations*

23. The VP locations and viewsheds used during the FAS are shown in Appendix A8.1 - Figure 8.1.2.

##### *Target Species*

24. Target species included the following:
- All wild swan, goose, heron and duck species;
  - All raptors and owls listed on Schedule 1 of the Wildlife and Countryside Act 1981<sup>5</sup> (as amended) and/or Annex I of the Birds Directive<sup>3</sup>;
  - All heron species;
  - All wader species; and
  - Black grouse.

25. In accordance with NatureScot guidance<sup>25</sup>, flight lines of all target species passing through the VP viewshed (see below) were mapped in the field. Each recorded flight line was numbered and cross-referenced to the following flight information, which was recorded on standardised survey forms:
- Species, age and sex (where identification of age/sex was possible);
  - Number of birds;
  - Time (when first seen);
  - Duration of flight within the viewshed; and
  - Flight height on detection and at 15 second intervals, recorded in the following height bands:
    1. < 20 m;
    2. 20 m to < 150 m; and
    3. > 150 m.
26. Height bands 1 and 2 fall within PCH, which is between 14-150 m.
- Secondary Species*
27. In addition to recording target species flights, the number and activity of 'secondary' species was summarised every 5-minutes during each FAS. Secondary species included the following: cormorant (*Phalacrocorax carbo*), sparrowhawk (*Accipiter nisus*), buzzard (*Buteo buteo*), kestrel (*Falco tinnunculus*), all gull species and raven (*Corvus corax*). Recording of target species took priority over that of secondary species.
- Survey Details*
28. Surveys were stratified to cover all times of day including dawn and dusk periods, to record to record any geese flying between roost sites and day time foraging grounds. Each watch lasted up to three hours with a minimum 30-minute break in between watches. During the 2019/20 non-breeding season a minimum of 45 hours of survey was completed from each VP, while during the 2019 breeding season 36 hours was carried out from each VP, meeting or exceeding the minimum recommendation of 36 hours' survey from each VP in each season<sup>25</sup>. The additional nine hours per VP undertaken during the non-breeding season was completed between September to November 2019 as this is a key period for migrating geese.

### **8.3.5.2 Foraging Goose Surveys**

29. Foraging Goose Surveys were undertaken between late September 2019 and February 2020 (inclusive) to assess use of the Site and a 3 km Buffer Area<sup>35</sup> by foraging geese. The surveys involved the surveyor driving or walking the Survey Area and stopping regularly to scan visually for birds using binoculars and/or a telescope.

### **8.3.5.3 Black Grouse Surveys**

30. Black Grouse Surveys were completed in April and May 2019, based on standard methods<sup>20</sup>. Surveys covered all potentially suitable lekking habitat within the Site and a surrounding 1.5 km Buffer Area<sup>35</sup>.

### **8.3.5.4 Breeding Raptor Surveys**

31. In line with NatureScot guidance<sup>25</sup>, walkover surveys and additional VP watches of suitable areas of breeding habitat were undertaken between March and July 2019 (inclusive) to detect the presence of target raptor species, primarily focusing on goshawk. Surveys followed standard methods<sup>21</sup> and the Survey Area comprised suitable habitat in accessible areas within 1 km of the Site for barn owl (*Tyto alba*) and goshawk, and within 2 km for all other target raptor species<sup>35</sup>.

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<sup>35</sup> Note that a survey buffer of the access track was not included in the various ornithology survey areas.

### **8.3.5.5 Moorland Breeding Bird Surveys**

32. A Moorland Breeding Bird Survey (MBBS) was undertaken between April and July 2019 (inclusive) to identify breeding wader territories. In line with NatureScot guidance<sup>25</sup>, the survey followed an adapted Brown and Shepherd (1993) method (designed to census upland breeding waders) and the Survey Area covered areas of open moorland within the Site and a surrounding 500 m Buffer Area<sup>35</sup>. Four survey visits were completed, at least seven days apart.

### **8.3.6 Collision Risk Modelling Methodology**

33. As recommended in NatureScot guidance<sup>25</sup>, the CRM method is based on the Band *et al.* (2007)<sup>14</sup>.
34. Following an initial screening to select species for assessment, data collected during the 2019-20 FAS were used to predict the number of individuals per species, per year, expected to collide with the turbine rotors.
35. FAS height band 2 (20-150 m) falls entirely within the RSH, while height band 1 (< 20 m) partly overlaps it. FAS height band 3 (> 150 m) lies outwith the RSH. Therefore, a 'worst-case scenario' approach was adopted and all target species flights recorded within height bands 1 and 2 that passed within the Collision Risk Zone (CRZ) were considered to be at potential risk of collision and included in the CRM (where sufficient flight activity was recorded).
36. CRM was completed for goshawk and curlew (*Numenius arquata*). All other target species listed in the NatureScot guidance<sup>29</sup> as 'Priority Species for Assessment' or as qualifying species of statutory designed sites listed in Table 8.5 were scoped out due to very low levels of flight activity<sup>36</sup> within the CRZ.
37. Full details of CRM are provided in Appendix A8.3.

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<sup>36</sup> Defined as species with fewer than three flights or 10 individuals recorded within the CRZ.

### 8.3.7 Methodology for the Assessment of Effects

38. The approach used for the Ecological Impact Assessment (EcIA) process is in line with guidance produced by CIEEM<sup>16</sup> and NatureScot<sup>31</sup>, and comprises the following stages:
- Evaluation of the importance of ornithological features through Desk Study and Baseline Ornithology Surveys – those considered to be Important Ornithological Features<sup>37</sup> (IOFs) are scoped into the assessment, while species not present, or considered to be of local or less than local importance are scoped out;
  - Identification and characterisation of potential effects on IOFs;
  - Assessment of potential effects on IOFs, both from the Development alone and in combination with other developments in the surrounding area (cumulative effects);
  - Identification of any measures required to avoid and mitigate (reduce) these effects; and
  - Assessment of the significance of any residual effects after mitigation.
39. Further details relating to the methods used for evaluating the importance of ornithological features, characterising potential impacts, and assessing the significance of residual effects are provided below.

#### 8.3.7.1 Sensitivity of Receptors

40. Ornithological features can be important for a variety of reasons and may relate, for example, to statutory designations (for protected sites), or (for species) to rarity, the extent to which they are threatened throughout their range, or to their rate of population decline.
41. The level of importance of ornithological features identified during the Desk Study and Baseline Ornithology Surveys has been determined using the criteria in Table 8.2. These criteria have been determined with reference to CIEEM guidance<sup>16</sup>. For protected sites, this includes a consideration of statutory designations and relevant legislation, as well as potential connectivity to the Site. For species, this includes a consideration of relevant legislation, conservation status, population size and distribution, level and type of Site use and, where not a designated feature of an SPA or Ramsar site (with potential connectivity to the Site), whether the species is identified in NatureScot guidance<sup>29</sup> as a priority for assessment when considering the development of onshore wind farms in Scotland.
42. Note that, in some cases, information relating to the size (and distribution) of local and regional populations can be limited or unavailable. Where this is the case and it is not clear whether a population is present in locally versus regionally (or regionally versus nationally) important numbers, a precautionary approach is used and the population is assessed as being of the higher level of importance.
43. In addition to the importance of each bird species in terms of relevant legislation and conservation listings, the evaluation of species importance levels also considers the value of the Site and immediate surroundings for that species, in terms of the number of individuals using it and the nature and level of use. For example, if one or more pairs of birds listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended)<sup>5</sup> was found to be breeding within the Site, the species would likely be assigned a regional or higher importance level (depending on population status and trends). However, if one to two Schedule 1 birds flew across the Site very occasionally, and the species was not considered to be using it regularly<sup>38</sup>, it would likely be assessed as being of low importance. Similarly, for protected sites, in addition to the statutory designations, the

<sup>37</sup> CIEEM guidance<sup>16</sup> recommends defining Important Ecological Features (IEFs), but for the purpose of this chapter, IEFs will be referred to as IOFs since only avian species are considered.

<sup>38</sup> Regular presence is based on professional judgement but is broadly defined as breeding, or more than occasional commuting, foraging or roosting.

potential for connectivity with the Site is taken into account when determining its importance in the context of the assessment. Thus, a statutory site identified during the Desk Study and designated as being of national or higher importance, but with no potential connectivity to the Site, would likely be evaluated as being of no more than local importance in the context of the assessment, because there is no pathway for the Development to have an effect.

**Table 8.2 Framework for Determining Importance of Ornithological Receptors**

Importance of Receptor	Examples
International	<ul style="list-style-type: none"> <li>• Statutory sites of international ornithological importance (SPAs and Ramsar sites) with potential connectivity to the Site.</li> <li>• The regular presence<sup>38</sup> within or around the Site of a cited interest of an existing or proposed statutory site of international ornithological importance, i.e., SPA or Ramsar site, with potential connectivity to the Site. Cited means mentioned in the citation text for the protected site as a species for which the site is designated. Numbers of birds making use of the Site and/or surrounding area are also taken into account.</li> <li>• The regular presence within or around the Site of other bird species that contribute to the integrity of an existing or proposed SPA or Ramsar site (such as part of an assemblage where this is a designated feature), where there is potential connectivity with the Site. Numbers of birds making use of the Site and/or surrounding area are also taken into account.</li> </ul>
National (Scotland)	<ul style="list-style-type: none"> <li>• Statutory sites of national ornithological importance (SSSIs and NNRs) with potential connectivity to the Site.</li> <li>• The regular presence within or around the Site of a designated feature of an existing or proposed statutory site of national ornithological importance, i.e. SSSI or NNR, with potential connectivity to the Site. Numbers of birds making use of the Site and/or surrounding area are also taken into account.</li> <li>• The regular presence within or around the Site of a species listed on Annex I of the Birds Directive, where the species is not a cited interest of a statutory site of international ornithological importance, but is present in nationally important numbers.</li> <li>• The regular presence within or around the Site of a breeding species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), where the species is not a cited interest of a statutory site of international ornithological importance but is present in nationally important numbers.</li> <li>• The regular presence within or around the Site of nationally important numbers of a species of conservation concern<sup>39</sup>, where this is identified in NatureScot guidance<sup>29</sup> as a priority for assessment.</li> <li>• The regular presence within or around the Site of nationally important numbers of a migratory species which is either rare or vulnerable, or warrants special consideration on account of the proximity of migration routes, or breeding, moulting, wintering or staging areas in relation to a proposed development, and which is identified in NatureScot guidance<sup>29</sup> as a priority for assessment.</li> </ul>
Regional	<ul style="list-style-type: none"> <li>• A cited interest of an existing or proposed SPA or Ramsar site, with potential connectivity to the Site, which is present within or around the Site infrequently or in relatively low numbers, but could use the Site more regularly post-construction.</li> <li>• Other bird species that contribute to the integrity of an existing or proposed SPA or Ramsar site, with potential connectivity to the Site, which is present within or around the Site infrequently or in low numbers, but could use the Site more regularly post-construction.</li> <li>• Other species listed on Annex I of the Birds Directive, or breeding species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), that are present within or around the Site infrequently or in low numbers (regionally or</li> </ul>

<sup>39</sup> An SBL priority species or Red/Amber-listed BoCC

Importance of Receptor	Examples
	<p>locally important numbers), but could use the Site more regularly post-construction.</p> <ul style="list-style-type: none"> <li>• A regionally (i.e. at the NHZ scale) important population/assemblage of a species of conservation concern<sup>39</sup> that regularly occurs within or around the Site, where this is identified in NatureScot guidance<sup>29</sup> as a priority for assessment.</li> </ul>
Local	<ul style="list-style-type: none"> <li>• Statutory sites of international or national ornithological importance (SPAs, Ramsar sites, SSSIs and NNRs) with no potential connectivity to the Site.</li> <li>• Sites of local ornithological importance (e.g., Local Nature Reserves (LNRs)).</li> <li>• A cited interest of an existing or proposed SPA or Ramsar site, with potential connectivity to the Site, but which is present within or around the Site infrequently or in low numbers, and Site use is not expected to increase significantly post-construction.</li> <li>• Other bird species that contribute to the integrity of an existing or proposed SPA or Ramsar site, with potential connectivity to the Site, but which are present within or around the Site infrequently or in low numbers, and Site use is not expected to increase significantly post-construction.</li> <li>• Other species listed on Annex I of the Birds Directive, or breeding species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), that are present within or around the Site infrequently or in low numbers, and Site use is not expected to increase significantly post-construction.</li> <li>• Other species identified in NatureScot guidance<sup>29</sup> as a priority for assessment, but which are present within or around the Site infrequently or in low numbers, and Site use is not expected to increase significantly post-construction.</li> <li>• A locally important population/assemblage of a species of conservation concern<sup>39</sup> that regularly occurs within or around the Site, but is not identified in NatureScot guidance<sup>29</sup> as a priority for assessment and is unlikely to be at significant risk of impact from the Development.</li> </ul>
Less than Local	<ul style="list-style-type: none"> <li>• All other species that are widespread and common and of low conservation concern (e.g., included on the UK BoCC Green-list) and which are not present in locally important (or greater) numbers.</li> </ul>

### 8.3.7.2 Identifying and Characterising Potential Effects

44. In line with the CIEEM EcIA guidance<sup>16</sup>, where possible, consideration is given to the following characteristics when identifying potential effects of the Development on IOFs:

- **Nature of effect:** whether it is positive (beneficial) to the IOF, 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;
- **Magnitude:** the size, amount, intensity, and volume of the effect;
- **Duration:** the duration of an effect as defined in relation to IOF characteristics (such as a species' life cycle) as well as human timeframes. It should also be noted that the duration of an activity may differ from the duration of the resulting effect; e.g., if short-term construction activities cause disturbance to breeding birds, there may be long-term implications from failure to reproduce that season;
- **Frequency:** the number of times an activity occurs may influence the resulting effect;
- **Timing:** this may result in an impact on an IOF if it coincides with critical life stages or seasons (e.g. the breeding season); and
- **Reversibility:** a reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation (within a reasonable timescale).

45. The criteria for assessing the magnitude of a potential effect are presented in Table 8.3.

**Table 8.3 Framework for Determining Magnitude of Potential Effects**

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

### 8.3.7.3 Significance of Effect

46. Prevailing CIEEM EcIA guidance<sup>16</sup> avoids and discourages use of the matrix approach to determine significance, and describes only two categories: 'significant' or 'not significant'.
47. According to the CIEEM guidance, for the purpose of EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for important ecological features (which in this case would be IOFs) or for biodiversity in general.
48. NatureScot guidance (2018a)<sup>29</sup> refers to maintaining the favourable conservation status of a bird species (or not affecting its recovery) when assessing the significance of any wind farm impact. Conservation status is defined in this guidance as:
- "The sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest (which for the purposes of the Birds Directive is the EU)".*
49. Conservation status is considered to be "favourable" under the following circumstances:
- *"population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;*
  - *the natural range of the species is not being reduced, nor is likely to be reduced for the foreseeable future; and*
  - *there is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis".*
50. Effects can be considered significant at a wide range of scales from international to local. NatureScot (2018a)<sup>29</sup> recommends that:
- "The concept of favourable conservation status of a species should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern. An adverse impact on a species at a regional scale (within Scotland) may adversely affect its national conservation status".*
51. Thus,
- "An impact should therefore be judged as of concern where it would adversely affect the existing favourable conservation status of a species or prevent a species from recovering to favourable conservation status, in Scotland."*
52. For all species, the most relevant scale for assessment of significant effects on conservation status of breeding populations is considered to be the appropriate NHZ.
53. The Site is located within the east of NHZ 20 (Border Hills)<sup>32</sup>. For wintering or migratory species that are not designated features of statutory sites, there is limited information on NHZ populations; in this situation effects on the conservation status of the Scottish

population have been considered when determining whether potential effects are likely to be significant.

54. In this assessment, all effects that could threaten the integrity of a statutory site designated for ornithological features or the favourable conservation status of a population have been scoped in.

### 8.3.8 Assessment Limitations

55. Minor limitations to the Baseline Ornithology Surveys are detailed in Appendix A8.1, but are not considered to have affected the robustness of the assessment.

### 8.3.9 Cumulative Effects

56. A cumulative ornithological assessment has been undertaken following NatureScot<sup>30</sup> guidance, and considering the favourable conservation status populations within the relevant NHZ (NHZ 20).

## 8.4 BASELINE CONDITIONS

### 8.4.1 Desk Study Results

#### 8.4.1.1 Statutory Sites

57. Designated sites matching the search criteria are shown in Table 8.4.

**Table 8.4 Summary of Statutory Sites Designated for Ornithological Interest**

Site name	Designation(s)	Designated features	Description	Approximate distance to the Site
Gladhouse Reservoir	SPA, Ramsar and SSSI	Pink-footed goose (non-breeding)	Located 270 m above sea level (asl) in the Moorfoot Hills, Gladhouse Reservoir regularly provides a winter roost for many wildfowl, including large numbers of pink-footed geese.	6.7 km north-east
Westwater	SPA, Ramsar and SSSI	Pink-footed goose (non-breeding); and Waterfowl assemblage (non-breeding)	Located 320 m above sea level (asl) in the Pentland Hills. The site is an artificial reservoir and supports large numbers of wintering pink-footed geese and over 20,000 wintering waterfowl <sup>40</sup> .	8.4 km to north-west
Moorfoot Hills	SSSI	Golden plover ( <i>Pluvialis apricaria</i> . breeding); and breeding bird assemblage.	Upland breeding bird assemblage includes ring ouzel, black and red grouse and nine species of breeding wader. Moorfoot Hills is also notified on account of its upland	8.5 km to east

<sup>40</sup> NatureScot. (2018). Citation for Special Protection Area (SPA) Westwater (UK9004251). Available online at: [https://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa\\_code=8591](https://gateway.snh.gov.uk/sitelink/siteinfo.jsp?pa_code=8591) (Accessed on 19/02/2021)

Site name	Designation(s)	Designated features	Description	Approximate distance to the Site
			birch and bog habitats. It also qualifies as a Special Area of Conservation (SAC) on account of its upland habitats.	

#### **8.4.1.2 Existing Records of Protected Species**

58. The Lothian and Borders Raptor Study Group provided records of a single active goshawk breeding territory within the Site which has been monitored over the past ten years. It was confirmed that this nest location was active in 2019 with two chicks successfully fledged. Due to the sensitivity of this information, further details on the territory and nest location are available in Confidential Appendix A8.2.
59. No further records of notable or protected bird species were obtained during the ornithological Desk Study.

#### **8.4.1.3 Previous Baseline Surveys and Reporting**

##### *Field Surveys*

60. Previous ornithology surveys were carried out at the Site between 2011 and 2012 to inform the 2012 Environmental Statement<sup>34</sup> for the Consented Scheme. Key results of these surveys are summarised below:
- A total of seven target species were recorded during the FAS. Goshawk (18 flights) were the species recorded most frequently, followed by merlin (13 flights), golden plover (nine flights), pink-footed goose (eight flights), osprey (*Pandion haliaetus*) and hen harrier (three flights each), peregrine (*Falco peregrinus*) goosander (*Mergus merganser*); and greylag goose (one flight each);
  - A total of 16 species were recorded as present within the woodland habitats during the non-breeding season point count surveys, of which two are Red-listed BoCC: starling (*Sturnus vulgaris*) and fieldfare (*Turdus pilaris*);
  - The car-transect surveys confirmed that small numbers of pink-footed geese roosting at the Westwater SPA feed in fields to the north and west of the Site (generally more than 3 km from the Site boundary);
  - Notable numbers of pink-footed geese were recorded using off-Site habitats during the targeted VP surveys at Westwater Reservoir SPA. A maximum flock size of 5,300 individuals was observed feeding on improved grassland approximately 15 km west of the Site and 9 km south of Westwater Reservoir;
  - Eleven target species were recorded during WWO surveys. This included one Annex I<sup>3</sup> species (golden plover) and one Schedule 1 species that could feasibly be breeding within the winter: crossbill;
  - No black grouse were recorded during targeted surveys undertaken in 2011, or on any of the other surveys;
  - A total of 10 species were recorded as breeding at the open area of habitat at Courhope or adjacent woodland, of which two are listed as NatureScot priority species<sup>29</sup> (lapwing, *Vanellus vanellus* (two territories) and curlew (three territories). Three species are included on the UK Birds of Conservation Concern (BoCC) Red list: lapwing, curlew and mistle thrush (*Turdus viscivorus*). Additionally, crossbill, a Schedule 1 species, was identified as breeding during the survey. A further 16 species were recorded as breeding within the woodland habitats during the point

count surveys, including two red listed BoCC: mistle thrush and tree pipit (*Anthus trivialis*).

- Two target raptor species were recorded during the breeding raptor surveys: goshawk and osprey.
  - Goshawk: an active goshawk territory was confirmed to be present within the Site, from which three chicks were successfully reared and fledged.
  - Osprey: the only observation was of a single bird circling over the southeast of the Site carrying a fish. No indication of breeding was recorded on any occasion.

#### CRM

61. Based on the results of the 2011-12 baseline FAS, CRM was carried out for five species, with the following estimated collision mortality estimates presented in the Ornithology Chapter of the 2012 Environmental Statement (ES)<sup>34</sup>

- Pink-footed goose: undetectable, likely to be no collisions;
- Golden plover: 1.7 birds per year;
- Merlin: 0.01 birds per year;
- Osprey: 0.02 birds per year; and
- Goshawk: 0.08 birds per year.

#### EcIA

62. No significant effects (including cumulative effects) were predicted for any bird species associated with the Site. However, slight (non-significant) impacts on goshawk were predicted; therefore, it was proposed that best practice measures would be followed during construction to protect breeding goshawk.

### 8.4.2 Baseline Surveys

63. Detailed Baseline Ornithology Survey results are presented in Appendices A8.1 and A8.2. A summary of key results during each survey is provided below.

#### 8.4.2.1 Flight Activity Surveys

64. A total of 88 flights by nine target species were recorded during the FAS. Of these, grey heron was recorded most frequently, with 24 flights. Wader flight activity was relatively high for curlew, woodcock and snipe (22, 14 and 10 flights respectively). All other species were recorded infrequently, with fewer than 10 registrations of each species. A summary of all target species flights, broken down by species, is provided in Table 8.5. Full details of each target species flight are presented in Table A4.1, Appendix A8.1 and flight lines are shown in Figures 8.1.3 to 8.1.6, Appendix A8.1. As goshawk is a sensitive Schedule 1 species, flight lines are shown within the Confidential Annex (Appendix A8.2).

**Table 8.5 Summary of Target Species Flights Recorded During the 2019-20 FAS**

Species*	Scientific Name	Total no. of flights	No. of birds per flight	Total no. of individuals recorded
Greylag goose	<i>Anser anser</i>	1	1	1
Pink-footed goose	<i>Anser brachyrhynchus</i>	1	30	30
Mallard	<i>Anas platyrhynchos</i>	7	1-2	13
Grey heron	<i>Ardea cinerea</i>	24	1-2	27
Osprey	<i>Pandion haliaetus</i>	1	1	1
Goshawk	<i>Accipiter gentilis</i>	8	1-2	9

Species*	Scientific Name	Total no. of flights	No. of birds per flight	Total no. of individuals recorded
Curlew	<i>Numenius arquata</i>	22	1-2	27
Woodcock	<i>Scolopax rusticola</i>	14	1-2	17
Snipe	<i>Gallinago gallinago</i>	10	1-2	11
<b>Total no. of flights</b>		<b>88</b>	<b>N/A</b>	<b>136</b>
*Species names and order in which they are listed follow the British List maintained by the BOU <sup>2</sup>				

#### *Secondary Species*

65. A number of secondary species were recorded during the FAS, including gull and raptor species. Secondary species were generally recorded in low numbers, apart from gull species, with small flocks regularly recorded (peak count of 18 individuals).

#### **8.4.22 Foraging Goose Surveys**

66. No pink-footed geese were recorded during the Foraging Goose Surveys. Small groups (five to twenty-one individuals) of greylag geese were recorded on Portmore Loch (located over 2 km from the Site). Small numbers of mute swan (*Cygnus olor*), and one record of four whooper swan (*Cygnus cygnus*) were recorded incidentally loafing on the loch.
67. Greylag geese flocks were also recorded foraging with flocks of 36 and 68 individuals recorded immediately west of the A703 (north of Eddleston) an additional flock of 30 greylag geese adjacent to the A703 at Hattonknowe (all located approximately 2 km from the Site).

#### **8.4.23 Black Grouse Surveys**

68. There were no records of black grouse during targeted Black Grouse Surveys (and the species was not recorded during any of the other 2019/20 Baseline Ornithology Surveys). As noted in Section 8.6.1, this species was scoped out of the assessment and is not discussed further within this Chapter.

#### **8.4.24 Breeding Raptor Surveys**

##### *Target Species*

69. Goshawk and osprey were the only target species recorded during targeted raptor surveys. A goshawk pair was recorded in March and April of 2019, and a single male was also recorded during the same April survey. Liaison with the Lothian and Borders Raptor Study Group confirmed that there was an active territory within the Site which produced two chicks in 2020.
70. Two individual ospreys were recorded during April, both flying west over the Site. There was no evidence of this species breeding within the Survey Area, and no waterbodies or watercourses were present which could be used by foraging osprey.
71. A derelict cottage at Courhope was searched for evidence of barn owl during Breeding Raptor Surveys, however no signs of barn owl were recorded. No further buildings were intensively searched. There was a single record of a barn owl hunting north-east of VP1 following completion of an FAS survey, and this species is likely to be breeding in the wider area outwith the Breeding Raptor Survey Area.
72. Further details of target raptor species are provided in Confidential Appendix A8.2.

*Secondary Species*

73. Sparrowhawk, buzzard, kestrel and tawny owl (*Strix aluco*) were all considered likely to be breeding within the Survey Area.

**8.4.25 Moorland Breeding Bird Surveys**

74. The breeding wader species assemblage within the Site and surrounding 500 m Buffer Area was typical of the Site location and habitats present. Breeding waders were recorded at low density with two curlew territories, two woodcock territories and single territories of both lapwing and snipe (see Table 8.6). One mallard territory was recorded, which was the only breeding wildfowl species.
75. The Survey Area also supports a range of non-target breeding species typical of the habitats present. These include crossbill, which is a Schedule 1 species, and low numbers of several red-listed passerine (perching/songbird) species of conservation concern<sup>17</sup>.
76. Full results of the MBBS are included in Appendix A8.1 and illustrated on Figure 8.1.7 of this Appendix.

**Table 8.6 Summary of Wader Species of Conservation Concern Assessed as Breeding During the 2019 MBBS**

Species*	Number of territories in MBBS Area			Conservation listings**
	Within Site Boundary	Within Buffer Area	Total	
Mallard	0	1	<b>1</b>	Amber
Lapwing	0	1	<b>1</b>	Red; SBL
Curlew	0	2	<b>2</b>	Red; SBL
Woodcock	2	0	<b>2</b>	Red; SBL
Snipe	0	1	<b>1</b>	Amber

\*Species names and order follow the British List maintained by the BOU<sup>2</sup>  
 \*\*Red = UK Red-listed BoCC<sup>17</sup>; Amber = UK Amber-listed BoCC<sup>17</sup>; SBL = listed on the Scottish Biodiversity List<sup>39</sup>.  
 \*\*\*As woodland habitats were not targeted during the MBBS, it is possible that further breeding woodcock are present, but were not detected during surveys.

### 8.4.3 Collision Risk Modelling Results

77. For each species for which CRM was completed, the annual risk of collision and number of years per collision, using species-specific avoidance rates recommended by NatureScot<sup>41</sup>, are presented in Table 8.7. Full results of the CRM are provided in Appendix A8.3.

**Table 8.7 Estimated Seasonal Collision Risk and Number of Years Per Collision for Species for Which CRM Was Completed**

Species	Period	Annual collision risk (no. of birds killed)		No. of years per collision	
		Assuming no avoidance	Using species-specific avoidance rates	Assuming no avoidance	Using species-specific avoidance rates*
Goshawk	2019/20 non-breeding season	0.116	0.002	8.562	428.076
	2019 breeding season	0.254	0.005	3.939	196.967
	2019/20 whole year	<b>0.370</b>	<b>0.007</b>	<b>2.698</b>	<b>134.898</b>
Curlew	2019 breeding season	<b>2.486</b>	<b>0.050</b>	<b>0.402</b>	<b>20.116</b>

### 8.4.4 Future Baseline

78. Assuming a lag between the baseline assessment and the commencement of Development construction, it is necessary to consider possible changes to baseline conditions during this time. **Chapter 13: Forestry** provides detail regarding the forestry management that will occur during the life of the wind farm. The pattern of felling and re-planting detailed is typical and not notably different to the way in which the forest has been historically managed. Therefore no substantial habitat modifications or changes that could influence ornithological interest are foreseen, and therefore it is considered unlikely that the future baseline will change from that assessed within this Chapter.

### 8.4.5 Embedded Mitigation

79. Ornithological features have been considered at all stages of the Development design, from initial feasibility to final layout. Standard good practice measures will also be implemented during construction (including felling, where this takes place prior to other construction works) to ensure compliance with relevant legislation protecting all breeding wild birds. This has helped to avoid or greatly reduce impacts on IOFs and other ornithological features.

80. The key embedded mitigation with relevance to ornithological features is the implementation of a Breeding Bird Protection Plan (BBPP), as outlined below, to protect breeding birds.

<sup>41</sup> NatureScot (2016) Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model <https://www.nature.scot/sites/default/files/2018-09/Wind%20farm%20impacts%20on%20birds%20-%20Use%20of%20Avoidance%20Rates%20in%20the%20SNH%20Wind%20Farm%20Collision%20Risk%20Model.pdf> (Accessed 12/03/21)

81. Subsequent sections of this chapter assume that the embedded mitigation described below will be fully implemented.
82. Under the Wildlife and Countryside Act 1981 (as amended)<sup>5</sup> it is an offence to kill or injure any bird, or to damage or destroy nests and eggs. Breeding species listed on Schedule 1 of the Act are afforded additional protection, and there was evidence of goshawk (which is a Schedule 1 species) establishing breeding territories within the Site (see Appendix A8.2). A BBPP will be developed to detail good practice measures aimed at ensuring the safeguarding of breeding birds and legislative compliance during all phases of the Development. Proposed measures are outlined below.

*Construction Phase*

83. **Timing of works:** where possible, site clearance works will take place outside the main breeding bird season (March to August inclusive).
84. **Pre-construction survey for breeding goshawk:** goshawk is a historic breeder within the Site, and there was one territory present during 2019 Baseline Ornithology Surveys (further details in Confidential Appendix A8.2). NatureScot defines the breeding season for this species as mid-March to mid-August<sup>43</sup>. As felling is required, precautions must be taken to avoid potential disturbance to nesting birds or destruction of active nests. A pre-construction survey of areas of suitable habitat for nesting goshawk within 500 m of works will be completed ahead of any operations, by a suitably experienced and qualified Ecological Clerk of Works (ECoW), to check for active nests (or other evidence of breeding).
85. **Pre-construction survey for breeding crossbill:** common crossbill (*Loxia curvirostra*) has a protracted breeding season, which NatureScot defines as January to mid-December<sup>42</sup>. Prior to any felling, precautions must be taken to avoid potential disturbance to nesting birds or destruction of active nests. A pre-construction survey of areas of suitable habitat for nesting crossbill within 150 m of works will be completed ahead of any operations, regardless of the time of year, by a suitably experienced and qualified ECoW, to check for evidence of breeding (such as active nests or territorial behaviour).
86. **Pre-construction survey for other breeding birds:** where construction works are required during the breeding bird season (March to August inclusive), the area within 500 m of works will be surveyed ahead of any operations, by a suitably experienced and qualified ECoW, to check for active nests of all bird species.
87. **Toolbox talk:** a 'toolbox talk' will be delivered by a suitably experienced ECoW to ensure that all contractors working on the Development are aware of ornithological sensitivities and relevant legislation.
88. **Protection of nesting birds:** if any nests (or breeding territories of Schedule 1 species) are identified during pre-construction surveys, an exclusion zone around the nest/breeding territory will be established (with the distance appropriate to the species and agreed through consultation with NatureScot). No works will be permitted within the exclusion zone and no personnel or vehicles will be allowed to enter or pass through until the ECoW has confirmed that the breeding attempt has reached a natural conclusion.
89. Where this is not feasible, NatureScot will be contacted and further mitigation measures agreed to ensure that nesting birds are not harmed and any breeding Schedule 1-listed species are not disturbed.

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<sup>42</sup> <https://www.nature.scot/sites/default/files/2017-07/A303080%20-%20Bird%20Breeding%20Season%20Dates%20in%20Scotland.pdf> (Accessed 12/03/21)

90. **Minimising disturbance from site vehicles:** where construction works are required during the breeding bird season, further mitigation measures to limit the impact of vehicular disturbance will be considered and implemented where necessary.

*Operational Phase*

91. Routine maintenance required during operation is expected to be minimal, limited to small areas and of temporary duration. However, should significant operational works be required during the nesting bird season, or any Schedule 1 nesting birds be observed during the operational phase, it is recommended that the mitigation measures outlined above for the construction phase are implemented to protect breeding birds and ensure compliance with the relevant legislation.

*Decommissioning Phase*

92. As decommissioning works are likely to be of a similar nature and duration as construction activities, the mitigation outlined above for construction works should also be implemented during the decommissioning phase, in order to protect breeding birds.

## **8.5 EVALUATION OF ORNITHOLOGICAL FEATURES**

93. An evaluation of the importance of each ornithological feature identified during the Desk Study or recorded during the Baseline Ornithology Surveys is provided in Table 8.8. As noted in Section 8.6.1, the assessment of effects upon all statutory sites identified during the Desk Study have been scoped out of the assessment. Species evaluated as being of Regional or higher importance are considered to be IOFs, while those of Local or lesser importance are not considered to be IOFs and have been scoped out of the assessment in the following sections.

**Table 8.8 Evaluation of Importance of Ornithological Features**

Importance level	Ornithological feature	Justification
<b>International</b>	No features using the Site and/or surrounding area were evaluated as being of international importance.	
<b>National</b>	No features using the Site and/or surrounding area were evaluated as being of national importance.	
<b>Regional</b>	Goshawk	<p>A Schedule 1 species identified in NatureScot guidance<sup>29</sup> as a priority for assessment. The species was recorded frequently during FAS surveys undertaken in 2011/12 and in 2019/20, with successful breeding from a single nest site in the survey area confirmed in 2011 and one territory present in 2019. Based on the extent of suitable breeding habitat (mature forestry with sufficient space to allow flights between trees) present, it is considered unlikely that use of the Site will increase following construction.</p> <p>A population of a single pair nesting within the Site would equate to 1.8 % of the NHZ population (57 pairs as a minimum estimate)<sup>19</sup>.</p> <p>More recent information from the Scottish Raptor Monitoring Scheme<sup>15</sup> suggests that the population of Scottish goshawk is slowly expanding from two clusters within Southern Scotland and northeast Scotland<sup>32</sup>. A national population estimate of 174 pairs is given, and with extensive suitable habitat present within Scotland, it is likely that the national population will increase in the future.</p> <p>Using a conservative estimate of two breeding territories present on Site, this would equate to approximately 1 % of the national population, which is likely to be an overestimate.</p>
	Crossbill	<p>As the Site is outside the known breeding distribution of Scottish crossbill (<i>Loxia scotica</i>)<sup>43</sup>, it is considered that crossbill species breeding on Site are 'common' crossbill. Crossbill is a Schedule 1-listed species. Small numbers were recorded incidentally (no breeding was identified, however this was not a target species) during the MBBS, and based on the habitats present (as well as fact that the species was recorded during the 2011 Breeding Bird Surveys), crossbill is likely to breed within the Site.</p> <p>Crossbill is widespread in Scotland within coniferous forestry, and the national breeding population is very variable, between 5,000-50,000 pairs each year. As crossbill is not a priority species for assessment no targeted surveys were completed. Previous surveys carried out in 2011/12<sup>34</sup> recorded a peak of 26 individuals.</p> <p>Use of the Site and surrounding area is unlikely to increase following construction and the population using the Site has been evaluated as being of regional importance.</p>

<sup>43</sup> Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. and Fuller, R.J., (2013) *Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland*. Thetford: BTO.

Importance level	Ornithological feature	Justification
<b>Local</b>	Hen harrier	Listed on Annex I, Schedule 1/1A, the SBL and the BoCC Red list. However, there were only three registrations of single birds recorded during the 2011/12 FAS and this species was not recorded during the 2019/20 surveys. There are no records of nesting within 2 km of the Site. Use of the Site is unlikely to increase post-construction and habitat present within and adjacent to the Site is considered to be sub-optimal for breeding.
	Merlin	Listed on Schedule 1, the SBL and the BoCC Red list. There were eight registrations of single birds recorded during the 2011/12 FAS and this species was not recorded during the 2019/20 surveys. There are no breeding records within 2 km of the Site. There is the potential for merlin to breed on Site in future in low numbers, with suitable nesting habitat (disused corvid nests) and foraging activity could increase within keyholed areas post-construction.
	Osprey	Listed on Annex I, Schedule 1 and the SBL. There was a single osprey flight recorded during the 2011/12 surveys and three flights recorded during the 2019/20 FAS. There are no breeding records within 2 km of the Site. Use of the Site is unlikely to increase post-construction and habitat present within and adjacent to the Site is considered to be sub-optimal for breeding.
	Peregrine	Listed on Schedule 1 and Annex I. There was a single peregrine flight recorded during the 2011/12 surveys and no records of this species during the 2019/20 surveys. There are no breeding records within 2 km of the Site. Use of the Site is unlikely to increase post-construction and habitat present within and adjacent to the Site is considered to be of negligible suitability for breeding.
	Curlew	<p>Listed on the SBL and BoCC Red list, LBAP and identified in NatureScot guidance<sup>29</sup> as a priority species for assessment. Curlew were recorded during the 2011/12 surveys (three territories) within the 500 m buffer and during the 2019/20 surveys (two territories). 22 curlew flights were recorded during the 2019/20 FAS.</p> <p>With an estimated breeding population of 58,800 breeding pairs, curlew is a common and widespread breeding bird in Scotland<sup>19</sup>. However, recent data from annual national monitoring surveys of breeding birds organised by the British Trust for Ornithology (BTO) found significant declines in numbers of breeding curlew in Scotland of 53% between 1995 and 2018<sup>44</sup>. Two-three curlew territories in the 500 m buffer equates to &lt;0.01 % of the Scottish breeding population.</p> <p>At the regional level, data are not available for the Border Hills NHZ. The BTO Breeding Bird Survey map<sup>45</sup> indicates that the Border Hills NHZ is a stronghold for the species with a relatively high population density. Based on the national breeding population, the regional population is therefore likely to be at least 5,000 pairs, but due to historical and recent declines, is considered to be in unfavourable conservation status.</p> <p>Due to the low numbers of birds on or close to the Site, which is unlikely to increase post-construction, curlew is evaluated as being of local importance.</p>

<sup>44</sup> Harris, S.J., Massimino, D., Balmer, D.E., Eaton, M.A., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P. & Gillings, S. 2020. *The Breeding Bird Survey 2019*. BTO Research Report 726. British Trust for Ornithology, Thetford.

<sup>45</sup> <https://www.bto.org/our-science/projects/bbs/latest-results/maps-population-density-and-trends>

Importance level	Ornithological feature	Justification
		CRM was completed for this species as a precautionary measure; however, the predicted collision risk was low with a collision estimated approximately every 20 years.
	Lapwing	Listed on the SBL and BoCC Red list, LBAP and identified in NatureScot guidance <sup>29</sup> as a priority species for assessment. Lapwing were recorded during the 2011/12 surveys (two territories) within the 500 m buffer and a single territory present during the 2019/20 surveys. No lapwing flights were recorded during the FAS.  With an estimated breeding population of 71,500-105,600 breeding pairs, lapwing is a common and widespread breeding bird in Scotland <sup>19</sup> . However, recent data from annual national monitoring surveys of breeding birds organised by the British Trust for Ornithology (BTO) found significant declines in numbers of breeding lapwing in Scotland of 59% between 1995 and 2018 <sup>46</sup> . One breeding pair of lapwing within the MBBS Survey Area equates to <0.01 % of the Scottish breeding population. No NHZ population estimate is available for this species.  Due to the low numbers of birds on or close to the Site, which is unlikely to increase post-construction, lapwing is evaluated as being of local importance.
	Golden plover	Listed on Annex I and the SBL, and in NatureScot guidance <sup>29</sup> as a priority species for assessment. Golden plover was regularly recorded during 2011/12 non-breeding season FAS in flocks (peak count of 130 individuals, mean count 33). Resulting in a CRM prediction of the loss of 1.7 non-breeding birds per annum. The wintering population of golden plover is estimated at between 25,000 – 35,000 birds <sup>19</sup> . As such, the loss of 1.7 birds per annum equates to <0.01 % of the Scottish population. The species was not recorded during the 2019/20 surveys. There are no records of any breeding birds within the MBBS Survey Area during any of the surveys. Use of the Site is unlikely to increase significantly post-construction, as habitats have negligible potential for supporting breeding birds.  For this reason, golden plover is evaluated as being of local importance.
	Other wildfowl, raptor, wader, gull, near-passerine and passerine species of conservation concern	Species of conservation concern that are generally considered as being at low risk from wind farm developments. It is considered unlikely that the Development would have a significant impact on local populations.
<b>Less than Local</b>	All species not covered above (e.g., species of low conservation concern)	Species that are generally common and widespread, of low conservation concern and which are considered as being at low risk from wind farm developments.
Note that good practice will be implemented during construction to protect all nesting birds (see Section 8.4.5), including species scoped out of the assessment.		

<sup>46</sup> Harris, S.J., Massimino, D., Balmer, D.E., Eaton, M.A., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P. & Gillings, S. 2020. *The Breeding Bird Survey 2019*. BTO Research Report 726. British Trust for Ornithology, Thetford.

## 8.6 ASSESSMENT OF POTENTIAL EFFECTS

### 8.6.1 Elements Scoped Out of Assessment

94. Two internationally designated statutory sites were identified for consideration during the Desk Study (as detailed in Section 8.4.1): Westwater SPA, Ramsar and Site of Special Scientific Interest (SSSI); and Gladhouse Reservoir SPA, Ramsar and SSSI. Both sites are designated wholly for their pink-footed goose (*Anser brachyrhynchus*) populations. The Site lies well within the core foraging range (15-20 km<sup>26</sup>) of pink-footed goose populations associated with the Westwater and Gladhouse Reservoir SPAs, and accordingly NatureScot noted that an Appropriate Assessment may be required to assess the potential effects of the Development on these sites.
95. However, only a single pink-footed goose flight was recorded during 2019/20 surveys (a skein of 30 birds in February, 2020) and no pink-footed geese were recorded during any of the Goose Foraging Surveys in 2019/20. This is consistent with the results of the surveys undertaken for the Consented Scheme in 2011/12, which recorded pink-footed goose flight activity at such a low level that collision risk was considered to be undetectable<sup>34</sup> and that foraging birds were typically over 3 km from the Site Boundary.
96. In consideration of these results, it is logical to conclude that the SPA birds rarely overfly the Site as it does not lie between routes taken to the feeding areas used by the SPA birds. It is considered extremely unlikely there will be any adverse effect on the SPAs resulting from the Development and that an Appropriate Assessment is not necessary to support this conclusion. Therefore pink-footed geese and both SPAs have been scoped out of the ornithological impact assessment.
97. Moorfoot Hills SSSI lies 8.5 km east of the Site and is notified on account of its breeding golden plover population and its upland bird assemblage. As the Site lies outwith the core foraging range of its notified species, this designated site has also been scoped out of this assessment.
98. As agreed with NatureScot, most passerine species have been scoped out of the assessment.
99. Features not recorded and considered not present, or very unlikely to be present within the zone of influence of the Development, are scoped out of the assessment. For example, black grouse (*Lyrurus tetrix*) was not recorded during the Baseline Ornithology Surveys and no records of this species were identified during the Desk Study, this species was also scoped out of the assessment.
100. Grey heron, mallard, woodcock and snipe although included as target species during the FAS surveys are not regarded as NatureScot priority species for the assessment of wind farms<sup>29</sup>. Furthermore, they either bred in very low numbers (two or less territories), or were not recorded as breeding (grey heron). On this basis they have been scoped out of the assessment.
101. Ornithological features considered to be of local (or less than local) importance (based on the criteria in Section 8.3.7.1, Table 8) have been scoped out of the assessment.

### 8.6.2 Potential Effects on Birds

102. The main ways in which a wind farm may affect IOFs are via:
  - Habitat loss due to land-take;
  - Habitat modification;
  - Disturbance/displacement; and
  - Collision with turbines.

103. Each of these potential effects, during each phase of the Development life cycle (construction, operation and decommissioning) in which the effect could occur, is discussed in turn below.
104. In addition, as noted previously, cumulative effects may arise as a result of the combined effects of multiple developments affecting the same bird population. Cumulative effects are considered in Section 8.7.

### **8.6.2.1 Effects during Construction**

#### *Habitat Loss*

105. Construction of turbine bases, associated infrastructure and forest keyholing will lead to direct habitat loss. The severity of potential effects is dependent on the extent of land-take, the type of habitat affected and the species using the Site and surrounding area. In this case, the extent of habitat loss will be relatively small (71.4 ha in total), and will largely (98%) comprise commercial conifer plantation. Keyholing will be used for clearance of coniferous plantation for turbines and associated infrastructure, which will minimise the impact of habitat loss. No species associated with nearby statutory sites will be impacted by habitat loss (identified in Section 8.4.1.1), and goshawk was the only species identified in NatureScot guidance<sup>29</sup> as priority species for assessment which made regular use of the Site for breeding, roosting or foraging. Other target raptors (osprey) were only occasionally recorded within/flying over the plantation and do not breed on Site or in the wider Breeding Raptor Survey Area. With the exception of woodcock (which have at least two territories within the forestry on Site), waders recorded (lapwing, curlew and snipe) are unlikely to breed within the forestry habitats and the flight activity recorded from these species, is considered to relate to locally breeding birds in adjacent open habitat. Crossbill is likely to be breeding within suitable habitat across the Site, but it is expected there will be plenty of suitable habitat remaining following keyholing to readily accommodate any displaced birds.
106. Habitat loss is relatively small and largely comprises coniferous plantation. As most of the Site and the surrounding area is comprised of coniferous forestry, it is likely that the impacts of habitat loss on birds will be minimal.

#### *Habitat Modification*

107. Habitat modification due to felling of the plantation will likely result in minor changes in Site use by certain IOFs. For example, it is anticipated that species such as merlin and hen harrier could forage over the Site more frequently as more open habitat becomes available and could recolonise the Site (given they were not recorded during the 2019 breeding surveys and only in the historical 2011/12 surveys). As keyholing will be used (rather than clear-felling the Site) there will only be a minor increase in the extent of open habitats created (70.6 ha), this is unlikely to result in a significant change in Site use by IOFs.

#### *Disturbance and Displacement*

108. During the construction phase of the Development, there will be increased levels of activity by Site personnel, vehicles and machinery, resulting in increased levels of noise and visual disturbance. This could lead to displacement or disruption of breeding, foraging and/or roosting birds. The severity of potential effects depends on the following:
- The timing of works, with potential effects likely to be greatest during the breeding season;
  - The magnitude of the disturbance (e.g., a vehicle driving slowly along the access track without stopping is likely to result in a relatively low or even negligible magnitude of disturbance, whereas a period of prolonged and noisy machinery operation involving numerous Site personnel is likely to be of high magnitude);

- The extent of displacement (both spatially and temporally);
- The availability of suitable habitats in the surrounding area for displaced birds to occupy; and
- The behavioural sensitivity of birds using the Site (which is likely to vary between species).

### **8.6.2.2 Effects during Operation**

#### *Disturbance and Displacement*

109. The operation of turbines and increased human activity associated with maintenance of the Development has the potential to cause disturbance and displace birds from the Site. However, disturbance effects during the operational phase are likely to be of a lower magnitude than during construction, as some species may become habituated to turbines, and the level of human activity and associated disturbance on Site will be considerably reduced compared to the construction phase.
110. Individual turbines, or a wind farm as a whole, may present a barrier to the movement of birds, restricting or displacing birds from much larger areas. The effect this would have on a population is subtle and difficult to predict with any degree of certainty. If birds regularly have to fly over or around obstacles or are forced into suboptimal habitats, this may result in reduced feeding efficiency and greater energy expenditure. By implication, this will reduce the efficiency with which they accumulate reserves, potentially affecting survival during migration and/or breeding success. Based on the location and size of the Development, presence of other wind farms in the wider area, habitats within the Site and wider area, and target species flight activity, it is considered highly unlikely that there will be any barrier effects on any target species.

#### *Collision with Turbines*

111. The frequency and likelihood of a collision occurring depends on a number of factors. These include aspects of the size and behaviour of the bird (including their use of a site), the nature of the surrounding environment and the structure and layout of the turbines. Clearly, birds that tend to fly above or below RSH are likely to collide less frequently than species that regularly fly at RSH. Collision risk is also likely to be higher for birds that spend much of the time in the air, such as foraging raptors and species that regularly commute between feeding and breeding or roosting grounds (e.g., geese and whooper swans), where this involves frequent flights over a site. The risk of bird collisions at wind farms is also higher in areas where large concentrations of birds are present (e.g., on major migration routes or close to roost sites used by large numbers of birds).
112. It should be noted that operational disturbance and collision risk effects are mutually exclusive in a spatial sense, i.e., a bird that avoids a wind farm due to disturbance cannot be at risk of collision with the turbine rotors at the same time<sup>47</sup>. However, they are not mutually exclusive in a temporal sense; a bird may initially avoid a wind farm but subsequently habituate to it, and could then be at risk of collision.

### **8.6.2.3 Effects during Decommissioning**

113. Turbine removal may cause disturbance to birds breeding, foraging or roosting on Site. The level of impact will depend on the bird species present at the time of decommissioning and cannot be reliably predicted at this stage. However, as decommissioning activities are generally of a similar type and intensity as construction activities, the assessment considers that the potential effects of decommissioning will be similar in nature to the potential effects of construction, with the exception that habitat

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<sup>47</sup> Madders, M. & Whitfield, D.P. (2006). Upland raptors and the assessment of wind farm impacts. *Ibis* 148, 43-56

is likely to be restored and any displaced birds will be able to return to abandoned territories.

### 8.6.3 Assessment of IOFs

114. Potential effects of the Development on each IOF are assessed below. The assessment considers the significance of potential impacts following implementation of the embedded mitigation proposed in Section 8.4.5.

#### 8.6.3.1 Species of Regional Importance

##### *Goshawk*

115. **Potential Construction Effects:** One pair is known to have successfully bred onsite during 2011/12 and one territory was present onsite during 2019/20. It is therefore considered likely that goshawk will nest on Site post-construction, and during construction, and there is the potential for breeding birds to be affected by both habitat loss and disturbance. Further details of activity, territory locations and historic nest locations are provided in Confidential Appendix A8.2.
116. There is the potential for historic nests to be lost if they are located in areas of coniferous plantation which are felled during construction (outwith the goshawk breeding season). Keyholing (and future forestry operations) will also result in loss of suitable breeding habitat (70.6 ha of coniferous plantation), which could limit the number of breeding goshawk in future. New nesting habitat will become available as areas of young plantation mature, which will offer long-term compensation for loss of nesting habitat.
117. Additionally, goshawk are known to move nest locations from year to year (Colin Nisbet pers. Obs.) and it is predicted that there will be sufficient suitable mature conifer stands remaining to accommodate the pair present within the Site. The impact of habitat loss on nesting resources is therefore likely to be low magnitude.
118. In addition, the construction of the Development will result in the loss of certain habitats which are expected to be part of the resident goshawks' traditional foraging grounds, including intact coniferous plantation woodland and open areas of clear-fell. Goshawk have a core range of 3 km, with a maximum range of 10 km, giving a core foraging range of 2,827 ha and a maximum foraging range of 31,415 ha<sup>22</sup>. The majority of the Site contains suitable habitat for foraging goshawk, with 765 ha of coniferous plantation and 119.8 ha of clear-fell.
119. Loss of foraging habitat within the Site amounts to 70.6 ha: 6.5 % of the habitats present within the Site. This is only 2.5 % of the core range, therefore loss of foraging habitat is considered to be negligible.
120. Works may deter goshawk from nesting within areas of the Site, which will be temporary, reversible, and of short-term duration, most likely only deterring breeding attempts for a single breeding season within the disturbance distance for nesting goshawk<sup>22</sup> (300-500 m).
121. Any works within 300-500 m of nesting goshawk have the potential to disturb the nest, which could constitute a legal offence and could adversely impact nesting success. This risk is addressed through the BBPP.
122. There is also the potential for disturbance to foraging goshawk, which could impact on their ability to hunt, thus impacting on their survival, or ability to provision young during nesting. As noted above, there is abundant foraging habitat present on Site, with construction only undertaken within small areas of the Site at any one time. Additionally, goshawk are likely to be less susceptible to disturbance during foraging compared to when incubating or visiting a nest.

123. The effects of construction of the Development on the NHZ 20 goshawk population are predicted to be of **low** magnitude and therefore **not significant**.
124. **Potential Operational Effects:**
125. There is the potential for turbines to deter goshawk from nesting nearby. However, as discussed above in relation to construction, it is anticipated that resident goshawks will be able to establish nest sites in alternative areas of suitable habitat within the Site, based on professional experience. Similar deterrence is thought to be regularly experienced by goshawks within commercial coniferous plantations with harvesting operations undertaken, with goshawks continuing to nest on active wind farm sites.
126. There is also the potential for displacement from foraging habitat during operation. Despite keyholing, which will minimise the loss of suitable foraging habitat, it is likely that goshawk will avoid foraging habitat in close proximity to turbines.
127. Potentially, goshawk could be deterred from foraging within 70.6 ha of habitat, which would constitute a very small proportion of the species core range of 3 km. Additionally, there is further suitable foraging habitat outwith the Site, with adjacent coniferous plantation to the west and northeast of the Site which could be used by foraging goshawk. Consequently, operational displacement on foraging goshawk is anticipated to be negligible.
128. Despite the presence of an active breeding territory, goshawk flight activity associated with the Site was relatively low, with the annual collision risk predicted as 0.007 birds killed per year, or one bird every 141 years.
129. Although the population within NHZ 20 is small, goshawk is likely to be under-recorded, and there is abundant suitable habitat within the NHZ which may be gradually colonised by the expanding population in the future. As such, collision risk to the NHZ 20 population from the Development is expected to decrease in magnitude as the population expands. Furthermore, there are no publicly available reports of goshawk collisions with turbines in the UK, and data collected from other European onshore wind farms<sup>48</sup> suggest that this species is not notably vulnerable to collision (although it is acknowledged that this data has limitations because the locations of monitored wind farms and extent of monitoring is not known).
130. The effects of the operational phase of the Development on the NHZ 20 goshawk population are predicted to be of **low** magnitude and therefore **not significant**.
131. **Potential decommissioning effects:** these are likely to be of the same nature as construction effects. Therefore, **no significant effects** during decommissioning are predicted for goshawk.

*Crossbill*

132. **Potential Construction Effects:** This species was recorded incidentally during MBBS and is likely to be breeding in areas of suitable habitat within the Site. Birds will lose nesting, roosting and foraging habitat following felling; however, it is considered likely that displaced birds will be accommodated within existing plantation woodland within the Site or wider area. The majority of the Site contains suitable habitat for crossbill, with 765 ha of coniferous plantation, therefore the impact of loss of suitable habitat (6.5 % of suitable habitat within the site) is likely to be negligible. Furthermore, the number of birds affected is likely to represent only a very small proportion of the regional population of breeding crossbills.

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<sup>48</sup> Dürr, T. (2019). *Vogelverluste an Windenergieanlagen / Bird fatalities at wind turbines in Europe*; Daten aus der zentralen Fundkartei der Staatlichen Vogelschutzwarte im Landesamt für Umwelt Brandenburg zusammengestellt: Tobias Dürr; Stand vom: 07 January 2020 [Online] Available at: <http://www.lfu.brandenburg.de/cms/detail.php/bb1.c.312579.de> (Accessed 26/08/20).

133. The embedded mitigation described in Section 8.4.5 includes measures to avoid disturbance to breeding birds, which could constitute a legal offence. By following these, the risk of disturbance to breeding birds will be minimised.
134. As such, potential construction phase effects on the regional crossbill species population are assessed as being of **low** magnitude and **not significant**.
135. **Potential operational effects:** It is unlikely that any breeding birds will be disturbed during operation, with implementation of embedded mitigation measures listed in Section 8.4.5. Furthermore, it is generally considered that passerine species are not significantly adversely impacted by wind farms<sup>25</sup>, and collision risk is thought to be negligible. As such, potential operation phase effects on the regional crossbill species are assessed as being of **negligible** magnitude and **not significant**.
136. **Potential decommissioning effects:** these are likely to be of the same nature as construction effects. Therefore, **no significant effects** during decommissioning are predicted for crossbill.

## 8.7 CUMULATIVE EFFECT ASSESSMENT

137. Potential cumulative effects can include direct habitat loss, disturbance and collision risk. The potential for each of these potential effects is considered in turn below.

### 8.7.1 Cumulative Habitat Loss

138. Forestry areas are dynamic habitats, often subject to management and areas of clearance on both a local and landscape scale. As such, it is likely that species breeding within them, such as goshawk and crossbill, are adapted to a degree of change. Areas of apparently suitable habitat within the wider Site Boundary and nearby forestry areas may be removed, altered, or replanted, but clearance of habitat is unlikely to be on a scale that will adversely affect NHZ populations of these species.
139. In relation to the Development, a total habitat loss of 70.6 ha is comparatively small, and the targeted nature of the felling, through keyholing, means the potential impacts are going to be lower than clear-fell operations. The abundance of comparable habitat locally and regionally is unlikely to change substantially and the impact of direct loss of habitat within the Site Boundary on IOFs is assessed as negligible magnitude and **not significant**.

### 8.7.2 Cumulative Disturbance

140. Disturbance effects are predicted to be of low to negligible magnitude for all IOFs. Potential disturbance effects during both construction and operation are localised to the Site, with no other comparable pressures that could be acting upon the same populations of birds known or predicted at the Site or in the wider area. It is likely that if any birds are displaced, they will breed in the wider area, either in less disturbed areas within the Site Boundary or nearby habitats, and birds will potentially return to breed on or around a development site post-construction. These birds would therefore only be temporarily loss from the breeding population. Disturbance during the construction, operational or decommissioning phases of the Development will be minimal and localised, and, with no other comparable pressures operating concurrently, cumulative impacts of disturbance on IOFs are assessed as negligible magnitude and **not significant**.

### 8.7.3 Cumulative Collision Risk

141. As a passerine species, crossbill is not considered to be at risk of collision with wind turbines.

142. A 1 in 141-year collision risk for goshawk is considered too low to result in any significant effects. A search for any relevant reports from wind farm applications within 10 km of the Site was conducted to assess the cumulative collision risk to goshawk. Just one operational wind farm was identified: Bowbeat Wind Farm, east of Eddleston. No proposed or consented wind farms were found. No information regarding goshawk was available from the Bowbeat Wind Farm ES and so it was assumed that this species was not present within the Site, or not considered an IOF. Based on a review of aerial imagery, there is apparently suitable goshawk habitat close to the windfarm; however, all turbines are in an elevated position in comparison, in open and exposed habitat. As such, the wind farm area is unlikely to form part of any goshawk core foraging areas and it is assumed that any collision risk was low or negligible.
143. Due to the low level of wind farm developments within 10 km of the Development, it is considered that cumulative collision effects are likely to be of negligible magnitude and **not significant**.

## **8.8 MITIGATION, MONITORING AND RESIDUAL EFFECTS**

### **8.8.1 Mitigation**

144. Embedded mitigation is described in Section 8.4.5. Mitigation relating to breeding goshawk is addressed in the BBPP. No requirements for further mitigation were identified.

### **8.8.2 Monitoring**

145. It is proposed that ornithological monitoring should take place post-construction, in line with NatureScot guidance<sup>49</sup>, as outlined below:
- Year-round collision monitoring, to determine whether actual bird collisions are in line with predicted values; and
  - Goshawk nest monitoring, in liaison with the Lothian and Borders Raptor Study Group, to determine the operational impacts on breeding success.
146. In line with NatureScot guidance<sup>50</sup>, monitoring should take place annually during construction, and after the Development becomes operational, during years 1-3, 5, 10 and 15 as a minimum, with the requirement for further surveys to be determined based on previous survey results.

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<sup>49</sup> NatureScot (2009) *Monitoring the Impact of Onshore Wind Farms on Birds*. Guidance Note.

<sup>50</sup> NatureScot (2009) *Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms*. Guidance Note.

## 8.9 SUMMARY OF EFFECTS

147. Table 8.9 provides a summary of the effects detailed within this chapter.

**Table 8.9 Summary of Effects on IOFs**

IOF*	Potential Effect	Significance of Effect**	Mitigation Proposed***	Residual Effect
<b>Construction Phase</b>				
Goshawk and crossbill	Disturbance to nesting birds	Not significant	N/A	Not significant
	Habitat loss (foraging birds)	Not significant	N/A	Not significant
	Habitat loss (loss of nests)	Not significant	N/A	Not significant
	Disturbance to foraging birds	Not significant	N/A	Not significant
<b>Operational Phase</b>				
Goshawk and crossbill	Disturbance (nesting birds)	Not significant	N/A	Not significant
	Disturbance (foraging birds)	Not significant	N/A	Not significant
	Collision risk	Not significant	N/A	Not significant
<p>*Species names and order in which they are listed follow the British List maintained by the BOU<sup>2</sup></p> <p>**The significance of effect assumes that the embedded mitigation described in in Section 8.4.5 is fully implemented</p> <p>***Where this is additional to the embedded mitigation described in Section 8.4.5; although no significant effects on goshawk are predicted, specific mitigation for this species (if breeding within 500 m of works) will be required to ensure compliance with legislation protecting breeding Schedule 1 species</p>				

## 8.10 STATEMENT OF SIGNIFICANCE

148. An assessment has been made of the potential for significant effects of the Development on IOFs. Embedded mitigation measures detailed in Section 8.4.5 (BBPP) will be implemented. Accounting for this, the magnitude of effects of the Development on IOFs both alone and in combination with other schemes are assessed as being of low to negligible magnitude, and thus non-significant in terms of the EIA Regulations.