# 7 Ornithology

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# 7 Ornithology

## 7.1 Executive Summary

7.1.1 This chapter considers the potential impacts of the Proposed Development and their associated effects on ornithological features in line with best practice guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM).

7.1.2 The study area was surveyed between 2013-2014 and again in 2020 to provide baseline information on the presence and activity of target bird species. The 2013-2014 surveys included breeding and wintering Vantage Point (VP) surveys, black grouse (*Lyrurus tetrix)* surveys, breeding raptor and breeding bird surveys (BBS). In 2020, further breeding surveys were conducted, comprising two VP survey locations overlooking the site, (used in both 2013/2014), black-throated diver (*Gavia arctica*) VP surveys (one survey location for Loch Beannach which lies 1.7 km southeast of the site boundary), and loch search surveys for black-throated divers. This survey effort in summer 2020 was agreed with NatureScot, who also requested that VP surveys be undertaken over winter 2020/21.

7.1.3 Through the first 12 months of surveys (2013-2014), no hen harriers (*Circus cyaneus*) or black-throated divers that could have been associated with the nearby Strath Carnaig and Strath Fleet Moors Special Protection Area (SPA) and Lairg and Strath Brora Lochs SPA were recorded. There were no records made of black grouse leks on or near to the site. Occasional goose flights passed over the Proposed Development above collision height. A suite of breeding birds typical of the area was recorded and included common crossbill (*Loxia curvirostra*), a Schedule 1 species protected from disturbance.

7.1.4 Breeding season surveys completed in 2020 again did not record either hen harrier or black-throated diver activity on, near or flying over the site. A pair of black-throated divers was identified using Loch Beannach, however no evidence of breeding was recorded. A small number of greylag goose (*Anser anser*) and pink-footed goose (*A. brachyrhynchus*) flights were recorded over the Proposed Development, with some at collision height. A possible greenshank (*Tringa nebularia*) territory was identified off-site to the north of the Proposed Development. Greenshank is a Schedule 1 species.

7.1.5 Predicted potential impacts include disturbance or nest destruction of protected species during the construction phase and collision risk during operation for breeding greylag goose from Loch Shin Important Bird Area (IBA). Standard good practice mitigation along with additional pre-felling/construction surveys to develop species-specific mitigation for common crossbill and/or greenshank, if required, is included. Predicted collision risk for both greylag goose and pink-footed goose is not considered to be significant.

7.1.6 Bird activity on the site is generally low, with no records of species from any of the SPAs in the area. As such, no likely significant effects on the integrity of any of those sites or activities contrary to their conservation objectives would result from construction or operation of the Proposed Development. No residual significant effects or significant cumulative effects are predicted.

## 7.2 Introduction

7.2.1 This chapter considers the potential effects on ornithological features associated with the construction, operation and decommissioning of the Proposed Development. Ornithological features are primarily particular bird species or groups of species. They also include sites designated for ornithological reasons and key ornithology habitats. The specific objectives of the assessment are to:

- Describe the assessment methodology and significance criteria used in completing the impact assessment.

- Describe the ornithological baseline of the Proposed Development and its Zone Of Influence (ZOI)[1], including designated nature conservation sites, protected and notable species.
- Describe the potential impacts, including direct and indirect, on ornithological features and assess whether they would result in significant effects.
- Describe the mitigation measures proposed to address likely significant effects.
- Assess the significance of residual effects remaining following the implementation of mitigation.
- Assess the significance of cumulative effects between the Proposed Development and cumulative developments.

7.2.2 Impacts upon non-ornithological ecological features are addressed separately in Chapter 8.

7.2.3 Ramboll UK Limited (Ramboll) previously completed desk study and field survey work for the Proposed Development in 2013-2014, comprising a VP survey, winter walkover survey, black grouse survey, breeding raptor survey and BBS.

7.2.4 This chapter is based on the Proposed Development as described in Chapter 3 and has been completed in accordance with the CIEEM Ecological Impact Assessment (EcIA) guidelines (CIEEM, 2018). The chapter has been written by Elizabeth Butler and Danny Oliver of Ramboll. Elizabeth is an ecological consultant with five years' experience of undertaking ornithology surveys and EcIAs and Danny is a senior ornithological specialist with eight years' experience of ecological consultancy. The chapter has been reviewed by Adam Fitchet CIEEM, who has 16 years' experience undertaking EcIAs both nationally and internationally. Desk study work was updated by Ramboll in 2020, with the field survey work undertaken by Stagfire Ecological Surveys Ltd. All field surveys were led by surveyors with Associated or Member level of CIEEM and surveyors followed all COVID 19 guidance and protocols relevant at the time.

7.2.5 This assessment has assessed the design which includes turbine layout F and infrastructure layout 4 as described in Chapter 2. For the purpose of this assessment, it has been assumed that the Proposed Development candidate turbines will not exceed 135 m to tip, and have a hub height of 77.8 m and rotor diameter of 117 m. It is recognised that turbine selection will be subject to commercial tendering and availability and the specific parameters of hub height and rotor diameter may therefore vary; it is however unlikely that a change to the hub height or rotor diameter from that assessed would result in a material change in the findings of the assessment.

7.2.6 This chapter is supported by the following technical appendices:

- Appendix 7.1 - Methodology and Results for Ornithological Impact Assessment;
- Appendix 7.2 - Habitats Regulations Appraisal.

## 7.3 Legislation, Policy and Guidelines

7.3.1 The scope of the assessment has been informed by the following policy and legal framework:

### *Legislation*

7.3.2 Relevant legislation documents have been reviewed and taken into account as part of this ornithology assessment. Of particular relevance are:

- EC Birds Directive, 79/409/EEC;
- EC Directive on the Conservation of Natural Habitats and Wild Flora and Fauna, 92/43/EEC;

[1] The area over which ecological features may be subject to significant effects as a result of the Proposed Development and its associated activities.

- Wildlife and Countryside Act (as amended);
- Conservation (Natural Habitats Etc.) Regulations (as amended);
- Nature Conservation (Scotland) Act (as amended);
- Wildlife and Natural Environment (Scotland) Act; and
- the Ramsar Convention on Wetlands (Ramsar Convention, 1971).

### *Planning Policy*

7.3.3 Details of all planning policies are provided in Chapter 5 of the EIA Report. Relevant planning policies reviewed for this ornithology assessment are:

- Scottish Planning Policy (Scottish Government, 2014);
- UK BAP (Joint Nature Conservation Committee (JNCC), 2012);
- Scottish Biodiversity List (Scott Wilson, 2005);
- 2020 Challenge (Scottish Government, 2013);
- Highland-wide Local Development Plan (The Highland Council (THC), 2012);
- Caithness and Sutherland Local Development Plan (THC, 2018); and
- the Highland BAP (THC, 2015).

### *Guidance*

7.3.4 Best practice guidance has been followed when undertaking the following field surveys:

- recommended bird survey methods to inform impact assessment of onshore wind farms (SNH, 2017); and
- bird monitoring methods (Gilbert *et al.*, 2011).

## 7.4 Consultation

7.4.1 Table 7.1 summarises the consultation responses received regarding ornithology and provides information on where and/or how these statements or queries have been addressed in this assessment.

**Table 7.1 – Consultation Responses**

| Consultee and Date | Response | Action Taken |
|---|---|---|
| SNH<br>3 April 2020, NatureScot 28 October 2020 | Survey data from previous iterations of the project are now seven years old so are useful to inform the baseline but need to be supplemented by further surveys. Surveys for black-throated diver on Loch Beannach and VP surveys targeting breeding diurnal raptors and wintering species are required. It is recommended that surveys are undertaken following NS guidance. | These surveys were undertaken as described in section 7.5. VP surveys were undertaken between April and August 2020. Further surveys started in October 2020 and will finish in March 2021. |

| Consultee and Date | Response | Action Taken |
|---|---|---|
| THC<br>9 September 2020 | No advice relevant to ornithology. | N/A |
| Royal Society for the Protection of Birds (RSPB), 1 July 2020 | Key species in this area include black grouse, and black-throated diver which commute between their breeding lochs in the Lairg and Strath Brora Lochs SPA and Loch Shin. We maintain a number of artificial rafts in the area that support the species. Other key species include red-throated diver, hen harrier, golden eagle and breeding waders. | The surveys undertaken as described in section 7.5 were developed to identify the presence or absence of the species indicated and identify black-throated diver flightlines if present. Section 7.6 provides details of those species recorded. |
| SNH, 1 March 2018 | The proposal lies approximately 2.5km from Loch Beannach, which forms part of this protected area designated for its black throated diver. We advise that the ornithological survey work undertaken to date is sufficient to assess this proposal's impacts on this protected area. | As of 2018, the 2013/14 survey data was considered usable. This is no longer the case and surveys were updated in 2020. |
| | If protected breeding birds could be affected by the proposal, mitigation should be identified and a Species Protection Plan supplied within the ES. We advise that any forestry operations should be undertaken outside the bird breeding season. Where a protected bird species do not have connectivity to an SPA, the ES should demonstrate the significance of the impacts in relation to the favourable conservation status of the Natural Heritage Zone (NHZ) population.g | Mitigation proposed, including removal of forestry outside of breeding bird season, in paragraphs 7.7.3 and 7.7.4. |
| SNH<br>2014 | Concerns over proximity of site to Loch Beannach, a component loch of the Lairg and Strath Brora Lochs SPA, classified for its breeding black-throated divers and the possibility that flights by that species might cross the site. | Additional survey aimed at understanding black-throated diver activity at Loch Beannach and other nearby lochs undertaken as described in Appendix 7.1. Baseline conditions described in paragraphs 7.6.20 and 7.6.21. |

| Consultee and Date | Response | Action Taken |
|---|---|---|
| | Concerns that the Caithness and Sutherlands Ramsar site lies within the 20 km connectivity distance for greylag goose and flights by that population of geese might cross the site. | Distance from the site to the nearest location (Bad na Gallaig Site of Special Scientific Interest (SSSI)) where Ramsar listed greylag geese are known to breed is 21 km, which is outwith grey lag goose commuting distance (NatureScot, 2016). |
| THC, 2014 | The ES should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the Proposed Development. | Nature conservation sites are described in Table 7.4 and described in more detail in Appendix 7.1. No significant impacts are predicted on designated sites. |
| | The ES should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant. | The mitigation proposed is described in section 7.10. |
| | The ES should provide a baseline survey of the bird and animals (mammals, reptiles, amphibians, etc) interest on-site. It needs to be categorically established which species are present on the site, and where, before a future application is submitted. The presence of protected species such as Schedule 1 birds or European Protected Species (EPS) must be included and considered as part of the planning application process, not as an issue that can be considered at a later stage. | Section 7.5 of this chapter details the surveys completed to understand the ornithological baseline of the site. Section 7.6 onwards details the findings of those surveys. |

# 7.5 Assessment Methodology and Significance Criteria

7.5.1 The assessment methodologies, including desk and field survey methodology, are described in Appendix 7.1. Impact assessment methodology is described below.

## *Impact Assessment Methodology*

**Criteria for Evaluating the Importance of Ecological Features**

7.5.2 Habitats and species (i.e. ecological features) identified within the study area have been assigned ecological values using the standard Chartered Institute of Ecology and Environmental Management (CIEEM) scale that classifies ecological features within a defined geographic context (CIEEM, 2018). The classification uses recognised and published criteria (Ratcliffe, 1977 and Wray et al., 2010),

where the ecological features are assessed in relation to their size, diversity, naturalness, rarity, fragility, typicalness, connectivity with surroundings, intrinsic value, recorded history and potential value. Table 7.2 describes the geographic frame of reference that has been used.

**Table 7.2 – Geographic Conservation Importance**

| Importance | Examples |
|---|---|
| International | Internationally designated sites including Special Protection Areas (SPA), Ramsar sites, Biogenetic Reserves, World Heritage sites, Biosphere Reserves, candidate SPAs and potential Ramsar sites; discrete areas which meet the published selection criteria for international designation but which are not themselves designated as such; or a viable area of a habitat type listed in Annex I of the Habitats Directive (European Directive, 1992), or smaller areas which are essential to maintain the viability of a larger whole.<br>Resident or regularly occurring populations of species which may be considered at an international level, such as European Protected Species (EPS), the loss of which would adversely affect the conservation status or distribution of the species at an international level; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle. |
| National | Nationally designated sites including Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Marine Nature Reserves; discrete areas which meet the published selection criteria for national designation but which are not designated as such; or areas of a habitat type identified in the UK Post-2010 Biodiversity Framework (UK Government, 2012).<br>Resident or regularly occurring populations of species which may be considered at the national level, such as species listed in Schedules 5 and 8 of the Wildlife and Countryside Act (UK Government, 1981), the loss of which would adversely affect the conservation status or distribution of the species across Britain or Scotland; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle. |
| Regional | Areas of a habitat type identified in the Regional BAP; viable areas of habitat identified as being of Regional value in the appropriate Natural Area Profile (or equivalent); or smaller areas of such habitat which are essential to maintain the viability of a larger whole.<br>Resident or regularly occurring populations of species which may be considered at an international level, or at the national level, the loss of which would adversely affect the conservation status or distribution of the species across the region; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle. |

| Importance | Examples |
|---|---|
| County | Designated nature conservation sites at the local authority level in Scotland including statutory Local Nature Reserves (LNR) and non-statutory Local Nature Conservation Sites; or discrete areas which meet the published selection criteria for designation but which are not designated as such.<br><br>Resident or regularly occurring populations of species which may be considered at the local authority level, the loss of which would adversely affect the conservation status or distribution of the species across the local authority area. |
| Local | Features of local value include areas of habitat or populations/communities of species considered to appreciably enrich the habitat resource within the immediate surrounding area, for example, species-rich hedgerows.<br><br>Resident or regularly occurring populations of species which may be considered at an international level, or at the national level, the loss of which would adversely affect the conservation status or distribution of the species across the immediate surrounding area; or where the population forms a critical part of a wider population; or the species is at a critical phase of its life cycle. |

7.5.3 A wide range of sources can be used to assign importance to ecological features, including legislation and policy. In the case of designated nature conservation sites, their importance reflects the geographic context of the designation. For example, sites designated as SPAs are recognised as being of importance at an international level. Ecological features not included in legislation and policy may also be assigned importance due to, for example, local rarity or decline, or provision of a functional role for other ecological features. Professional judgement is used to assign such importance.

**Characterising Impacts**

7.5.4 The potential impacts upon ecological features have been considered in relation to the Proposed Development. The impacts have been assessed without consideration of any specific mitigation measures that will be employed. The assessment of likely ecological impacts has been made in relation to the baseline conditions of the study area. The likely impacts of development activities upon ecological features have been characterised according to several variables detailed in Table 7.3.

**Table 7.3 – Impact Characterisation**

| Parameter | Description |
|---|---|
| Direction | Impacts are either adverse (negative) or beneficial (positive). |
| Magnitude | This is defined as high, moderate, low or negligible, with these being classified using the following criteria: |

| Parameter | Description |
|---|---|
| | High: Total/near total loss of a population due to mortality or displacement or major reduction in the status or productivity[2] of a population due to mortality or displacement or disturbance. Total/near total loss of a habitat.<br><br>Moderate: Partial reduction in the status or productivity of a population due to mortality or displacement or disturbance. Partial loss of a habitat.<br><br>Low: Small but discernible reduction in the status or productivity of a population due to mortality or displacement or disturbance. Small proportion of habitat lost.<br><br>Negligible: Very slight reduction in the status or productivity of a population due to mortality or displacement or disturbance. Reduction barely discernible, approximating to the 'no change' situation. Slight loss of habitat that is barely discernible from the habitat resource as a whole. |
| Extent | The area over which the impact occurs. |
| Duration | The time for which the impact is expected to last prior to recovery of the ecological feature or replacement of the feature by a similar resource (in terms of quality and/or quantity). This is expressed as a short-term, medium-term, or long-term effect relative to the ecological feature that is impacted. |
| Reversibility | Irreversible impacts: permanent changes from which recovery is not possible within a reasonable time scale or for which there is no reasonable chance of action being taken to reverse it.<br><br>Reversible impact: temporary changes in which spontaneous recovery is possible or for which effective mitigation (avoidance/cancellation/reduction of effect) or compensation (offset/recompense/offer benefit) is possible. |
| Frequency and Timing | The number of times an activity occurs will influence the resulting effect (if appropriate, described as low to high and quantified, where possible).<br><br>The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons e.g. the breeding season. |

7.5.5 The assessment only describes those characteristics relevant to understanding the ecological impact and determining the significance of the effect.

**Assessment of Potential Effect Significance**

7.5.6 Significant effects are assessed with reference to the geographical importance of the ecological feature. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, a significant effect on a species

[2] Status is defined as the conservation status of the species and indicates whether the species is likely to become extinct in the near future. Productivity is defined as the rate of population growth.

protected by national legislation does not necessarily equate to a significant effect on its national population.

7.5.7 For the purposes of Ecological Impact Assessment (EcIA), apart from in exceptional circumstances, a significant effect, as defined by the Town and Country Planning (Environmental Impact Assessment) Regulations (UK Government, 2017) is only considered to be possible where the feature in question is considered to be of regional, national or international importance. That is not to say that impacts from the Proposed Development could not result in significant effects on features of county or local importance, simply that those effects are not likely to be significant under EIA Regulations, unless the effect is likely to undermine biodiversity conservation objectives (such as local policies for no net loss) or biodiversity in general. Whether an effect at local or county importance is considered to be significant or not significant under the EIA Regulations is made clear in the impact assessment of each ecological feature.

**Requirements for Mitigation**

7.5.8 Mitigation and/or compensation is proposed for all effects considered significant under the EIA Regulations. Where appropriate, as part of additional good practice, mitigation and/or compensation may be proposed for significant effects on features of county or local importance, or where required in relation to protected species where legislation may require actions to protect populations or individuals.

**Assessment of Cumulative Effect Significance**

7.5.9 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects are particularly important in EcIAs as many ecological features are already exposed to background levels of threat or pressure and may be close to critical thresholds, where further impacts could cause irreversible decline and significant cumulative effects. Further impacts can also make habitats and species more vulnerable or sensitive to change.

7.5.10 Developments included in the cumulative effects assessment are the following types of future development within the same Zone of Influence (ZOI):

- proposals for which consent has been applied;
- projects that have been granted consent but have not yet been started or have been started but are not yet completed (i.e. under construction);
- proposals that have been refused permission but are subject to appeal; and
- proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority.

7.5.11 It may also be necessary to consider developments that are operational but whose full environmental effects are not yet known and cannot be accounted for in the baseline.

## *Consultation*

7.5.12 Section 7.4 provides full details of the consultation completed in April and October 2020 and the scoping opinions provided by THC in 2018 and 2014.

## *Study Area*

7.5.13 The field study area for this assessment includes the area within the site boundary and a buffer distance of 250 m beyond the site boundary, as shown on Figure 7.1. The field study area also includes Loch Beannach, where species-specific black-throated diver surveys were undertaken.

7.5.14 There is a separate desk study area, which includes the area within the site boundary and a 10 km buffer around the site boundary (refer to Figure 7.1). This is based on NS connectivity guidance,

using information for species for which the SPAs (NatureScot, 2016) around the site are defined, including black-throated diver, golden eagle *(Aquila chrysaetos)* and hen harrier.

### *Limitations to Assessment*

7.5.15 It should be noted that the availability and quality of the data obtained during desk studies is reliant on third party responses and recorders. This varies from region to region and for different species groups. Furthermore, the comprehensiveness of data often depends on the level of coverage, the expertise and experience of the recorder and the submission of records to the local recorder.

7.5.16 The ornithology surveys provide a snapshot of ornithological conditions and do not record species that may be present in the study area at different times of the year. The absence of a particular species cannot definitely be confirmed by a lack of field signs and only concludes that an indication of its presence was not located during the survey effort. However, surveys for bird species were undertaken during optimal periods for locating field signs. Bird survey data has also been collected on the site and the surrounding area in 2013 and 2014, therefore the presence of bird species in the area is well understood. Given the consistency of the habitats still present on site, the suite of species is likely to be consistent between 2013/14 and 2020/21.

7.5.17 Due to the remote nature of the site, surveys were not impacted by coronavirus restrictions as local surveyors were able to travel separately to the site and maintain social distancing.

## 7.6 Baseline Conditions

### *Current Baseline*

#### Desk Study

Designated Nature Conservation Sites

7.6.1 Figure 7.3 shows the location of all sites designated for ornithological interests. These are listed in Table 7.4, with more detail in Appendix 7.1.

**Table 7.4 – Designated Sites**

| Site Name | Qualifying Feature(s) | Distance from Proposed Development at Closest Point | Connectivity with Proposed Development |
|---|---|---|---|
| Lairg and Strath Brora Lochs SPA | Breeding black-throated diver | 1.7 km south-east of the Proposed Development | Yes |
| Loch Shin and Nearby Lochs IBA | Breeding greylag goose<br>Breeding black-throated diver<br>Breeding merlin *(Falco columbarius)*<br>Breeding Scottish crossbill *(Loxia scotica)* | 3.3 km to the south-west of the Proposed Development | Yes |

| Site Name | Qualifying Feature(s) | Distance from Proposed Development at Closest Point | Connectivity with Proposed Development |
|---|---|---|---|
| Caithness and Sutherland Peatlands SPA | Breeding golden eagle<br>Breeding short-eared owl *(Asio flammeus)*<br>Breeding hen harrier<br>Breeding merlin<br>Breeding black-throated diver<br>Breeding red-throated diver *(Gavia stellata)*<br>Breeding golden plover *(Pluvialis apricaria)*<br>Breeding wood sandpiper *(Tringa glareola)*<br>Breeding dunlin *(Calidris alpina)*<br>Breeding common scoter *(Melanitta nigra)*<br>Breeding greenshank<br>Breeding wigeon *(Anas penelope)* | 6.7 km west of the Proposed Development | Yes |
| Strath Carnaig and Strath Fleet Moors SPA | Breeding hen harrier | 7 km south-east of the Proposed Development | Yes |

2013 and 2014 Survey Results

7.6.2 The results of the 2013 and 2014 surveys are listed below. These have not been used to defined the current baseline, as they are considered by NatureScot to be too old to serve that purpose, but they do provide useful context to the results of the surveys undertaken in 2020 and are referred to in the chapter as such.

7.6.3 Through the 12 months of surveys, no hen harriers or black-throated divers that could have been associated with the nearby Strath Carnaig and Strath Fleet Moors SPA and Lairg and Strath Brora Lochs SPA, respectively, were recorded. Eight flights of greylag goose were recorded between January and May 2014, with only three of those flights flying at collision height[3] within the site

[3] When adjusted for the current proposed dimensions.

boundary. Two flights of pink-footed goose were recorded between February and April 2014, but neither of the flights flew within the site boundary[4].

7.6.4 Flight activity by other species was limited to a few commoner species. Common buzzard (*Buteo buteo)* was the most frequently recorded species on-site, with over 100 flights. Northern goshawk (*Accipiter gentilis)* was recorded once on-site, sparrowhawk (*Accipiter nisus)* was recorded nine times and kestrel (*Falco tinnunculus)* was recorded twice on-site. Thirty common raven (*Corvus corax)* flights were recorded as well as two flights by Eurasian curlew (*Numenius arquata)*, one common snipe (*Gallinago gallinago)* flight and one Eurasian woodcock (*Scolopax rusticola)* flight.

7.6.5 No black grouse sightings or leks were recorded on the site. The BBS completed in 2014 recorded 29 species of bird, with 23 of those species confirmed or probable breeders on-site. Of those 23 species, the nine species listed in Table 7.5 are protected or notable species and given the consistency of habitats on-site in 2020 with those in 2014, it is likely that they are still present. As agreed with SNH, BBS were not repeated during the 2020 surveys.

**Table 7.5 – Protected and Notable Species**

| Species | Details | Status[5] |
|---|---|---|
| Common crossbill | 3 territories | Schedule 1 (UK Government, 1981) |
| Common sandpiper (*Actitis hypoleucos)* | 1 territory | Amber listed species of medium conservation concern |
| Grasshopper warbler *(Locustella naevia)* | 1 territory | Red listed species of high conservation concern |
| Lesser redpoll (*Carduelis caberet)* | 12 territories | Red listed species of high conservation concern |
| Mistle thrush (*Turdus viscivorus)* | 1 territory | Red listed species of high conservation concern |
| Meadow pipit (*Anthus pratensis)* | 6 territories | Amber listed species of medium conservation concern |
| Skylark (*Alauda arvensis)* | 3 territories | Red listed species of high conservation concern |
| Tree pipit (*Anthus trivialis)* | 1 territory | Red listed species of high conservation concern |
| Willow warbler (*Phylloscopus trochilus)* | 24 territories | Amber listed species of medium conservation concern |

7.6.6 The breeding bird assemblage occurring on site is considered to be of local importance.

[4] These flights are not shown on Figures 7.4a.

[5] All conservation concern species are taken from Eaton et al. (2015).

## *2020 Field Survey*

**Vantage Point Surveys**

7.6.7 Full details of the results of the field surveys undertaken for the Proposed Development are provided in Appendix 7.1. The results below focus on the information on the ornithological features required to undertake the impact assessment.

7.6.8 Detailed descriptions of the species recorded during the VP surveys are provided in this section. For any target species recorded during the VPs as overflying the site at collision height, further information on population size and trends is provided. This is due to these species being considered to be potentially at risk of collision with turbines.

7.6.9 The data presented from the winter VP surveys is from the period of October 2020 to December 2020, as this is all of the data available at time of writing.

Pink-footed Goose

7.6.10 Pink-footed goose flights from the summer 2020 VP surveys are shown on Figure 7.4a. Two flights of pink-footed geese were recorded during the VP surveys, both on 29 April 2020. The first flight involved 200 pink-footed geese flying north over the site. This flight was recorded flying at approximately 100 m altitude, which is within collision risk height for the Proposed Development. The second flight of pink-footed geese recorded on 29 April 2020 involved 250 birds and was recorded flying north approximately 300 m east of the Proposed Development. This flight was recorded to be above collision risk height.

7.6.11 No pink-footed goose flights were recorded during the winter 2020 VP surveys.

7.6.12 Approximately 370,000 pink-footed geese overwinter in the UK, constituting 90% of the global population (Scottish Wildlife Trust, 2020). This species overwinters predominately in Scotland, north-west England and East Anglia between October and March, before migrating north to breed in Iceland and Greenland. Pink-footed geese are of medium conservation concern (Eaton *et al.*, 2015). Based on survey records from 2013/14, when two flights totalling 143 birds were recorded, and from 2020 surveys, when two flights totalling 450 birds were recorded, the pink-footed geese that overfly the Proposed Development are not considered to be a significant part of the total UK wintering population. They are considered to be of regional importance.

Greylag Goose

7.6.13 There were four greylag goose flights recorded during the summer 2020 VP surveys, as shown on Figure 7.4a. The first flight was recorded on 29 April 2020 and involved a single bird flying south-east across the site within collision risk height. Two greylag goose flights were recorded in May during the VP surveys. The first was recorded on 11 May 2020, involving two birds flying north-west over the site at collision risk height. The second was recorded on 17 May 2020, involving a single bird flying south across the western edge of the site, also at collision risk height. A third greylag goose flight was recorded on 15 June 2020, with four birds flying south, off-site to the west and above collision risk height.

7.6.14 Greylag goose was the most common species recorded during the winter 2020 VP surveys, with 12 flights recorded in total. Two flights were recorded on 31 October 2020, with these flights involving 65 birds and two birds flying north-east past the north-west corner of site. Neither flight crossed the site boundary. Six greylag goose flights were recorded during the surveys in November, one on the 5 November 2020 of 150 birds crossing the north-west corner of the site at collision risk height. The other five flights were recorded on 12 November 2020 with flights of 60, 44, 43, 25 and a single bird flying past the north-west corner of the site. Only the flights of 60 and 25 birds crossed the site at collision risk height. Four greylag goose flights were recorded on 1 December 2020 with flights of six, five and two birds recorded off site to the west. The other flight, a flight of nine birds, was recorded flying north across the site, but at above collision risk height.

7.6.15 Approximately 110,000 greylag geese overwinter in Scotland. This includes both migratory birds and resident birds. Over 95% of the Icelandic greylag goose population overwinters in Scotland. This population is believed to be increasing. Greylag geese are of medium conservation concern (Eaton *et al.*, 2015). The Loch Shin and Nearby Lochs IBA held a population of 100 breeding pairs in 1994. The birds overflying and flying close to the Proposed Development in summer are considered to be part of this IBA population. The breeding population of the IBA is considered to be of international importance.

Whooper Swan

7.6.16 No whooper swan (*Cygnus cygnus*) flights were recorded during the summer 2020 VP surveys.

7.6.17 A single whooper swan flight was recorded during the winter 2020 VP surveys, as shown on Figure 7.4a. This flight involved two birds flying south-west across the site at collision risk height.

7.6.18 The population of whooper swan overwintering in Northern Scotland was 1,474 birds in winter 2019/20 (Wildfowl and Wetland Trust [WWT], 2020). The Icelandic population of whooper swan, which birds in Northern Scotland are a part, has been steadily increasing since 1986. Whooper swan are of medium conservation concern (Eaton *et al.*, 2015). The whooper swan using the site are considered to be of regional importance.

Greenshank

7.6.19 Three greenshank flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4b. All three flights were recorded in June 2020 and were recorded off-site, immediately to the north of the site. The first flight was recorded on 15 June 2020, a short flight of a single bird briefly at collision height and landing north of the site. Two flights were recorded on 17 June 2020, the first involved two birds flying and alarm calling, suggesting the presence of a nest or chicks nearby. One of these birds was recorded calling from a fence post, then flying and returning to the same fence post.

7.6.20 No greenshank flights were recorded during the winter 2020 VP surveys.

7.6.21 These flights suggest the possible presence of a greenshank nest within the habitat to the north of the Proposed Development. The habitat in this area, as described in Chapter 8, is felled coniferous plantation, felled in the past five years. There are pools that have formed between the rows of stumps, where peatland habitats are regenerating. These could provide some habitat for greenshank to nest and fledge chicks. If a nest was present, it would be approximately 80 m north of the site boundary: 200 m from the northern access track and 350 m from Turbine 2. The greenshank recorded are not considered to be birds from the Caithness and Sutherland Peatlands SPA as this designated site lies 6.7 km from the Proposed Development, which is much further than greenshank are likely to travel to forage (maximum range 3 km (NatureScot, 2016)).

7.6.22 There are approximately 700-1,500 breeding pairs of greenshank nesting in north and west Scotland each year (RSPB, 2020). Approximately 700 overwinter in the UK, with approximately 1,400 recorded during passage. Greenshank are of medium conservation concern (Eaton *et al.*, 2015). The potential breeding pair present to the north of the site is considered to be of county importance.

Hen Harrier

7.6.23 No hen harrier flights were recorded during the summer 2020 VP surveys.

7.6.24 Five hen harrier flights were recorded during the winter 2020 VP surveys, with these shown on Figure 7.4c. A single male was observed hunting over moorland either side of the River Tirry on 12 November 2020, off site to the west. Four flights were recorded on 17 November 2020, three of which were recorded approximately 1.2 km west of site. The fourth flight involved a ringtail[6] bird

[6] A female or juvenile.

just over 100 m north of site. The majority of these flights were recorded below collision risk height and none were within the site boundary.

7.6.25 There are estimated to be 460 breeding pairs on hen harriers in Scotland, based on last counts from 2016 (Wotton et al., 2017). This represents a decrease of 9% from the previous survey. Hen harrier are of high conservation concern (Eaton *et al.*, 2015). The population of hen harrier in the area surrounding the site are considered to be of regional importance.

Secondary Species

*Goosander*

7.6.26 No goosander (*Mergus merganser*) flights were recorded during the summer 2020 VP surveys. Two goosander flights were recorded during the winter 2002 VP surveys, with these shown on Figure 7.4a. Both flights were recorded along the River Tirry, to the west of site, with single male birds recorded on 5 November 2020 and 3 December 2020. Goosander are of low conservation concern (Eaton *et al.*, 2015) and the population of goosander surrounding the site is considered to be of local importance.

*Eurasian Curlew*

7.6.27 A single Eurasian curlew flight was recorded during the summer 2020 VP surveys, as shown on Figure 7.4b. This flight was of a single bird flying east across the site on 11 June 2020, above collision risk height. No curlew flights were recorded during the winter VP surveys. There is no evidence of breeding curlew on-site, with the only curlew recorded being a bird flying over the site. Although curlew are of high conservation concern (Eaton *et al.*, 2015), the population of curlew using the site is considered to be of local importance.

*Northern Lapwing*

7.6.28 Eight northern lapwing (*Vanellus vanellus)* flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4b. Two flights of individual birds were recorded flying across the site at collision risk height, both recorded on 11 May 2020. The other six flights were recorded off-site to the north. One of these flights was at collision risk height, with the remainder below collision risk height. Of these six flights, one was recorded on 29 April 2020 and the other five were recorded in June 2020. Two northern lapwing flights were recorded during the winter VP surveys. These flights, involving 70 birds and 30 birds respectively were recorded approximately 1 km west of the site. There is no evidence of breeding lapwing on site, with some likely to be present to the north-west of site. Although lapwing are of high conservation concern (Eaton *et al.*, 2015), the population of lapwing using the site are considered to be of local importance.

*Common Snipe*

7.6.29 Five common snipe flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4b. Two flights were recorded on 22 April 2020, both of single birds and both below collision risk height. One flight was recorded flying into the site from the north-east and the other was flying to the south out of the site. Another two flights were recorded on 29 April 2020. Both of these flights were display flights by a single bird and were at collision risk height, with one within the site boundary and the other just outside to the south. The fifth flight was recorded on 17 May 2020, of a single bird flying south over the site at collision risk height. No snipe flights were recorded during the winter VP surveys. Snipe are of medium conservation concern (Eaton *et al.*, 2015). Display flights of snipe to the south of the site suggest the presence of a territory. The snipe on-site are considered to be of local importance.

*Sparrowhawk*

7.6.30 Two sparrowhawk flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4c. The first was recorded on 29 April 2020 flying at collision risk height into the site from the east. The flight involved a single bird carrying food and descending into the trees, suggesting a possible sparrowhawk nest within the Proposed Development. The second sparrowhawk flight was recorded

on 11 May 2020, flying over the Feith Osdail within the site but below collision risk height. No sparrowhawk flights were recorded during the winter VP surveys. Sparrowhawk are of low conservation concern (Eaton *et al.*, 2015). Sparrowhawk are considered to be of local importance as they are common in the surrounding area.

*Common Buzzard*

7.6.31 Four common buzzard flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4c. The first was recorded on 17 May 2020, with a single buzzard flying into the site from the north-west, flying below collision risk height. The second flight was recorded on 22 May 2020, with a single buzzard flying across the site from the west at collision risk height. The final two flights were both recorded on 14 August 2020, both involving single birds flying south-west. Both flights were at collision risk height but were recorded off-site to the south-east. Buzzard are of low conservation concern (Eaton *et al.*, 2015). Buzzard were not considered a target species during the winter VP surveys as the raven using the site are considered to be of local importance.

*Common Raven*

7.6.32 Eight common raven flights were recorded during the summer 2020 VP surveys, as shown on Figure 7.4c. All eight flights were recorded within the site boundary, with four of these flights, involving eight birds, flying at collision risk height. Raven are of low conservation concern (Eaton *et al.*, 2015). Raven were not considered a target species during the winter VP surveys as the raven using the site are considered to be of local importance.

**Species-specific Black-throated Diver Surveys**

Diver VP Surveys at Loch Beannach

7.6.33 Results of the species-specific black-throated diver surveys are shown on Figure 7.5. There were five records of black-throated diver recorded during the diver VPs, which were carried out from a location at the south-eastern edge of Loch Beannach between April and August 2020. The first black-throated diver was observed on 22 May 2020, with an adult bird recorded on the loch during the duration of the VP survey. The adult bird flew across the loch from the north, landing on the surface to feed. On 11 June 2020, two adults were observed on the loch, one was recorded feeding in the north of the loch, the second was recorded on the diver raft installed by the RSPB previously to encourage successful breeding on the loch. Two adults were also observed later in June (17 June 2020), one adult on the diver raft and the other sleeping and loafing on the loch nearby. The final observation of diver activity was on 7 July 2020, with a single adult black-throated diver observed loafing[7] on the loch near the diver raft. No evidence of breeding, nesting or chicks was recorded. No black-throated divers were seen to fly from the loch in the direction of the Proposed Development and none were seen to fly to the loch from that direction.

Loch Search Surveys

7.6.34 Lochs surrounding Loch Beannach were visited to search for black-throated divers each month between April and August 2020. This included the inspections of Loch Shin, Little Loch Shin, Loch na Fuaralachd and Loch na Fuaralachd Beag. A pair of black-throated divers was recorded on Little Loch Shin and a single adult black-throated diver was recorded on Loch Shin on 8 June 2020. No divers were recorded on any of these lochs in April, May or July 2020. Five black-throated divers were recorded on Little Loch Shin on 19 August 2020. It is possible that one or both of the adults from Loch Beannach were within the group of five seen in August 2020, having failed to breed. Those birds would not have crossed the Proposed Development to reach Little Loch Shin.

7.6.35 The black-throated divers recorded on Loch Beannach are considered to be of national importance as they are part of one of the most productive groups of black-throated divers within Scotland.

[7] Loafing describes bird behaviour not connected with feeding or breeding, including preening and resting.

### *Future Baseline*

7.6.36 The future baseline of the field study area under the "do nothing" scenario is unlikely to change significantly in the absence of the Proposed Development. The coniferous plantation is likely to be harvested by clear fell methods before the trees reach maturity at 40-70 years. Without the Proposed Development, the forest would be felled within approximately the next two decades. These areas are then typically restocked for another rotation of the process. As such, the suite of bird species occurring on-site that uses the coniferous plantation is considered unlikely to change. Temporary to long-term displacement of forest species is likely as coniferous plantations are clear felled and replanted and species recolonise the previously displaced area. However, those activities are already part of the wider landscape baseline.

7.6.37 The peatland habitats are also considered unlikely to change significantly in the absence of the Proposed Development as the open habitats would continue to be impacted and shaped by afforestation and grazing. The majority of habitats are already modified by the surrounding coniferous plantation and grazing by deer, which are expected to continue. Therefore, the distribution of bird species using the open areas of the site is considered unlikely to change.

## 7.7 Standard Mitigation

### *Mitigation During Construction*

**Ecological Clerk of Works**

7.7.1 All work will be overseen by an Ecological Clerk of Works (ECoW) or, where required, by a suitably qualified ornithological specialist. The ECoW/specialist will undertake pre-construction surveys for the two Schedule 1 species present/potentially present namely crossbill and/or greenshank.

**Construction Environmental Management Plan**

7.7.2 All work will comply with the requirements of the Construction Environmental Management Plan (CEMP), as detailed in Appendix 3.2. Should any Species Protection Plans (SPPs) be required, e.g. for Schedule 1 bird species, these will form part of the CEMP and will address the protected species known to be present in the study area and will provide details on the actions required if other species not recorded during surveys are encountered during construction of the Proposed Development. The CEMP will also include an outline of the proposed approach to construction methods and environmental protection during all aspects of the construction work, including details of ornithological constraints and standard pollution prevention guidelines to ensure no water or air borne pollutants will reach ecological features used by birds, such as the Feith Osdail. The CEMP will also include the procedures for surface water management during construction.

**Timing of Felling**

7.7.3 In order to avoid the period of nest building and breeding, felling will, as far as possible, be completed outside of the main bird breeding season of March-August.

**Pre-Felling Survey**

7.7.4 Where felling outside of the main bird breeding season is not possible, a pre-felling survey of the area will be completed to identify potential nesting birds within the felling areas. This survey will be completed by a suitably qualified ornithologist. Where nests are identified a suitable buffer distance would be established within which no work could be undertaken until the nest is no longer in use. The buffer distance would be determined by the ECoW, who would also be responsible for confirming when the nest is no longer in use.

**Bird Deterrence**

7.7.5 Following felling, aspects of the following deterrence methods will be used to prevent birds from nesting within construction areas:

- iridescent tape/bird scarers across the construction areas prior to construction activities;
- bird deterring devices that produce intermittent loud noises; and
- walking of the felled area by individuals on a regular basis to prevent birds settling and attempting to nest prior to construction commencement.

## 7.8 Features Brought Forward for Assessment

### *Summary of Important Ornithological Features*

7.8.1 A summary of the ornithological features identified as being sensitive to the potential impacts of construction, operation or decommissioning of the Proposed Development, which have been included in the assessment is given in Table 7.6, together with the rationale for their inclusion.

**Table 7.6 – Features Brought Forward for Assessment**

| Feature | Importance | Rationale |
|---|---|---|
| Loch Shin and Nearby Lochs IBA - Breeding greylag goose | International | The Proposed Development lies within connectivity distance with the IBA and greylag geese, presumed to be from the IBA population, were recorded flying over the site. Operational impacts in the form of collision with the Proposed Development has the potential to result in significant effects upon the IBA population. |
| Pink-footed goose | Regional | Pink-footed geese are migratory, breeding in Iceland and Greenland and overwintering in the UK. Large groups of this species are found in the overwintering areas and on migratory flyways to and from Iceland and Greenland. Many geese move through Caithness and Sutherland during their migration. Operational impacts in the form of collision with the Proposed Development has the potential to result in significant effects for the species. |
| Greenshank | County | The construction of the Proposed Development has the potential to disturb this protected species in the possible territory recorded outwith but close to the northern site boundary. |
| Crossbill | Local | The construction of the Proposed Development has the potential to disturb, damage or destroy this protected species, which has been |

| Feature | Importance | Rationale |
|---|---|---|
| | | recorded breeding within the coniferous woodland plantation on-site. |

## *Effects Scoped Out of Assessment*

7.8.2 A summary of the ornithological features identified as not being sensitive to the potential impacts of construction, operation or decommissioning of the Proposed Development with or without standard mitigation, which are not considered further in the assessment is given in Table 7.7, together with the rationale for their exclusion.

**Table 7.7 – Features Not Assessed Further**

| Feature | Importance | Rationale |
|---|---|---|
| Loch Shin and Nearby Lochs IBA:<br>Breeding black-throated diver<br>Breeding merlin<br>Breeding Scottish crossbill | International | None of the species listed were recorded as occurring on, near or flying over the Proposed Development. The Proposed Development is too far from the designated site to disturb the species whilst breeding. |
| Lairg and Strath Brora Lochs SPA:<br>Breeding black-throated diver | National | Although within the connectivity distance for birds from the SPA, no black-throated divers were seen to fly over or near the Proposed Development. |
| Caithness and Sutherland Peatlands SPA:<br>Breeding golden eagle<br>Breeding short-eared owl<br>Breeding hen harrier<br>Breeding merlin<br>Breeding black-throated diver<br>Breeding red-throated diver<br>Breeding golden plover<br>Breeding wood sandpiper;<br>Breeding dunlin<br>Breeding common scoter<br>Breeding greenshank<br>Breeding wigeon | National | Although within the connectivity distance for all but one of the bird species from the SPA, none were seen on or near the Proposed Development or flying over or near the Proposed Development.<br>Greenshank were recorded next to the Proposed Development. However, these are considered to be non-SPA birds, as they are possibly breeding far outside the boundary of the SPA. In addition, the distance to the SPA (6.7 km) is greater than the typical foraging distance for breeding greenshank. |
| Strath Carnaig and Strath Fleet Moors SPA:<br>Breeding hen harrier | National | No hen harriers were recorded on, near or flying over or near the Proposed Development. |

| Feature | Importance | Rationale |
|---|---|---|
| Secondary species:<br>Curlew<br>Lapwing<br>Snipe<br>Sparrowhawk<br>Buzzard<br>Raven | Local | These secondary species were all recorded flying over the site and in the case of sparrowhawk, likely nesting on-site. None are protected beyond the standard protection for birds from nest damage or destruction. Although the wader species are of high or medium conservation concern, their occurrence over the site was limited and the site does not represent good breeding habitat for the species. Sparrowhawk, buzzard and raven are all of low conservation concern and common in the wider area. Any impacts from collision risk or habitat loss are extremely unlikely to be significant. |
| Breeding birds (excluding crossbill) | Local | The breeding bird assemblage on-site is typical of that found across the wider landscape of coniferous woodland plantation on peatland habitats with areas of wet or scrub woodland. The Proposed Development would result in the loss of a small amount of the habitats on-site, habitats which, in the "do nothing" scenario would already be disturbed by felling and harvesting in the future. Any impacts from collision risk or habitat loss are extremely unlikely to be significant. |

# 7.9 Potential Effects

7.9.1 This section considers the potential impacts and associated effect significance of the construction, operation and decommissioning of the Proposed Development based on the typical activities described in Chapter 3.

### *Construction*

**Disturbance of Breeding Greenshank**

7.9.2 The construction of the Proposed Development, particularly the proposed northern access track, has the potential to disturb a possible greenshank territory located approximately 80 m north of the northern site boundary and 200 m north of the proposed northern access track. The territory appears to be centred on an area of felled forestry with peatland regrowth and pools between the remaining stumps. This is atypical habitat for greenshank, which would typically nest in more open peatland habitats, particularly close to small waterbodies. However, the behaviour of the birds indicates the presence of a nest or chicks in the immediate area.

7.9.3 A previous study into greenshank breeding behaviour (Hancock *et al.*, 1997) identified an average territory size of 800 m radius from a nest. This would encompass a large area of the Proposed Development including the proposed location of Turbine 2. However, that study considered nests

in open landscapes away from woodland habitats. The possible greenshank territory would not include any of the coniferous woodland plantation, extending instead into the 20-50 m of open ground within the northern site boundary and into the open habitats west of the A836. As such, the Proposed Development would not result in any habitat loss for the species.

7.9.4 However, works to construct the proposed northern access track, the northern temporary entrance compound and creation of a temporary borrow pit within Search Area A all lie within disturbance distance of the greenshank territory. The disturbance is likely to result in a temporary adverse impact of low magnitude as the retained forestry between much of the proposed northern access track would block much of the potential visual disturbance and attenuate much of the noise that has the potential to disturb the birds. The impact duration would be limited to the period of tree felling and subsequent construction for the access track and Turbine 2 and it is likely that felling or construction activity in that period would be constant morning to evening, Monday-Friday and Saturday mornings. As such, if a pair of greenshank were breeding or attempting to breed in the territory, a likely significant effect is predicted for greenshank, which have been assessed to be of county importance.

**Disturbance of Breeding Crossbill or Destruction of Crossbill Nests**

7.9.5 Three crossbill territories were identified on-site in 2014, all of which lie outwith the footprint of the Proposed Development. However, all of the coniferous woodland plantation within the footprint is considered to be suitable to support nesting crossbill, as cone-bearing trees are found throughout. Potential disturbance of other Schedule 1 bird species or avoidance of nest damage or destruction would typically be achievable by timing works outwith the main breeding bird season of March to August. However, crossbill are known to nest in all months of the year in Scotland. Whilst it is unlikely that the species would nest in northern Scotland during the coldest winter months, such species could be nesting during other periods before or after the main bird breeding season.

7.9.6 Guidance (Ruddock *et al*., 2007) suggests a buffer of 50-150 m to avoid disturbance of nesting crossbill might be appropriate. It would be prudent to consider that felling and construction works within 150 m would have the potential to adversely impact crossbill as a result of visible activity or noise-related disturbance. However, the presence of dense coniferous woodland plantation means that disturbance impacts are unlikely beyond the lower end of the proposed range, i.e. 50 m. The temporary impact duration would be limited to the period of felling or construction and it is likely that felling or construction activity in that period would be constant from morning to evening, Monday-Friday and Saturday mornings. As such, if a pair of crossbill were breeding or attempting to breed within 150 m of construction activities, a potential significant effect is predicted for crossbill, which have been assessed to be of local importance.

7.9.7 Nest destruction would occur where crossbill are nesting within the footprint of the Proposed Development at the time of felling activities. Nest destruction would be a short-term, permanent, moderate magnitude impact for the crossbill population of the local area and a likely **significant effect** for this feature of local importance. However, it is considered that the potential impact is reversible, i.e. mitigation is possible to avoid the impact or reduce it to a non-significant level.

## *Operation*

**Collision Risk**

7.9.8 Greylag goose from Loch Shin IBA and pink-footed goose and whooper swan not identified as being from a designated site were assessed for their potential to be impacted by collision with the Proposed Development. These species were the only ones for which flight activity within or over the Proposed Development, and at collision risk height, was sufficiently high for a potential collision risk to exist. This Collision Risk Assessment (CRA) was undertaken as described in Appendix 7.1. Where CRA has been undertaken based on winter VP survey data, this is based on flight data collected between October 2020 and December 2020. Surveys are continuing until March 2021, at which point a more complete CRA can be undertaken for each species.

Loch Shin IBA: Greylag Goose

7.9.9 Greylag geese are present around the site year-round, with a breeding population present around Loch Shin. Four flights of greylag geese were recorded during the bird surveys, with three flights (involving four birds) crossing the site at collision risk height.

7.9.10 The CRA for greylag goose based on the summer 2020 VP survey resulted in an estimate of 0.02 bird mortalities per year. Using the baseline population of 100 breeding pairs, this represents a decrease of 0.0001% of this population.

7.9.11 The CRA for greylag goose based on the winter 2020 VP survey resulted in an estimate of 0.87 bird mortalities per year. Using the baseline population of 110,000 bird which overwinter in Scotland, this represents a decrease of 0.0008% of this population.

7.9.12 Mortality as a result of collision risk would be a permanent, adverse impact upon the breeding population of greylag goose of Loch Shin IBA. The estimated mortality of 0.02 birds per year equates to 0.5 birds in total if the Proposed Development were operational for 30 years. As it is not possible to have partial mortality, this is considered to represent the death of one greylag goose from collision with a turbine over the lifetime of the Proposed Development. This low magnitude mortality rate is extremely unlikely to impact upon the viability of the Loch Shin breeding population. The estimated mortality of 0.87 birds per year equates to 26 birds in total if the Proposed Development were operational for 30 years. This is an insignificant effect given the size of the over-wintering population. As such, the impact of collision risk upon the internationally important population is assessed to result in a non-significant effect.

Pink-footed Goose

7.9.13 A single pink-footed goose flight was recorded crossing the Proposed Development at collision risk height, with this flight involving 200 birds. The VP surveys were undertaken in the summer and so did not cover the peak periods of movement for pink-footed goose. Surveys undertaken in 2013 and 2014 recorded two flights of pink-footed geese, one in February and one in April, with neither crossing the Proposed Development at collision risk height. While pink-footed geese have been recorded flying over the site in spring, it is not considered to be a primary flyway due to the low number of birds observed.

7.9.14 The CRA for pink-footed goose based on the summer 2020 VP survey resulted in an estimate of 1.2 bird mortalities per year. Using a baseline population of 370,000 pink-footed geese, this represents a decrease of 0.0003% of this population.

7.9.15 This is considered to be an overestimate based on a limited data set (surveys were designed to record black-throated diver and raptor flights). Of the other pink-footed goose flights recorded in 2013-2014 and 2020, all were off-site and above collision risk height.

7.9.16 Mortality as a result of collision risk would be a permanent, adverse impact upon the population of pink-footed goose overwintering in this part of Scotland. However, the estimated mortality of 1.2 birds per year equates to 30 birds dying as a result of collision with the Proposed Development if it were operational for 30 years. Even at this likely overestimated number, it represents a low magnitude mortality rate extremely unlikely to impact upon the viability of the overwintering population of pink-footed goose. As such, the impact of collision risk upon the regionally important population is assessed to result in a negligible effect that is **not significant.**

Whooper Swan

7.9.17 A single whooper swan flight was recorded crossing the Proposed Development at collision risk height, with this flight involving two birds.

7.9.18 The CRA for whooper swan based on the winter 2020 VP survey resulted in an estimate of 0.02 bird mortalities per year. Using the baseline population of 1,474 whooper swans overwintering in Northern Scotland, this represents a decrease of 0.0017% of this population.

7.9.19 Mortality as a result of collision risk would be a permanent, adverse impact upon the population of whooper swan overwintering in Northern Scotland. However, the estimated mortality of 0.02 birds per year equates to 0.74 birds dying as a result of collision with the Proposed Development if it were operational for 30 years. This low magnitude mortality rate is extremely unlikely to impact upon the Northern Scotland wintering population or the Icelandic breeding population. As such, the impact of collision risk upon the regionally important population is assessed to result in a negligible effect that is **not significant.**

### *Decommissioning*

7.9.20 Decommissioning impacts would involve personnel and machinery accessing locations across the study area to dismantle and remove infrastructure, including turbines, hardstanding and site buildings, as detailed in Chapter 3. The wind turbines and switching station would be removed to ground level, with the concrete turbine foundations left in-situ and broken down to approximately 1 m below ground level. Switching station foundations would also be removed. The access tracks and electrical cables would be left in-situ to minimise habitat disturbance. These impacts would be short-term, intermittent and temporary and last weeks for months at any given location. Existing access tracks would be used to access the infrastructure to be decommissioned. Birds are extremely unlikely to be using any of the decommissioning work areas for breeding, however they may use areas immediately adjacent to those areas. As a result, if decommissioning works occur during the bird breeding season or close to a crossbill territory, temporary disturbance impacts are possible, however these are considered to be **extremely unlikely to be significant** for the birds of local importance breeding on-site.

## 7.10 Additional Mitigation and Enhancement

### *Mitigation During Construction*

7.10.1 Pre-felling and pre-construction surveys will be required to check for Schedule 1 species nesting on or in proximity to the Proposed Development. As detailed in Section 7.9, the two Schedule 1 species known to be present on or near the site are crossbill and greenshank, respectively. The following additional mitigation is proposed.

**Crossbill**

Pre-felling Survey

7.10.2 Felling on-site will be preceded by a survey for breeding crossbills within the Proposed Development and, as far as possible within the constraints of surveying within coniferous woodland plantation, a buffer applied of up to 50 m. Where a pair is shown to be present and unless nesting/a breeding attempt could be shown to not be occurring, given the species' year-round breeding season and following the precautionary principle, an SPP will be developed and implemented during the construction phase. The SPP will outline measures such as buffer area restrictions, safe working methods and/or watching briefs as is considered appropriate, pragmatic and feasible.

**Greenshank**

7.10.3 A pre-construction survey for greenshank would be undertaken to identify if a pair is present and a nesting attempt occurring. These surveys would commence in April of the year when felling or construction activities at the north of the site are due to be undertaken. Were a pair to be present and construction activities proposed during the period of April-July, then an SPP will be developed and implemented during the construction phase. The SPP will outline measures such as buffer area restrictions, safe working methods and/or watching briefs as appropriate, pragmatic and feasible.

### *Mitigation During Operation*

7.10.4 No additional mitigation is proposed.

### *Mitigation During Decommissioning*

7.10.5 No additional mitigation is proposed.

## 7.11 Residual Effects

### *Construction*

7.11.1 Following the implementation of all standard and additional mitigation, no significant residual effects on ornithological features are predicted.

### *Operation*

7.11.2 Following the implementation of all standard and additional mitigation, no significant residual effects on ornithological features are predicted.

### *Decommissioning*

7.11.3 Following the implementation of all standard and additional mitigation, no significant residual effects on ornithological features are predicted.

## 7.12 Cumulative Assessment

7.12.1 This section considers the potential for cumulative effects on ornithological features from those proposed, applied, under construction and consented schemes within the desk study area. Table 7.8 shows the cumulative developments that could result in cumulative effects on ornithological features in combination with the Proposed Development.

**Table 7.8 – Developments Considered in Cumulative Assessment**

| Development | Number of Turbines | Status | Distance from Proposed Development (km) |
|---|---|---|---|
| Lairg II | 10 | Consented | 11.4 |
| Braemore | 18 | Consented | 13.0 |
| Creag Riabhach | 22 | Consented | 13.4 |
| South Kilbraur | 7 | Application | 20.8 |
| Meall Buidhe | 9 | Application | 22.0 |
| Gordonbush Extension | 11 | Under Construction | 26.0 |
| Strathrory | 8 | Application | 35.6 |

### *Other Wind Farms*

Conclusion

7.12.2 All potential effects resulting from the potential impacts of the Proposed Development are either not significant or have been avoided or reduced to non-significant via standard or additional mitigation. No effects for statutory designated sites, e.g. SPAs, are predicted, either because the qualifying interest species were not recorded or a qualifying interest species occurs on or near the site, but at a distance beyond published connectivity distances for SPA species.

7.12.3 A negligible non-significant effect on the non-statutory Loch Shin IBA breeding greylag population is assessed to occur and it is possible that in combination with other projects in the Loch Shin area

within the connectivity distance of those greylag geese, e.g. Lairg II[8], a significant effect could occur. However, for that to occur, the predicted mortality rates for greylag goose for those other projects would need to be extremely high, far higher than predicted.

7.12.4 As such, **no significant cumulative effects** are predicted.

## 7.13 Summary

7.13.1 This chapter considers the potential impacts and their associated effects on ornithological features in line with best practice guidance from CIEEM.

7.13.2 Surveys were completed in 2013-2014 and breeding season surveys updated in 2020 to provide baseline information on the presence and activity of bird species. Surveys included VP surveys, black-throated diver surveys, black grouse surveys, breeding raptor surveys and BBS.

7.13.3 Bird activity on the Proposed Development site is generally low. No hen harriers or black-throated divers that could be associated with the nearby SPAs were recorded during on-site surveys in either 2013-2014 or 2020. There were no survey results of black grouse. Occasional flights by both greylag goose and pink-footed goose passed over the Proposed Development mostly above collision height.

7.13.4 Measures will be put in place to avoid disturbance of nesting birds and avoid damage to nesting birds. The predicted collision risk for the two goose species is extremely low and would not result in a significant effect on the populations of either species.

[8] The ornithology chapter for Lairg II could not be accessed during the desk survey.

**Table 7.9 – Summary of Effects**

| Description of Effect | Significance of Potential Effect | | Mitigation Measure | Significance of Residual Effect | |
|---|---|---|---|---|---|
| | Significance | Beneficial/ Adverse | | Significance | Beneficial/ Adverse |
| Construction | | | | | |
| Disturbance of greenshank | Significant effect | Adverse | Pre-felling/construction survey to develop mitigation measures if required | Not significant | Adverse |
| Disturbance of common crossbill/destruction of common crossbill nest | Significant effect | Adverse | Pre-felling/construction survey to develop mitigation measures if required | Not significant | Adverse |
| Operation | | | | | |
| Collision risk for breeding greylag goose from Loch Shin IBA | Not significant | Adverse | N/A | Not significant | Adverse |
| Collision risk for overwintering pink-footed goose | Not significant | Adverse | N/A | Not significant | Adverse |
| Collision risk for overwintering whooper swan | Not significant | Adverse | N/A | Not significant | Adverse |
| Decommissioning | | | | | |
| Disturbance of breeding birds | Not significant | Adverse | N/A | Not significant | Adverse |

## 7.14 References


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Contains Goose & Swan Monitoring Programme (GSMP) data from "WWT. (2020). Goose & Swan Monitoring Programme: survey results for Whooper Swan *Cygnus cygnus*. WWT/JNCC/NatureScot, Slimbridge" retrieved from https://monitoring.wwt.org.uk/our-work/goose-swan-monitoring-programme/species-accounts/whooper-swan/ © copyright and database right 2020. The GSMP is organised by the Wildfowl & Wetlands Trust (WWT) in partnership with the Joint Nature Conservation Committee (JNCC) and NatureScot with fieldwork conducted by volunteers.