# CHAPTER 9 Ornithology



**Figures (Volume 3)**



**Technical Appendices (Volume 4)**

# 9. Ornithology

## 9.1 Executive Summary

9.1.1 This Chapter provides the assessment of the potential effects of the proposed Achany Extension Wind Farm on bird species of conservation concern.

9.1.2 There are no statutory or non-statutory natural heritage designations within the Proposed Development's boundary. The Caithness and Sutherland Peatlands Special Protection Area (SPA) does adjoin the Site to the north-east, as does the SPA's underlying Ramsar Site and the Grudie Peatlands Site of Special Scientific Interest (SSSI). The SPA is designated for a range of breeding birds. The Ramsar site is designated for its blanket bog and breeding bird assemblage and the SSSI features of interest are blanket bog and three upland breeding waders (dunlin, golden plover and greenshank).

9.1.3 The nearest other international sites designated for birds are the Strath Carnaig and Strath Fleet Moors SPA, approximately 15km to the east, Inverpolly, Loch Urigill and nearby Lochs SPA and Lairg and Strath Brora Lochs SPA, approximately 11km from the Site. The latter two SPAs have been scoped out of the assessment as no significant effects on their associated populations are predicted alone, or in combination with other plans and projects. The potential effects of the Proposed Development are assessed on the Caithness and Sutherland Peatlands SPA, underlying Ramsar Site and the Grudie Peatlands SSSI.

9.1.4 There are no lochans or other waterbodies within the Proposed Development and these were relatively limited in the wider area or separated by substantial altitudinal differences. As a result, breeding red-throated and black-throated divers were absent from the site and survey buffer, and no flights of either species were recorded over the survey period. SPA/Ramsar qualifying ducks were only present in very limited numbers. There were no breeding greylag geese recorded.

9.1.5 No breeding raptors were identified on or in proximity to the Proposed Development.

9.1.6 Moorland breeding bird surveys identified a characteristic assemblage of species present, including dunlin, golden plover and greenshank (qualifying species of the Caithness and Sutherland Peatlands SPA/Ramsar and Grudie Peatlands SSSI).

9.1.7 There were no black grouse recorded on site, breeding (or in flight).

9.1.8 In terms of other flight activity, the comprehensive surveys conducted over the 2019 and 2020 breeding seasons revealed golden eagle activity, including over and to the northeast and northwest of the site, the distribution of which was taken into account during the turbine layout iterations. Flight activity of other raptors was limited, including SPA qualifying species hen harrier and merlin.

9.1.9 Flight activity over the 2019/2020 non-breeding season was limited, as is typical for the northern Highlands over this period, with limited flight activity recorded over the site for any species, including migrating geese or swans. Flight activity was also limited during the 2018/2019 non-breeding season, albeit flight activity surveys covered the northern part of the site only (as the Proposed Development area shifted to the south-east from April 2019, as part of the design iteration process).

9.1.10 Using the combination of desk study data and survey results, the assessment of the Proposed Development's effects on IOFs has taken into account the area's bird populations, and specifically on the Caithness and Sutherland Peatlands SPA. The

assessment considered predicted effects on the SPA qualifying species against the SPA's conservation objectives.

9.1.11 The assessment also identified the likely significance of effect on the IOF's of the Caithness and Sutherland Peatlands Ramsar site and ornithological features of its underlying Strath Grudie Peatlands SSSI. The assessment work on IOF's and on these designated sites addressedthe likely significance of effects predicted to result from the Proposed Development both alone, and in combination with other plans and projects. The assessment concluded that there would be **no significant effects** on any IOFs, and it concluded beyond reasonable scientific doubt, there would be **no likely significant effects** that would adversely affect the integrity of these designated sites.

## 9.2 Introduction

9.2.1 This Chapter provides an assessment of the predicted effects of the proposed Achany Extension Wind Farm, 'the Proposed Development', on the areas' important bird populations. The assessment covers the construction, operation and decommissioning of the Proposed Development and describes:

- the legislative background and relevant guidance;
- the surveys carried out, including their survey methodologies and results,
- the approach used to assess the predicted effect on important ornithological features (IOFs), and the criteria used to define these IOFs;
- the predicted potential effects and their significance;
- the mitigation measures proposed to address these effects; and
- the residual effects remaining after mitigation is implemented.

9.2.2 The assessment focuses on species considered to be potentially vulnerable to the effects of onshore wind farm development and whose populations are also of conservation importance internationally, nationally or in a regional context.

9.2.3 As well as the effect on these IOFs, the assessment also considers the effects of the Proposed Development on international and nationally important sites designated for their bird interest. The Chapter and its Technical Appendices include information to inform an appropriate assessment of the Proposed Development's effects on designated Special Protection Areas (SPAs), with regard to the Habitat Regulations (Conservation (Natural Habitats &c.) Regulations 1994) and the Conservation of Habitats and Species Regulations 2017 (both as amended and taking account of the Scottish Government's Guidance on the Habitats Regulations after Brexit (Scottish Government 2020)).

9.2.4 The Chapter also includes consideration of the Proposed Development's effects on Ramsar sites and Sites of Special Scientific Interest (SSSIs).

9.2.5 The potential effects are considered from the Proposed Development, itself and cumulatively from other projects.

9.2.6 The assessment is based on a combination of specifically commissioned bird surveys carried out from March 2019 to August 2020, plus comprehensive desk study data. These include results from the original Glencassley Wind Farm surveys (completed over April 2010 to March 2012), pre-and post-construction bird monitoring results from the nearby Achany Wind Farm and Rosehall Wind Farm, as well as other data sources.

9.2.7 The assessment involved consultation with relevant Statutory and non-Statutory organisations, following the issuing of an initial Scoping Report in August 2019, and a further refreshed Scoping Report in November 2020.

9.2.8 The survey approach followed published NatureScot guidance on bird monitoring for wind farms (NatureScot 2017), and the assessment of effects was carried out in accordance with Chartered Institute of Ecology and Environmental Management Guidelines (CIEEM 2018).

9.2.9 Summary information on surveys and the resulting ornithological baseline are reported in this Chapter. Details of survey methods and results are provided in a Technical Appendix to this Chapter (Technical Appendix 9.1 Ornithology Baseline, Collision Risk Modelling and Cumulative Report). This Technical Appendix includes details of breeding locations of protected species at risk from human persecution and / or disturbance.

Therefore, in accordance with the guidance on the publication of environmentally sensitive information (NatureScot 2016[1]), Technical Appendix 9.1 is issued in Confidential and Non-confidential versions (the former available to Scottish Ministers, NatureScot and the Royal Society for the Protection of Birds (RSPB). A HRA report is provided in Technical Appendix 9.2: Information to Inform a Habitats Regulations Assessment. This reviews the effects of the Proposed Development against the conservation objectives of the Caithness and Sutherland Peatlands Special Protection Area/Ramsar site, and is to assist the competent authority carry out an appropriate assessment in accordance with the Habitat Regulations (the Conservation (Natural Habitats &c.) Regulations 1994) and the Conservation of Habitats and Species Regulations 2017 (both as amended and taking account of the Scottish Government's Guidance on the Habitats Regulations after Brexit (Scottish Government 2020)).

9.2.10 A list of Technical Appendices that are relevant to this Chapter is given in Table 9.1.

**Table 9.1: Technical Appendices Supporting this Chapter**

| Technical Appendix |
|---|
| 9.1 – Ornithology Baseline, Collision Risk Modelling and Cumulative Report |
| 9.2 – Information to Inform a Habitats Regulations Assessment |
| 8.10 – Outline Habitat Management Plan |

9.2.11 This Ornithology Chapter should be read in conjunction with the development description provided in Chapter 3: Description Development**.**

9.2.12 Chapter 8: Ecology, which details the habitats identified on Site and the effects of the Proposed Development on these, also provides details of the Proposed Development's Outline Habitat Management Plan (HMP). The lead assessor for the ornithology chapter has contributed to this HMP (included in Technical Appendix 8.10). It outlines the peatland restoration measures that will have benefits for moorland breeding birds.

9.2.13 The ornithological baseline studies, evaluations and assessments presented in this Ornithology Chapter and Technical Appendices were carried out by RPS, on behalf of the Applicant. All surveys and assessments were completed by suitably experienced ornithologists and EIA practitioners. RPS staff have extensive experience with onshore wind farm development planning in Scotland including baseline ornithological surveys, wind farm design advice and impact assessment on over 35 onshore windfarm EIAs.

## 9.3 Scope of Assessment

### Study Area

9.3.1 The Study Area encompasses the area over which all desk-based and field data were gathered to inform the assessment presented in this Chapter. The Study Area comprises:

- The Site, covering the red line boundary (as defined in Chapter 3: Description of Development); and

[1] Scottish Natural Heritage (2016). Environmental Statements and Annexes of Environmentally Sensitive bird Information. Guidance for Developers, Consultants and Consultees. Available from: https://www.nature.scot/environmental-statements-and-annexesenvironmentally-sensitive-bird-information

- The Proposed Development, comprising the wind farm infrastructure only.

9.3.2 These terms are used for specific purposes in this Chapter, notably the Proposed Development when describing, for example, distances between bird interests (such as territory centres) and the nearest turbine.

9.3.3 The Study Area encompasses the area over which all desk-based and field data were gathered to inform the assessment, comprising:

- The desk study area for European sites. The distance of 20km was selected based on the core foraging range of species (NatureScot, 2012) that are qualifying features of SPAs within the area surrounding the Proposed Development and therefore considered to have the potential to be affected;
- The desk study area for IOF data searches to RSPB and the Highland Raptor Study Group (HRSG) (out to 6km around the Development Site to take account of potential golden eagle core territories); and
- The bird survey boundaries determined in accordance with NatureScot guidance on the species group being surveyed.

9.3.4 Being located adjacent to one edge of the Caithness and Sutherlands Peatlands SPA, the study area for the assessment has taken account of this SPA as a whole, plus the other SPAs within 20km of the Proposed Development. Figure 9.1 therefore shows the Proposed Development in this context, and also shows the NatureScot Natural Heritage Zones (NHZ) in the area. Although NHZ's have no planning or legal basis, for relevant species, they provide the context for assessing the effects of developments on regional bird populations.

9.3.5 Figures 9.2 and 9.3 respectively show the Proposed Development, wind farms and other developments in relation to the Caithness and Sutherland Peatlands SPA, and at the local scale. For further study area context, Figure 9.4 shows other designated sites and wind farm developments local to the Proposed Development.

9.3.6 The infrastructure footprint for the Proposed Development is shown in Figure 9.5. As both Achany and Rosehall Wind Farms are visible in the aerial photo, Figure 9.5 also helps give an appreciation of the scale of infrastructure for wind farm development, within the wider landscape.

9.3.7 Figure 9.6 shows land holding boundaries relevant to the Proposed Development (in terms of on-going land management and the Outline Habitat Management Plan) (refer to Technical Appendix 8.10 for the full extent of the HMP area).

9.3.8 In terms of the bird Study Areas themselves, vantage points and their viewsheds are shown in Figure 9.7. The survey areas for red and black-throated divers are given in Figure 9.8, and for black grouse, moorland and raptor breeding survey in Figure 9.9.

9.3.9 As the design of the Proposed Development has evolved iteratively, the Study Area, and its constituent parts, has been regularly reviewed to ensure that its extent was adequate to enable the assessment of all potentially significant effects on the ornithological features identified. Changes to the initial developable area, and the nature of the development have been reviewed in light of the ornithological features present (this being informed by the data gathering exercise) and the potential effects that could occur.

**Consultation Responses**

9.3.10 To inform the scope of the assessment for the Proposed Development, consultation was undertaken with statutory and non-statutory bodies. Table 9.2 summarises the scoping and consultation responses relevant to ornithology and nature conservation and provides information on where and/or how points raised have been addressed in this assessment.

9.3.11 Full details on the consultation responses and scoping opinion can be reviewed in Chapter 5: Scoping and Consultation, and associated appendices.

9.3.12 NatureScot also provided (in February 2021) an Excel spreadsheet of wind farm developments with potential connectivity to the Caithness and Sutherlands Peatlands SPA, to assist with the cumulative assessment. RSPB and the Highland Raptor Study Group (HRSG) also provided data search results of bird records held for the Site and a 6km radius around it.

**Table 9.2: Consultation Responses**

| Consultee and Date | Issue Raised | Response/Action Taken |
|---|---|---|
| **Scoping Consultation Responses [2019 Scoping Opinion]** | | |
| **Scottish Ministers** | **Ornithology**<br>The Company should take note of RSPB Scotland advice in respect of "scoped in effects" to be assessed for the purposes of the EIAR. It is also recommended by the Scottish Ministers that decisions on bird surveys – species, methodology, viewsheds and duration: site specific and cumulative – should be made following discussion between the Company, NatureScot and RSPB Scotland | RSPB Scotland's consultation responses have been taken into account, including in relation to scoped in effects (see below). Ornithology surveys (species, methods, viewsheds and duration) are summarised within this chapter and presented in Technical Appendix 9.1, and have taken account of feedback from NatureScot and RSPB Scotland, in tandem with guidance and professional judgement. |
| | **Habitat Management Plan**<br>The Company should take on board The Highland Council's comments regarding a Habitat Management Plan. | An outline HMP is has been produced with combined ecology and ornithology objectives. The Outline HMP is provided within Chapter 8 Technical Appendix 8.10 and aims to restore and enhance blanket bog and benefit breeding moorland birds, including qualifying wader species of the Caithness and Sutherland Peatlands SPA. |
| **NatureScot** | **Caithness and Sutherland Peatlands SPA and Ramsar Site**<br>As this proposal abuts this protected area, there is a high risk that this development could impact on a range of upland birds connected to the SPA (within and outwith the site), such as; divers, golden plover and greenshank, etc. Issues such as; displacement, disturbance and collision risk should be assessed for all stages of the development. We note that part of the development is not visible, as indicated in the vantage point (VP) and view-shed map (in proximity to VP's 3 & 5). We therefore assume that turbines are not proposed in this location as impacts to SPA birds will not have been adequately assessed. Clarification of the turbine layout would help to determine whether bird survey coverage is going to be considered sufficient. As divers use some of the lochs close to the proposal, VP survey work should be undertaken at a time of day which will maximise flight data to gauge what level of impact, if any, that this proposal might have. If divers are found to be breeding on these lochs then focal diver observations may be required. Assessments should be carried out in context to the Conservation Objectives of this SPA | Potential impacts on the Caithness and Sutherland Peatlands SPA and Ramsar Site are considered in this chapter and addressed in Technical Appendixes 9.1 and 9.2, including in relation to the SPA's Conservation Objectives. Mitigation measures are presented in Section 9.9.<br>The visible coverage from vantage points is shown in Figure 9.7 and VP selection is detailed further in paragraphs 9.5.17 to 9.5.19 and in Technical Appendix 9.1, Section 4.1). All turbine locations are visible from one or more vantage points, sufficient to encompass all flight activity in the rotor swept area. Flight activity surveys and collision risk modelling have therefore enabled impacts on SPA birds to be adequately assessed, as presented in Section 9.8 and Technical Appendices 9.1 and 9.2.<br>Baseline survey results are summarised in this chapter and presented in detail in Technical Appendix 9.1. No red or black-throated diver breeding activity was recorded during specific diver or other surveys. |

| Consultee and Date | Issue Raised | Response/Action Taken |
|---|---|---|
| | **SSSI's**<br>The proposal abuts Grudie Peatlands SSSI, which is protected for its nationally important bog habitat and breeding populations of upland birds, including: golden plover, dunlin and greenshank. Impacts on all these features should be assessed within the EIA Report. | Potential impacts on the Grudie Peatlands SSSI are considered in this chapter in Sections 9.6 and 9.8**,** and addressed in Technical Appendix 9.1**.** |
| **RSPB** | **Survey Method**<br>We note that ornithological field surveys have already started and will continue until August 2019, with a possibility of extension until August 2020. Since the original surveys are over five years old, we advocate that new surveys should continue until August 2020 to allow two new years of data collection as per NatureScot guidance.<br>In addition to the surveys already underway, targeted surveys for golden eagle within 6km of the site and red-throated and black-throated divers on all lochs and bog pools within 1km. Additional work to cover cryptic species such as wood sandpiper should also be included.<br>Current VPs do not adequately cover the proposed access tracks and it is not clear from the Scoping Report that the new access track is included in the survey boundaries.<br>In addition, we note from Figure 6 (Vantage Point Locations) that VPs 3, 4 and 5 are inside the site boundary. This is contrary to 3.8.4 of NatureScot guidance.<br>Justifying the positions of the VPs should be provided within the EIA Report to demonstrate that the survey data are adequate, robust and accurate. | The age of the original Glencassley survey data is acknowledged. However, from discussions with the long-term estate staff and comparison of previous and 2020 habitat data, it is evident that habitat conditions have remained consistent over the 2010 to 2020 period. Therefore, the original 2010 to 2020 fieldwork completed for the original Glenscassley application (SSE 2012) still provides relevant and useful data on the ornithological interests of the Proposed Development and its surroundings.<br>The contemporary surveys for this current Site were extended to August 2020. After the initial September 2018 to March 2019 non-breeding season survey, the location of the Proposed Development was moved south-east however. As a result, the Vantage Points used at the outset (September 2018) no longer encompassed all the Proposed Development's turbine array, Therefore new Vantage Points were established and used from April 2019 onwards.<br>The resulting survey coverage for the Proposed Development therefore covers the entire 2019 breeding season, the 2019/2020 non-breeding season, and the 2020 breeding season.<br>The range of surveys completed accords with NatureScot guidance, and included diver and raptor surveys (extending to 1km and 6km respectively). The extent of survey coverage is shown in Figure 9.7 for divers and Figure 9.8 for other species. Wood sandpiper were surveyed for using standard moorland breeding bird surveys as these are considered sufficient to record this species.<br>Vantage point surveys are not a relevant survey method for surveying access tracks, and would not accord with NatureScot guidance (since flight activity data are not needed to assess access track effects on birds). |

| Consultee and Date | Issue Raised | Response/Action Taken |
|---|---|---|
| | | This chapter and Technical Appendix 9.1 do however, provide details of the appropriate breeding bird surveys competed to determine baseline bird interests along the access track.<br>NatureScot guidance on vantage point location has been taken into account during survey preparations. Justification for the locations of VPs 3 and 5 is provided in this chapter (paragraphs 9.5.17 to 9.5.19) and Technical Appendix 9.1 Section 4.1, and is necessitated due to the topography surrounding and adjacent to the Proposed Development Site. |
| | **Scoped in Effects**<br>All direct and indirect impacts on birds and habitats should be scoped in to the assessment. These include displacement, disturbance and collision' risk for birds. It would be advisable to include disturbance resulting from operational turbines as well as personnel and maintenance in the assessment. | All indirect and direct impacts on birds and their habitats have been assessed and those that have been scoped in are analysed in the results sections for each species in Section 9.7 of this Chapter**,** from displacement, disturbance and collision risk. |
| | **Post-construction, Mitigation and Habitat Management Plan**<br>The EIA Report should include plans for post-construction monitoring, collision mortality and monitoring for priority species such as breeding raptors and waders. We note that there is a significant amount of land identified within the site, out with the development area, which may be used for habitat management. We would welcome positive management of land for wildlife, provided the mitigation hierarchy has been followed in the design of any proposal. We request that a detailed Habitat Management Plan (HMP) is prepared as part of the EIA and submitted with any application. In the 2012 application, we commended proposed drain blocking to improve habitat in the long-term which could help reverse the unfavourable status of golden plover on the SPA. | Pre-construction, construction and post-construction mitigation measures are provided in Section 9.9 of this chapter. These will be implemented through the final Construction Environmental Management Plan (CEMP), (an outline CEMP is provided as Chapter 3 (Technical Appendix 3.1) to minimise impacts on IOFs.<br>Details of an Outline HMP with benefits for IOFs, including golden plover and other waders, are also outlined in Chapter 8 (Technical Appendix 8.10), including undertaking re-wetting by drain blocking**.**<br>Proposals for post-construction bird monitoring are included in Section 9.9 of this chapter. |
| **The Highland Council** | **Protected Bird Species**<br>The presence of protected species such as Schedule 1 Birds or European Protected Species must be included and considered as part of the planning application process, not as an issue which can be considered at a later stage. Any consent given without due consideration to these species may breach European Directives with | Schedule 1 and Annex 1 species were included as IOF target species in the baseline surveys carried out for the Study Area. Results are summarised in this chapter in Section 9.6 and detailed in Technical Appendix 9.1. |

| Consultee and Date | Issue Raised | Response/Action Taken |
|---|---|---|
| | the possibility of consequential delays or the project being halted by the EC. Please refer to the comments of NatureScot in this respect. | |
| | **Collision Risk**<br>An assessment of the impacts to birds through collision, disturbance and displacement from foraging / breeding / roosting habitat will be required for both the proposed development site and cumulatively with other proposals. The EIAR should be clear on the survey methods and any deviations from guidance on ornithology matters. | The assessment includes effects from collision, disturbance and displacement, from the development and cumulatively. Collision risk modelling was completed and details are provided in Technical Appendix 9.1. Summary collision risk results are provided in Sections 9.7 of this chapter. Predicted effects from collision, disturbance and displacement have been considered for the Proposed Development and cumulatively, including with the other developments shown in Figure 9.2 and in Sections 9.10 of this chapter. The survey methods used accord with standard NatureScot and bird survey guidance, and any limitations are highlighted in paragraphs 9.5.53 to 9.5.57 Assumptions and Limitations. |
| **Scoping Refresh Consultation Responses [2020]** | | |
| **NatureScot** | **Protected Areas**<br>The Proposed Development abuts a component part of the Caithness and Sutherland Peatlands SPA and Ramsar Site, protected for its upland birds. | The effects of the Proposed Development on this SPA and Ramsar Site, alone and in combination with other plans and projects, is included in Sections 9.10 of this chapter. The details are presented in Technical Appendix 9.1 and Information to Inform an Appropriate Assessment is presented in Technical Appendix 9.2.<br>In response to a data search request, NatureScot also provided (in February 2021) an Excel spreadsheet of wind farm developments with potential connectivity to the Caithness and Sutherlands Peatlands SPA, to assist with the cumulative assessment. |
| **RSPB** | **White-tailed eagle**<br>White-tailed eagle breeding data within 6km should be requested from HRSG | This information was requested from the HRSG and a data search was also made to RSPB. The resulting information from both organisations was included as part of the baseline desk study. |

| Consultee and Date | Issue Raised | Response/Action Taken |
|---|---|---|
| | **Vantage Point Coverage**<br>Figure 6 in the 2019 Scoping Report and new Figure 3 show that vantage points 3, 5 and 7 do not cover the full 500m envelope around the proposed turbine locations, and they are within close proximity to some turbine locations – this will need to be justified in the EIA report. | A clear methodology and justification for vantage point selection is provided in Technical Appendix 9.1 Section 4.1, and Section 9.5 of this chapter (paragraphs 9.5.17 to 9.5.19).<br>The extent of the viewshed shown in Figure 6 of the Scoping Report and 'new Figure 3' are a GIS-generated theoretical extent based on low resolution (50m x 50m) Ordnance Survey altitude point data. It is therefore not an accurate reflection of the area actually visible to the surveyors, who were able to see the rotor swept areas of all turbines (as evidenced by flight activity monitoring results from all height bands). Figure 9.7 in this chapter shows the viewsheds calculated using OS 5m x 5m resolution point data.<br>NatureScot guidance on vantage point location has been taken into account during survey preparations. Justification for the locations of VPs 3, 5 and 7 is provided in this chapter, and is necessitated due to the topography surrounding and adjacent to the Development Site. |
| | **Cumulative Assessment**<br>Due to the increasing number of wind developments in this area of the Highlands and adjacent to the Caithness and Sutherland Peatlands SPA, a robust cumulative assessment on the SPA and NHZ populations of impacted bird species should be undertaken with regards to collision risk, displacement and barrier effects. The assessment should include other proposed, consented and operational developments and the various grid connection projects associated with these wind developments. | A cumulative assessment is provided in Section 9.10 of this chapter and developments considered include those shown in Figure 9.2. Section 9.5 provides a justification for the scoping in and out of potential cumulative effects. The effects considered cover collision risk, displacement and barrier effects, and impacts have been assessed in the context of the SPA and NHZ (shown in Figure 9.2) |

## 9.4 Legislation, Policy and Guidance

### Legislative Context

9.4.1 The following legislation has been considered in the assessment of the effects on ornithological features:

- Birds Directive (Council Directive 2009/147/EC on the Conservation of Wild Birds) and Habitats Directive (Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora) as transposed into Scots Law[2] (as provided in Scottish Government guidance) by;
  - the Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland) (the "Habitats Regulations"); and
  - The Conservation of Habitats and Species Regulations 2017 which apply in Scotland in relation to certain specific activities (reserved matters), including consents granted under Section 36 of the Electricity Act 1989;
- Wildlife and Countryside Act 1981 (as amended in Scotland);
- The Wildlife and Natural Environment (Scotland) Act 2011 (as amended) (WANE Act); and
- Nature Conservation (Scotland) Act 2004 (as amended).

### Planning Policy Context

- UK BAP (https://jncc.gov.uk/our-work/uk-bap/);
- Scottish Planning Policy (https://www.gov.scot/publications/scottish-planning-policy/);
- The Scottish Biodiversity List (https://www.nature.scot/scottish-biodiversity-list);
- The 2020 Challenge (https://www.gov.scot/publications/2020-challenge-scotlands-biodiversity-strategy-conservation-enhancement-biodiversity-scotland/); and
- The Highland BAP (https://www.highlandenvironmentforum.info/biodiversity/action-plan/).

### Technical Guidance

9.4.2 Technical guidance used to define the bird survey methods and inform this ornithology assessment are listed below (with full references given in Section 9.12):

- Band *et al*. (2007) Developing Field and Analytical Methods to Assess Avian Collision Risk at Wind Farms;
- Bright *et al*. (2016) Bird Sensitivity Map to Provide Locational Guidance for Onshore Wind Farms in Scotland;
- Chartered Institute of Ecology and Environmental Management (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1 - updated September 2019. Chartered Institute of Ecology and Environmental Management, Winchester;

[2] https://www.gov.scot/publications/eu-exit-habitats-regulations-scotland-2/
Following the EU exit, policy on the protections and standards afforded by the Habitats Regulations remains unchanged, but there have been some changes in terminology and the Scottish Ministers now exercise some functions that were previously carried out at an EU level.

- Dürr (2019) Bird Fatalities at Wind Turbines in Europe;
- Gilbert *et al*. (1998) Bird Monitoring Methods;
- Hardey *et al*. (2013) Raptors: A Field Guide to Survey and Monitoring. 3rd edition;
- Hotker *et al*. (2006) The Impact of Renewable Energy Generation on Biodiversity with Reference to Birds and Bats;
- Scottish Government (2013). The Scottish Biodiversity List (SBL);
- Scottish Government (2020) EU Exit: The Habitats Regulations in Scotland.
- NatureScot (2000) Calculating a Theoretical Collision Risk Assuming No Avoidance Action;
- NatureScot (2009a) Monitoring the Impacts of Onshore Wind Farms on Birds;
- NatureScot (2009b) Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms;
- NatureScot (2010) Use of Avoidance Rates in the NatureScot Wind Farm Collision Risk Model;
- NatureScot (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments;
- NatureScot (2013) Avoidance Rates Wintering Species of Geese in Scotland at Onshore Wind Farms;
- NatureScot (2014) Flight Speeds and Biometrics for Collision Risk Modelling;
- NatureScot (2016a) Planning for Development: What to Consider and Include in Habitat Management Plans;
- NatureScot (2016b) Wind Farm Proposals on Afforested Sites – Advice on Reducing Suitability for Hen Harrier, Merlin and Short-eared Owl;
- NatureScot (2016c) Assessing Connectivity with Special Protection Areas (SPAs);
- NatureScot (2017) Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms;
- NatureScot (2018a). Environmental Impact Assessment Handbook;
- NatureScot (2018b) Assessing Significance of Impacts from Onshore Wind Farms on Birds Outwith Designated Areas. Version 2;
- NatureScot (2018c) Avoidance Rates for the Onshore NatureScot Collision Risk Model;
- NatureScot (2020a). The Effect of Aviation Obstruction Lighting on Birds at Wind Turbines, Communication Towers and Other Structures;
- NatureScot (2020b). NatureScot 2020 General Pre-application and Scoping Advice for Onshore Wind Farms;
- Scottish Renewables, NatureScot, SEPA, Forestry Commission Scotland, Historic Environment Scotland and Marine Scotland Science (2019). Good Practice During Wind Farm Construction (4th Edition);
- Ruddock and Whitfield (2007) A review of Disturbance Distances in Selected Bird Species; and
- Wilson *et al*. (2015) Natural Heritage Zone (NHZ) Bird Population Estimates, Scottish Wind Farms Bird Steering Group (SWBSG) Commissioned Report No. 1504.

## 9.5 Methodology

**Target Species Selection**

9.5.1 NatureScot Guidance (NatureScot 2017) states that assessment of effects of wind farms on birds should be limited to protected species and other species of conservation concern that are particularly subject to adverse effects from wind farms. The Guidance states that there are three principal lists describing protected species and species of conservation concern:

- Species listed on the Birds Directive (Directive 2009/147/EC) on the Conservation of Wild Birds (up-dated in accordance with Scottish Government 2020);
- Species protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); and
- Red-listed Birds of Conservation Concern (BoCC) (Eaton *et al*. 2015).

9.5.2 In addition, special consideration should also be given to species listed on the Scottish Biodiversity list (and UKBAP Priority species), Local Biodiversity Action Plans (LBAP) and any species for which a site holds a particular concentration, such as regionally-important numbers (particularly where species are of moderate conservation concern, i.e. Amber-listed on BoCC).

9.5.3 As individual sites can vary in their ornithological sensitivity, NatureScot (2017) also recommends that survey programmes and efforts be tailored to the specific requirements of individual sites.

9.5.4 In light of this guidance, and also informed by consultation responses and desk study, the following species/groups were identified as target species:

- All qualifying birds of the Caithness and Sutherland Peatlands SPA and Ramsar site;
- Features of Interest of the Grudie Peatlands SSSI;
- All species listed on Annex 1 of the Birds Directive/Schedule 1 of Wildlife and Countryside Act (as amended);
- All wild goose, whooper swan and duck species (with the exception of Canada goose); and
- All wader species.

9.5.5 Other species/groups were identified as secondary species. These are birds which are of conservation value but not identified by NatureScot guidance as target species. Whilst fieldwork methods are not specifically targeted to assess these species, they were recorded during fieldwork and assessed for importance. The following species/groups were identified as secondary species:

- All other raptor and owl species;
- Raven; and
- Red and Amber-listed BoCC.

**Desk Study**

9.5.6 The desk study area was determined by NatureScot guidance, taking account of (i) the international, national and local statutory and non-statutory designated sites for which there could be potential connectivity with birds using the Proposed Development (based

on the core foraging range of species that are qualifying features of SPAs) (NatureScot 2016c) and (ii) the recommended survey boundaries of target species.

9.5.7 This ensured on a precautionary basis that, as a minimum, the Zone of Influence[3] (ZoI) relevant to all ornithological features was covered during baseline data collection.

9.5.8 A search was made for all designated sites of European, national or local importance with ornithological features, including Special Protection Areas (SPAs), wetlands of International Importance (Ramsar sites), Sites of Special Scientific Interest (SSSIs), National Nature Reserves (NNRs) and Local Nature Reserves (LNRs). The search considered all sites within 20km of the Proposed Development using:

- NatureScot Sitelink database website;
- Scotland's Environment website
- MAGIC Map application; and
- Joint Nature Conservation Committee (JNCC) website.

9.5.9 A desk-based data-gathering exercise was undertaken to obtain existing records of IOFs. The resulting data form part of the baseline assembled for this assessment and are included in the compilation of ornithology results presented in Technical Appendix 9.1).

9.5.10 Where appropriate, data were drawn from existing ornithological records to provide further insights into baseline bird interest, including from field surveys conducted from April 2010 to March 2012 as part of the 2012 Glencassley Wind Farm Application (SSE 2013), and from more recent pre and post-construction monitoring at Rosehall and Achany Wind Farms, plus bespoke surveys completed by RPS, the Applicant's ornithology consultants and reported in RPS (2015).

9.5.11 Table 9.3 lists the organisations and other sources that have supplied data, together with the nature of the information provided.

**Table 9.3: Main Sources of Site-Specific Desk Study Data**

| Source | Nature of Information Provided |
|---|---|
| Glencassley Wind Farm Environmental Statement 2012, Chapter 8 and associated Technical Appendices. | Extensive baseline studies were reported in the Ornithology Technical Appendix Report and Confidential Annex for the original application. Extensive breeding bird surveys were completed, covering broad buffer areas that encompass the Proposed Development, with viewsheds also covering the majority of the Proposed Development's turbine array. These survey coverages are shown in Technical Appendix 9.1 (Figures A9.1 and 9.2). |
| SSE (2019) Achany Wind Farm Bird Monitoring Report | Post-construction bird monitoring results from 2019. |
| SSE (2020) Achany Wind Farm Habitat Management Plan: 10 Year Review | Location of habitat management prescriptions, groundworks undertaken, and monitoring results. |
| RWE/E.ON Climate and Renewables (2019) Rosehall Wind Farm Monitoring Report | Post-construction bird and habitat monitoring results from 2018. |

[3] The Zone of Influence (ZoI) in this context is the area over which an individual ornithological feature may be subject to a potentially significant effect resulting from changes in the baseline environment due to the Proposed Development.

| Source | Nature of Information Provided |
|---|---|
| RPS (2015) A Review of the Combined Findings of Achany and Rosehall Wind Farms Bird Monitoring 2003-2014. | Compilation of pre and post-construction monitoring results at Achany and Rosehall Wind Farms, and additional targeted breeding wader and flight monitoring at Achany Wind Farm. |
| NatureScot's interactive map facility at (https://sitelink.nature.scot/home) | Access to data and information on key protected areas across Scotland. |
| Scotland's Environment website (https://map.environment.gov.scot/sewebmap/) | Information on the designations, hydrology, peatland, wind farm applications and forestry. |
| National Biodiversity Network (NBN) Atlas information service (https://nbnatlas.org/) | Commercially-available records of protected and/or notable species from within the last ten years. |
| Highland Raptor Study Group | Data request for records of raptor species within a 6km radius of the Site. |
| RSPB | Data request for bird records within 6km of the Site. |
| Google Maps and Google Earth websites | Review of aerial imagery to determine potential habitats and features of interest. |

**Field Surveys**

9.5.12 Bird surveys were conducted for the Proposed Development for two breeding seasons (2019 and 2020) and one non-breeding season (September 2019 to March 2020). Summary results are presented in this chapter. Vantage Point surveys covering the northern half of the Proposed Development were also conducted from September 2018 to March 2019, prior to the Proposed Development being moved to the south. The resulting additional winter's flight activity data have provided useful further context of non-breeding season activity. Further details of all surveys are described in Technical Appendix 9.1.

9.5.13 The bird surveys carried out for the Proposed Development, conducted in accordance with NatureScot guidance, were:

- Flight activity Vantage Point surveys (April 2019 to August 2020);
- Breeding Diver Surveys (2019 and 2020 breeding season);
- Breeding Raptor Surveys (2019 and 2020 breeding season);
- Moorland Breeding Bird Surveys (MBBS) (2019 and 2020 breeding season); and
- Black Grouse Surveys (2019 and 2020 breeding season).

9.5.14 These surveys used identical or comparable methods to the 2012 Glencassley ES fieldwork. Although these previous Glencassley surveys are 10 years old, in upland environments where limited habitat changes have taken place, or habitat change occurs relatively slowly, a dataset that encompasses four years' survey work (2010, 2011, 2019 and 2020), spanning a decade, helps to provide a robust and insightful dataset from which to complete the ornithological assessment. Surveys and data compilations completed by RPS (RPS 2015) from the Achany and Rosehall Wind Farms add further to the substantial body of field data available for this assessment.

9.5.15 As well as the bird surveys completed, to help further understand the distribution and nesting patterns of target bird species, consideration has also been given to the Phase 1 and National Vegetation Classification (NVC) habitat survey results reported in Chapter

8. The Phase 1 Habitat Survey was completed between 25 May and 19 June 2020, in order to update baseline results obtained to inform the 2012 Glencassley Wind Farm Environmental Statement (ES). An additional visit to map Phase 1 habitats along the length of the proposed access route was carried out on 05 November 2020 (Technical Appendix 8.1 and Figure 8.1.3). The survey was conducted in accordance with standard guidance (JNCC, 2010) to establish the presence and distribution of semi-natural vegetation within the Study Area.

9.5.16 The NVC survey, including an assessment of potential Ground Water Dependant Terrestrial Ecosystems (GWDTEs), was carried out in September 2020. This was also carried out to update baseline results from the 2012 Glencassley Wind Farm ES. Full details relating to the NVC survey results are provided in Chapter 8 Technical Appendix 8.2 and Figures 8.2.1 – 8.2.5.

Vantage Point (VP) Flight Activity Surveys

9.5.17 VP surveys are a standardised method for assessing flight activity over a site and are a method advocated by NatureScot for onshore wind developments (NatureScot 2017). A surveyor records flight path and height of target species from a fixed VP. The resulting data are used to predict a theoretical collision rate by collision risk modelling (CRM). The flight patterns also shed light on how birds use the landscape, including foraging and breeding locations.

9.5.18 NatureScot guidance identifies that where possible, VPs should be located outside the site, looking into the development area. Due to constraints including topography however, this is not always feasible (hence the 'where possible' in the guidance). Of the seven VPs covering the Proposed Development, two therefore had to be placed within the red line boundary (VPs 3 and 5). This was specifically due to the combination of topographical constraints, from the steep drop off along the west of the Site, down to Glen Cassley, and from the ridge extending south from the summit of Carn nam Bo Maola. The resulting VP locations minimised the number of VPs, in accordance with NatureScot guidance (2017), and gave visibility of all the Proposed Development's turbines and rotor swept areas. The viewsheds also provided substantial buffers around all turbines. Although these did not extend to 500m for Turbine 8 and Turbine 14, the fact that VPs were located at approximately 300m and 800m from these locations ensured accuracy of flight mapping was higher, making a 500m buffer unnecessary. The viewshed overlap therefore allowed comprehensive flight activity data to be collected, suitable for the assessment (reported in detail in Technical Appendix 9.1, Section 4.1).

9.5.19 The preference for VPs to be located outside the site is to minimise the risk of surveyors' influencing birds' behaviour and use of the immediate area. However, this can be mitigated as the surveyors are professional field ornithologists highly experienced in conducting surveys with minimal disturbance through good field craft. The location and viewsheds of each vantage point are shown in Figure 9.7.

Breeding Diver Surveys

9.5.20 Breeding diver surveys were carried out in accordance with the standard survey method for these species (Gilbert *et al*. 1998), covering the Proposed Development plus 1km, in accordance with NatureScot (2017) guidance (see Technical Appendix 9.1). The extent of the breeding diver survey area is shown in Figure 9.8.

Breeding Raptor Surveys

9.5.21 Breeding raptor surveys were carried out in accordance with the standard survey method for these species (Hardey *et al*., 2013) and in accordance with NatureScot guidance (2014, 2017). Raptor breeding territories and, if required, nest locations, were detected through a combination of walk-over surveys and fixed-point watches. Raptor surveys covered the Site plus 2km, with desk study raptor searches extended out to 6km for golden and white-tailed eagle, in accordance with NatureScot guidance. The extent of the 2km breeding raptor survey area is shown in Figure 9.9 and further survey details are provided in Technical Appendix 9.1.

Moorland Breeding Bird Surveys

9.5.22 Breeding moorland bird surveys were carried out in accordance with the standard survey method for these species (Brown and Shepherd, 1993), covering the Site plus 500m. The extent of the moorland breeding bird survey area is shown in Figure 9.9.

9.5.23 This methodology ensures surveyors methodically search within 100m of all points within the survey area. Territories of breeding birds are mapped and the final number of territories determined by reviewing the consistency of distribution and territorial behaviour across all visits. For greenshank, additional standard methods for estimating territory numbers were also used. Details of surveys and results are provided in Technical Appendix 9.1.

Black Grouse Surveys

9.5.24 Black grouse surveys were carried out in accordance with the standard survey method for this species (Etheridge and Baines, 1995 and Gilbert *et al*., 1998), covering the Site plus 1.5km (Figure 9.9) (see Technical Appendix 9.1).

**Modelling Methodology**

Collision Risk Modelling (CRM)

9.5.25 CRM is a tool for predicting the number of individuals of a target species that might collide with wind turbine rotors. Based on the model developed by Band *et al*. (2007), it is the modelling approach recommended by NatureScot (2000).

9.5.26 The CRM uses data collected at VP surveys to calculate theoretical collision risk by establishing the amount of time birds are flying through airspace potentially occupied by rotating turbine blades. The data give the typical duration birds are observed flying at potential collision height (PCH), where a collision might occur if a turbine was in place, known as the potential collision zone (PCZ).

9.5.27 The CRM model requires a minimum of at least three flights, or more than 10 individuals of a given species per survey season (i.e. breeding or non-breeding), where the flight is both at PCH and within the PCZ (for a particular turbine location). Using fewer flights, which match these criteria, would fail to give a statistically robust collision risk value when using the CRM model, as the sample of flight activity is so limited.

9.5.28 Full technical details of the CRM model, including all data input to the CRM process, is provided in Technical Appendix 9.1. This approach allows independent calculation of collision rates for the Proposed Development to be carried out and follows NatureScot Guidance (NatureScot 2000, 2014b, 2017, 2010, 2013).

**Assessment Methodology**

Identification of Potential Effects

9.5.29 The assessment process follows the approach detailed in CIEEM (2018) which places a greater emphasis on professional judgement of the reporting ornithologist.

9.5.30 For each impact with the potential to affect the relevant IOF, the assessment considers the following parameters:

- Whether the impact is positive or negative in its influence;
- The extent of the impact;
- The magnitude, duration and timing of the impact; and
- The impact's frequency and ease of reversibility.

9.5.31 The assessment identifies any potential cumulative impacts from other developments prior to determining the significance of any effect, be this negligible, minor, moderate or major. Effects could be either beneficial or adverse.

9.5.32 The effects of wind farm developments are relatively well known, as a result of monitoring before, during and post-construction, and through the inputs from Ecological Clerk of Works. Consideration of effects is typically considered in stages, covering construction, operation and decommissioning.

Potential Construction Effects

9.5.33 In general, the potential effects that could arise on birds from construction of the Proposed Development are:

- Direct temporary or permanent loss of habitat for the construction requirements (such as borrow pits) and permanent wind farm infrastructure;
- Direct physical damage to nests or nesting birds by construction traffic or personnel; and
- Disturbance and displacement from foraging or nesting areas.

Potential Operational Effects

9.5.34 The potential effects that could arise on birds during operation are:

- Displacement of foraging or nesting due to the presence of turbines or other wind farm infrastructure;
- Collision with turbines when birds are in flight;
- Barrier effects, if the presence of the turbines prevents movement across previously used airspace; and
- Disturbance from staff, vehicles or other activities during operation (e.g. lighting) or operational maintenance.

Potential Decommissioning Effects

9.5.35 The potential effects that could arise on birds from the decommissioning of the Proposed Development are anticipated to be the same as those from construction, except land take, which would be reduced (based on current knowledge and guidance). Some habitats may also be restored, following removal of parts of the wind farm infrastructure.

Potential Cumulative Construction Effects

9.5.36 The potential for cumulative effects from wind farm and other construction activity arises if construction periods overlap with each other, which means birds could be exposed to construction effects over longer periods than would otherwise be the case. The second form of cumulative effects is if the construction areas are in proximity to each other. In these circumstances, the spatial extent of a potential effect could overlap, and cumulatively cover a larger area, either effecting a greater proportion of habitat used by a territorial pair of birds, for example, or effecting a greater number of territories (or a combination of both). The potential causes of cumulative construction effects are the same set of influences as for construction effects (physical damage to nests, disturbance and displacement from foraging or nesting areas etc.).

Potential Cumulative Operational Effects

9.5.37 The potential for cumulative operational effects from wind farm operation and other developments occurs in two sets of circumstances, firstly where developments are sufficiently close together that their operational effects impact the same birds (for example where two or more developments fall within a golden eagle territory), or where the bird population within a certain area is exposed to potential effects from a number of developments farms (for example the birds of the Caithness and Sutherland Peatlands SPA). The potential causes of cumulative operational effects are the same set of influences as for operational effects (displacement, barrier effects, collision etc.).

Assessment of Residual Effects

9.5.38 The assessment of residual effects follows consideration of mitigation measures proposed to avoid or minimise the significance of predicted effect that has been assessed for the relevant IOFs. The residual effect will take into account the likely success of the proposed mitigation measures to reduce the extent, magnitude and duration of any impact prior to determining the residual significance of any effect.

*Criteria for Assessing Importance and Sensitivity of Receptors*

9.5.39 The identification of IOFs and assessing their sensitivity ('value') is guided by a range of criteria, examples of which are described in Table 9.4. These criteria are a guide and not definitive; ornithologists apply judgment based on knowledge of the region and bird populations involved.

9.5.40 Following identification of IOFs, it is necessary to determine the importance of the Site for these birds. This is assigned from international through to negligible importance (Table 9.4).

9.5.41 The site importance is a function of the species value in combination with size and nature of the population reliant upon the site. For example, where an internationally important species has only been recorded over-flying the site as a migrant, making no use of its habitats, then the site level of importance would be considered negligible.

**Table 9.4: Criteria for Assessing Importance and Sensitivity of IOFs**

| Level of Importance | Sensitivity | Example of IOF |
|---|---|---|
| International | High | Species listed as qualifying feature of an internationally designated site (SPA/Ramsar site, including candidate sites). This includes birds outside of protected areas, particularly when there is clear connectivity with |

| Level of Importance | Sensitivity | Example of IOF |
|---|---|---|
| | | internationally designated populations or where the populations are at levels with sufficient conservation importance to meet criteria for SPA selection. |
| National | High | Birds listed as Annex 1/Schedule 1 (but no connectivity with international site).A species listed as a notified feature of a nationally designated site (e.g. SSSI). |
| Regional | Medium | A bird species present in regionally-important numbers, e.g. more than 1% of regional or Natural Heritage Zone population.<br>Birds that are subject to conservation action plans e.g. Scottish Biodiversity List/UKBAP/LBAP.<br>Birds that form part of the cited interests of a Local Nature Reserve, or some local–level site designation. |
| District | Medium | Bird species where a significant proportion (greater than 1%) of the sub-regional/district population breeds within the site. |
| Local | Low | A bird species that is of nature conservation value in a local context only, with insufficient value to merit a formal designation (e.g. Red and Amber-listed BoCC species). |
| Negligible | Low | Common and widespread species of little or no conservation importance (Green-listed BoCC species). |

Criteria for Assessing Magnitude of Change

9.5.42 The magnitude of an impact is influenced by its duration, reversibility and cumulative effect with other impacts. With regard to duration of impact, it can be defined as permanent (beyond 25 years duration), long-term (15-25 years), medium-term (5-15 years) and short-term (upto 5 years). Again, knowledge of the ability of the birds to recover from impacts is required to assess the duration of the effect. For example, mortality events for species with small population sizes and low reproductive output (such as raptors) will take considerably longer to recover than abundant and widespread species that have high output so can fill vacant territories and replace numbers rapidly (e.g. small passerines such as skylark and meadow pipit).

9.5.43 The magnitude of change from a given development will differ between species and populations and therefore assessing the magnitude requires consideration of the behavioural sensitivity of the birds to the Proposed Development, population size and trends (among other considerations). Examples include the different responses by different species to disturbance, different risk of collision between species, and the greater vulnerability of small, declining and isolated populations to the impacts of additional pressures.

9.5.44 Consideration of the above factors allows quantification as to the magnitude of change. Table 9.5 presents magnitude at six levels, from Total/near total to None and this is the scale by which effector change is quantified in this Chapter. Note that the magnitude of change is sometimes readily quantified, such as a percentage change in population, range etc. However, it is often necessary to give a qualitative scale, such as high to low. Note that some of the lower magnitudes of effect can be applied to beneficial (positive) effects.

**Table 9.5: Criteria for Assessing Magnitude of Change**

| Magnitude | Typical Descriptors of Effect |
|---|---|
| Total/Near total | Would cause the loss of a major proportion or whole feature/population or cause sufficient damage to a feature so as to immediately compromise viability. Irreversible. |
| Substantial | Major effects on feature/population, which would have sufficient effect to irreversibly alter the nature of the feature in the short-to-long term and affect long-term viability. For example, more than 20% decline in population an area is able to support. |
| Moderate | Effects detectable in short and longer-term, but which should not alter the long-term viability of the feature/population, for example 10-20% decline in population an area is able to support. |
| Slight | Minor effects, ether sufficiently small-scale or short duration to not cause long-term decline in feature/population; e.g. less than a 10% decline in population that an area can support. |
| Negligible | A potential impact that is not expected to affect the feature/population in any meaningful way, with no detectable decline in population/distribution. |
| None | No impacts to feature/population. |

Criteria for Assessing Significance

9.5.45 CIEEM (2018) guidance requires a determination of whether an effect is significant or not significant. Significance of an effect is determined by a combination of the magnitude of the effect and the sensitivity of a species. Table 9.6 shows the matrix used for this assessment of effect on ornithological features.

9.5.46 As set out in CIEEM (2018), a significant effect is one that either supports or undermines biodiversity conservation objectives for an important ornithological feature. The meeting of conservation objectives is a judgement based on the species' extent, abundance and distribution on site and more widely, its population trends, and the condition of the habitats and ecosystems on which it depends.

9.5.47 As shown in Table 9.6, a significant effect is shown by Major and Major/moderate in the matrix (shaded dark grey). Moderate effects are not considered significant, based on considerations relating to the conservation objectives of the IOF.

**Table 9.6: Matrix for Determining Significance of Effects**

| | Magnitude of Change | | | | | | |
|---|---|---|---|---|---|---|---|
| **Sensitivity** | | **Total/Near Total** | **Substantial** | **Moderate** | **Slight** | **Negligible** | **None** |
| | **High** | Major | Major | Major/ moderate | Moderate | Moderate / minor | None |
| | **Medium** | Major | Major/ moderate | Moderate | Moderate / minor | Minor | None |
| | **Low** | Major | Moderate | Moderate / minor | Minor | Minor/ none | None |
| | Significant effects are in dark shading. | | | | | | |

9.5.48 The site's value in supporting the population is a key factor in this (for example, whether the site is used infrequently or at all by a species to breed, whether birds only overfly the site, making no use of it as supporting habitat, or whether the species is present in low

or high numbers or densities compared to elsewhere in its range). Moderate effects do not prejudice achievement of the species' conservation objectives at the scale that is ecologically appropriate for that IOF (national populations for wide-ranging species, for example).

9.5.49 All legally protected species and IOFs that are of sufficient importance were taken through to the next stage of the assessment. IOFs that were determined to be of local and negligible sensitivity were scoped out of the assessment. This is because effects on them would not influence the decision-making about whether or not consent should be granted for the Proposed Development (in other words a significant effect in EIA terms could not occur). This approach is consistent with that described in CIEEM (2018).

**Assumptions and Limitations**

9.5.50 As described in the Scoping Refresh (November 2019), during the design iteration approach, the location of the Proposed Development moved southwards to take account of previous landscape concerns. As a result, the initial September 2018 to March 2019 wintering season VP viewsheds did not ultimately cover all the Proposed Development. These initial viewsheds covered the north of the finalised Proposed Development only. In March 2020, new VP locations were selected and were subsequently used, covering the full Proposed Development.

9.5.51 As was widely the case in 2020 with survey work for wind farm projects in Scotland, the Covid-19 outbreak necessitated a delay to fieldwork, avoiding non-essential travel in accordance with UK and Scottish Government guidance. No fieldwork was therefore undertaken between 24 March -11 May 2020. This temporary interruption was offset by additional survey effort in May to ensure sufficient survey effort was completed in the 2020 breeding season to meet NatureScot guidance. This fieldwork amounted to 386 survey hours in May 2020, covering a combination of VP, moorland breeding bird, black grouse, diver and raptor surveys.

9.5.52 This Covid 19 restriction and the subsequent May survey effort was notified to NatureScot (David Patterson, NatureScot's Area Officer - Northern Isles and North Highland) in July 2020, and also noted in the Scoping Refresh (November 2020).

9.5.53 As a result of the additional May survey effort, it is considered there is no significant limit on the 2020 baseline dated collected.

9.5.54 No further limitations to the assessment completed for the Proposed Development were identified. Surveys, where required, have been completed as agreed with the relevant statutory agency, NatureScot, to ensure that baseline information is valid against which the assessment of effects can be completed.

9.5.55 As required by the relevant professional guidance (CIEEM, 2018), the precautionary principle has been adopted when undertaking the assessment to ensure that conclusions on residual effects are robust and realistic. Any assumptions made regarding effects to IOFs are based on current guidance, scientific knowledge, and the expert professional opinion of the author and are therefore deemed appropriate for the Proposed Development.

## 9.6 Baseline Summary

9.6.1 The description of the IOFs below provides a summary of the ornithology baseline determined through desk study and field surveys. Further details of the desk study and bird surveys are provided in Technical Appendix 9.1.

**Current Baseline**

Site Overview

9.6.2 The Site is located on the adjoining land to the north-west of the operational Achany Wind Farm. It is approximately 4.5km north of the village of Rosehall and approximately 11km west-north-west of Lairg.

9.6.3 It is an upland area of rocky hills and valleys covered with mire habitat, and forms part of a Highland deer stalking and fishing estate (see Figure 9.6). Sheep grazing ceased in the region of 20 years' ago. Muirburn has not taken place in over a decade (*pers. comm*. Glencassley Gamekeeper - Mark White).

9.6.4 The topography of the area rises very steeply from Glen Cassley, forming a south-west facing escarpment ridge on which the Site sits. This ridge is undulating, with the high point the summit of Beinn Sgeireach in the north. The topography slopes away east, dropping down to conifer plantation and the shores of Loch Shin.

9.6.5 The estate has two Scottish Rural Development Programme applications for native woodland planting. These lie outwith the Site boundary and will not alter the baseline conditions of the Proposed Development.

9.6.6 Two operational wind farms are located to the south east of the Proposed Development, namely Rosehall (19 turbines) and Achany (19 turbines) (see Figure 9.4).

Desk Study and Field Survey Results

***Designated Sites***

9.6.7 This Section describes all statutory designated sites with qualifying ornithological features that may have ecological connectivity with the Proposed Development, and screens them in or out for further consideration as IOFs.

9.6.8 Table 9.7 details all designated nature conservation sites with ornithological interest that have potential connectivity with the Proposed Development. Sites designated for ecological interests are considered in Chapter 8: Ecology.

**Table 9.7: Designated Sites**

| Site Name | Conservation Value and Qualifying Interest/Features | Distance from Proposed Development at Closest Point |
|---|---|---|
| **Caithness and Sutherland Peatlands SPA** | Internationally important site, the boundary of which is adjacent to the Proposed Development. This site is designated for supporting breeding populations of red and black-throated diver, common scoter, dunlin, golden eagle, golden plover, greenshank, hen harrier, merlin, short-eared owl, wigeon and wood sandpiper. No direct impacts to the SPA features are predicted, however, as there is a potential risk of indirect impacts through the disturbance, displacement or barrier effects, this **SPA has therefore been screened in.** | The SPA site borders the eastern boundary of the Proposed Development (See Figure 9.3) |
| **Caithness and Sutherland Peatlands Ramsar** | Internationally important site, the boundary of which is adjacent to the Proposed Development. Blanket bog, aggregation of breeding birds. Most of the Ramsar designated species are already considered above given they are SPA qualifying species also. The Ramsar species | The Ramsar site borders the eastern boundary of the Proposed Development (See Figure 9.3) |

| Site Name | Conservation Value and Qualifying Interest/Features | Distance from Proposed Development at Closest Point |
|---|---|---|
| | that are not also SPA qualifying species are Arctic skua, breeding greylag goose, and teal and curlew as assemblage species. **This Ramsar has therefore been screened in.** | |
| **Grudie Peatlands SSSI** | Nationally important site (part of the Caithness and Sutherland Peatlands SPA/Ramsar site) designated for its blanket bog and breeding populations of dunlin, golden plover and greenshank. No direct impacts to the SSSI features are predicted, however, as there is a potential risk of indirect impacts through the disturbance, displacement or barrier effects, **this SSSI has therefore been screened in.** | Adjacent to the north and north-east of the Proposed Development. |
| **Inverpolly, Loch Urigill and nearby Lochs SPA** | Internationally important site designated for breeding black-throated diver. Due to the distance from the Proposed Development, no impacts to the SPA features are predicted. **This SPA has therefore been screened out.** | 11.7km to the west of the Proposed Development (See Figure 9.3) |
| **Lairg and Strath Brora Lochs SPA/SSSI** | Internationally important site, designated for supporting breeding populations of black-throated diver. Due to the distance from the Proposed Development, no impacts to the SPA are predicted. **This SPA and SSSI have therefore been screened out.** | 11.6km to the east of the Proposed Development. |
| **Strath Carnaig and Strath Fleet Moors SPA/SSSI** | Internationally important site designated for breeding hen harrier. Due to the distance from the Proposed Development, no impacts to the SPA features are predicted. **This SPA has therefore been screened out.** | 11.6km to the east of the Proposed Development. |
| **Strath an Loin SSSI** | Nationally important site (part of the Caithness and Sutherland Peatlands SPA/Ramsar site). It does not however, have any designated ornithological features so **this SSSI has been screened out of the assessment**. | 3.3km to the north of the Proposed Development |
| **Kyle of Sutherland Marshes SSSI** | Nationally important site. It does not however, have any designated ornithological features so **this SSSI has been screened out of the assessment.** | 7km to the southeast of the Proposed Development |
| **Strath Duchally SSSI** | The site is designated for the nationally important blanket bog habitat and breeding populations of dunlin, golden plover and greenshank. Due to the distance from the Proposed Development, no impacts to the SSSI features are predicted so **this SSSI has been screened out.** | 9.5km to the north of the Proposed Development |
| **Cnoc an Alaskie SSSI** | Nationally important blanket bog habitat, populations of breeding greenshank and nationally important range of breeding upland bird species (including red-throated diver, teal, dunlin, golden eagle, merlin and wood sandpiper). Due to the distance from the Proposed Development no impacts to the SSSI features are predicted so **this SSSI has been screened out.** | 8.5km to the north of the Proposed Development. |
| **Loch Awe and Loch Ailsh SSSI** | Nationally important populations of breeding black-throated diver. Due to the distance from the | 11.6km to the east of the Proposed Development |

| Site Name | Conservation Value and Qualifying Interest/Features | Distance from Proposed Development at Closest Point |
|---|---|---|
| | Development Site no impacts to the SSSI features are predicted so **this SSSI has been screened out.** | |

9.6.9 The desk study confirmed there are no statutory designated nature conservation sites for ornithological or ecological features that occur within the site boundary of the Proposed Development.

9.6.10 The statutory sites therefore screened in are:

- Caithness and Sutherland Peatlands SPA;
- Caithness and Sutherland Peatlands Ramsar site; and
- Grudie Peatlands SSSI.

9.6.11 These are shown on Figures 9.1 and 9.3 for SPAs/Ramsar sites and Figure 9.4 for the SSSI.

***Caithness and Sutherland Peatlands SPA and Ramsar Site***

9.6.12 The Caithness and Sutherland Peatlands SPA and Ramsar sites share a boundary with the north-eastern edge of the Proposed Development (Figures 9.1 and 9.3). The SPA and Ramsar sites occupy the same area (as does the Caithness and Sutherland Peatlands Special Area of Conservation (SAC)), considered in Chapter 8: Ecology.

9.6.13 As the SPA/Ramsar site shares a boundary with the site, the survey buffers for ornithological baseline are within the designated area and all qualifying species are regarded as having potential ecological connectivity. This follows NatureScot Guidance (NatureScot 2016).

9.6.14 This SPA qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting the following important populations of bird species listed on Annex 1 of the Directive during the breeding season:

- Red-throated diver;
- Black-throated diver;
- Hen harrier;
- Golden eagle;
- Merlin;
- Short-eared owl;
- Golden plover; and
- Wood sandpiper.

9.6.15 The SPA also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species during the breeding season:

- Wigeon;
- Common scoter;
- Dunlin; and
- Greenshank.

9.6.16 Further details of the qualifying species of the Caithness and Sutherland Peatlands SPA and Ramsar site are provided in Technical Appendix 9.1.

9.6.17 The qualifying species are regarded as IOFs of international importance and form the key part of the ornithological assessment in this Chapter. Due to the possible connectivity of the Development Site and SPA qualifying bird populations, these species are also discussed in the Habitat Regulations Appraisal (HRA) in Technical Appendix 9.2**.**

9.6.18 All turbines and associated infrastructure of the Proposed Development are outside the SPA and Ramsar site boundaries. In all cases, care has been taken in the design process and formulation of the CEMP to avoid direct or indirect effects on the designated sites adjacent to the Site.

*Grudie Peatlands SSSI*

9.6.19 The Grudie Peatlands SSSI shares a boundary with the north-east edge of the Proposed Development (Figures 9.4). The SSSI also underpins the Caithness and Sutherland Peatlands SPA and Ramsar site.

9.6.20 As with the SPA/Ramsar site, the is no overlap between the Proposed Development and the SSSI.

***Species Records***

*Desk Study and Field Survey Results*

9.6.21 Combined desk study and field survey results are provided below, arranged according to species group and covering SPA qualifying species first then wider countryside Schedule 1/Annex 1 species (in alphabetical order). The resulting combined baseline findings on the Proposed Development's importance for each species are summarised in Table 9.8 for IOFs of international importance and in Table 9.9 for those of national importance.

9.6.22 For reference, the Proposed Development sits within the original Glencassley 2012 application boundary, but is smaller, occupying approximately the southern half of the original application area, and closer to the existing operational Achany Wind Farm (see Technical Appendix 9.1 for further details, notably Figures A9.1 and A9.2).

***Divers***

*Red-throated Diver*

9.6.23 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.24 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species within the Proposed Development, either breeding or flight activity. Red-throated divers were recorded flying across the site only once (on 16/03/11) during two years of ornithological monitoring and a single bird was recorded on the edge of the site on Dubh Loch Mòr and flying off it eastwards away from the Site in 2010.

9.6.25 Field survey results from September 2018 to August 2020 corroborate previous results, confirming the Proposed Development is of no importance for this species. Red-throated divers were not recorded breeding by the targeted diver surveys (across the areas shown in Figure 9.8) and the only records were two sightings of single red-throated divers recorded on Loch Sgeireach on the same day (21/07/20), firstly an individual seen with a fish on the loch, before flying north, and the other in flight over the loch. No flights were recorded across the site. Further details on the findings of the red-throated diver desk study and field survey results are provided in Technical Appendix 9.1.

9.6.26 On the basis of desk study and baseline field surveys, it is evident that the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment, other than in the HRA Technical Appendix 9.2.

*Black-throated Diver*

9.6.27 The data search carried out from RSPB to 6km of the Site boundary returned a 2016 single nesting record of this species in the last 10 years, well over 5km from the Proposed Development and at significantly lower altitude.

9.6.28 This is consistent with the findings of survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES, which identified no evidence of this species breeding within 5km of the Development Site, and no flight activity over it. Black-throated divers were occasionally recorded fishing on larger water bodies between c.400m and c.2km from the Proposed Development (Loch Shin and Loch Sgeireach, and once on Lochan a' Choire and Dubh Loch Beag).

9.6.29 Field survey results from September 2018 to August 2020 corroborate previous results, confirming the Proposed Development is of no importance for this species. There were no birds recorded during the targeted diver surveys (across the areas shown in Figure 9.8) and the only records were two birds on 14/05/2020 and an individual on 09/06/2020, recorded during the 2020 MMBS surveys on Loch Sgeireach. There were no flights recorded across the Proposed Development, identical to 2010 and 2011. Further details on the findings of the black-throated diver desk study and field survey results are provided in Technical Appendix 9.1.

9.6.30 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment, other than in the HRA (Technical Appendix 9.2).

***Raptors***

*Golden Eagle*

9.6.31 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this SPA qualifying species within the last 10 years.

9.6.32 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES confirmed no pairs of golden eagles nested within the 6km study area, with the nearest occupied territory being over 15km from the Proposed Development. An old and un-used nest over 6km to the north-west of the Proposed Development had been checked in 2009, 2010 and 2011 and confirmed as unoccupied. Non-breeding golden eagles were present recorded during the 2010 and 2011 survey work. DNA evidence from feathers collected over 1km north-east of the Development Site indicated up to five individual eagles had used that location, with other individuals also identified from DNA evidence further north in the wider region. Flight activity occurred in the non-breeding and breeding seasons, generally concentrated to the north of the current Proposed Development. In the absence of breeding territories, these are considered likely to have been sub-adult birds.

9.6.33 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 6km of the Proposed Development. Patterns of flight activity were commensurate with previous levels, with the majority of flights skirting the north and north-east of the proposed turbine array. Sufficient 'at risk' flights over the Proposed Development did occur for collision risk modelling to be carried out.

Desk study and breeding surveys out to 6km from the Proposed Development confirmed there were still no territories present in this area, with only a minority of birds recorded being adults. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.34 On the basis of desk study and field survey results, the Proposed Development is of **regional importance** for this species. Given the flight activity recorded around the Site, golden eagle was therefore taken forward for further assessment of the Proposed Development's effect.

*Hen Harrier*

9.6.35 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this SPA qualifying species within 5km in the last 10 years.

9.6.36 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site, and only four flight lines were recorded across the site during two years of survey.

9.6.37 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 2km of the Proposed Development. Patterns of flight activity were commensurate with previous levels, limited to a total of five flights from all VP surveys, all recorded in 2020, and four of which were over or in close proximity to the Development Site. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.38 On the basis of desk study and field survey results, the Proposed Development is of **regional importance** for this species. Although flight activity was limited, as these were close to the Proposed Development, this species was taken forward for further assessment of the Proposed Development's effect.

*Merlin*

9.6.39 The data search carried out from RSPB to 6km of the Site boundary returned no records of this SPA qualifying species within 5km in the last 10 years. The HRSG records identified one regularly used nesting site but beyond 1km from the Proposed Development.

9.6.40 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site. Merlin were seldom seen from VPs and were recorded flying in the site only once (in 2010 on the edge of the site at the summit of Beinn Sgeireach) during two years of ornithological surveys.

9.6.41 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 1km of the Proposed Development. Patterns of flight activity were also commensurate with 2010 and 2011 results. In 2019, one flight was recorded during VP surveys within the Development Site. In 2020, four flights were recorded during VP surveys, all within the Development Site. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.42 On the basis of desk study and field survey results, the Proposed Development is of **regional importance** for this species. Although flight activity was limited, as these were within the Proposed Development, this species was taken forward for further assessment of the Proposed Development's effect.

*Osprey*

9.6.43 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this species within 2km of the Proposed Development in the last 10 years.

9.6.44 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km to the Development Site, but flight activity did occur, concentrated to the north of the current Proposed Development towards the location of a traditional nesting location. Birds from this site were recorded crossing from Glencassley to feed in the Loch Shin catchment.

9.6.45 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 2km of the Proposed Development. Patterns of flight activity were also broadly commensurate with 2010 and 2011 results, although in 2019, no osprey flights were recorded during VP surveys. In 2020, five flights were recorded, two of which were over the Development Site. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.46 Given the absence of breeding locations within 2km of the Proposed Development, and an average of one flight per breeding season, the Proposed Development is evidently of **negligible importance** for this species, and it is not considered further in this assessment.

*Peregrine*

9.6.47 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.48 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site. Peregrines were seldom seen from VPs and were recorded flying across the site only five times during two years of ornithological surveys, twice during the 2011 breeding season, once during the 2010 to 2011 winter and twice during 2011 to 2012 winter.

9.6.49 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 2km of the Proposed Development. Patterns of flight activity were also broadly commensurate with 2010 to 2012 results, although in 2019, no peregrine flights were recorded during VP surveys. In 2020, just two flights were recorded, both immediately south-west of the access track and outwith the turbine array. Details of the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.50 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment.

*Red Kite*

9.6.51 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.52 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site, and flight activity was limited to a single flight over two years' of survey.

9.6.53 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 2km of the Proposed Development. Patterns of flight activity were also commensurate with 2010 and 2011 results. No flights were recorded during VP surveys in 2019 and only one flight in 2020. Further details on the findings of the desk study and field survey results are provided in Technical Appendix 9.1.

9.6.54 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment.

*Short-eared Owl*

9.6.55 The data search carried out from RSPB and HRSG to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.56 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site, and no flight activity was recorded over two years of survey.

9.6.57 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no occupied territories within 2km of the Proposed Development and no flights recorded.

9.6.58 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment.

*White-Tailed Eagle*

9.6.59 The data search carried out from RSPB to 6km from the Proposed Development returned no records of this species within the last 10 years. The data from the HRSG confirmed no nesting within 2km of the Proposed Development, although a sub-adult pair were associated with an osprey nest beyond this distance, and successful breeding reported in early 2021. Further details are provided in Technical Appendix 9.1**.**

9.6.60 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 6km to the Development Site. White-tailed eagles were recorded flying across the site only once during two years of ornithological survey. A regular white-tailed eagle winter roost was reported over 5km south of the Proposed Development, although checks of desk study information that a further roost was located over 5km north-west of the Proposed Development recorded no birds in that area during the 2011-2012 winter.

9.6.61 Field survey results from September 2018 to August 2020 indicate an increase in white-tailed eagle flight activity. This may correspond to the presence of birds to the north-west in Glen Cassley, in closer proximity to the site than either of these previous roost locations, or it may be a reflection of its significantly increased UK population, or both. A total of seven flights were recorded over September 2018 to March 2019, although only one of these was in proximity to the Proposed Development, skirting its northern edge. One flight was recorded in the 2019 breeding season. Three flights were recorded in September 2019 to March 2020 non-breeding season, with only one crossing the Proposed Development. No flights were recorded during the 2020 breeding season. Flight activity over the Development Site therefore remains negligible, and in behavioural terms, this is to be expected, given there is no suitable foraging habitat on or near to the Site. Further details on the findings of the desk study and field survey results are provided in Technical Appendix 9.1.

9.6.62 On the basis of desk study and 2019 and 2020 field survey results, the Development Site still however remains of **negligible importance** for this species, so it is not considered further in this assessment.

***Waders***

*Dunlin*

9.6.63 The data search carried out from RSPB within 6km of the Site boundary returned no records of this SPA qualifying species within the last 10 years.

9.6.64 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified eight pairs of Dunlin nested in its study area in 2010, and seven in 2011. Six of these pairs appeared to hold the same or similar territories between years (albeit that mapped territories are notional territory centres, based on an average 'territory centre' location from multiple sightings of birds from successive counts during the breeding season). There was very little flight activity recorded during two years of ornithological surveys.

9.6.65 Field survey results from September 2018 to August 2020 indicate similar findings to the earlier surveys. Within 500m of the Site, 12 dunlin territories were present in 2019 and eight territories in 2020 breeding season. In 2019, eight flights were recorded from VPs and in 2020 it was 19 flights. Flight activity was generally around the fringes of the site, to the north-west and south-east of the Proposed Development. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.66 Given the presence of breeding territories on and near to the Proposed Development, and despite the limited flight activity recorded, the Proposed Development is considered of **international importance** for this species and was taken forward for further assessment of the Proposed Development's effect.

*Golden Plover*

9.6.67 The data search carried out from RSPB to 6km of the Site boundary returned no records of this SPA qualifying species within the last 10 years.

9.6.68 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified 17 pairs of golden plovers nested in its study area in 2010. Eighteen pairs nested in the study area in 2011. Many of these pairs appeared to hold the same or similar territories between years. However, it should be noted that the territories are notional territory centres, based on an average 'territory centre' location from multiple sightings of birds from successive counts during the breeding season.

9.6.69 Field survey results from September 2018 to August 2020 indicate that within 500m of the Site, 24 territories were recorded in 2019, and 20 during the 2020 breeding season. Non-breeding season flights are likely to be migrant or over-wintering birds, and therefore with negligible risk of connectivity to the Caithness and Sutherlands Peatlands SPA. Twenty-two and seventeen flights were recorded across the VP survey area in the 2019 and 2020 breeding seasons respectively. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.70 Given the presence of breeding territories on and near to the Proposed Development, and the flight activity recorded, the Proposed Development is considered of **international importance** for this species and was taken forward for further assessment of the Proposed Development's effect.

*Greenshank*

9.6.71 The data search carried out from RSPB to 6km of the Site boundary returned no records of this SPA qualifying species within the last 10 years.

9.6.72 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified three greenshank pairs within the survey area and negligible flight activity over that proposed wind farm site (one flight a year). This was the result of detailed intense observations focussed on this species. Records did appear to show considerable consistency in site use over both years (consistent to the findings of Nethersole-Thompson and Nethersole-Thompson 1979).

9.6.73 Field survey results from September 2018 to August 2020 indicate in 2019, eight territories within 500m of the Site and five within 500m in 2020, applying the standard Brown and Shepherd (1993) territory interpretation. Territory mapping using the minimum pairs method gave five and two for 2019 and 2020, and the 'best estimate' method gave eight and three territories in 2019 and 2020 respectively (Bellamy and Eaton 2010). Flight activity was limited in the Development Site in both years, with 18 flights recorded across the whole flight survey area in 2019 and 10 fights in 2020. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.74 Given the presence of breeding territories on and near to the Proposed Development, and the flight activity recorded, the Proposed Development is considered of **international importance** for this species and was taken forward for further assessment of the Proposed Development's effect.

*Wood Sandpiper*

9.6.75 The data search carried out from RSPB to 6km of the Site boundary returned no records of this SPA qualifying species within the last 10 years. The only records were from 2003 and 2004, of birds in suitable breeding habitat (the dates of observations were not included), one of which was within 1km of the Proposed Development.

9.6.76 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES included specifically targeted surveys, but no sightings of wood sandpipers were made in the study area during two years of ornithological surveys.

9.6.77 No observations of wood sandpiper were made during the two further years of field survey from 2018 to 2020. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.78 Given the lack of wood sandpiper records over this extended period of fieldwork, the Proposed Development is of **negligible importance** for this species and it is not considered further in this assessment (other than in the HRA Technical Appendix 9.2) because no likely interactions with the Proposed Development are predicted.

*Curlew*

9.6.79 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species within 2km in the last 10 years.

9.6.80 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no curlew territories or flights within 1km of the site. The nearest record was a single sighting over 2km north, on the edge of Dubh Loch Mòr.

9.6.81 Field survey results from September 2018 to August 2020 indicate that within 500m of the Proposed Development, no curlew were recorded in 2019 but there were two territories in 2020, both approximately 1km from the nearest turbine. One was to the north-west of the Proposed Development, and the other just outside the Proposed Development boundary to the south-east, adjacent to the access track. No flight activity was recorded. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.82 Given the presence of breeding territories on and near to the Proposed Development, and the flight activity recorded, the Proposed Development is considered of **international importance** for this species and was taken forward for further assessment of the Proposed Development's effects.

***Wildfowl***

*Arctic Skua*

9.6.83 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.84 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site, and no flight activity was recorded over two years of survey.

9.6.85 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no nesting within 2km of the Proposed Development and no flights recorded.

9.6.86 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment.

*Greylag Geese*

9.6.87 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species.

9.6.88 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no greylag geese nesting within 2km of the site. Relatively low numbers of greylag geese flights were recorded but these were insufficient to carry-out collision risk modelling. There were also no important roost sites in the vicinity of the study area.

9.6.89 Field survey results from September 2018 to August 2020 corroborated these findings. No greylag geese were recorded nesting within 2km of the site. Flight activity was limited to three flights, all well outside the Development Site, in the 2019 breeding season. In the autumn 2019 to spring 2020 migration period, four flights (all south-westerly) were recorded, three of which crossed the Proposed Development, with just one flight recorded in the 2020 breeding season.

9.6.90 The recent exponential rate of increase in the abundance of breeding greylag geese in Scotland means that, despite being a Schedule 1 species in the North of Scotland, it is not considered a species of high conservation importance.

9.6.91 Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.92 Due to a combination of low number of flights recorded and the absence of breeding native greylag geese, the Development Site is therefore considered of **negligible importance** for this species, and it is not considered further within this assessment (other

than in the HRA Technical Appendix 9.2 for the Caithness and Sutherland Peatlands Ramsar site IOF assessment, for which breeding greylag geese are a qualifying species).

*Pink-footed Geese*

9.6.93 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species.

9.6.94 Pink-footed geese are predominantly a migrant species in the Highlands, passing through the area in autumn and spring. Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified occasional flights across the site, specifically a flight of 15 birds in October 2010 and two flights (of 34 and 100 birds in April 2011). Most other pink-footed goose sightings were skeins recorded either outside the study area, adjacent to and parallel with Loch Shin or the River Cassley or flying well over the study area.

9.6.95 Field survey results from September 2018 to August 2020 showed similar limited levels of use. Flight activity was negligible, limited to six flights in the September 2018 to March 2019 non-breeding season, only two of which crossed the Proposed Development, with one flight in the 2019 breeding season. In the September 2019 to March non-breeding season, only six flight were recorded, with three crossing the Proposed Development. There were no VP flights recorded in the 2020 breeding season. There were also no roost sites within 2km of the Proposed Development. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.96 Given the high avoidance rate for geese and the low flight activity recorded over the Site, the Proposed Development is considered of **negligible importance** for this species, and it is not considered further within this assessment because no likely interactions with the Proposed Development are predicted.

*Teal*

9.6.97 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species.

9.6.98 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm showed teal only occasionally bred within 2km around the site, and in small numbers (so the species was scoped out of that assessment).

9.6.99 Field survey results from September 2018 to August 2020 identified a small number of breeding birds, at loch sites over 1km from the Development Site. No flights were recorded during VP surveys. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.100 Given the limited activity recorded, the Proposed Development is considered of **negligible importance** for this species and it is not considered further within this assessment because no likely interactions with the Proposed Development are predicted.

*Whooper Swan*

9.6.101 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species.

9.6.102 Whooper swans are a migratory winter visitor to Scotland. Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified recorded only two flights (in winter 2010) over the survey period.

9.6.103 Field survey results from September 2018 to August 2020 were similar. Flight activity was negligible, limited to three flights in the 2018/2019 non-breeding season and one over the 2019/2020 non-breeding season (one crossing the Proposed Development). Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.104 In light of the limited flight activity, the Proposed Development is considered of **negligible importance** for this species, and it is not considered further within this assessment because no likely interactions with the Proposed Development are predicted.

*Wigeon*

9.6.105 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species within the last 10 years.

9.6.106 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no evidence of this species breeding within 2km of the Development Site, and no flight activity was recorded over two years of survey.

9.6.107 Field survey results from September 2018 to August 2020 corroborate previous results, confirming no nesting within 2km of the Proposed Development and no flights recorded.

9.6.108 On the basis of desk study and field survey results, the Proposed Development is of **negligible importance** for this species, and it is not considered further in this assessment.

***Other Species***

*Black Grouse*

9.6.109 The data search carried out from RSPB to 6km of the Site boundary returned no records of this species.

9.6.110 Field survey work carried out from April 2010 to March 2012 to inform the previous Glencassley Wind Farm ES identified no lekking males or female black grouse nesting within the site and a 1km buffer in either year. The maximum count of black grouse at leks in the study area was 17 birds (all males) in April 2010 and 24 birds (22 males and 2 females) in April 2011.

9.6.111 Field survey results from September 2018 to August 2020 recorded no flight activity over the Proposed Development in either year. There were also no leks within 1km of the Development Site. Further details on the findings of the desk study and field survey results for this species are provided in Technical Appendix 9.1.

9.6.112 The Proposed Development is considered of **negligible importance** for this species on the basis of these results, and it is not considered further within this assessment because no likely interactions with the Proposed Development are predicted.

**Future Baseline and Modifying Influence**

9.6.113 According to NatureScot (2018a), baseline studies should identify the existing processes of change in the environment, which are likely to influence the character of the site or its surroundings, so that any changes that are predicted to occur due to the Proposed Development can be distinguished from those which are expected to occur regardless. The predicted future environmental conditions which would exist if the Proposed Development did not materialise is known for EIA purposes as the 'do nothing scenario'.

9.6.114 Determining a future baseline draws upon information about the likely future use and management of the site in the absence of development, including land management,

known population trends for target species, effects driven by climate change and any other proposed developments (consented or otherwise) that may act cumulatively with the Proposed Development components to affect ornithological features.

9.6.115 The majority of the study area is presently managed as a private sporting estate for deer stalking and fishing with holiday lets for tourists. If the proposed wind farm did not go ahead, under a 'do nothing scenario', land use would therefore be likely to remain unchanged and vegetation remain similar to that shown in Figure 8.2 and 8.2.2a,b of Chapter 8: Ecology.

Developments

9.6.116 There are no forthcoming developments with planning permission or S36 consent within the site boundary and on this basis, there is no likely change to baseline conditions for the purposes of assessment.

Nearby Wind Farm Development Projects

9.6.117 The Site is situated adjacent (along its south eastern access track) to two operational wind farm schemes, Rosehall (19 turbines/operational in 2013) and Achany (19 turbines/ operational in 2010). As such, baseline conditions established for birds may be affected to some extent by actions undertaken on or around these other developments outwith the Proposed Development, including HMP implementation and decommissioning activities.

9.6.118 Consideration has been given to this potential for change, through reference to pre- and post-construction monitoring at these two wind farms. The history and further monitoring at these sites has been considered, drawing on RPS (2015) (specifically in relation to greenshank, showing the chronology of data from 2003 to 2014), and further post-construction monitoring findings from SSE Renewables for the Achany Wind Farm (SSE 2019, SSE 2020), and RWE/E.ON Climate and Renewables (2019), reporting on survey results from 2018 for Rosehall Wind Farm (noted in Table 9.3**)**.

Deer Management

9.6.119 The background to deer management in relation to the Proposed Development is explained in Chapter 8 (paras. 8.6.49-8.6.52). The reason deer management is of significance specifically for ornithology is that grazing pressure influences vegetation characteristics, particularly sward height, which in turn can create more favourable conditions for some IOFs than others. Importantly, as dead deer, gralloch and young can be a food for golden eagles, the presence of these food sources can influence the distribution of golden eagle activity. Therefore, as part of this ornithological assessment, there has been liaison between Ecology and Ornithology chapter lead authors, and the head gamekeeper on the Glencassley Estate, taking cognisance of current habitat condition, deer densities and deer movements around the Proposed Development and the Estate. This has helped inform the Outline HMP (Technical Appendix 8.10) and is further detailed within Technical Appendix 8.9 (Deer Management Plan).

**Baseline Results and the Assessment of Important Ornithological Features**

9.6.120 Drawing on the baseline findings reported above in Section 9.6, the importance of the Proposed Development for each of the IOF's has been identified, to take forward into the next stage in the assessment process. This has taken into account the definitions in Table 9.4 and the approach set out in paragraphs 9.5.39 to 9.5.41. As a result, the Site

importance for IOFs' from the Caithness and Sutherland Peatlands SPA/Ramsar site are given in Table 9.8. The importance of the Proposed Development for these species assigned on the following insights from the results of the baseline compilation of data:-

- For SPA qualifying species that breed on Site and have connectivity to the adjacent SPA, the Proposed Development is considered of International importance;
- For Ramsar designated or assemblage features that breed on Site and has connectivity to adjacent Ramsar site, the Proposed Development is considered of International importance;
- For SPA and Ramsar species that regularly use the Proposed Development during breeding season (for foraging) and have connectivity to adjacent SPA/Ramsar, the Proposed Development is considered of International importance;
- For SPA and Ramsar species that occasionally use the Site during breeding season (for foraging) and have possible connectivity to the adjacent SPA/ Ramsar site, the Proposed Development is considered of regional importance; and
- For SPA/Ramsar species not recorded from on Site or within survey buffers, the Proposed Development is considered of negligible importance.

9.6.121 The Site importance for IOFs' from the Grudie Peatlands SSSI (dunlin, golden plover and greenshank) are incorporated into Table 9.8 as they are SPA qualifying species, and Table 9.9 gives the site importance for remaining IOFs that have Schedule 1/Annex 1 status (see paragraphs 9.6.129 to 9.6.137).

Summary of the Proposed Development's Importance for IOFs of the Caithness and Sutherland Peatlands SPA

9.6.122 All named qualifying species of the Caithness and Sutherland Peatlands SPA site were categorised as of international importance for the assessment, due to the SPA proximity and the clear potential for connectivity with the Proposed Development.

9.6.123 To summarise, the baseline compilation, combining desk study and survey results, confirmed that of the SPA's 12 qualifying species, no divers, raptors or wildfowl were recorded breeding on or within 2km of the Proposed Development (i.e. no red or black-throated divers, hen harrier, golden eagle, merlin, short-eared owl, wigeon or common scoter). Of the qualifying wader species, only dunlin, golden plover and greenshank were recorded within the Proposed Development or within 2km. In common with the 2010 and 2011 fieldwork, no wood sandpiper were recorded during any surveys either. The only record of this species was from desk study data of a 2003 record within 1km of the Development Site.

9.6.124 In terms of flight activity, there were no flights recorded across the Proposed Development for red or black-throated divers, short-eared owl, wigeon or common scoter, or wood sandpiper. Flights of merlin, hen harrier and dunlin were minimal, and it was only golden eagle, golden plover and greenshank that had more frequent flight activity recorded out of the SPA qualifying species.

On this basis, the Proposed Development is of **negligible importance** for red or black-throated divers, short-eared owl, wigeon, common scoter and wood sandpiper. It is of **regional importance** for golden eagle, hen harrier and merlin, and **international importance** for dunlin, golden plover and greenshank (Table 9.8).

Summary of the Proposed Development's Importance for IOFs of the Caithness and Sutherland Peatlands Ramsar Site

9.6.125 Other than Arctic skua, curlew and breeding greylag geese, all the Caithness and Sutherland Peatlands Ramsar's qualifying species are the same as the Caithness and Sutherland Peatlands SPA, so are covered above.

9.6.126 In assessing the site importance for the three additional Ramsar qualifying features, the baseline findings confirmed there were no Arctic skua breeding within 2km or during flight activity surveys, and no breeding greylag recorded breeding within 2km. Greylag flights were recorded but were primarily wintering or migratory birds, outside potential collision risk height and/or outside the PCZ.

9.6.127 On this basis, the site is of **negligible importance** for Arctic skua and greylag geese.

9.6.128 Curlew territories were recorded, albeit in 2020 only, with two territory centres located just beyond the Proposed Development. On a precautionary basis, however, the Proposed Development was categorised as of **international Importance** for curlew, given its proximity to the Ramsar site, and the resulting potential connectivity of these curlew territories with the Ramsar site.

**Table 9.8: Baseline Summary for International IOFs of the Caithness and Sutherland Peatlands SPA/Ramsar Site**

| Species(IOF) | IOF Level of Importance | Reason for IOF Level of Importance | Site Level of Importance | Rationale for Site Level of Importance[1] |
|---|---|---|---|---|
| **Divers** | | | | |
| Red- throated diver | International | SPA feature and Ramsar: Assemblage feature | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |
| Black- throated diver | International | SPA feature and Ramsar: Assemblage feature | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |
| **Raptors** | | | | |
| Golden eagle | International | SPA feature and Ramsar nationally important feature | Regional | No breeding recorded in the 6km survey area over 2019 and 2020, (or 2011 to 2012). Suitability of site and surroundings for golden eagle foraging is mixed, based on Golden Eagle Topographic (GET) model and levels of flight activity. Although the Proposed Development is not within the core range of any golden eagle territories from the SPA/Ramsar, and the majority of birds recorded were not adults, as a precaution, flights over the site taken to indicate possible connectivity. |
| Hen harrier | International | SPA feature and Ramsar: | Regional | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). Although the Proposed |

| Species(IOF) | IOF Level of Importance | Reason for IOF Level of Importance | Site Level of Importance | Rationale for Site Level of Importance[1] |
|---|---|---|---|---|
| | | Assemblage feature | | Development is not within the core range of hen harrier territories from the SPA/Ramsar, flights over the site may indicate connectivity. |
| Merlin | International | SPA feature and Ramsar: Assemblage feature | Regional | No breeding recorded within 1km over 2019 and 2020, (or 2011 to 2012). Although the Proposed Development is not within the core range of any merlin territories from the SPA/Ramsar, flights over the site may indicate connectivity. |
| Short-earedowl | International | SPA feature and Ramsar nationally important feature | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). No flight activity indicates no significant connectivity to the SPA/Ramsar site. |
| **Waders** | | | | |
| Curlew | International | Ramsar: Assemblage feature | International | Two territories in proximity to the Proposed Development in 2020. Lack of flight activity possibly indicates lack of significant connectivity to the Ramsar site but precautionary approach taken, assuming connectivity of the Proposed Development with the Ramsar site. |
| Dunlin | International | SPA qualifying feature and Ramsar: Designated feature | International | Breeding confirmed annually within the Proposed Development and within core range of SPA/Ramsar site's breeding territories. |
| Golden plover | International | SPA feature and Ramsar: Assemblage feature | International | Breeding confirmed annually within the Proposed Development and within core range of SPA/Ramsar site's breeding territories. |
| Greenshank | International | SPA feature and Ramsar: Assemblage feature | International | Breeding confirmed annually within the Proposed Development and within core range of SPA/Ramsar site's breeding territories. |
| Wood sandpiper | International | SPA feature and Ramsar: Assemblage feature | Negligible | No breeding or flights recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |
| **Wildfowl** | | | | |
| Arctic skua | International | Ramsar nationally | Negligible | No breeding or flights recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |

| Species(IOF) | IOF Level of Importance | Reason for IOF Level of Importance | Site Level of Importance | Rationale for Site Level of Importance[1] |
|---|---|---|---|---|
| | | important feature | | |
| Common scoter | International | SPA feature & Ramsar: Assemblage feature | Negligible | No breeding or flights recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |
| Greylag goose (breeding) | International | Ramsar: designated feature | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). Of the small number of flights recorded over the site, the majority are in non-breeding period, so birds not considered part of Ramsar local breeding population. Distance from SPAs for which wintering greylag are qualifying interest and beyond connectivity distance from the Proposed Development. |
| Teal | International | Ramsar: Assemblage feature | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012). |
| Wigeon | International | SPA feature and Ramsar: Assemblage feature | Negligible | Breeding confirmed within survey area but absent from the Proposed Development, either breeding or flight activity. |

Summary of the Proposed Development's Importance for IOFs of the Grudie Peatlands SSSI

9.6.129 The Grudie Peatlands SSSI borders the site and overlaps the survey areas (Figure 9.4 and Figure 9.9), and its IOFs therefore have potential connectivity with the Proposed Development.

9.6.130 The SSSI's ornithological features (breeding dunlin, golden plover and greenshank) are all also features of the SPA/Ramsar site however, so have been considered above (included in Table 9.8). The Proposed Development is therefore of International importance for dunlin, golden plover and greenshank (as detailed in Table 9.8 above) as qualifying ornithology features of Grudie Peatlands SSSI.

9.6.131 The Kyle of Sutherland Marshes SSSI and the Strath an Loin SSSI do not have designated ornithological features so are considered in Chapter 8: Ecology.

Summary of Site Importance for Other IOFs

9.6.132 Drawing on the baseline findings reported above in Section 9.6, the importance of the Proposed Development for each of the remaining Annex 1 and Schedule 1 IOF's has been identified, to take forward (where necessary) into the next stage in the assessment process. This has taken into account the definitions in Table 9.4 and the approach set out in paragraphs 9.5.39 to 9.5.41. As a result, the Site importance for these IOFs' from the Caithness and Sutherland Peatlands SPA/Ramsar site are given in Table 9.9. The

importance of the Proposed Development for these species assigned on the following insights from the results of the baseline compilation of data:-

- For remaining Annex 1/Schedule 1 species regularly using the Proposed Development for foraging it is assigned regional importance; and
- For remaining Annex 1/Schedule 1 species rarely or not using the Proposed Development for foraging or other purposes it is assigned negligible importance;

9.6.133 Of the Annex 1 and Schedule 1 species recorded, the results from the 2019 and 2020 surveys show for osprey, the Proposed Development Site is therefore considered of **regional importance**.

9.6.134 Peregrine very rarely used the Proposed Development, with only two records during VP surveys, with no nesting recorded within 2km. The Proposed Development is considered of **negligible importance** for this species.

9.6.135 Red kite was recorded on-site with one individual flight recorded during a VP survey. The Proposed Development is therefore considered of **negligible importance** for this species.

9.6.136 The final Annex 1 and Schedule 1 species recorded was white-tailed eagle. Although white-tailed eagles are relatively sensitive to turbine collision, there are two factors that have resulted in the allocation of **negligible importance**, rather than regional. Firstly, the Proposed Development's lack of suitable foraging or nesting habitat for this species, and lack of evidence that it may lie between nesting and roosting, or foraging habitat mean that the site has no ecological or territorial significance for this species. The second reason is that as the white-tailed eagle population grows and extends its range across the UK, sites where birds are occasionally recorded will also progressively diminish in relative importance (Sansom e*t al.* 2016).

9.6.137 Black grouse was not recorded breeding on the Proposed Development and no flights were recorded, so the site is considered of **negligible importance** for this species.

**Table 9.9: Baseline Summary for Remaining National IOFs (excluding SSSI features IOFs that are SPA/Ramsar IOFs)**

| Species(IOF) | IOF Level of Importance | Reason for IOF Level of Importance | Site Level of Importance | Rationale for Site Level of Importance[1] |
|---|---|---|---|---|
| Osprey | National | Schedule 1 and Annex 1 | Regional | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012), and minimal flight activity. |
| Peregrine | National | Schedule 1 and Annex 1 | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012), and minimal flight activity. |
| Red kite | National | Schedule 1 and Annex 1 | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012), and minimal flight activity. |
| White-tailed eagle | National | Schedule 1 and Annex 1 | Negligible | Limted suitable foraging habitat in the Proposed Development and minimal flight activity over 2019 and 2020. |

| Species(IOF) | IOF Level of Importance | Reason for IOF Level of Importance | Site Level of Importance | Rationale for Site Level of Importance[1] |
|---|---|---|---|---|
| Black grouse | National | Conservation priority | Negligible | No breeding recorded in the 2km survey area over 2019 and 2020, (or 2011 to 2012), and minimal flight activity. |

*Potential IOFs Scoped-out*

9.6.138 Following the baseline assessment and consideration of the Proposed Development's importance for IOFs, the species below have not been taken forward for further assessment:

- Red-throated diver;
- Black-throated diver;
- Peregrine;
- Red kite;
- Short-eared owl;
- White-tailed eagle;
- Wood sandpiper;
- Arctic skua;
- Greylag goose;
- Common scoter;
- Pink-footed goose;
- Whooper swan;
- Teal;
- Wigeon; and
- Black grouse.

9.6.139 In accordance with convention and NatureScot Guidance, passerine species, which are typically semi- migratory and therefore only present during the breeding season, were not assessed for the Proposed Development. This group of birds is not considered susceptible to effects of wind farm development. Passerines are typically common breeding bird present throughout the Development Site and are ascribed a low sensitivity. The Bird Protection and Mitigation Plan, as part of the CEMP, and the deployment of an ornithologist and ECoW are measures proposed to mitigate disturbance and nest impacts on these species, through pre-construction breeding bird checks (see Section 9.8).

## 9.7 Potential Effects

9.7.1 The following section considers the potential effects of the Proposed Development during construction, operation and decommissioning on IOFs identified through desk study and the 2018 to 2020 baseline surveys, aiming to highlight any that are potentially significant.

9.7.2 Initially the typical generic potential effects of wind farm development on birds are highlighted, followed by species-specific assessment for each IOF scoped into the assessment.

Construction

***Land-take Effects***

9.7.3 Direct habitat loss may result in loss or fragmentation of breeding and/or foraging habitat. In the context of wind farms, this is generally considered to be of low magnitude, as construction only involves relatively small losses of land associated with turbine bases, access tracks and other infrastructure.

***Disturbance***

9.7.4 Disturbance may temporarily displace birds from breeding sites and/or foraging areas while construction is underway and where the individual is within disturbance range. The effect of disturbance on birds is species, seasonal and site specific, but may potentially affect breeding success or survival (Ruddock and Whitfield 2007).

9.7.5 In addition, with wind farm construction work undertaken during the breeding season there is a risk of illegal destruction (or disturbance to occupied bird nests in the case of Annex 1 species)[4]. The nests of all bird species are protected by law and it is necessary to take measures to ensure compliance with the appropriate legislation, as highlighted in the Legislation and Policy Context, Section 9.4 of this Chapter.

Operational

***Disturbance***

9.7.6 The maintenance activity at an operational wind farm does have the potential to cause disturbance to birds but it tends to be short-term (shorter than during construction), infrequent and highly localised. It is also reversable. Therefore, operational disturbance is not considered to be significant.

***Displacement***

9.7.7 The presence and operation of turbines throughout the 50-year lifespan of the Proposed Development does have the potential to cause displacement from nesting and foraging habitat. Again, displacement effects are species, season and site specific, and individual birds may also respond differently. Habituation to the presence of turbines is also possible, reducing the impact of displacement over time.

9.7.8 Studies relating to the effect of wind farms on bird behaviour have shown that in general bird species are not disturbed beyond 800m from turbines and in some cases have not been disturbed at all. References are noted in the species assessments below.

***Collisions with Turbines***

9.7.9 Bird collisions with turbine blades will usually be fatal, and birds can also die from collision with turbine towers. The effect of an individual loss on a population is influenced by several characteristics of the affected populations, notably its size, density, recruitment rate (additions to the population through reproduction or immigration) and mortality rate (the natural rate of losses due to death or emigration).

[4] The breeding season is generally April to July for most species but there are some species differences, given in NatureScot (2014).

***Barrier Effect***

9.7.10 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. This could potentially reduce access to foraging, roosting or nesting opportunities, or increase energy expenditure to reach these resources.

***Potential Decommissioning Effects***

9.7.11 The potential effects that could arise on birds from decommissioning of the Proposed Development would be the same as those from construction, other than loss of habitat (on the basis that the decommissioning process would not require more land than previously used).

***Cumulative Effects***

9.7.12 The potential for cumulative effects on birds arises from construction and operational phases of development. Cumulative wind farm construction effects can arise if construction periods overlap and, in these circumstances, the extent of physical damage to nests, or disturbance, can cover a larger area than would be the case from an individual development. Therefore, cumulative construction impacts can either effect a greater proportion of habitat used by a territorial pair of birds or effect a greater number of territories (or a combination of both).

9.7.13 The sources of cumulative operational effects from wind farms are considered to be mainly from cumulative collision, displacement and in certain circumstances, barrier effects. In relation to collision, for example, the cumulative number of bird fatalities within an area may have a significant effect on a territory, local or regional population, when all predicted collisions from wind farms are combined.

***Effects Scoped Out***

9.7.14 There are no anticipated significant secondary effects on any target species as a result of construction or operation of the Proposed Development. These include indirect effects on birds, for example a reduction in fitness or breeding productivity due to a reduction in quality of foraging habitat or prey numbers, rather than a direct exclusion or fatality. Any displacement of prey species would be at a highly localised scale around turbines, and as such, all **secondary effects are not considered to be significant** and are scoped out of further assessment.

***Potential Effects on IOFs Taken into the Assessment Process (Prior to Mitigation)***

9.7.15 The remainder of this Section considers the potential effects of the Proposed Development during construction and operation on IOFs identified through desk study and the 2018 to 2020 baseline surveys, aiming to highlight any effects that are potentially significant.

9.7.16 The potential effects are described for each IOF scoped into the assessment. Table 9.16 then gives the summary of predicted significance for construction and operational phases of the Proposed Development on IOFs taken forward into the assessment process.

9.7.17 In accordance with good environmental assessment practice (NatureScot 2018a), a precautionary approach has been taken, drawing on the range of impact evidence available on bird/wind farm interactions, so that risks of impacts are fully accounted for, prior to mitigation.

Golden Eagle

***Construction Effects***

*Direct Land Take*

9.7.18 The direct loss of habitat due to construction of wind farm infrastructure is recognised as having negligible effect on birds (Bright *et al.*, 2008) because the habitat lost is relatively small compared to the habitat available within a bird's territory. This is particularly the case for sub-adult golden eagles, who have particularly extensive ranges. Even for adult birds, ranges nominally extend to approximately a 6km radius from the nest location, so the scale of direct land take even in those circumstances is insignificant (the scale of wind farm infrastructure can be seen in Figure 9.5, for example, where the Achany and Rosehall operational wind farms can be seen, set in the wider landscape context). The land take from construction, even including the additional areas needed for construction compounds, laydown areas and borrow pit excavation, are therefore not predicted to have a significant effect on this species. No negative effects on golden eagles are therefore predicted from direct land take.

*Disturbance*

9.7.19 In the absence of nesting or roost areas in proximity to the Proposed Development, no visual or noise disturbance is predicted to affect this species.

***Operational Effects***

*Disturbance*

9.7.20 Noise levels generated by an operational wind farm are limited, and the potential sources of visual disturbance are also relatively minor. Operational activities are also likely to be localised around particular turbines or short stretches of track, and shorter-term. As a result of these characteristics, and the absence of nesting or roosting sites in disturbance range for this species, the predicted effect of operational disturbance to golden eagle is negligible.

*Displacement*

9.7.21 Increasing evidence suggests that both juvenile and adult golden eagles actively avoid turbines (Fielding *et al.* 2019a). This displaces them from the wind farm footprint, which could have consequences for foraging efficiency and access to prey in areas where eagles might otherwise hunt. It could also interfere with territorial behaviour, where birds from neighbouring territories interact.

9.7.22 Part of this evidence is derived from satellite tracking golden eagles revealing how individuals use the landscape, helping to determine the key influences on flight distribution. The availability of ridges and slopes in the landscapes has been identified as the main determinant of flight distribution, in areas where golden eagle occur, resulting in the Golden Eagle Topography (GET) Model (Fielding *et al.* 2019b). Based on a ranking of grid squares from zero to 10, this model identifies the relative suitability of the landscape to support golden eagles flight activity. Although primarily derived from tracking of juvenile golden eagles, it is thought to indicate the relative suitability of the landscape for flights by all golden eagle age groups (Figure 9.10).

9.7.23 The flight activity surveys identified flight activity over and around the Development Site by golden eagles in 2019 and 2020, with the main focus of flight activity being to the north and north-east (Figure 9A, Technical Appendix 9.1). Given the avoidance of wind farms

by golden eagles, and this pattern of flights recorded, a relatively low proportion of eagle activity would be deterred from the turbine footprint once the wind farm was operational, potentially diverting birds north around the turbines along Beinn Sgeireach's south-western and southern slopes, or to the north-east in the area between Loch Seireach to Loch an Rasail north-east of the Development Site. Of the 55 flights recorded in 2019 during VP surveys or during other surveys, only 10 out of 55 flights would require birds to divert more than approximately 500m to avoid the turbines. Five of the 20 flights recorded in 2020 would require such actions (i.e. approximately 18-25% in 2019 and 2020 respectively).

9.7.24 Such relatively minor diversions for this relatively limited proportion of birds indicates that the predicted energetic effect on golden eagles from displacement would be negligible.

9.7.25 In terms of habitat displacement, surveys showed no particular dependence on the Proposed Development by golden eagles for foraging (or other activities). Discussions with Glencassley Estate's head keeper on deer movements also confirm relatively limited use of the Proposed Development by deer (given their preference for lower altitude areas). As a result, the likelihood of golden eagles being reliant on deer carrion availability in the Site is negligible. In light of this, and given the absence of territories within at least 6km, and the fact that the majority of birds recorded were sub-adults, even complete exclusion from the Proposed Development is therefore considered to represent negligible loss of suitable habitat within these birds' foraging ranges.

*Collision Risk*

9.7.26 Collision risk modelling was completed for the 2019 and 2020 breeding seasons, and for the 2019/2020 non-breeding season. Predicted mortalities were relatively low, based on an avoidance rate of 99%, at 0.11 collisions for the 2019 breeding season, and 0.02 a year for 2020 (giving a breeding season mean of 0.07), with the addition of 0.07 for the 2018/2019 non-breeding season and 0.03 for the 2019/2020 non-breeding season (giving a non-breeding season mean of 0.05), totalling 0.12 birds annually. This equates to one bird every nine years, or six birds over the 50-year lifetime of the wind farm (assuming a 99% per cent avoidance rate). Further details of the CRM carried out are provided in Technical Appendix 9.1).

*Barrier Effects*

9.7.27 The Development Site does not lie between nest sites and foraging areas, or between nest sites and roosts. It is therefore not likely to present a barrier to golden eagle movement or territorial interaction, especially as there is clearly a commonly used area to the north of the site, that provides a route around the turbine array.

***Decommissioning Effects***

9.7.28 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Golden Eagle (Prior to Mitigation)***

9.7.29 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects other than from collision risk, for which the magnitude is slight.

For this IOF of international importance, for which the Proposed Development is of regional importance, the predicted effects are **minor to moderate/minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Hen Harrier

***Construction Effects***

*Direct Land Take*

9.7.30 The direct loss of habitat due to construction of wind farm infrastructure is predicted to have negligible effect on this species, given no nesting birds were recorded within 2km and harriers were very rarely recorded in or near to the Proposed Development (Figure A9.9 Technical Appendix 9.1).

*Disturbance*

9.7.31 In the absence of nesting or roost areas in proximity to the Proposed Development, no visual or noise disturbance is predicted to affect this species.

***Operational Effects***

*Disturbance*

9.7.32 Given the absence of nesting sites within 2km of the Proposed Development, the predicted effect of operational disturbance to hen harrier is negligible.

*Displacement*

9.7.33 There is evidence to suggest localised displacement around turbines (Howarth and Fielding 2015) but this is generally considered of limited negative effect because the area birds are displaced from is a small fraction of their potential foraging range (*ibid.*). For the Development Site, the level of harrier flight activity was so low that displacement effects would, in any case, be negligible.

*Collision Risk*

9.7.34 The number of 'at risk' flights recorded during 2019 and 2020 was so low (zero in 2019 and three in 2020), that collision risk modelling was not merited (collision risk modelling with three or less flights is unlikely to generate reliable predicted collision rates, as the sample size is so small). The predicted effect of the Proposed Development on hen harrier from collision is therefore considered negligible.

*Barrier Effects*

9.7.35 The Development Site does not lie between nest sites and foraging areas. In combination with the fact that flight activity was so limited, any barrier effects are considered to be negligible.

***Decommissioning Effects***

9.7.36 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Hen Harrier (Prior to Mitigation)***

9.7.37 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects. For this IOF of international importance, for which the Proposed Development is of regional importance, the predicted effects are **minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Merlin

***Construction Effects***

*Direct Land Take*

9.7.38 The direct loss of habitat due to construction of wind farm infrastructure is predicted to have negligible effect on this species, given no nesting birds were recorded within 2km and merlin were very rarely recorded in or near to the Proposed Development (Figures A9.10-A9.12 Technical Appendix 9.1).

*Disturbance*

9.7.39 In the absence of nesting areas in proximity to the Proposed Development, the predicted effects from visual and noise disturbance is negligible for this species.

***Operational Effects***

*Disturbance*

9.7.40 Given the absence of nesting sites within 1km of the Proposed Development, the predicted effect of operational disturbance on merlin is negligible.

*Displacement*

9.7.41 There is limited evidence on displacement of merlin at wind farms but it is generally considered of limited negative effect because the area birds may be displaced from is a small fraction of their potential 5km foraging range (NatureScot 2016). For the Development Site, the level of merlin activity was so low in 2019 and 2020 that displacement effects would be negligible.

*Collision Risk*

9.7.42 The number of 'at risk' flights recorded during 2019 and 2020 was so low (limited to two flights in the 2020 breeding season), that collision risk modelling was not merited. The predicted effect of the Proposed Development on merlin from collision is therefore considered negligible.

*Barrier Effects*

9.7.43 The Development Site does not lie between nest sites and foraging areas. In combination with the fact that flight activity was so limited, any barrier effects are considered to be negligible.

***Decommissioning Effects***

9.7.44 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Merlin (Prior to Mitigation)***

9.7.45 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects. For this IOF of international importance, for which the Proposed Development is of regional importance, the predicted effects are **minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Curlew

***Construction Effects***

*Direct Land Take*

9.7.46 The proposed access track will intersect the territory centre of one breeding curlew pair recorded in proximity to the Development Site (Figure A9.20 Technical Appendix 9.1). When assigning a territory centre unless a direct indicative sign is located (i.e. an active nest) the centre of relevant registrations is assigned based on a central location of activity recorded. This can mean that although the territory centre has been assigned where the access track is due to be situated, in reality it could be some distance away.

9.7.47 Nonetheless, it is still prudent to assume that the territory centre is in an area of importance to this species associated with foraging activity even though it may not be a representation of the nesting location. The land take will result in a small proportion of foraging area being permanently lost, the extent of which is not considered to be significant.

*Disturbance*

9.7.48 In a worst-case scenario, one breeding pair of curlew will be displaced from within the immediate vicinity of works. There is extensive suitable habitat across the Site and within the wider landscape that will offer alternatives should the worst-case be realised. This will only be a temporary effect during the construction phase of the Proposed Development, which once completed will allow curlew to reoccupy an area close to the current territory centre. On this basis the magnitude of effect is therefore considered to be negligible.

***Operational Effects***

*Disturbance*

9.7.49 Once a wind farm becomes operational, sources of disturbance are considerably reduced. As a result, no reduction in breeding territories or breeding success would be anticipated from operational disturbance.

*Displacement*

9.7.50 Curlew are particularly susceptible to the effects of displacement by wind farms (Humphreys *et al.* 2015a). Multi-site studies have shown a reduction in the occurrence in proximity to turbines, with breeding birds showing behavioural avoidance up to 800m (Pearce-Higgins *et al.* 2009). Pearce-Higgins *et al.* (2012) also concluded curlew density within 500m of turbines decreased an estimated 42% (with a 95% confidence interval of 3–73%). The two putative curlew territory centres are at sufficient (over 1km) distance from the nearest turbines to not be affected, however, should these more precautionary distances apply. There is, however, also evidence that curlew can breed relatively close to turbines (Whitfield *et al.* 2010).

9.7.51 No curlew flight activity was recorded during the surveys, suggesting limited use is being made of the Development Site. In the context of the wider surrounding landscape, as noted above, there is extensive suitable habitat that will provide displaced birds with suitable alternative, and therefore the magnitude of this effect is considered to be negligible.

*Collision Risk*

9.7.52 No 'at risk' flights were recorded during 2019 and 2020 so the predicted effect of the Proposed Development on curlew from collision is therefore negligible.

*Barrier Effects*

9.7.53 The Development Site does not lie between nest sites and foraging areas. In combination with the fact that flight activity was not recorded across or adjacent to the Development Site, any barrier effects are considered to be negligible.

***Decommissioning Effects***

9.7.54 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Curlew (Prior to Mitigation)***

9.7.55 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects. For this IOF of international importance, for which the Proposed Development is of international importance, the predicted effects are **Moderate/minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Dunlin

***Construction Effects***

*Direct Land Take*

9.7.56 The direct loss of habitat due to construction of wind farm infrastructure is predicted to have negligible effect on this species, despite there being nesting dunlin recorded within the Development Site (Figures A9.21 and A9.22 Technical Appendix 9.1). Dunlin forage in wetter bog habitats, and land take is not likely to affect these areas, given they are avoided by the Proposed Development's infrastructure layout. Dunlin also evidently vary nesting location and are not tied to a particular location so it is likely sufficient habitat extent would remain to accommodate the same number of territories, despite the land take from the wind farm.

*Disturbance*

9.7.57 The distances at which dunlin would be disturbed from foraging or nesting locations is dependent on various factors, including line of sight, the frequency and duration of a potentially disturbing episode, the suddenness and nature of noise, and the degree of habituation the individual bird has developed.

9.7.58 Dunlin can be relatively confiding, remaining despite close proximity to disturbance sources and with a flight initiation distance (FID) of an estimated 75m (Cutts *et al.,* 2013).

During the breeding season, disturbance distances could be higher however as birds are more alert, especially when with young.

9.7.59 Table 9.10 shows the number of putative dunlin territories that would therefore potentially be disturbed if uniform precautionary disturbance distances of 500m or 250m were applied to the Proposed Development. These disturbance risk distances are highly precautionary in reality however, since not only do they exceed the 75m FID figure from Cutts *et al.,* (2013), visual disturbance at this distance assumes birds have clear line of sight from wherever they are to sources of potential disturbance, which is unlikely to be the case. Furthermore, in reality there is not continuous disturbance from all locations at all times, and not all activities are equally disturbing. It is highly unlikely therefore, that all territories within these distances would be disturbed, before mitigation.

**Table 9.10: Maximum Number of Dunlin Territories At Potential Risk From Construction Disturbance (Before Mitigation)**

| | **Number of Territories At Potential Risk From Construction Disturbance** | | | |
|---|---|---|---|---|
| | **In and Around the Proposed Development, Assuming Disturbance Distance to:-** | | **In the Caithness and Sutherland Peatlands SPA Assuming Disturbance Distance from the Development Site to:-** | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 12* | 4** | 6 | 0 |
| **2020** | 5 | 1 | 4 | 0 |
| **Mean** | 8.5 | 2.5 | 5.0 | 0.0 |
| | **% of NHZ Population (% of NHZ population at lower and upper confidence intervals)** | | **% of Caithness and Sutherland Peatlands SPA Population (1,860 pairs)** | |
| **2019** | 0.5 (1.8-0.3) | 0.2 (0.6-0.1) | 0.3 | 0.0 |
| **2020** | 0.2 (0.7-0.1) | 0.0 (0.0-0.0) | 0.2 | 0.0 |
| **Mean** | 0.4 (1.3-0.2) | 0.1 (0.4-0.1) | 0.3 | 0.0 |

**Note:** The dunlin NHZ population estimate is from Wilson *et al.* (2015) at 2,196 breeding pairs (confidence intervals 671-3,722)

* Includes 1 territory that just falls outside the 500m buffer but it has been counted as an added precaution, in case micrositing of turbines ultimately led to it being inside the 500m buffer

** Only 1 territory falls in the 250m buffer, but as 3 additional putative territory locations are just beyond 250m buffer, these have been added as a precaution, in case micrositing of turbines ultimately led to them falling inside the 250m buffer

9.7.60 This disturbance (prior to mitigation) would be temporary, applying only during the breeding seasons over the construction period. Assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) would be 1.8% or 0.3% of those populations respectively.

9.7.61 In reality, the number of territories would be much lower (prior to mitigation). If the 250m disturbance distance was applied to the Proposed Development (closer to the 75m FID of Cutts *et. al.* 2013), no SPA dunlin territories would be within this impact zone and none would likely be displaced (Figures A9.21 and A9.22 Technical Appendix 9.1).

9.7.62 Taking a highly precautionary approach, and prior to mitigation, the effect of potential construction disturbance on dunlin (before mitigation) would be of negligible magnitude.

***Operational Effects***

*Disturbance*

9.7.63 Once the wind farm is operational, sources of disturbance are considerably reduced. As a result, and given the 75m FID for dunlin, (Cutts *et. al.* 2013), no reduction in breeding territories or breeding success would be anticipated from operational disturbance.

*Displacement*

9.7.64 Following a comprehensive review of available evidence, Humphreys *et al.* (2015b) suggested displacement effects from operational wind turbines on dunlin nesting distribution were limited, citing research by Pearce-Higgins *et al.* (2012) which found no evidence of wind farm displacement on nesting dunlin in their multi-site analysis.

9.7.65 Work by Fielding and Haworth (2015) at the Farr Wind Farm, however, did suggest some avoidance may occur, of nesting closer than 250m to wind turbines. Post-construction monitoring in 2019 at the Achany Wind Farm for the first time since monitoring began at the site (pre-construction) in 2003, had a dunlin territory recorded, at a distance of approximately 250m from the closest wind turbine (SSE 2019).

9.7.66 Applying a precautionary displacement distance of 500m from operational turbines, the number of dunlin territories that could be permanently displaced is shown in Table 9.11, along with the number of territories displaced at 250m.

**Table 9.11: Maximum Number of Dunlin Territories At Risk From Operational Displacement (Before Mitigation)**

| | **Number of Territories At Risk from Operational Displacement** | | | |
|---|---|---|---|---|
| | **In and Around the Proposed Development, Assuming Displacement Distance of:-** | | **In the Caithness and Sutherland Peatlands SPA Assuming Displacement Distance from the Development Site of:-** | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 6 | 2* | 4** | 0 |
| **2020** | 4 | 0 | 4 | 0 |
| **Mean** | 5.0 | 1.0 | 4.0 | 0.0 |
| | **% of NHZ Population (% of NHZ population at lower and upper confidence intervals)** | | **% of Caithness and Sutherland Peatlands SPA Population (1,860 pairs)** | |
| **2019** | 0.3 (0.9-0.2) | 0.1 (0.3-0.1) | 0.2 | 0.0 |
| **2020** | 0.2 (0.6-0.1) | 0.0 (0.0-0.0) | 0.2 | 0.0 |
| | 0.2 (0.7-0.1) | 0.0 (0.0-0.0) | 0.2 | 0.0 |

**Note:** The dunlin NHZ population estimate is from Wilson *et al.* (2015) at 2,196 breeding pairs (confidence intervals 671-3,722).

* Only 1 territory falls in the 250m buffer, but as 1 additional putative territory location is just beyond 250m buffer, this has been included as an added precaution, in case micrositing of turbines ultimately led to it falling inside the 250m buffer.

| | Number of Territories At Risk from Operational Displacement |
|---|---|
| ** Only 2 territories fall in the 500m buffer, but as 2 additional putative territory locations are just beyond 500m buffer, these have been included as an added precaution, in case micrositing of turbines ultimately led to these territories falling inside the 500m buffer. | |

9.7.67 Even using a highly precautionary displacement distance of 500m, and assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) from the operational phase would be less than 0.9% and 0.2% of those populations respectively, and therefore of negligible magnitude.

*Collision Risk*

9.7.68 Three 'at risk' flights were recorded during 2019 and none in 2020, resulting in a mean predicted collision rate for 2019 and 2020 of 0.001 birds per breeding season. The predicted effect of the Proposed Development on dunlin from collision is therefore negligible.

*Barrier Effects*

9.7.69 The Development Site is considered unlikely to present a barrier to dunlin movements (beyond the risk of displacement, discussed above). Turbine spacing is sufficient for birds to fly between, with flight heights also typically below PCH. The species also forages relatively close to its nesting areas (NatureScot 2016c) so again the wind farm infrastructure is less likely to interfere with these small scale movements. Therefore, barrier effects are considered to be negligible.

***Decommissioning Effects***

9.7.70 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Dunlin (Prior to Mitigation)***

9.7.71 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects (none for barrier effects). For this IOF of international importance, for which the Proposed Development is of international importance, the predicted effects are **Moderate**/**minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Golden Plover

***Construction Effects***

*Direct Land Take*

9.7.72 The direct loss of habitat due to construction of wind farm infrastructure is predicted to have negligible effect on this species, despite there being nesting golden plover recorded within the Proposed Development (Figures A9.23 to A9.26 Technical Appendix 9.1). Golden plover evidently vary nesting location and are not tied to a particular location, so it is likely sufficient habitat remain to accommodate the same number of territories, despite the land take from the wind farm.

*Disturbance*

9.7.73 Golden plover are moderately sensitive to disturbance, having a flight initiation distance to a disturbance source of approximately 200m (Cutts *et al.* 2013). It should be noted that during the breeding season this could be higher as birds are more alert, especially when adults have young.

9.7.74 Table 9.12 shows the number of putative golden plover territories that would therefore potentially be disturbed if a uniform disturbance distance of 500m or 250m was applied to the Proposed Development. These disturbance risk distances are highly precautionary in reality, since not only do they exceed the FID figure from Cutts *et al.,* (2013), visual disturbance at this distance assumes birds have clear line of sight from their location to sources of potential visual disturbance, which is unlikely to be the case. Furthermore, in reality there is not continuous disturbance from all locations at all times, and not all activities are equally disturbing. It is highly unlikely therefore, that all territories within these distances would be disturbed, before mitigation.

**Table 9.12: Maximum Number of Golden Plover Territories Temporarily At Risk From Construction Disturbance (Before Mitigation)**

| | **Number of Territories At Potential Risk From Construction Disturbance** | | | |
|---|---|---|---|---|
| | **In and Around the Proposed Development, Assuming Disturbance Distance to:-** | | **In the Caithness and Sutherland Peatlands SPA Assuming Disturbance Distance from the Development Site to:-** | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 14 | 9* | 2 | 2 |
| **2020** | 10 | 6 | 3 | 1 |
| **Mean** | 12.0 | 7.5 | 2.5 | 1.5 |
| | **% of NHZ Population (% of NHZ population at lower and upper confidence intervals) 3,125 pairs (2,907-3,343)** | | **% of Caithness and Sutherland Peatlands SPA Population (1,064 pairs)** | |
| **2019** | 0.4 (0.5-0.4) | 0.3 (0.3-0.3) | 0.2 | 0.2 |
| **2020** | 0.3 (0.3-0.3) | 0.2 (0.2-0.2) | 0.3 | 0.1 |
| **Mean** | 0.4 (0.5-0.4) | 0.2 (0.3-0.2) | 0.3 | 0.2 |

**Note:** The golden plover NHZ population estimate is from Wilson *et al.* (2015) at 3,125 breeding pairs (confidence intervals 2,907-3,343)

* Includes 1 territory that falls just outside the 250m buffer but it has been counted as an added precaution, in case micrositing of turbines ultimately led to it being inside the 250m buffer

** Only 1 territory falls in the 250m buffer, but as 3 additional putative territory locations are just beyond 250m buffer, these have been added as a precaution, in case micrositing of turbines ultimately led to them falling inside the 250m buffer

9.7.75 This precautionary scale of disturbance (prior to mitigation) is temporary, applying only during the breeding seasons over the construction period. Assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) would be 0.5% or 0.3% of those populations respectively.

9.7.76 Taking a highly precautionary approach, and prior to mitigation, the effect of construction disturbance on golden plover would be of negligible magnitude.

***Operational Effects***

*Disturbance*

9.7.77 Once the wind farm is operational, sources of disturbance are considerably reduced, to intermittent occasional activity from maintenance personnel, mainly in vehicles (and therefore less likely to cause any disturbance). Furthermore, disturbance will be confined to within the infrastructure and turbine footprint. Using the 200m FID distance for this species, the reduced likelihood and highly localised risk of disturbance means that overall predicted effects of operational disturbance are of negligible magnitude.

*Displacement*

9.7.78 Golden plover are well studied in relation to wind farm effects, although research has produced variable findings on the occurrence and extent of displacement. Studies reviewed by Humphreys et al. (2015c) reported substantial reductions in golden plover densities (almost 40%) at 500m from turbines (Pearce-Higgins et al. 2008, 2009). Later work by Pearce-Higgins *et al.* (2012) concluded in contrast that population densities of golden plover were not affected by the presence of wind farms. Although different in study characteristics, this conclusion was similar to findings by Douglas *et al.* (2011) and Haworth (2013). Post-construction monitoring at the existing Achany Wind Farm also showed no long-term displacement, with golden plover putative territories within 200m of turbines (SSE 2019). Post-construction monitoring at Lairg Wind Farm found golden plover nesting 110m from the nearest turbine. Sansom and Douglas (2014) and Sansom *et al.* (2016b) however, found a significant decrease in golden plover occupancy, with estimated displacement of 400-600m and 400m from turbines respectively.

9.7.79 In light of the above, applying a displacement distance of 500m from operational turbines is considered appropriate and sufficiently precautionary, particularly given the local findings from the long-term monitoring at Achany Wind Farm (SSE 2019). The number of golden plover territories that could be displaced at this distance during the lifetime of the wind farm is shown in Table 9.13. As well as 500m, the predicted displacement figures are also shown using a figure that reflects territory to turbine distances reported in SSE (2019), at approximately 250m.

**Table 9.13: Maximum Number of Golden Plover Territories At Risk From Operational Displacement (Before Mitigation)**

| | **Number of Territories At Potential Risk From Operational Displacement** | | | |
|---|---|---|---|---|
| | **In and Around the Proposed Development, Assuming Displacement Distance of:-** | | **In the Caithness and Sutherland Peatlands SPA Assuming Displacement Distance from the Development Site of:-** | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 12 | 5* | 1 | 0 |
| **2020** | 8 | 4 | 2 | 1 |
| **Mean** | 10.0 | 4.5 | 1.5 | 0.5 |

| | Number of Territories At Potential Risk From Operational Displacement | | | |
|---|---|---|---|---|
| | % of NHZ Population (% of NHZ population at lower and upper confidence intervals)<br>3,125 pairs (2,907-3,343) | | % of Caithness and Sutherland Peatlands SPA Population (1,064 pairs) | |
| **2019** | 0.4 (0.4-0.4) | 0.2 (0.2-0.1) | 0.1 | 0.0 |
| **2020** | 0.3 (0.3-0.2) | 0.1 (0.1-0.1) | 0.2 | 0.1 |
| | 0.3 (0.3-0.2) | 0.1 (0.1-0.1) | 0.1 | 0.0 |

**Note:** The golden plover NHZ population estimate is from Wilson *et al.* (2015) at3,125 breeding pairs (confidence intervals 2,907-3,343)

* Only 2 territory falls in the 250m buffer, but as 3 additional putative territory locations are just beyond 250m buffer, these have been included as an added precaution, in case micrositing of turbines ultimately led to them falling inside the 250m buffer.

9.7.80 Even using a highly precautionary displacement distance of 500m, and assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) from the operational phase would be less than 0.4% and 0.2% those populations respectively, and therefore of negligible magnitude.

*Collision Risk*

9.7.81 Fourteen VP flights were recorded in the 2019 breeding season within the PCZ, and nine breeding season flights in 2020. A single flight (comprising seven birds) was recorded over the 2019 to 2020 non-breeding season, with too few flights to merit collision risk modelling over that period. The predicted collisions rates for the 2019 breeding season were 0.04 birds and 0.02 birds for the 2020 breeding season. Evidently, collision risk is extremely low, with an average of 0.03 birds per breeding season, or one breeding season collision every 33 years. The predicted effect of the Proposed Development on golden plover from collision is therefore of negligible magnitude.

*Barrier Effects*

9.7.82 The Development Site is considered unlikely to present a barrier to golden plover movements (beyond the risk of displacement, discussed above). Turbine spacing is sufficient for birds to fly between, and much flight activity was below PCH. These combined characteristics are likely to mitigate any barrier effects between nesting and foraging grounds. Therefore, barrier effects are considered to be negligible for this species.

***Decommissioning Effects***

9.7.83 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. There would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Golden Plover (Prior to Mitigation)***

9.7.84 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects (none for barrier effects). For this IOF of international importance, for which the Proposed Development is of international importance, the predicted effects are **Moderate/minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

Greenshank

***Construction Effects***

*Direct Land Take*

9.7.85 The overall land take associated with the Proposed Development is small when considered in the context of the wider landscape. In addition, given greenshank forage in wetter bog habitats, and along water margins, land take is not likely to affect these areas, given they are avoided by the Proposed Development's infrastructure layout. Therefore, the direct loss of habitat due to construction of wind farm infrastructure is predicted to be of negligible magnitude for this species (Figures A9.27 and A9.28 Technical Appendix 9.1).

*Disturbance*

9.7.86 Table 9.14 shows the number of putative greenshank territories that would potentially be disturbed if a uniform disturbance distance was applied to the Proposed Development. This area of disturbance risk is highly precautionary since, in reality, there is not continuous disturbance from all locations at all times. It also assumes all activities are equally disturbing (which they are not) and that the birds have clear line of sight from wherever they are, to sources of potential visual disturbance. It is highly unlikely therefore, that all territories within these distances would be disturbed, before mitigation.

**Table 9.14: Maximum Number of Greenshank Territories At Potential Risk From Construction Disturbance (Before Mitigation)**

| | **Number of Territories At Potential Risk From Construction Disturbance** | | | |
|---|---|---|---|---|
| | **In and Around the Proposed Development, Assuming Disturbance Distance to:-** | | **In the Caithness and Sutherland Peatlands SPA Assuming Disturbance Distance from the Development Site to:-** | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 5 | 1 | 2 | 0 |
| **2020** | 1 | 0 | 1 | 0 |
| **Mean** | 3.0 | 0.5 | 1.5 | 0.0 |
| | **% of NHZ Population (% of NHZ population at lower and upper confidence intervals) 421 pairs (273-587)** | | **% of Caithness and Sutherland Peatlands SPA Population 653 (389-917 pairs)** | |
| **2019** | 1.2 (1.8-0.9) | 0.2 (0.4-0.2) | 0.3 (0.5-0.2) | 0.0 (0.0-0.0) |
| **2020** | 0.2 (0.4-0.2) | 0.0 (0.0-0.0) | 0.2 (0.3-0.1) | 0.0 (0.0-0.0) |
| **Mean** | 0.7 (1.1-0.5) | 0.1 (0.2-0.1) | 0.2 (0.4-0.2) | 0.0 (0.0-0.0) |

**Note:** The greenshank NHZ population estimate is from Wilson *et al.* (2015) at 421 breeding pairs (confidence intervals 273-587) .

| | Number of Territories At Potential Risk From Construction Disturbance |
|---|---|
| The SPA population at designation (1999) was 256 pairs, but the most recent estimate (Bellamy and Eaton 2010), produced an estimate of 653 greenshank pairs (95% confidence limits 389–917). This more recent figure is used for the assessment.<br>Wilson *et al.* (2015) do draw attention to the fact that the NHZ population estimate, derived from 1995 data, may be an underestimate, given that the near-comprehensive survey of NHZ 5 in 2009, the breeding greenshank population was estimated to be 1,052 (95% C.I. 389 – 1,752) pairs (Bellamy and Eaton 2009). Whether the assessment of Bellamy and Eaton (2009) is an over-estimate, or the 1995 NHZ an under-estimate, or whether there has been an increase between the two periods that was not captured in the Atlas data (Forrester *el al.* 2007) is not known. It is clear however, is that the NHZ figure is substantially lower than the accepted SPA figure, and this adds an additional level of precaution in the comparison of the disturbance and displacement figures with the NHZ population. | |

9.7.87 This precautionary scale of disturbance (prior to mitigation) is temporary, applying only during the breeding seasons over the construction period. Using a highly precautionary displacement distance of 500m, and assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) would be up to 1.8% and 0.3% of those respective populations (noting in the case of the NHZ, that 421 pairs is a highly precautionary population estimate).

9.7.88 Taking a highly precautionary approach, and prior to mitigation, the effect of construction disturbance on greenshank would be of negligible magnitude.

***Operational Effects***

*Disturbance*

9.7.89 Once the wind farm is operational, sources of disturbance are considerably reduced, to intermittent occasional activity from maintenance personnel, mainly in vehicles (and therefore less likely to cause any disturbance). Furthermore, disturbance will be confined to within the infrastructure and turbine footprint. The reduced likelihood and highly localised risk of disturbance means that overall predicted effects of operational disturbance are predicted to be of negligible magnitude.

*Displacement*

9.7.90 As noted by Humphreys et al. (2015d), the evidence from post-construction monitoring, (although not reviewed by those authors) enabled NatureScot to consider that greenshank do not show a high level of behavioural displacement around turbines. Part of this evidence came from Achany Wind Farm (RPS 2015), as well as Rosehall Wind Farm (ibid.). More recent monitoring from both sites (SSE 2019, and RWE/E.ON Climate and Renewables 2019) suggests that greenshank continue to nest in proximity to these wind farms. This is consistent with post-construction findings from Causeymire (Ventient Energy 2020) and from Strathy North (SSE 2020).

9.7.91 Applying a 500m displacement distance from operational turbines is therefore extremely precautionary, but the number of greenshank territories that could be displaced during the lifetime of the wind farm is shown in Table 9.15. The predicted displacement figures are also shown using a more realistic (albeit still precautionary) figure of 250m.

**Table 9.15: Maximum Number of Greenshank Territories At Risk From Operational Displacement (Before Mitigation)**

| | Number of Territories At Potential Risk From Operational Displacement | | | |
|---|---|---|---|---|
| | In and Around the Proposed Development, Assuming Displacement Distance of:- | | In the Caithness and Sutherland Peatlands SPA Assuming Displacement Distance from the Development Site of:- | |
| **Displacement Distance** | **500m** | **250m** | **500m** | **250m** |
| **Year** | | | | |
| **2019** | 4 | 0 | 2 | 0 |
| **2020** | 1 | 0 | 1 | 0 |
| **Mean** | 2.5 | 0.0 | 1.5 | 0.0 |
| | **% of NHZ Population (% of NHZ population at lower and upper confidence intervals) 421 pairs (273-587)** | | **% of Caithness and Sutherland Peatlands SPA Population 653 (389-917 pairs)** | |
| **2019** | 1.0 (1.5-0.7) | 0.0(0.0-0.0) | 0.3 (0.5-0.2) | 0.0 (0.0-0.0) |
| **2020** | 0.2 (0.4-0.2) | 0.0 (0.0-0.0) | 0.2 (0.3-0.1) | 0.0 (0.0-0.0) |
| | 0.5 (0.7-0.3) | 0.0 (0.0-0.0) | 0.2 (0.4-0.2) | 0.0 (0.0-0.0) |

**Note:** The greenshank NHZ population estimate is from Wilson *et al.* (2015) at 421 breeding pairs (confidence intervals 273-587) .

9.7.93 Even using a highly precautionary displacement distance of 500m, and assuming that all displaced territories would be lost from the regional and SPA populations, the predicted level of displacement (prior to mitigation) from the operational phase would be less than 1.5% and 0.5% of those respective populations, and therefore of negligible magnitude.

*Collision Risk*

9.7.94 Eight flights during the 2019 breeding season were recorded within the PCZ and six in 2020. These resulted in predicted collision rates of 0.07 birds for the 2019 breeding season and 0.02 birds for 2020, giving an average of 0.05 collisions per breeding season. Evidently, collision risk is extremely low, with one collision every 20 years. The predicted effect of the Proposed Development on greenshank is therefore of negligible magnitude.

*Barrier Effects*

9.7.95 The Development Site is considered unlikely to present a barrier to greenshank movements (beyond the risk of displacement, discussed above). Turbine spacing is sufficient for birds to fly between, and much flight activity was below PCH. These combined characteristics are likely to mitigate any barrier effects between nesting and foraging grounds. Therefore, barrier effects are considered to be negligible for this species.

***Decommissioning Effects***

9.7.96 The decommissioning effects are predicted to be the same as construction effects, given the type and nature of activities on site would be comparable. The would be no further land take effects (and restoration of habitats would in fact, be expected) and disturbance would be negligible.

***Predicted Effects on Greenshank (Prior to Mitigation)***

9.7.97 Having assessed the potential effects of construction, operation and decommissioning, the magnitude of change from the Proposed Development prior to mitigation, is negligible for all effects (none for barrier effects). For this IOF of international importance, for which the Proposed Development is of international importance, the predicted effects are **Moderate**/**minor** and **not significant** in terms of the EIA Regulations (Table 9.16).

## 9.8 Assessment Summary

9.8.1 A summary of the assessment on IOFs prior to mitigation is provided in Table 9.16**,** encompassing predicted effects from all phases of the Proposed Development. The effects of decommissioning are assumed to be the same or less than during construction and so are not specified separately in the table.

**Table 9.16: Summary of Significance of Effects on IOFs**

| IOF | Project Stage and Source of Potential Effect | Importance of Ornithological Feature (Table 9.4)[1] | Sensitivity (Table 9.4)[1] | Importance of Site (Table 9.8 and 9.9) [2] | Magnitude of Change (Table 9.5) [3] | Effect (Table 9.6)[4] | Significance (Table 9.6)[4] |
|---|---|---|---|---|---|---|---|
| Golden Eagle | Construction - Land Take | International | Medium | Regional | Negligible | Minor | Not significant |
| | Construction - Disturbance | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Disturbance | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Displacement | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Collision | International | Medium | Regional | Slight | Moderate/Minor | Not significant |
| | Operation - Barrier | International | Medium | Regional | Negligible | Minor | Not significant |
| Hen Harrier | Construction - Land Take | International | Medium | Regional | Negligible | Minor | Not significant |
| | Construction - Disturbance | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Disturbance | Inernational | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Displacement | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Collision | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Barrier | International | Medium | Regional | Negligible | Minor | Not significant |
| Merlin | Construction - Land Take | International | Medium | Regional | Negligible | Minor | Not significant |
| | Construction - Disturbance | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Disturbance | Inernational | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Displacement | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Collision | International | Medium | Regional | Negligible | Minor | Not significant |
| | Operation - Barrier | International | Medium | Regional | Negligible | Minor | Not significant |
| Curlew | Construction - Land Take | International | Medium | International | Negligible | Moderate/Minor | Not significant |
| | Construction - Disturbance | International | Medium | International | Negligible | Moderate/Minor | Not significant |

| IOF | Project Stage and Source of Potential Effect | Importance of Ornithological Feature (Table 9.4)[1] | Sensitivity (Table 9.4)[1] | Importance of Site (Table 9.8 and 9.9) [2] | Magnitude of Change (Table 9.5) [3] | Effect (Table 9.6)[4] | Significance (Table 9.6)[4] |
|---|---|---|---|---|---|---|---|
| | Operation - Disturbance | Inernational | Medium | Inernational | Negligible | Moderate/Minor | Not significant |
| | Operation - Displacement | International | Medium | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Collision | International | Medium | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Barrier | International | Medium | International | Negligible | Moderate/Minor | Not significant |
| Dunlin | Construction - Land Take | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Construction - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Displacement | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Collision | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Barrier | International | High | International | None | None | Not significant |
| Golden Plover | Construction - Land Take | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Construction - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Displacement | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Collision | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Barrier | International | High | International | None | None | Not significant |
| Greenshank | Construction - Land Take | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Construction - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Disturbance | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Displacement | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Collision | International | High | International | Negligible | Moderate/Minor | Not significant |
| | Operation - Barrier | International | High | International | None | None | Not significant |

1. The importance and associated sensitivity of the IOF is defined as per Table 9.4, using the criteria and approach set out in paragraphs 9.5.38 to 9.5.41.
2. The site's importance for IOFs of International conservation importance is identified in Table 9.8 and for IOFs of national importance in Table 9.9 for, using the criteria and approach set out in paragraphs 9.6.99 to 9.6.117.
3. The magnitude of change on an IOF resulting from the Proposed Development is defined as set out in Table 9.5 (using categories of total/near total, substantial., moderate, slight, negligible or none) and using the criteria and approach set out in paragraphs 9.5.42-9.5.45.
4. The significance of the effect is defined using the matrix given in Table 9.6, which draws together the IOF's conservation importance, sensitivity the site's importance, and the magnitude of the effect, all to combine in the judgement on the significance of the particular effect. Significant effects are those categorised either as Major or Major/Moderate, using the criteria and approach set out in paragraphs 9.5.46 to 9.5.51.

9.8.2 As is evident from Table 9.16, prior to mitigation, there are no predicted effects from the Proposed Development that are significant in terms of the EIA Regulations.

9.8.3 The 2018 and 2019 survey results, combined with the added insights from desk study information, gives a high level of confidence in these predictions. The extensive earlier bird survey results create a longer term insight into the Proposed Developments FOIs, and it is unusual to have pre, during and post-construction monitoring results from two local operational wind farms (in this case, from Achany and Rosehall) close to the Proposed Development, providing locally relevant long-term data.

## 9.9 Proposed Mitigation and Enhancement

9.9.1 The assessment completed on the 2019 and 2020 baseline show, prior to mitigation, there are no significant adverse effects predicted on any IOFs from the Proposed Development. This is despite the precautionary assumptions included throughout the assessment process.

9.9.2 Nonetheless, as a matter of good practice, mitigation and enhancement measures are proposed to help avoid and reduce the risk of negative effects on IOFs. The following two sections outline these measures, during construction and operation respectively.

**Mitigation During Construction**

9.9.3 Mitigation measures to be employed during construction would ensure all wildlife protection legislation is complied with, including avoiding disturbance to breeding Schedule 1 and Annex 1 species, and preventing damage to any wild bird nests. This would be achieved by:

- The production and implementation of a Bird Protection and Mitigation Plan, as part of the CEMP. This would set out the survey methods, coverage and reporting schedule for all bird monitoring pre and during construction, the protocols and appropriate buffer distances to be put in place should breeding birds be identified (depending on species, line of sight and nature of construction activities), and, materials for tool box talks for all site staff on legal obligations and best practice. It would also establish protocols for recording and disseminating bird survey results (where appropriate) or information on disturbance buffers and protection measures to site staff to inform ongoing construction works; and
- As part of the Bird Protection and Mitigation Plan, a complete pre-construction survey would also be undertaken (specifically for moorland breeding birds, breeding divers and breeding raptors) to inform the detailed measures required to ensure effective mitigation of breeding birds.

9.9.4 Through these combined activities, the Bird Protection and Mitigation Plan would ensure all potentially significant disturbance during construction is avoided. The Plan would be implemented by a suitably experienced on-site ornithologist, who would work in close liaison with the on-site ECoW during construction.

**Mitigation During Operation**

9.9.5 The second is to mitigate for the possible displacement and loss of breeding territories from the Proposed Development, specifically on curlew, dunlin, golden plover and greenshank.

9.9.6 The measures proposed are set out in Chapter 8, Technical Appendix 8.10 – Outline Habitat Management Plan. These would be implemented during operation of the Proposed Development and would restore and enhance blanket bog habitat within three identified candidate management units. The goal is to increase the quality and extent of blanket bog resource and compensate for habitat loss incurred as a result of the Proposed Development (Chapter 8 Ecology).

9.9.7 Three off-site candidate management units have been identified in liaison with Glencassley Estate. These have been subject to extensive historical drainage and support lower deer densities in comparison with other parts of the Estate. The identification of candidate areas and determination of likely habitat types and the suitability for restoration has been informed through engagement with Glencassley Estate, use of aerial imagery, OS mapping and remote-sensed high resolution habitat maps[5]. The off-site candidate management units are:

1. Unit A, situated north of Langwell Hill (comprising c. 43.42 Ha);
2. Unit B, situated to the east of Allt Dail Faid (comprising c. 176.74 Ha); and
3. Unit C, situated further to the north of here and due south-west of Carrachan Dubh (comprising c. 86.73 Ha).

9.9.8 These areas have been identified as comprising blanket bog habitat, that has the potential for recovery and would respond to a programme of damming, along with appropriate deer grazing levels.

9.9.9 The implementation of restoration proposals within these candidate areas would result in increased habitat suitability for breeding waders. As noted above, even based on precautionary assumptions, there are no significant effects predicted on any IOFs, including breeding waders. However, these HMP proposals would enhance habitat suitability for dunlin, golden plover and greenshank by improving blanket bog habitat condition and increasing the extent of wetland foraging habitat. Improving habitat condition, through drain blocking and managing deer grazing pressure to meet conservation objectives, would increase the management unit's capacity to support successful breeding by dunlin, greenshank and golden plover. This would provide benefit to breeding wader through a combination of increased carrying capacity and increased breeding success in the candidate management unit selected. Through this enhancement, the goal is for the predicted magnitude of change to diminish from Minor to None, and therefore result in no effect (remaining **Not Significant).**

9.9.10 To accompany the HMP, detailed post-construction bird monitoring would take place to monitor operational effects on IOFs and provide information on effectiveness of operational mitigation measures, and to determine if there is a requirement for any additional measures.

**Mitigation During Decommissioning**

9.9.11 Mitigation during decommissioning would employ many of the same measures described for construction (paragraph 9.9.4), whereby a Bird Protection Plan would be designed and implemented, informed by a pre-decommissioning survey of the area potentially

[5] https://www.space-intelligence.com/scotland-landcover/

affected. This plan would be further refined to take account of any changes in legal requirements, guidance or policy in the intervening years.

## 9.10 Cumulative Effects

9.10.1 The above sections have assessed predicted effects of the Proposed Development on IOFs in isolation from the potential effects of other developments. The EIA and Habitats Regulations also require that the Proposed Development be assessed cumulatively, so any combined implications can be identified.

9.10.2 Whilst the Proposed Development is predicted to have no significant effects on any IOFs itself, in combination with other proposed developments, cumulative effects may be significant. Therefore, as outlined in Section 9.3, consideration has been given whether any of the IOFs taken forward for assessment in this Chapter are likely to be subject to cumulative effects because of the effects generated by other developments.

9.10.3 For the Caithness and Sutherland Peatlands SPA/Ramsar site IOF, an in-combination assessment of relevant plans and projects is required for the SPA/Ramsar as a whole. NatureScot maintains an Excel spreadsheet of wind farm developments where there is potential connectivity to this SPA. This was supplied to the Applicant's technical team (February 2021) and reviewed for each qualifying species that has been recorded at the Proposed Development. The spreadsheet was up-dated and expanded, taking into account new desk study information and consultation feedback from RSPB on other potential cumulative developments, to inform the 'in combination' assessment.

9.10.4 The NatureScot spreadsheet also allowed scrutiny of cumulative effects at the NHZ level, supplemented by examination at the NHZ level, using https://map.environment.gov.scot/sewebmap/ and its onshore wind farm layer.

9.10.5 Through the compilation of NatureScot and RSPB feedback, over fifty wind farm, national grid infrastructure and transport projects were identified for consideration, to determine whether or not they had the potential to cumulatively impact on ornithological features of the Caithness and Sutherland SPA, in combination with the Proposed Development. These include developments shown in Figures 9.2 and 9.3. Full details of the process for identifying cumulative/in combination plans and projects are given in Technical Appendix 9.1 (notably its Annex I).

9.10.6 The information available for each potential cumulative development was examined for details on construction and operational disturbance effects, displacement effects, collision rates, and barrier effects. Where figures were available, these data were incorporated into the cumulative effects calculation, and compared to the NHZ and Caithness and Sutherland Peatlands SPA populations to assess the cumulative and in combination effect respectively.

9.10.7 As noted above, the Proposed Development is predicted to have no significant effects on any IOFs as a result of its construction, operation or decommissioning. Implementation of good practice mitigation measures during construction (see Section 9.9) would further reduce the magnitude and risk of any effects during that phase. Once operational, good practice measures would also avoid disturbance to IOFs.

9.10.8 Habitat enhancement through implementation of the proposed HMP would ensure the magnitude of displacement is negligible or zero for SPA qualifying species, once habitat enhancements take affect over time. However, the potential for cumulative/in

combination effects from collision, initial territory displacement and barrier effects have been assessed for the IOFs taken forward into the assessment.

9.10.9 The following sections provide the results of the cumulative assessment for each IOF taken into the assessment. Further details on the cumulative developments are provided in Technical Appendix 9.1 and the in combination assessment in Technical Appendix 9.2.

**Golden Eagle**

*Collision Risk*

9.10.10 Collision rates are not available for the grid connection developments highlighted by RSPB that are being developed in proximity to the SPA. Collisions with power lines do occur, but collisions are considered rare in the UK context.

9.10.11 Collision rates are available from wind farm developments. The annual collision rate predicted from the Proposed Development is 0.12 birds a year. The cumulative figure from cumulative/in combination developments in NHZ 5 amount to a predicted 0.52 birds a year, giving a cumulative/in combination rate of 0.64 birds a year with the Proposed Development. For the SPA, the predicted cumulative/in combination rate of 0.40 birds a year, giving a predicted rate of 0.52 birds a year with the Proposed Development added. Given the emerging evidence that indicate golden eagle generally display macro avoidance of turbines in Scotland (Fielding *et al.* 2019a), it is likely the predicted collision rates (extracted from the wind farm Environmental Statements) are over-estimates, and therefore the actual cumulative/in combination risk is likely to be significantly lower than these totals. The cumulative and in combination predicted effect with the Proposed Development is therefore considered of **Slight magnitude** and therefore **Moderate** effect and **not significant**.

*Displacement and Barrier Effects*

9.10.12 There are no predicted effects for golden eagle from either displacement or barrier effects from the Proposed Development. No cumulative effects are therefore anticipated for the SPA or NHZ populations of this species.

*Outcome of Cumulative/In Combination Assessment for Golden Eagle*

9.10.13 The cumulative assessment therefore identified that residual effects on NHZ and SPA/Ramsar site populations with the Proposed Development would be of negligible magnitude, of minor effect and **not significant** in EIA terms, nor cause any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Hen harrier**

*Collision Risk*

9.10.14 The level of flight activity from the Proposed Development is so low that collision risk modelling was not justified and would be at or close to zero. No cumulative effect would therefore be anticipated for the SPA or NHZ populations of this species.

*Displacement and Barrier Effects*

9.10.15 There are no predicted effects for hen harrier from either displacement or barrier effects from the Proposed Development, not least because there are no harrier territories within

2km of the Development Site. No cumulative effects would therefore be anticipated for the SPA or NHZ populations of this species.

*Outcome of Cumulative/In Combination Assessment for Hen Harrier*

9.10.16 The cumulative assessment therefore identified that residual effects on NHZ and SPA/Ramsar site populations with the Proposed Development were of negligible magnitude, of minor effect and therefore **not significant** in EIA terms. They would also not cause any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Merlin**

*Collision Risk*

9.10.17 The level of 'at risk' flight activity recorded during flight activity surveys for the Proposed Development was so low that collision risk modelling was not justified and would be at or close to zero. No cumulative effects would therefore be anticipated on the SPA or NHZ population from collision risk.

*Displacement and Barrier Effects*

9.10.18 Given the absence of breeding merlin within 1km of the Proposed Development, no in combination effects would be anticipated on the SPA or NHZ population from displacement of territories or barrier effects to this species

*Outcome of Cumulative/In Combination Assessment for Merlin*

9.10.19 The cumulative assessment therefore identified that residual effects on NHZ and SPA/Ramsar site populations with the Proposed Development were of negligible magnitude, of minor effect and therefore **not significant** in EIA terms. They would also not cause any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Curlew**

*Collision Risk*

9.10.20 The level of 'at risk' flight activity recorded during flight activity surveys for the Proposed Development was so low that collision risk modelling was not justified and would be zero or close to it. No cumulative effect would therefore be anticipated on the SPA or NHZ population from collision risk.

*Displacement and Barrier Effects*

9.10.21 Given that the two curlew territories were beyond displacement distances from the Proposed Development (greater than 1km from the nearest turbine), no cumulative effects are anticipated on the SPA or NHZ population from displacement of territories.

9.10.22 Given the negligible flight activity or territories in proximity to the Proposed Development, these is also considered to be no risk of barrier effects negatively effecting this species and therefore no in combination effects on the SPA, Ramsar site or NHZ population.

*Outcome of Cumulative/In Combination Assessment for Curlew*

9.10.23 The cumulative assessment therefore identified that residual effects on NHZ and SPA/Ramsar site populations with the Proposed Development would be of negligible magnitude, of minor effect and therefore **not significant** in EIA terms, nor cause any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Dunlin**

*Collision Risk*

9.10.24 The level of 'at risk' flight activity recorded during flight activity surveys for the Proposed Development was very low, resulting in a mean predicted collision rate for 2019 and 2020 of 0.001 birds per breeding season. This contribution to collision rates is so small that no in cumulative effects would therefore be anticipated on the SPA, Ramsar site or NHZ population from collision risk.

*Displacement and Barrier Effects*

9.10.25 On a precautionary basis, it is possible that up to five territories could be displaced from the Proposed Development and a 500m buffer, and up to four of which would be from the Caithness and Sutherland Peatlands SPA. Alternatively, if a more evidence-based precautionary displacement distance of 250m is used, the number of displaced territories would be one and zero respectively. Based on NatureScot's original cumulative spreadsheet compilation, and the data compiled for this cumulative assessment, there are no additional territories predicted to be displaced from other developments, from either the NHZ or SPA/Ramsar (or Grudie Peatlands SSSI) site populations. No in combination effects are anticipated on the SPA, Ramsar, SSSI or NHZ population from displacement of territories, therefore.

9.10.26 As for the Proposed Development, no predicted barrier effects are reported from the other cumulative developments. No in combination effects are anticipated on the SPA, Ramsar, SSSI or NHZ population from barrier effects, therefore.

*Outcome of Cumulative/In Combination Assessment for Dunlin*

9.10.27 The cumulative assessment therefore identified that residual effects on NHZ, SPA/Ramsar site and Grudie Peatlands SSSI populations with the Proposed Development was of negligible magnitude, of minor effect and therefore **not significant** in EIA terms, nor caused any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Golden Plover**

*Collision Risk*

9.10.28 The level of 'at risk' flight activity recorded during flight activity surveys for the Proposed Development was limited, resulting in a mean predicted collision rate for 2019 and 2020 of 0.03 birds per breeding season. This contribution to collision rates is so small that no in combination effects are therefore anticipated on the SPA, Ramsar site or NHZ population from collision risk, as a result of the Proposed Development.

*Displacement and Barrier Effects*

9.10.29 On a precautionary basis (and using the 2019 and 2020 mean of potentially displaced territories), it is possible that up to 10 territories could be displaced from the Development Site and a 500m buffer, 1.5 of which would be from the Caithness and Sutherland Peatlands SPA/Ramsar site. Alternatively, if a moderately precautionary displacement distance of 250m is used, the number of displaced territories would be 4.5 and 0.5 respectively. Based on NatureScot's original cumulative spreadsheet compilation, and the data reviewed and compiled for this cumulative assessment, other developments have the potential to displace (or have displaced, based on post-construction monitoring), up to 21 golden plover territories from the NHZ population and up to one territory from SPA/Ramsar site populations. The combined potential reduction in territories from the Proposed Development and other developments is therefore up to 31 from the NHZ and 2.5 from the SPA/Ramsar site, equating to 1% (1.1%-0.9%) of the estimated NHZ population and 0.2% of the SPA/Ramsar population. There is no cumulative impact anticipated on the Grudie Peatlands SSSI. No in combination effects are therefore anticipated on the SPA, Ramsar, SSSI or NHZ population from displacement of territories.

9.10.30 As for the Proposed Development, no predicted barrier effects are reported from the other cumulative developments. No in combination effects are anticipated on the SPA, Ramsar, SSSI or NHZ population from barrier effects, therefore.

*Outcome of Cumulative/In Combination Assessment for Golden Plover*

9.10.31 The cumulative assessment therefore identified that residual effects on NHZ, SPA/Ramsar site and Grudie Peatlands SSSI populations with the Proposed Development was of negligible magnitude, of minor effect and therefore **not significant** in EIA terms, nor caused any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

**Greenshank**

*Collision Risk*

9.10.32 The level of 'at risk' flight activity recorded during flight activity surveys for the Proposed Development was limited, resulting in a mean predicted collision rate for 2019 and 2020 of 0.05 birds per breeding season. This contribution to collision rates is so small that no cumulative effects would therefore be anticipated on the SPA, Ramsar site or NHZ population from collision risk, as a result of the Proposed Development.

*Displacement and Barrier Effects*

9.10.33 On a precautionary basis (and using the 2019 and 2020 mean of potentially displaced territories), it is possible that up to 2.5 territories could be displaced from the Development Site and a 500m buffer, 1.5 of which would be from the Caithness and Sutherland Peatlands SPA/Ramsar site. Alternatively, if a moderately precautionary displacement distance of 250m is used, the number of displaced territories would be zero in both cases. Based on NatureScot's original cumulative spreadsheet compilation, and the data reviewed and compiled for this cumulative assessment, other developments have the potential to displace (or have displaced, based on post-construction monitoring) no greenshank territories from the NHZ population, SPA/Ramsar site, or the Grudie

Peatlands SSSI . No in combination effects are therefore anticipated on the SPA, Ramsar, SSSI or NHZ population from displacement of territories.

9.10.34 As for the Proposed Development, no predicted barrier effects are reported from the other cumulative developments. No in combination effects are anticipated on the SPA, Ramsar, SSSI or NHZ population from barrier effects, therefore.

*Outcome of Cumulative/In Combination Assessment for Greenshank*

9.10.35 The cumulative assessment therefore identified that residual effects on NHZ, SPA/Ramsar site and Grudie Peatlands SSSI populations with the Proposed Development would be of negligible magnitude, of minor effect and therefore **not significant** in EIA terms, nor cause any in combination adverse effect on SPA integrity. Further details of the in combination assessment against the conservation objectives of the Caithness and Sutherland Peatlands SPA are provided in Technical Appendix 9.2.

## 9.11 Residual Impacts

9.11.1 There were no significant effects identified by the assessment on IOFs from the Proposed Development alone, or cumulatively. Effects that were identified as non-significant were displacement to breeding waders, specifically curlew, dunlin, golden plover and greenshank and infrequent collision risk for golden eagle and greenshank.

9.11.2 The in combination effects on the Caithness and Sutherland Peatlands SPA/Ramsar site have been considered, and there are no adverse effects on site integrity, either alone or in combination with other plans and projects (see Technical Appendix 9.2).

## 9.12 Conclusion

9.12.1 An assessment of the likely effects of the Proposed Development on IOFs has been made following industry guidance (CIEEM 2018). The assessment has considered the sensitivity/importance of Important Ornithological Features at the Proposed Development and magnitude of effects during construction, operation and decommissioning stages.

9.12.2 This assessment process included consideration of international, national and local designated sites, screening in those with potential connectivity to the Proposed Development. As a result, assessment has considered potential effects on the qualifying species and conservation objectives of the Caithness and Sutherland Peatlands SPA/Ramsar site and the Grudie Peatlands SSSI. The Proposed Development has no connectivity to any other designated sites.

9.12.3 The assessment of potential effects of the Proposed Development on IOFs concluded that, particularly with best practice to avoid disturbance to breeding birds during construction (the required measures are described in Section 9.9), there will be no major or major/moderate, and therefore no significant effects to any bird interests using the Proposed Development. No significant effects from habitat loss are also predicted.

9.12.4 The assessment also considered the effects of wind farm operation on important bird communities in terms of displacement, collision risk and barrier effects. It is concluded that none of these effects are significant for the bird communities present.

9.12.5 The implementation of the proposed HMP would provide an additional benefit of increased habitat suitability for breeding waders, including SPA qualifying species dunlin, golden plover and greenshank (species that are also features of the Grudie Peatlands SSSI).

9.12.6 It is concluded that beyond reasonable scientific doubt that there will be no likely significant effects on any designated site, and therefore no adverse impact on site integrity, either alone or in combination with other plans or projects. There will also be no residual significant effects, in terms of the EIA Regulations, on bird populations from cumulative effects on the regional populations of the NHZ.

## 9.13 References

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