

Mid Moile Wind Farm

Environmental Impact Assessment Report Chapter 8: Ornithology

December 2021

CONTENTS

8 ORNITHOLOGY	1
Non-Technical Summary	1
Introduction	1
Scope of Assessment.....	2
Policy, Legislation and Guidance	2
Methodology.....	3
Baseline Conditions	10
Assessment of Effects	22
Mitigation.....	47
References.....	50

TABLES

- Table 8.1: Ornithological surveys undertaken at Mid Moile in Year 1 & Year 2
- Table 8.2: Criteria for assessing the value of Ornithological Receptors.
- Table 8.3: Criteria for assessing the sensitivity of species, habitats and sites.
- Table 8.4: Criteria for magnitude of impacts.
- Table 8.5: Matrix for assessing significance of effects.
- Table 8.6: Definitions of the duration of effects.
- Table 8.7: Statutory designated ornithology sites within 20km of Mid Moile Wind Farm.
- Table 8.8: NatureScot response to the Scoping Opinion Request for Mid Moile Wind Farm.
- Table 8.9: RSPB response to the Scoping Opinion Request for Mid Moile Wind Farm.
- Table 8.10: Total number of flights, and seconds of flights, through the Turbine Swept Area.
- Table 8.11: Wind Farm Developments/Applications within 20km of Mid Moile Wind Farm which have the Potential to Add Cumulative Effects.
- Table 8.12: Summary of Effects of Wind Farms within 20km of Mid Moile Wind Farm on Hen Harrier.
- Table 8.13: Assessment of the effects of the development prior to mitigation.

APPENDICES

- Technical Appendix 8.1: Ornithology Technical Appendix

8 ORNITHOLOGY

Non-Technical Summary

- 8.1 The ornithology studies consisted of a review of the main potential bird issues associated with the proposed wind farm, consultation with relevant groups and a number of field surveys, including:
- Breeding Bird Surveys;
 - Species-specific Surveys for scarce raptors and owls, wildfowl, Black Grouse and Nightjar; and
 - Vantage Point (Flight Activity) Surveys.
- 8.2 There are several internationally or nationally designated sites within the vicinity of the Mid Moile proposed wind farm. The Glen App and Galloway Moors Special Protection Area (SPA), designated for its breeding Hen Harrier population, which is adjacent to the proposed wind farm. The Loch of Inch and Torrs Warren SPA, designated for its wintering populations of Greenland White-fronted Goose and Hen Harrier, which is 8.3 km from Mid Moile. There are predicted to be no significant effects on either of these SPAs from the proposed Mid Moile Wind Farm.
- 8.3 The assessment identified 19 Valued Ornithological Receptors present within the proposed wind farm site or the core study area. These were: Barnacle Goose, Pink-footed Goose, Greylag Goose, Teal, Goosander, White-tailed Eagle, Hen Harrier, Goshawk, Red Kite, Peregrine, Merlin, Oystercatcher, Golden Plover, Lapwing, Snipe, Curlew, Barn Owl, Long-eared Owl and Common Crossbill.
- 8.4 Through careful siting and the implementation of best practice construction measures, the highest potential ornithological effects are considered to be moderate/minor during both the construction and operational phases of the proposed wind farm. There will be no significant effect on the Glen App and Galloway Moors SPA or their breeding Hen Harriers. There will also be no predicted effects on the wintering Greenland White-fronted Goose and Hen Harrier populations of the Loch Inch and Torrs Warren SPA. After mitigation the effects on all the VORs are considered to be Not Significant in the context of EIA Regulations.

Introduction

- 8.5 This chapter describes and evaluates the ornithological interest of the Site and the adjacent area (core study area). Potential impacts on the valued ornithological receptors are discussed and, where required, mitigation is suggested. This chapter should be read with Chapter 9: Ecology of this EIAR, which evaluates the ecological effects on non-avian flora and fauna.
- 8.6 This chapter provides a summary of various ornithological consultations, desktop studies, surveys and assessments undertaken at the proposed Mid Moile Wind Farm during the period of October 2019 to September 2021. Further details are set out in Technical

Appendix 8.1: Ornithology Technical Appendix. This Technical Appendix includes details of the nest locations of Schedule 1 species and therefore should only be made available to NatureScot (NS) and the Royal Society for the Protection of Birds (RSPB). The Technical Appendix should not be placed in the public domain.

8.7 The potential impacts of the Proposed Development on the ornithological interest of the core study area include:

- Displacement effect during the construction, operational and decommissioning phases of the wind farm;
- Direct loss of habitat used for foraging, nesting and shelter due to the proposed wind farm infrastructure;
- Direct risk of injury or death through collision with the wind farm infrastructure, in particular the turbines;
- Destruction and disturbance of nesting birds during the construction, operational and decommissioning phases of the wind farm; and
- Indirect displacement through visual and noise disturbance from the proposed wind farm infrastructure

Scope of Assessment

Core Study Area

8.8 The ornithological core study area is defined as the wider Mid Moile Site and a 2km buffer zone. Survey distances are in line with those detailed in SNH (2017).

Survey Areas

8.9 All ornithological survey work included the wider Mid Moile Site as these surveys were started, and largely undertaken, prior to the layout of the Proposed Development being finalised. However, the data presented within this Chapter is discussed with regard to two different areas. The combined breeding bird data uses the wider Mid Moile Site, plus 1km and 2km buffers, whilst the vantage point survey data uses the reduced Turbine Swept Area associated with the final design of the Proposed Development (plus a 500m buffer around the swept area to account for survey error) instead of the wider Mid Moile Site. The boundaries of both these sites/areas are detailed in Technical Appendix 8.1.

Policy, Legislation and Guidance

Policy

8.10 Planning policies relevant to this assessment are summarised in Chapter 5: Planning and Renewable Energy Policy Context of this EIAR and are considered in detail in the Planning Statement accompanying this application.

Relevant Legislation

- 8.11 Three key pieces of statutory legislation are in place to help ensure the protection of specific bird species within Scotland. The EC Birds Directive (Council Directive 79/409/EEC) on the conservation of wild birds, the Wildlife and Countryside Act 1981 (as amended) (WCA) and the Nature Conservation (Scotland) Act 2004 (NCA).
- 8.12 Annex 1 of the EC Birds Directive lists those rare and vulnerable species of wild bird that are subject to specific conservation measures, including those species whose presence can dictate the identification and classification of Special Protected Areas (SPA). Such development sites are protected against any activity that could compromise the structure, function, integrity or 'favourable conservation status' of the features for which they are designated.
- 8.13 Under the WCA it is an offence to intentionally kill, injure or take any wild bird; take, damage or destroy the nest of any wild bird while it is being built or in use; and take or destroy any eggs belonging to any wild bird. A number of species are included on Schedule 1 of the Act and these receive additional protection against intentionally or reckless disturbance whilst breeding/at the nest, including having dependant young.
- 8.14 The NCA also makes amendments to the WCA which strengthen the legal protection for threatened species, with the inclusion of 'reckless' activities which negatively affect wild birds. The protection afforded to the nests of certain bird species is extended to cover the entire year, while the disturbance of particular bird species while at a lek site is prohibited.

Methodology

Consultation

- 8.15 Ornithological consultation data was requested from the RSPB Scotland Conservation Data Management Unit, the Dumfries & Galloway Raptor Study Group (D&GRSG) and the Dumfries & Galloway Black Grouse Study Group, in order to obtain further information regarding the presence and distribution of key bird species within the Proposed Wind Farm Site and surrounding area.
- 8.16 Consultation was also undertaken with both NatureScot and RSPB at the EIA scoping stage to request Scoping Opinion from each of them with regard to the ornithological surveys and assessment undertaken. Their responses are detailed in Table 8.8 and Table 8.9 of the Chapter.

Desk Study

- 8.17 A desk-top search/assessment was also carried out using the following resources:
- The Government's Multi-Agency Geographic Information for the Countryside;
 - The *Birdguides* website;
 - The relevant Ordnance Survey maps;

- Google Earth; and
- The Dumfries and Galloway Bird Reports *Birds in Dumfries and Galloway* (Henderson 2018, Henderson 2020 and Henderson 2021).

Field Surveys

- 8.18 A summary of the ornithological surveys undertaken in Year 1 (October 2019 – September 2020) and Year 2 (October 2020 – September 2021) is detailed in Table 8.1. Summaries of survey methodologies used are briefly described below. However, please refer to Technical Appendix 8.1 for full details of survey methodologies.

Table 8.1: Ornithological surveys undertaken at Mid Moile in Year 1 & Year 2

Survey	Year 1 (2019-2020)		Year 2 (2020-2021)	
	Winter: October 2019 – March 2020	Summer: April – September 2020	Winter: October 2020 – March 2021	Summer: April – September 2021
Vantage Point Surveys	✓	✓	✓	✓
Moorland Bird Surveys		✓		✓
Black Grouse Surveys	✓	✓	✓	✓
Raptor & Owl Surveys		✓		✓
Nightjar Surveys		✓		✓

Vantage Point Surveys

- 8.19 Vantage Point (VP) Surveys were undertaken from four VP locations to quantify the flight activity of species of conservation concern (target species) within and outwith the proposed Windfarm site, with the principal aim of determining collision risk.
- 8.20 The methodology for VP Surveys was derived from SNH guidelines (SNH 2017). A total of 138 hours of VP Surveys has been undertaken at each of the four VP locations, as follows:
- 36 hours at each VP location during the winter of Year 1 (October 2019 – March 2020);
 - 36 hours at each VP location during the summer of Year 1 (April – September 2020);
 - 36 hours at each VP location during the winter of Year 2 (October 2020 – March 2021); and
 - 36 hours at each VP location during the summer of Year 2 (April – September 2021).
- 8.21 Full details of the VP watches, including methodologies, survey timings, weather conditions, target species are provided in Technical Appendix 8.1.

Moorland Bird Survey

- 8.22 Moorland Birds Surveys (MBS), for breeding waders and other moorland birds, were undertaken in both Year 1 and Year 2. Four MBS survey visits were completed in April-July of both years, with all suitable habitats within the wider Mid Moile Site, and a 1km

buffer around the Site, surveyed. This survey area was surveyed using the MBS constant-effort survey, following the methodology detailed in Brown & Shepherd (1993), but modified to include four instead of three survey visits (Calladine *et al.* 2009). Full details of the MBS surveys can be found in Technical Appendix 8.1.

Black Grouse Surveys

- 8.23 Surveys for lekking, and non-lekking, Black Grouse were undertaken, of suitable areas within the Mid Moile Site, and a 1.5km buffer, during both Year 1 and Year 2: March to early-May 2020 and March to early-May 2021. The survey methods used for Black Grouse are based on Etheridge & Baines (1995) and are as detailed in Gilbert *et al.* (2000). Full details of the Black Grouse surveys can be found in Technical Appendix 8.1.

Raptor and Owl Surveys

- 8.24 Species-specific surveys (for raptors, owls and wildfowl etc.) were undertaken, of all suitable habitats within the Mid Moile Site and a 2km buffer, during both Year 1 and Year 2: March to August 2020 and March to August 2021. The Survey Area was surveyed using a variety of survey methodologies dependant on habitats and species being searched for. Full details of the methodologies used can be found in Hardey *et al.* (2013), Gilbert *et al.* (1998) and Bibby *et al.* (2000). Full details of the Raptor, Owl and Wildfowl surveys can be found in Technical Appendix 8.1.

Nightjar Surveys

- 8.25 Specific nocturnal surveys for Nightjar (and other nocturnal species) were undertaken, of all suitable habitats within the Site and a 1km buffer, during Year 1 and Year 2: June to August 2020 and June to August 2021. The survey methods used for Nightjar are based on Cadbury (1981) and Morris *et al.* (1994) and are detailed in Gilbert *et al.* (2000).

Collision Risk Modelling Methodology

- 8.26 Flights of target species observed during the VP Surveys were recorded in a manner that will allow collision risk modelling to be undertaken, if required, as per SNH (2017) guidance.
- 8.27 Collision risk modelling was not undertaken on any target species due to the low number of flights recorded within the “risk window” (area within the outermost turbines plus blades at rotor sweep height) and therefore it did not warrant undertaking further analysis as collision risk was unlikely to be significant.

Impact Assessment Methodology

- 8.28 In order to determine the value of the habitats and species found through the ornithological surveys detailed above, and the impacts of the Proposed Development, the baseline and survey results were assessed against the criteria developed by the Chartered Institute of Ecology and Environmental Management (CIEEM 2019).
- 8.29 The method used in this assessment involved four key stages:

- Baseline studies;
- Identification of Valued Ornithological Receptors;
- Identification and characterisation of potential impacts; and
- Assessment of impact significance.

8.30 Further guidance on the assessment of effects, particularly pertaining to birds, has been taken from NatureScot guidance (SNH 2006 & SNH 2017). This guidance is specific to windfarm developments and therefore a combination of approaches with that given by CIEEM is deemed appropriate for an ornithological assessment of the proposed Mid Moile Wind Farm.

Baseline Studies

8.31 Baseline studies are conducted within the identified zone of influence of the proposed Mid Moile Wind Farm. To provide necessary context to the ornithological community present on or adjacent to the proposed windfarm site, the zone was set at between 500m and 2km around the windfarm depending on the target species highlighted in each particular survey type (SNH 2017).

8.32 Baseline information about ornithological features, including international and national site designations, species populations, species assemblages and habitats, was primarily obtained from field surveys, but was also supported by desktop studies, consultation and existing ornithological data relevant to the Site.

Identification of Valued Ornithological Receptors

8.33 From amongst the species populations or species assemblages present within the zone of influence of the proposed wind farm, Valued Ornithological Receptors (VORs) are identified. VORs are typically species of conservation that could be significantly affected by the proposed wind farm.

8.34 The value of populations of species, species assemblages and habitats is evaluated with reference to:

- Their importance in terms of 'biodiversity conservation' value (which relates to the need to conserve representative areas of different habitats and the genetic diversity of species populations);
- Any social benefits that species and habitats deliver (e.g. relating to enjoyment of flora and fauna by the public); and
- Any economic benefits that they provide.

8.35 For the purposes of this assessment, sites, species populations, species assemblages and habitats have been valued using the following scale:

- International;
- National;
- Regional/County;
- Local; and

- Low.

8.36 Table 8.2 below provides definitions for the above criteria.

Table 8.2: Criteria for assessing the value of Ornithological Receptors.

Value of Feature	Key Examples
International	<p>An internationally designated or candidate site for birds. For instance, Special Protection Area (SPA), proposed SPA (pSPA), Ramsar site, Important Bird Area (IBA), or an area which meets the designation criteria for such sites.</p> <p>Any regularly occurring, globally threatened species.</p> <p>A regularly occurring population of an internationally important species (such as an Annex 1 species), which is threatened or rare in the UK, or of uncertain conservation status.</p> <p>A regularly occurring, nationally significant population/number of any internationally important species.</p>
National	<p>A nationally designated site for birds, for instance a site of Special Scientific Interest (SSSI) or National Nature Reserve (NNR), or a discrete area which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) on ornithological grounds irrespective of whether or not it has yet been notified.</p> <p>A regularly occurring significant number/population of a nationally important bird species, such as those listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).</p> <p>A regularly occurring population of a nationally important bird species that is threatened or rare in the county or region.</p>
Regional/County	<p>A regularly occurring significant population/number of any bird species important at a regional/county level.</p> <p>Any regularly occurring, locally significant population of a bird species which is listed in a Regional/County RDB or BAP on account of its regional rarity or localisation.</p> <p>Sites of ornithological conservation importance that exceed the district selection criteria but that fall short of SSSI selection guidelines.</p>
Local	<p>Areas identified in a Local BAP or the relevant natural area profile for their ornithological value.</p> <p>Local Nature Reserves selected on Parish/Local ornithological criteria.</p> <p>Significant numbers/population of a locally important bird species <u>e.g.</u> one which is listed on the Local BAP.</p> <p>Any bird species, populations or assemblages of local importance.</p>
Low	<p>Habitats of moderate to low diversity which support a range of locally and nationally common bird species, the loss of which can be easily mitigated.</p>

Sensitivity

8.37 The sensitivity of any species or habitat/feature to the proposed wind farm development was also considered when determining the significance of any impact upon a particular species or habitat. This is based upon the conservation value or importance of that species or habitat, as outlined in Table 8.3.

Table 8.3: Criteria for assessing the sensitivity of species, habitats and sites.

Sensitivity of Feature	Assessment Criteria
------------------------	---------------------

Very High	A species or population which is/are a designated feature of an SPA, Ramsar or SSSI.
High	Species of international or national importance as identified through field survey, desk survey or consultation, or features that are likely to be significantly affected by the proposals. These include: Rare UK breeding birds (<300 pairs) plus Whooper Swan (<i>Cygnus Cygnus</i>), Golden Eagle (<i>Aquila chrysaetos</i>), White-tailed Eagle (<i>Haliaeetus albicilla</i>), Honey Buzzard (<i>Pernis apivorus</i>), Osprey (<i>Pandion haliaetus</i>), Marsh Harrier (<i>Circus aeruginosus</i>) and Hen Harrier (<i>Circus cyaneus</i>). Species present in Internationally important numbers (>1% of the UK population).
Moderate	Species of regional or county importance, as identified through field survey, desk survey or consultation, or features, although potentially affected, which will not suffer significantly as a result of the proposals. These include: Species present in Regionally important numbers (>1% of the regional population). Species listed on the Annex 1 of the EC Birds Directive. Schedule 1 species of the Wildlife and Countryside Act (1981). Species listed on the UK Red or Amber Lists, or on the Scottish Biodiversity List.
Low	Species of local importance, as identified through field survey, desk survey or consultation, or features which will not be significantly affected by the proposals.

Impact Magnitude

8.38 The magnitude of each potential impact was determined using Table 8.4. The impact magnitude was also assessed based on whether the impact will be positive or negative and direct or indirect.

Table 8.4: Criteria for magnitude of impacts.

Magnitude of Impact	Assessment Criteria
Very Major	The proposed development will have effects which would result in a change in the integrity of the SPA or SSSI, or a change in the ability of a species to retain its current population levels (at a regional or higher level).
Major	The proposed development would have effects which would result in a change in the integrity of a site, or a change in the ability of a species to retain its current population levels (at a regional or higher level).
Intermediate	The proposed development would have effects which would alter key attributes of a site but which would not result in a change to a site's evaluation, or would result in changes in the distribution of a species but not affect its population status at a regional level.
Minor	The proposed development would have effects which would neither alter key attributes of a site nor change its evaluation, or would affect the distribution or status of a species at a local level.
Neutral/Negligible	No impact or the proposed development will have very minor effects which would neither alter key attributes of a development site nor change its evaluation, or will affect the distribution or status of a species at a local level.

8.39 Significance of Effect

8.40 The magnitude of impacts was compared against the value and sensitivity of particular features in order to determine the significance of effects the proposed windfarm is likely to have upon such features. It should be noted that such effects may be negative or positive. The matrix below (Table 8.5) was used to determine the significance of effects upon sites and species. Cells highlighted in light grey are classified as a significant effect for the purposes of this EIA.

Table 8.5: Matrix for assessing significance of effects.

Sensitivity of Feature	Magnitude of Impact				
	Very Major	Major	Intermediate	Minor	Neutral/Negligible
Very High	Very Major	Major	Moderate/ Major	Minor	Negligible
High	Major	Major	Moderate/ Major	Minor	Negligible
Moderate	Major	Moderate/ Major	Moderate/ Minor	Minor	Negligible
Low	Moderate/ Major	Moderate/ Minor	Minor	Minor/ Negligible	Negligible

8.41 The impacts that will have a Very Major, Major or Moderate/Major negative effect upon a feature are considered to be significant, and measures will be put in place to mitigate or compensate for these effects where appropriate.

- 8.42 Effects that were assessed to be Minor/Negligible were subject to professional judgement as to whether the effect was indeed Minor or Negligible. In such cases, mitigation or compensation was included for effects where appropriate to help ensure that there is no net loss in biodiversity as a result of the proposed windfarm.
- 8.43 The duration and reversibility of effects was also considered as a part of the assessment. The definitions used to describe the duration of the effects are explained in Table 8.6. The duration of effects is extremely variable and is dependent upon an individual or species tolerance towards an effect.

Table 8.6: Definitions of the duration of effects.

Effect Magnitude	Assessment Criteria
Permanent	Effects that have the potential to continue over 15 years are considered as permanent. This typically includes habitat loss such as tree felling.
Temporary	Long term: 10 to 15 years. Medium term: 5 to 10 years. Short term: 0 to 5 years.

- 8.44 Reversibility
- 8.45 A temporary impact is one that means recovery is possible. A permanent impact is one that means recovery is unlikely to occur within a reasonable timescale.

Cumulative Effects

- 8.46 All operational and consented wind farm developments, plus those currently in planning, within 20km of the proposed Mid Moile Wind Farm were considered when assessing cumulative effects of the wind farm. Environmental Statements (ES) were used to gain ornithological data from these wind farm developments. Data was not always available for operational wind farms and therefore the cumulative assessment has been made using the data available at the time of writing this ornithology chapter (December 2021). No cut-off date was used for the ornithological data that was included within the cumulative assessment.

Baseline Conditions

Designations

- 8.47 The Proposed Development does not lie within any sites or areas designated or recognised for their international or national ornithological value.
- 8.48 However, the Mid Moile proposed Wind Farm is almost completely surrounded by the immediately adjacent Glen App and Galloway Moors Special Protection Area (SPA) and Glen App and Galloway Moors Site of Special Scientific Interest (SSSI). Both the SPA and SSSI comprise just over 8,948 hectares of heather moorland and rough grassland. The qualifying features of both the SPA and SSSI are detailed in Table 8.7 below.

8.49 In addition, another internationally designated statutory site (SPA and Ramsar site) can be found within 20km of Mid Moile, with another SSSI within 10km. These sites are also detailed in Table 8.7 below.

Table 8.7: Statutory designated ornithology sites within 20km of Mid Moile Wind Farm.

Site	Designation(s)	Qualifying Feature(s)	Description	Distance from Mid Moile
Glen App & Galloway Moors	Special Protection Area Site of Special Scientific Interest	Hen Harrier (breeding)	SPA: an average of 10 breeding females annually (1994-1998) comprising 2% of the GB breeding population SSSI: holding 2% of the GB breeding population	Adjacent
Loch of Inch & Torrs Warren	Special Protection Area Ramsar	Greenland White-fronted Goose (non-breeding)	Ramsar: 641 individuals, 2.3% of the biographic population (5-year peak mean 1996/97 – 2000/01) SPA: 534 individuals, 4% of British wintering population % 2% of World population (5-year peak mean 1991/92 – 1996/97)	8.3km south
		Hen Harrier (non-breeding)	SPA: 8 individuals, 1% of British winter population (5-year peak mean 1991/92 – 1996/97)	
White Loch - Lochinch	Site of Special Scientific Interest	Greylag Goose – Icelandic breeding population (non-breeding)	Up to 2% of the Icelandic Greylag Goose population overwintering in the UK	8.3km south

Consultation

NatureScot

- 8.50 In August 2021, Energiekontor sent NatureScot a Scoping Opinion Request, to which NatureScot provided a response in September 2021. NatureScot's key comments on the scoping document, and how these have subsequently been addressed in the Ornithology Chapter of the EIAR are detailed in Table 8.8 below.

Table 8.8: NatureScot response to the Scoping Opinion Request for Mid Moile Wind Farm.

Summary of Response	How this is Addressed
The direct & indirect impacts of the proposed wind farm on protected areas should be assessed. The assessment should be for the proposal on its own & cumulatively with other plans or projects also affecting the protected areas.	The Ornithology Chapter assesses the impacts of the proposed wind farm against the features & interests as requested, both in isolation and cumulatively.
The proposal could affect the Glen App and Galloway Moors SPA, classified for its breeding Hen Harrier. The proposed development lies adjacent to the boundary of the SPA. Possible access routes may either run through part of the SPA, or may sit adjacent to the SPA.	It is likely that the preferred northern access route into the Site will be used rather than the southern route. This will lessen the predicted impact on the SPA/SSSI but we acknowledge the sites proximity to the designation and this will be reflected in the EIAR.
NatureScot would expect that a non-breeding season of bird survey should be complete for 2020/21 in order that there will be available information covering 2 breeding season and 2 non-breeding season at 36hrs/per season/VP.	Two years of ornithological survey (2 breeding seasons & 2 non-breeding seasons) were completed by the end of September 2021.
NatureScot note that "surveys are being conducted from 4 VP locations which were chosen to provide a wide and unrestricted view of the proposed development area and a 500m buffer". However, there are no maps indicating where these VPs are located and their associated view sheds.	The 4 VP locations provide a robust view of the proposed wind farm, plus a 500m buffer around each turbine. The Ornithology Technical Appendix includes a figure illustrating the 4 VP locations and their viewsheds in comparison to the turbine layout.
It is important that the selected height bands are based around the turbine dimensions. The applicant should demonstrate how the flight activity height information recorded can be appropriately considered in the assessment of effects in relation to the turbine sizes proposed.	Assessment of bird flights over/within the site will be undertaken appropriately with regard to the dimensions of the proposed turbines.
NatureScot consider the range of potentially significant effect on ornithological interest identified in the scoping report to be appropriate. For the assessment of impacts on the SPA, of particular relevance will be the collision risk to SPA qualifying species and how this may affect the viability of the relevant species' population. The application must contain sufficient information on these matters to allow the assessment to be carried out.	The Ornithology Technical Appendix and Ornithology EIAR Chapter will contain sufficient data for NatureScot to independently undertake collision risk for SPA species if required
NatureScot encourage the development of an outline Habitat Management Plan to submit with the EIA.	The application will be accompanied by an outline habitat management plan.
NatureScot advise that it would be better for turbines to be located at least far enough from the SPA edge to allow the retention of a strip of forestry	If deemed necessary, a strip of forestry will be retained between all turbine keyholes and the SPA edge.

Summary of Response	How this is Addressed
between the turbine keyholes and the SPA, while taking account of typical micro siting allowances.	
NatureScot welcome consultation with RSPB and local Raptor Study Group, encourage retrieval of historical Hen Harrier breeding data and suggest contact with local Black Grouse Study Group.	Consultation has been undertaken with RSPB, Dumfries & Galloway RSG and the Black Grouse Study Group. The RSG have been able to provide historical Hen Harrier breeding data.

Royal Society for the Protection of Birds

8.51 In July 2021, Energiekontor submitted a Scoping Report to which RSPB commented in November 2021. RSPBs key comments on the scoping document, and how these have subsequently been addressed in the Ornithology Chapter of the EIA are detailed in Table 8.9 below.

Table 8.9: RSPB response to the Scoping Opinion Request for Mid Moile Wind Farm.

Summary of Response	How this is Addressed
We consider it essential that, considering this development will have a likely significant impact on the Glen App and Galloway Moors SPA, that two years-worth of ornithological survey work are undertaken; specifically, two full breeding seasons and two full non- breeding seasons worth of coverage.	Two years of ornithological survey (2 breeding seasons & 2 non-breeding seasons) completed by the end of September 2021.
As the site is adjacent to an SPA, the duration of vantage point watches should go above and beyond the minimum required to ensure a robust assessment of the impacts of this development on an internationally protected area. It is disappointing that it appears the applicant has only completed the absolute minimum number of hours suggested in NatureScot guidance.	Vantage Point surveys have been robustly undertaken adhering strictly to NatureScot guidance.
There are no maps showing the viewsheds of the vantage point surveys, so we are unable to comment on the suitability of the location and coverage of them.	The 4 VP locations provide a robust view of the proposed wind farm, plus a 500m buffer around each turbine. The Ornithology Technical Appendix of the EIA includes a figure illustrating these VP locations and their viewsheds in comparison to the turbine layout.
The applicant is correct in stating that the status of Hen Harrier within the SPA was favourable maintained when the last assessment was made, in 2008. However, since then the population has plummeted, and there were no breeding records in 2020. The EIA should demonstrate that this proposal, on its own and in combination with other development, will not be detrimental to the full recovery of the breeding population of Hen Harrier, a qualifying feature of the SPA, which is currently in a perilous state.	It's incorrect to state that there were no Hen Harrier breeding records within the SPA in 2020. The Raptor Study Group did not record any breeding Hen Harrier in 2020 due to their survey season being severely curtailed by Covid restrictions. Surveys for the Mid Moile proposed wind farm confirmed two pairs of nesting Hen Harrier in 2020, both within the SPA.
Population modelling on an NHZ-level scale, in addition to SPA-scale, should be included, in order to properly assess the cumulative impact of all wind farms currently operational, approved or in planning within 10km of the SPA and within the NHZ.	A cumulative impact assessment has been undertaken within the EIA.

- 8.52 The RSPB Scotland Conservation Data Management Unit did not have any RSPB owned records, that they were able to supply externally, within a 2km buffer (or 6km for Golden Eagle) of the Mid Moile Proposed Wind Farm.

Dumfries & Galloway Raptor Study Group

- 8.53 The Dumfries and Galloway Raptor Study Group (D&GRSG) were able to supply details of four species (Hen Harrier, Peregrine and Merlin), that have been recorded within 5km of the Mid Moile proposed Wind Farm Site between 2015 and 2020. Full details of these records are provided within Technical Appendix 8.1.

Desk Study

- 8.54 A search of various resources, including the Dumfries & Galloway Bird Reports, identified thirteen species that had been recorded within the vicinity of the proposed Mid Moile Wind Farm: Pale-bellied Brent Goose, King Eider, Great Northern Diver, Red-throated Diver, Black-throated Diver, Pacific Diver, Red-necked Grebe, Slavonian Grebe, Sabines Gull, Little Gull, Short-eared Owl, Great Grey Shrike and White Wagtail. Full details of these records are included within Technical Appendix 8.1.

Field Surveys

- 8.55 Those species of Regional/County conservation importance and above, as well as those listed by NatureScot (SNH 2006; SNH 2017) as important, and therefore considered as VORs, recorded during the field surveys are summarised within this section. Further details of the results or the ornithological surveys can be found within Technical Appendix 8.1.
- 8.56 A total of 19 VORs were recorded within the core study area during the ornithological surveys. All of these are species of conservation concern being included on one or more of the following lists: Schedule 1 of the Wildlife and Countryside Act, Annex 1 of the EC Birds Directive, the fifth review of the Birds of Conservation Concern (BoCC5) Red or Amber List species and species on the Scottish Biodiversity List.

Wildfowl

Barnacle Goose

- 8.57 Barnacle Goose is included on the BoCC5 Amber List (Stanbury *et al.* 2021). The latest wintering population estimate, for the Greenland breeding population (naturalised population excluded) is 56,000 individuals (Frost *et al.*, 2019).
- 8.58 The only Barnacle Geese flightlines recorded over the turbine swept area, was a flock of 41 during the October 2019 VP surveys. There were no other Barnacle Goose flightlines over the turbine swept area during any of the VP surveys between October 2019 and September 2021. The proposed wind farm site is considered to be of Low value for Barnacle Goose.

Pink-footed Goose

- 8.59 Pink-footed Goose is included on the BoCC5 Amber List. The latest International Icelandic-breeding grey goose census (Brides *et al.* 2020) recorded an overwintering UK population of 500,928 individuals, with 15,225 of these recorded in Dumfries and Galloway.
- 8.60 The only flock of Pink-footed Geese recorded over the turbine swept area, was a flock of 55 over during the November 2020 VP surveys. There were no other Pink-footed Goose flightlines over the turbine swept area during any of the VP surveys between October 2019 and September 2021. The proposed wind farm site is considered to be of Low value for Pink-footed Goose.

Greylag Goose

- 8.61 Greylag Goose is included on the BoCC5 Amber List. There are two populations of Greylag Goose wintering in the UK, the Icelandic-breeding population and a naturalised/feral population, breeding in Scotland and Northern England. The latest International Icelandic-breeding grey goose census (Brides *et al.* 2020) recorded an overwintering UK population of 73,355 individuals (from the Icelandic-breeding population), with a further 27,880 naturalised birds. None of these Icelandic-breeding birds were found to be wintering in Dumfries & Galloway. However, Henderson (2021) states that Greylag Goose is a common winter visitor to coasts and inland waters, as well as breeding on inland waterbodies.
- 8.62 No Greylag Geese were recorded breeding within the wider Mid Moile Site in 2020. However, a single pair were nesting on Loch Ree (within the wider Mid Moile Site) in 2021. In addition, five pairs of Greylag Goose bred on Penwhirn Reservoir (within the 1km buffer) during 2020, with six pairs on the reservoir in 2021.
- 8.63 Vantage Point surveys, between October 2019 and September 2021, recorded three Greylag flights over the turbine swept area: singles on 8th January 2020 and 1st October 2020, and a pair on 21st December 2020.
- 8.64 The Greylag Geese breeding on Loch Ree and Penwhirn Reservoir, and recorded flying over the wider Mid Moile Site, are considered to be local breeding feral/naturalised Greylag Geese, rather than from the Icelandic-breeding population that winters in Great Britain. The proposed wind farm site is considered to be of Low value for the Icelandic-breeding population of Greylag Goose.

Teal

- 8.65 Teal is on the BoCC5 Amber List. The UK breeding population of Teal is estimated to be between 2,700 and 4,750 pairs (Balmer *et al.* 2013; Woodward *et al.* 2020) and the wintering population approximately 435,000 individuals (Frost *et al.* 2019). In Dumfries & Galloway, Teal is a scarce, but probably very under recorded breeding species on inland waters and a common winter visitor to coastal and inland waters (Henderson 2021).
- 8.66 A pair of Teal bred on Penwhirn Reservoir during both 2020 and 2021. Penwhirn Reservoir is outside the wider Mid Moile Site, but within the 1km buffer around the Site. Vantage Point surveys, between October 2019 and September 2021, recorded no Teal flights

over the turbine swept area. The proposed wind farm site is considered to be of Low value for Teal.

Goosander

- 8.67 The UK breeding population of Goosander is estimated to be approximately 4,800 pairs and the wintering population approximately 14,500 individuals (Frost *et al.* 2019; Woodward *et al.* 2020). Goosander is a common resident breeder on inland waters in Dumfries & Galloway (Henderson 2021).
- 8.68 During both the 2020 and 2021 breeding seasons, no Goosander bred within the proposed wind farm site, the wider Mid Moile Site, or the 1km buffer around the Site. However, a pair of Goosander bred on Main Water of Luce, within the 2km buffer around the Site, in both 2020 and 2021. Vantage Point surveys recorded no Goosander flights over the turbine swept area. The proposed wind farm site is considered to be of Low value for Goosander.

Raptors

White-tailed Eagle

- 8.69 White-tailed Eagle is included on the Annex 1, Schedule 1, BoCC5 Amber List and Scottish Biodiversity Lists. The UK breeding population of White-tailed Eagle is approximately 116 pairs, in 2019, with all of these pairs in Scotland (Eaton *et al.* 2021). None of these pairs of White-tailed Eagle bred in Dumfries & Galloway in 2018 (Henderson 2021).
- 8.70 White-tailed Eagle did not breed within the proposed wind farm site, the wider Mid Moile Site, or a 6km buffer around the Site, during either the 2020 or 2021 breeding seasons.
- 8.71 A second calendar-year (immature) White-tailed Eagle was recorded flying north over the wider Mid Moile Site (but outside the turbine swept area) during a VP survey on 27th November 2019. This bird was a satellite-tracked male (named Aonghus) from the Irish release project that was hatched in Connemara in 2018 (*pers com* Dr Allan Mee, Irish White-tailed Sea Eagle Reintroduction Programme). His satellite-track around the time of the VP sighting shows him moving over Mid Moile and Loch Ryan on the afternoon of 27th November.
- 8.72 After being present in the Loch Ryan area, Aonghus spent some time in the Rhins of Galloway where it roosted on the cliffs near the Mull of Galloway. It then crossed the Irish Sea to the Isle of Man, to spend some of the winter there before returning to the West Galloway area in January 2020 (Henderson 2021). During a Mid Moile VP survey on 19th March 2020, 'Aonghus' was again recorded, this time over Penwhirn Reservoir, outside of both the wider Mid Moile site and a 500m buffer. Since this record there were no further sightings of White-tailed Eagle within the Mid Moile area up until September 2021.
- 8.73 The proposed windfarm site is considered to be of Low value for White-tailed Eagle.

Hen Harrier

- 8.74 Hen Harrier is included on the Annex 1, Schedule 1, Red List and Scottish Biodiversity Lists. The UK breeding population of Hen Harrier is approximately 575 pairs (Eaton *et al.* 2021). Approximately 15 pairs of Hen Harrier bred in Dumfries & Galloway in 2018 (Henderson 2020) and 14 pairs in 2019 (Henderson 2021).
- 8.75 Hen Harrier did not breed within the proposed wind farm site or the wider Mid Moile Site during either the 2020 or 2021 breeding seasons. However, during 2020, a pair of Hen Harrier was found to be nesting within the 1km buffer around the Site, with another pair in the 2km buffer around the Site. No Hen Harriers were found to be nesting within either the 1km or 2km buffers during 2021.
- 8.76 Consultation with both D&GRSG and RSPB produced no records of Hen Harrier nesting/holding territory within the wider Mid Moile Site, but did record single pairs in both the 1km and 2km buffers in 2019.
- 8.77 During the October 2019 to September 2021 Vantage Point surveys, 12 Hen Harrier flights were recorded over/through the turbine swept area, with another flight over the wider Mid Moile Site. Flights were recorded within both the breeding and non-breeding seasons.
- 8.78 It is considered that Hen Harrier are occasionally using the proposed Mid Moile Wind Farm Site as a part of a wider foraging area, both in the breeding and winter seasons. As such, the proposed wind farm site is considered to be of Local value for foraging Hen Harrier.

Goshawk

- 8.79 Goshawk is included on the Annex 1 and Schedule 1 Lists. The UK breeding population of Goshawk is approximately 712 pairs (Eaton *et al.* 2021). Goshawk is a resident breeder in Dumfries & Galloway, with an expanding and increasing population. At least 22 pairs nested in the county in 2018 (Henderson 2020) and 28 in 2019 (Henderson 2021).
- 8.80 Goshawk did not breed within the proposed wind farm site or the wider Mid Moile Site during either 2020 or 2021. However, an active Goshawk territory, within the 1km buffer, was occupied in both 2020 and 2021. Just two Goshawk flights were recorded over/through the turbine swept area, in April and June 2020, with no further flights during the rest of the VP surveys (October 2019 to September 2021).
- 8.81 Consultation with both D&GRSG and RSPB produced no records of Goshawk nesting/holding territory within the wider Mid Moile Site, or the 1km buffer around the Site.
- 8.82 Despite the forestry within the wider Mid Moile Site the raptor surveys and vantage point surveys confirmed that the proposed wind farm site is of Low value for Goshawk.

Red Kite

- 8.83 Red Kite is included on the Annex 1, Schedule 1 and Scottish Biodiversity Lists. The UK breeding population of Red Kite is at least 4,400 pairs (Holling *et al.* 2012). Red Kite is an increasing resident breeder in Dumfries & Galloway, with at least 125 pairs nesting in 2018 (Henderson 2020) and at least 126 pairs in 2019 (Henderson 2021).
- 8.84 Red Kite did not breed within the proposed wind farm site, the wider Mid Moile Site or a 2km buffer around the Site during either 2020 or 2021. Consultation with both D&GRSG and RSPB produced no records of Red Kite nesting/holding territory within the wider Mid Moile Site, or the 2km buffer around the Site.
- 8.85 A total of seven individual Red Kite flights were recorded over/through the turbine swept area between October 2019 and September 2021, with another flight over the wider Mid Moile Site, but outside the turbine swept area, in the same time period. The proposed wind farm site is considered to be of Local value for Red Kite.

Peregrine

- 8.86 Peregrine is included on the Annex 1, Schedule 1 and Scottish Biodiversity Lists. The UK breeding population of Peregrine is approximately 1,750 pairs (Wilson *et al.* 2018; Eaton *et al.* 2021). Peregrine is a resident breeder in Dumfries & Galloway, with at least 62 pairs nesting in 2018 (Henderson 2020) and 59 pairs in 2019 (Henderson 2021).
- 8.87 Peregrine did not breed within the proposed wind farm site, the wider Mid Moile Site, or a 1km buffer around the Site during either 2020 or 2021. Likewise, consultation with both D&GRSG and RSPB produced no records of Peregrine nesting/holding territory within the wider Mid Moile Site, or a 1km buffer around the Site. However, a pair of Peregrine were confirmed as nesting, at a traditional site, in the 2km buffer in both 2020 and 2021.
- 8.88 Eight individual Peregrine flights were recorded over/through the turbine swept area, during the two years of VP surveys, with another two flights over the wider Mid Moile Site. All of these records were aged as adults and are likely to be the 2km buffer pair hunting over the survey area. The proposed wind farm site is considered to be of Low value for Peregrine.

Merlin

- 8.89 Merlin is included on the Annex 1, Schedule 1, BoCC5 Red and Scottish Biodiversity Lists. The UK breeding population of Merlin is approximately 1,160 pairs (Ewing *et al.* 2011; Woodward *et al.* 2020). Merlin is a scarce resident breeder in Dumfries & Galloway, with nine pairs nesting in 2018 (Henderson 2020) and eight in 2019 (Henderson 2021).
- 8.90 Merlin did not breed within the proposed wind farm site or the wider Mid Moile Site in either 2020 or 2021. However, a pair nested within the 1km buffer in both years. Consultation with D&GRSG and RSPB also confirmed that there are no historical records of nesting Merlin within the wider Mid Moile Site, but that a pair had nested within the 1km buffer in previous years.
- 8.91 During the October 2019 to September 2021 VP surveys, six Merlin flights were recorded over/through the turbine swept area. It is considered that these flights are all likely to be of the pair of Merlin that nested within the 1km buffer around the Mid Moile Site. It

is considered that Merlin are occasionally using the proposed Mid Moile Wind Farm Site as part of a wider foraging area, both in the breeding and winter seasons. As such, the proposed wind farm site is considered to be of Local value for foraging Merlin.

Waders

Oystercatcher

- 8.92 Oystercatcher is included on the BoCC5 Amber List. The UK breeding population of Oystercatcher is estimated to be approximately 95,500 pairs (O'Brien 2004; Balmer *et al.* 2013) and the wintering population approximately 285,000 individuals (Frost *et al.* 2019). Oystercatcher is a common breeding species In Dumfries & Galloway, with an additional influx of non-breeding birds in the winter months (Henderson 2021).
- 8.93 No Oystercatchers nested, or held breeding territory, within the proposed windfarm site or the wider Mid Moile Site during either the 2020 or 2021 breeding seasons. However, three pairs nested within the 1km buffer around the Mid Moile Site in 2020, with two pairs in the 1km buffer in 2021. No Oystercatcher flights were recorded over/through the turbine swept area, during the VP surveys. The proposed wind farm site is considered to be of Low value for Oystercatcher.

Golden Plover

- 8.94 Golden Plover is a Scottish Biodiversity Species. The UK breeding population of Golden Plover is estimated to be approximately 42,500 pairs (Woodward *et al.* 2020; Balmer *et al.* 2013) and the wintering population approximately 410,000 individuals (Gillings & Fuller 2009; Woodward *et al.* 2020). Golden Plover is a scarce upland breeding species In Dumfries & Galloway, but a common wintering species on the coast (Henderson 2021).
- 8.95 No Golden Plover nested, or held breeding territory, within the proposed wind farm site, the wider Mid Moile Site, or a 1km buffer around the Mid Moile Site during either the 2020 or 2021 breeding seasons. Golden Plover flights were recorded over the turbine swept area on one occasion; a flock of four in January 2020. In addition, a flock of 14 Golden Plover were recorded over the wider Mid Moile Site, but outwith the turbine swept area. The proposed wind farm site is considered to be of Low value for Golden Plover.

Lapwing

- 8.96 Lapwing is included on the BoCC5 Red List and is a Scottish Biodiversity Species. The UK breeding population of Lapwing is estimated to be approximately 97,500 pairs (O'Brien 2004; Balmer *et al.* 2013) and the wintering population approximately 635,000 individuals (Gillings & Fuller 2009). Lapwing is a common, but declining, breeding species In Dumfries & Galloway, with an additional influx of non-breeding birds in the winter months (Henderson 2021).
- 8.97 No Lapwings nested, or held breeding territory, within the proposed windfarm site or the wider Mid Moile Site in either the 2020 or 2021 breeding seasons. However, two pairs were nesting within the 1km buffer in both 2020 and 2021.

- 8.98 Lapwings were recorded flying over the turbine swept area on eight separate occasions during the October 2019 to September 2021 VP surveys. These flights were as follows: singles in February 2020 and May 2020, two together in November 2020 and a flock of three in January 2021, plus singles in March 2021, May 2021, July 2021 and August 2021. In addition, Lapwings were recorded over the wider Mid Moile Site on a further two occasions: singles in May 2020 and May 2021
- 8.99 The proposed wind farm site is considered to be of Low value for Lapwing.

Snipe

- 8.100 Snipe is included on the BoCC5 Amber List. The UK breeding population of Snipe is estimated to be approximately 66,500 pairs (O'Brien 2004; Balmer *et al.* 2013) and the wintering population approximately 1,100,000 individuals (Musgrove *et al.* 2011; Musgrove *et al.* 2013; Frost *et al.* 2019). Snipe is a common, but declining, breeding resident in Dumfries & Galloway (Henderson 2021).
- 8.101 In 2020, one pair of Snipe was confirmed to be breeding within the wider Mid Moile Site, with a further five pairs in a 1km buffer around the Site. In 2021, two pairs were confirmed to be breeding within the wider Site, with four pairs in the 1km buffer.
- 8.102 A total of six Snipe flights were recorded over/through the turbine swept area, during the VP surveys, with another seven flights over the wider Mid Moile Site. The proposed windfarm site is considered to be of Local value for Snipe.

Curlew

- 8.103 Curlew is included on the BoCC5 Red List and is a Scottish Biodiversity Species. The UK breeding population of Curlew is estimated to be approximately 58,500 pairs (O'Brien 2004; Balmer *et al.* 2013) and the wintering population approximately 125,000 individuals (Frost *et al.* 2019). Curlew is a declining severely as a breeding species in Dumfries & Galloway (Henderson 2021), although it also remains a common passage and winter visitor.
- 8.104 No Curlew nested, or held breeding territory, within the proposed wind farm site or the wider Mid Moile Site during either the 2020 or 2021 breeding seasons. However, four pairs of Curlew nested within the 1km buffer around the Mid Moile Site in 2020, with three pairs in the 1km buffer in 2021. A total of nine Curlew flights were recorded over/through the turbine swept area, during the VP surveys, with another two flights over the wider Mid Moile Site. The proposed wind farm site is considered to be of Low value for Curlew.

Game birds

Black Grouse

- 8.105 Black Grouse is included on the Annex 1 and BoCC5 Red Lists and is a Scottish Biodiversity Species. The UK breeding population of Black Grouse is estimated to be approximately 4,850 pairs (Woodward *et al.* 2020). Black Grouse is an uncommon and localised breeding resident in Dumfries & Galloway (Henderson 2021).

- 8.106 No Black Grouse were recorded within the proposed wind farm site, the wider Mid Moile Site or the 1km of 2km buffers during the period of October 2019 to September 2021 inclusive. Specific Black Grouse surveys, in March-May 2020 and March-May 2021, to record lekking birds, did not produce any records of such. The proposed windfarm site is considered to be of Low value for Black Grouse.

Owls

Barn Owl

- 8.107 Barn Owl is a Schedule 1, Annex 1 and Scottish Biodiversity Species. The UK breeding population of Barn Owl estimated to be between 4,000 and 14,000 pairs (Toms *et al.* 2001). Barn Owl is a common breeding resident in Dumfries & Galloway (Henderson 2021).
- 8.108 No Barn Owls nested within the proposed wind farm site or the wider Mid Moile Site during either 2020 or 2021. However, a single pair of Barn Owl were found nesting, in both 2020 and 2021, within the 1km buffer around the wider Mid Moile Site. Several other traditional, and suitable, nest sites were checked during both 2020 and 2021 but no other breeding Barn Owl pairs were recorded within 2km of the Site.
- 8.109 No Barn Owl flights were recorded over/through the turbine swept area, or the wider Mid Moile Site, during the VP surveys. The proposed wind farm site is considered to be of Low value for Barn Owl.

Long-eared Owl

- 8.110 The UK breeding population of this under-recorded species is estimated to be over 1,800 pairs (Woodward *et al.* 2020). Long-eared Owl is considered to be an uncommon breeding resident in Dumfries & Galloway (Henderson 2021), although again it is under-recorded in the county. Survey work undertaken for the proposed Mid Moile Wind Farm, and other such sites in Dumfries & Galloway, certainly indicates that Long-eared Owl is more widespread in the county than other sources show.
- 8.111 No Long-eared Owls were recorded within the proposed windfarm site in either 2020 or 2021. However, a single pair of Long-eared Owl were confirmed to have bred successfully within the wider Mid Moile Site during both 2020 and 2021. In addition, another pair of Long-eared Owl were breeding within the 1km buffer, around the wider site, in 2021.
- 8.112 No Long-eared Owl flights were recorded over/through the turbine swept area, or the wider Mid Moile Site, during the VP surveys. The proposed wind farm site is considered to be of Local value for Long-eared Owl.

Nightjar

Nightjar

- 8.113 Nightjar is included on the Annex 1 and BoCC Amber Lists as well as being a Scottish Biodiversity Species. The UK breeding population of Nightjar is estimated to be

approximately 4,600 pairs (Conway *et al.* 2007). Nightjar is an uncommon summer visitor and breeder in Dumfries & Galloway (Henderson 2021). During 2018, at least 49 'churring' male Nightjars were recorded from 11 locations in Dumfries & Galloway (Henderson 2020), with at least 41 'churring' males in 2019 (Henderson 2021).

- 8.114 No Nightjars were recorded within the proposed wind farm site, the wider Mid Moile Site or the 2km buffer during the period of October 2019 to September 2021 inclusive. The proposed wind farm site is considered to be of Low value for Nightjar.

Passerines

Common Crossbill

- 8.115 Common Crossbill is included on the Schedule 1 list as well as being a Scottish Biodiversity Species. The UK breeding population of Common Crossbill is estimated to be approximately 26,000 pairs (Woodward *et al.* 2020). Common Crossbill is a breeding resident in coniferous plantations in Dumfries & Galloway (Henderson 2021).
- 8.116 Seven pairs of Common Crossbill were considered to have bred within the wider Mid Moile Site during 2020, with a further two pairs in the 1km buffer around the Site. In 2021, ten pairs of Common Crossbill were considered to be breeding within the wider Mid Moile Site, with another two pairs in the 1km buffer. The proposed wind farm site is considered to be of Local value for Common Crossbill.

Modifying Influences

- 8.117 The populations of VORs recorded during the survey period are likely to follow the national, regional and county population trends.

Information Gaps

- 8.118 It is considered that the ornithological baseline surveys, consultation and desktop studies provide the full suite of data required, as per SNH (2006) and SNH (2017), and subsequent specific consultation with SNH. There are considered to be no significant ornithological information gaps.

Design Evolution

- 8.119 Due to the considered low impact on VORs from the Proposed Development, the design of the project was not constrained by ornithological issues.

Assessment of Effects

Species of Conservation Importance

- 8.120 The effects of the Proposed Development on species of Regional/County conservation importance and above, which are also listed by SNH (SNH 2006; SNH 2017) as important, and therefore considered as VORs, are summarised within this section.

- 8.121 A summary of effects, without mitigation measures, is provided in the table at the end of this section (Table 8.7).

Construction Phase

- 8.122 This section summarises the significance of potential effects on VORs during the construction phase of the development.

Habitat Modification

- 8.123 The proposed wind farm site is currently a mixed commercial conifer plantation with limited ornithological biodiversity. As part of the construction phase, approximately 63.96 ha of conifer plantation will be felled as a result of key-holing turbines with clearance for other infrastructure. This felling will result in a direct permanent loss of breeding/foraging habitat, as although such felling already occurs on the plantations, these areas are then replanted with trees on a rotational basis.

- 8.124 Tree felling has the potential to disturb breeding birds and damage or destroy bird nests, eggs or young. It is an offence under the WCA to kill or injure any bird, disturb Schedule 1 breeding bird species or to damage or destroy bird nests, eggs or young. As Common Crossbill (a Schedule 1 species) was recorded breeding within the wider Mid Moile Site, mitigation measures will be implemented to ensure compliance with the legislation.

Disturbance and Displacement

Wildfowl

Barnacle Goose

- 8.125 Barnacle Geese were only recorded flying over the proposed wind farm during the non-breeding season. Therefore disturbance during the construction phase would have **no effect** on this species with regard to either breeding or wintering/passage birds.

Pink-footed Goose

- 8.126 Pink-footed Geese were only recorded flying over the proposed wind farm during the non-breeding season. Therefore disturbance during the construction phase would have **no effect** on this species with regard to either breeding or wintering/passage birds.

Greylag Goose

- 8.127 Greylag Geese were recorded from the core study area during both the breeding and non-breeding seasons. All Greylag Geese recorded from the Core Study Area are considered to be local breeding feral/naturalised Greylag Geese, rather than from the Icelandic-breeding population that winters in Great Britain. Disturbance during the construction phase would therefore have **no effect** on the Icelandic-breeding population of Greylag Goose.

- 8.128 One pair of feral/naturalised Greylag Goose bred on Loch Ree (in 2021), which is within the wider Mid Moile Site and approximately 250m from the proposed wind farm

development. Given the distance of the proposed construction works from the loch, it is considered that disturbance during the construction period on breeding (feral/naturalised) Greylag Goose, a receptor of **moderate sensitivity**, would be **minor**, resulting in a **minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

- 8.129 Further pairs of Greylag Geese (five pairs in 2020 and six pairs in 2021) were recorded breeding on Penwhirn Reservoir. The nest sites on Penwhirn Reservoir are approximately 860m from the nearest proposed construction and therefore disturbance during the construction phase would have **no effect** on Greylag Geese nesting on Penwhirn Reservoir.

Teal

- 8.130 Teal were only recorded from the core study area during the breeding season. No Teal were found to be breeding within the proposed wind farm site or the wider Mid Moile Site. There were also no Teal flights recorded over the proposed wind farm or the wider Mid Moile Site. However, one pair of Teal bred on Penwhirn Reservoir (within the 1km buffer) in both 2020 and 2021, with the nest site being approximately 1.8km from the proposed wind farm infrastructure. Given the distance of the proposed construction works from the nest site, it is considered that disturbance during the construction period on breeding Teal, a receptor of **moderate sensitivity**, would be **negligible**, resulting in a **negligible effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Goosander

- 8.131 Goosander were only recorded from the core study area during the breeding season. There were no Goosander flights recorded over the proposed wind farm or the wider Mid Moile Site. Likewise, no Goosanders were found to be breeding, or wintering, within the proposed wind farm site, the wider Mid Moile Site or the 1km buffer. However, a pair of Goosander bred within the 2km buffer around the wider Mid Moile Site in both 2020 and 2021. This pair nested on Main Water of Luce, approximately 2.5km from the nearest proposed construction. It is therefore considered that disturbance during the construction phase on breeding Goosander, a receptor of **low sensitivity**, would be **negligible**, resulting in a **negligible effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Raptors

White-tailed Eagle

- 8.132 The only records of White-tailed Eagle during all the surveys undertaken, was of the same second-calendar year bird seen in flight, over the wider Mid Moile Site in November 2019 and then over the 1km buffer in March 2020. This bird is known to be a wandering immature bird from the Irish reintroduction program. There were no other records of White-tailed Eagle from the proposed wind farm site, or the core study area, during either the 2020 or 2021 breeding season – there are no known nesting pairs of

White-tailed Eagle in Dumfries & Galloway. There will therefore be **no effect** on nesting White-tailed Eagle from disturbance during the construction period.

- 8.133 Non-breeding White-tailed Eagles are unlikely to regularly hunt within, or adjacent to, the proposed wind farm site, as demonstrated by the VP surveys. Wind farm construction would therefore have a **negligible impact** on a feature of **high sensitivity**, resulting in a **negligible effect** which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Hen Harrier

- 8.134 A combination of surveys and consultation confirmed that no Hen Harriers were nesting within the proposed wind farm site, or the wider Mid Moile Site, in either 2020 or 2021. However, two pairs of Hen Harrier were considered to be nesting within the core study area during 2020; one pair within the 1km buffer and one pair in the 2km buffer. These two pairs were 875m and 2.4km from the wind farm construction site respectively. No pairs were recorded nesting within the 1km or 2km buffers in 2021.
- 8.135 Given the distance between the 2km buffer nest site and the proposed development site, disturbance during the construction period, on this Hen Harrier nest/territory, is considered to be **negligible** and thus **not significant**.
- 8.136 The nearest Hen Harrier nest is located 875m from an area where it is proposed to construct a wind turbine. Currie & Elliot (1997) suggested a Hen Harrier disturbance free buffer of 500-1,000m around nest sites when undertaking forest management works. However, Ruddock & Whitfield (2007) considered this buffer to be excessive, both from survey results and expert opinion, suggesting a disturbance free buffer of 500-750m instead. Given that the distance between the proposed construction works and the Hen Harrier territory is an extra 125m beyond the upper limit of this proposed disturbance free buffer, then it is considered that disturbance during the construction phase on this harrier territory would be minor. Construction would cause a **minor impact** on a feature of **very high sensitivity**, resulting in a **minor effect** which is **not significant**. Any displacement and disturbance to this pair that did occur during the construction period would be short-term and reversible.
- 8.137 It is considered that both breeding and non-breeding/wintering Hen Harrier occasionally use the Mid Moile area (including the wider Mid Moile Site) as a part of a wider foraging area. Hen Harriers were observed in flight, over either the turbine swept area or the wider Mid Moile Site, on 13 occasions between October 2019 and September 2021. Although Hen Harriers are not nesting within either the proposed wind farm site or the wider Mid Moile Site, they are using the area occasionally for foraging. It is therefore considered that disturbance during the construction period would have a **minor impact** on foraging Hen Harriers, a feature that is of **very high sensitivity**, through displacement. This would in turn result in a **minor effect** which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

- 8.138 Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Goshawk

- 8.139 No Goshawk bred within either the proposed wind farm site or the wider Mid Moile Site, in either 2020 or 2021. However, a combination of surveys and consultation confirmed that a pair of Goshawk bred, in both 2020 and 2021, within the 1km buffer around the Mid Moile Site. This pair are approximately 1.3km from the proposed development. As a result of the distance between this nest site and the proposed development site, disturbance during the construction period on nesting Goshawks is considered to be **negligible** and thus **not significant**.
- 8.140 During the VP surveys Goshawks were observed in flight, on two occasions, over the turbine swept area. It is considered that disturbance during the construction period, on hunting Goshawk, would be negligible. A **negligible impact** on a feature of **moderate sensitivity** and thus a **negligible effect** which is **not significant**. Any displacement and disturbance that did occur on foraging birds, during the construction period would be short-term and reversible.

Red Kite

- 8.141 A combination of surveys and consultation confirmed that no Red Kites were nesting within the proposed wind farm site, the wider Margree Site, or the 2km buffer in either 2020 or 2021. There will therefore be **no effect** on nesting Red Kite from disturbance during the construction period.
- 8.142 Red Kites were observed in flight, over either the turbine swept area or the wider Mid Moile Site, on eight occasions between October 2019 and September 2021. Although Red Kites are not nesting within either the proposed wind farm site or the wider Mid Moile Site, they are using the area occasionally for foraging. It is therefore considered that disturbance during the construction period would have a **minor impact** on foraging Red Kites, a feature that is of **moderate sensitivity**, through displacement. This would in turn result in a **minor effect** which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Peregrine

- 8.143 A combination of surveys and consultation confirmed that Peregrines did not breed within the proposed wind farm site, the wider Mid Moile Site or a 1km buffer around the site during 2020 or 2021. However, a pair did breed within the 2km buffer in both years. This pair are approximately 2.1km from the proposed development. As a result of the distance between the nest site and the proposed development site, disturbance during the construction period on nesting Peregrine is considered to be **negligible** and thus **not significant**.
- 8.144 Peregrines were observed in flight, over either the turbine swept area or the wider Mid Moile Site, on ten occasions between October 2019 and September 2021. It is considered that disturbance during the construction period would have a **negligible**

impact on hunting/commuting Peregrines, a feature of **moderate sensitivity** and thus a **negligible effect** which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Merlin

- 8.145 A combination of surveys and consultation confirmed that Merlin did not breed within the proposed wind farm site or the wider Mid Moile Site, in either 2020 or 2021. However, a pair did breed within the 1km buffer in both years. This pair are approximately 1.5km from the proposed development. As a result of the distance between the nest site and the proposed development site, disturbance during the construction period on nesting Merlin is considered to be **negligible** and thus **not significant**.
- 8.146 Merlins were observed in flight, over either the turbine swept area or the wider Mid Moile Site, on six occasions between October 2019 and September 2021. It is considered that disturbance during the construction period would have a **negligible impact** on hunting/commuting Merlin, a feature of **moderate sensitivity** and thus a **negligible effect** which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Waders

Oystercatcher

- 8.147 No Oystercatchers were found to be breeding within the proposed wind farm site or the wider Mid Moile Site. However, up to three pairs of Oystercatcher were recorded breeding within the 1km buffer around the Mid Moile Site: three pairs in 2020 and two pairs in 2021. These pairs were on Penwhirn Reservoir, with the nearest nesting birds being approximately 1.9km from the proposed construction. No Oystercatcher flights were recorded over either the turbine swept area or the wider Mid Moile Site during the VP surveys. It is therefore considered that disturbance during the construction phase would have a **negligible impact** on a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Golden Plover

- 8.148 Breeding bird surveys confirmed that Golden Plover did not breed within the core study area during 2020 or 2021. Vantage Point surveys recorded Golden Plover flights over the wider Mid Moile Site on two occasions; a flock of four and a flock of 14. It is considered that disturbance during the construction phase would have a **minor impact** on a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Lapwing

- 8.149 No Lapwing were found to be breeding within the proposed wind farm site or the wider Mid Moile Site. However, two pairs of Lapwing were recorded breeding within the 1km

buffer around the Mid Moile Site in both 2020 and 2021. The nearest of these nesting Pairs were approximately 1.2km from the proposed construction. Vantage Point surveys recorded Lapwing flights over the wider Mid Moile Site on ten occasions. It is considered that disturbance during the construction phase would have a **minor impact** on a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Snipe

- 8.150 One pair of Snipe was recorded breeding within the wider Mid Moile Site in 2020, with two pairs in the wider site in 2021. The 2020 pair was approximately 475m from the nearest proposed construction, whilst the 2021 pairs were 475m and 500m from the nearest construction. Given the distance of the proposed construction works from the above pairs, it is considered that disturbance during the construction period on breeding Snipe (within the wider Mid Moile Site), a receptor of **moderate sensitivity**, would be **intermediate**, resulting in a **moderate/minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.
- 8.151 Further pairs of breeding Snipe were recorded within the 1km buffer: five pairs in 2020 and four pairs in 2021. The nearest of these pairs were approximately 1.3km from the nearest proposed construction and therefore disturbance during the construction phase would have **no effect** on Snipe nesting within the 1km buffer.

Curlew

- 8.152 No Curlew nested within the proposed wind farm site or the wider Mid Moile Site in either 2020 or 2021. However, four pairs were recorded breeding within the 1km buffer in 2020, with three pairs in the 1km buffer in 2021. The nearest of these pairs was approximately 1.25km from the nearest proposed construction. Eleven Curlew flights were recorded over either the turbine swept area or the wider Mid Moile Site during the VP surveys. It is therefore considered that disturbance during the construction phase would have a **minor impact** on a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Game Birds

Black Grouse

- 8.153 No Black Grouse were recorded within the core study area during the October 2019 to September 2021 ornithology surveys. It is therefore considered that disturbance during the construction phase would have **no effect** on Black Grouse.

Owls

Barn Owl

- 8.154 No Barn Owl nested within the proposed wind farm site, or the wider Mid Moile Site, in either 2020 or 2021. However, a combination of surveys and consultation confirmed that a pair of Barn Owl bred, in both 2020 and 2021, within the 1km buffer around the wider Mid Moile Site. Although this traditional nest site is within the 1km buffer, it is over 1.6km from the nearest construction, as a part of the proposed windfarm. As a result of the distance between the breeding location and the development site, disturbance during the construction period on nesting Barn Owls would be **negligible** and thus **not significant**.
- 8.155 No Barn Owl flights were recorded within either the turbine swept area or the wider Mid Moile Site. It is considered that disturbance during the construction period would have a **negligible** impact on a feature of **moderate** sensitivity and thus a **negligible** effect which is **not significant**. Any displacement and disturbance that did occur during the construction period would be short-term and reversible.

Long-eared Owl

- 8.156 Long-eared Owls were recorded from the Core Study Area during both the 2020 and 2021 breeding seasons. There were no Long-eared Owl flights recorded over the proposed wind farm or the wider Mid Moile Site. However, a pair of Long-eared Owl bred in the wider Mid Moile Site, in the same area in both 2020 and 2021, being approximately 640m from the nearest proposed wind farm construction. Another pair of Long-eared Owl was recorded in the 1km buffer around the Mid Moile Site, but only in 2021. This pair was approximately 1.2km from the nearest proposed construction. Given the distance of the proposed construction works from these two territories, it is considered that disturbance during the construction period on breeding Long-eared Owl, a receptor of **low sensitivity**, would be **minor**, resulting in a **minor/negligible effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Nightjar

- 8.157 No Nightjars were recorded within the core study area during the October 2019 to September 2021 ornithology surveys. It is therefore considered that disturbance during the construction phase would have **no effect** on Nightjar.

Passerines

Common Crossbill

- 8.158 Common Crossbills were recorded as nesting from the Core Study Area during both the 2020 and 2021 breeding seasons. Seven pairs of Common Crossbill bred in the wider Mid Moile Site in 2020, with ten pairs in the wider site in 2021. The nearest of these pairs was approximately 190m from the nearest proposed wind farm construction. Given the proximity of the proposed construction works to some of the Crossbill territories, it is considered that disturbance during the construction period on breeding Common Crossbills, a receptor of **moderate sensitivity**, would be **intermediate**, resulting in a **moderate/minor effect** which is **not significant**. Displacement and disturbance during the construction period would be short-term and reversible.

Operational Phase

Disturbance, Displacement and Collision

- 8.159 This section summarises and evaluates the significance of the potential effects on birds (without mitigation measures) during the 35-year operational period of the Development. Both displacement and collision effects on VORs are considered within this section.
- 8.160 The main causes of displacement to birds during the operational period of a wind farm are visual and noise disturbance from turbines. Increased presence of people within the site boundary undertaking maintenance of a proposed development also has the potential to cause disturbance to birds.
- 8.161 It has been recorded that breeding densities of certain species decrease up to 800m from wind farm developments. Open habitat upland breeding species have been recorded to actively avoid wind turbines (Pearce-Higgins *et al.* 2009). Displacement of birds from wind turbines may result in individuals abandoning optimal breeding or foraging habitats. This is generally over distances between 100m and 200m. Species such as Buzzard, Golden Plover and Snipe which show avoidance of turbines also exhibit avoidance of other infrastructure associated with wind farms, such as tracks (Pearce-Higgins *et al.* 2009; Pearce-Higgins *et al.* 2012).
- 8.162 Levels of human activity on the operational wind farm site are likely to be comparable to the existing situation, with the proposed development site being operated as a commercial forestry plantation. There are currently no active farms or active dwellings within the wider Mid Moile Site boundary and the site is a forestry plantation with access being difficult. Therefore current levels of background human activity within the proposed wind farm site boundary are likely to be **negligible**. Predicted human presence within the development site, during the operational period, is likely to be similar, with the wind farm being operated remotely and maintenance visits being infrequent. Human activity, during the operational phase, would therefore result in a negligible impact on VORs of **high – low sensitivity**, all resulting in **negligible** effects, which are **not significant**.

Wildfowl

Barnacle Goose

- 8.163 The only Barnacle Geese recorded over the turbine swept area was a flock of 41 over in October 2019. Based on this, it is considered that the risk of collision with the proposed turbines is very low.
- 8.164 The operational period of the Proposed Development would therefore have a **negligible impact** on Barnacle Goose, a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Pink-footed Goose

- 8.165 The only Pink-footed Geese recorded over the turbine swept area was a flock of 55 over in November 2020. Based on this, it is considered that the risk of collision with the proposed turbines is very low.
- 8.166 The operational period of the Proposed Development would therefore have a **negligible impact** on Pink-footed Goose, a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Greylag Goose

- 8.167 All Greylag Geese recorded from the Core Study Area are considered to be local breeding feral/naturalised Greylag Geese, rather than from the Icelandic-breeding population that winters in Great Britain. Impacts during the operational phase would therefore have **no effect** on the Icelandic-breeding population of Greylag Goose.
- 8.168 One pair of feral/naturalised Greylag Goose bred on Loch Ree (in 2021), which is within the wider Mid Moile Site and approximately 250m from the proposed wind farm redline boundary. Given the distance of this nest from the wind farm, it is considered that disturbance during the operational period on breeding Greylag Goose would be **minor**.
- 8.169 The only Greylag Geese recorded within the turbine swept area were singles in January and October 2020, and a pair in December 2020. Based on this, it is considered that the risk of collision with the proposed turbines is very low.
- 8.170 The operational period of the Proposed Development would therefore have a **minor impact** on Greylag Goose, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Teal

- 8.171 No Teal were recorded breeding, or wintering, within the proposed wind farm site or the wider Mid Moile Site. However, a pair of Teal did nest approximately 1.8km from the wind farm redline boundary, in both 2020 and 2021. Given the distance of this nest site from the proposed wind farm, it is considered that disturbance to nesting Teal, during the operational period, would be **negligible**.
- 8.172 No Teal were recorded flying over the turbine swept area during the VP surveys. It is therefore considered that the risk of collision with the proposed turbines is very low.
- 8.173 The operational period of the wind farm would therefore have a **negligible impact** on Teal, a receptor of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Goosander

- 8.174 No Goosander were recorded breeding, or wintering, within the proposed wind farm site, the wider Mid Moile Site or the 1km buffer. However, a pair did nest approximately 2.5km from the wind farm redline boundary, in both 2020 and 2021. Given the distance

of this nest site from the proposed wind farm, it is considered that disturbance to nesting Goosander, during the operational period, would be **negligible**.

- 8.175 No Goosander were recorded flying over the turbine swept area during the VP surveys. It is therefore considered that the risk of collision with the proposed turbines is very low.
- 8.176 The operational period of the wind farm would therefore have a **negligible impact** on Goosander, a receptor of **low sensitivity**, resulting in a **negligible effect** which is **not significant**.

Raptors

White-tailed Eagle

- 8.177 A combination of the ornithology surveys, desktop and consultation data confirmed that White-tailed Eagle were not nesting/holding territory within the proposed wind farm site, the wider Mid Moile Site or the core study area. Therefore, the windfarm will cause **no effect** on breeding White-tailed Eagle from disturbance during the operational period.
- 8.178 The only White-tailed Eagle recorded during the VP surveys was a single second-calendar bird recorded over the wider Mid Moile Site in November 2019 and then over the 1km buffer in March 2020. No flights were recorded within the turbine swept area. Based on this, it is considered that the risk of collision with the proposed turbines is very low.
- 8.179 The operational period of the Development would therefore have a **negligible impact** on White-tailed Eagle, a feature of **high sensitivity**, resulting in a **negligible effect** which is **not significant**.

Hen Harrier

- 8.180 A combination of the ornithology surveys, desktop and consultation data confirmed that Hen Harrier were not nesting/holding territory within the proposed wind farm site or the wider Mid Moile Site, during either 2020 or 2021. However, two pairs of Hen Harrier were considered to be nesting within the core study area during 2020, being approximately 875m and 2.4km from the proposed wind turbines respectively.
- 8.181 The nearest Hen Harrier nest is located 875m from the proposed wind turbines. Currie & Elliot (1997) suggested a Hen Harrier disturbance free buffer of 500-1,000m around nest sites when undertaking forest management works. However, Ruddock & Whitfield (2007) considered this buffer to be excessive, both from survey results and expert opinion, suggesting a disturbance free buffer of 500-750m instead. Given that the distance between the proposed wind farm and the Hen Harrier territory is an extra 125m beyond the upper limit of this proposed disturbance free buffer, then it is considered that disturbance during the operational phase of the wind farm, on this harrier territory, would be **minor impact**.
- 8.182 Only one Hen Harrier flight was recorded within the turbine swept area, during the VP surveys, with another eleven flights over the swept area but below collision risk height

(<30m). Given that this is one flight within the turbine swept area, recorded over a period of 24 months of surveys, then it is considered that the risk of collision with the proposed turbines is very low.

- 8.183 The operational period of the Development would therefore have a **minor impact** on Hen Harrier, a feature of **very high sensitivity**, resulting in a **minor effect** which is **not significant**.

Goshawk

- 8.184 A combination of the ornithology surveys, desktop and consultation data confirmed that Goshawk were not nesting/holding territory within the proposed wind farm site or the wider Mid Moile Site, during either 2020 or 2021. However, a pair were considered to be nesting within the core study area during both 2020 and 2021, with the nest approximately 1.3km from the wind farm redline boundary. Given the distance between this nest site and the proposed wind farm, disturbance during the operational period on nesting Goshawks is considered to be **negligible**.

- 8.185 Two Goshawk flights were recorded over/within the turbine swept area during the VP surveys. It is therefore considered that the risk of collision, between Goshawk and the proposed turbines is very low.

- 8.186 The operational period of the wind farm would have a **minor impact** on Goshawk, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Red Kite

- 8.187 A combination of the ornithology surveys, desktop and consultation data confirmed that Red Kite were not nesting/holding territory within the proposed wind farm site, the wider Mid Moile Site or the core study area. Therefore, the windfarm will cause **no effect** on breeding Red Kite from disturbance during the operational period.

- 8.188 During the VP surveys undertaken to date, a total of seven Red Kite flights were recorded over/within the turbine area, with five of these being within the turbine swept area. The other three flights were below collision risk height (<30m). Given that this amounts to a total of five Red Kite flights within the turbine swept area, during the 24 months of October 2019 to September 2021, then it is considered that the risk of collision between Red Kite and the proposed turbines is low.

- 8.189 The operational period of the windfarm would have a **minor impact** on Red Kite, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Peregrine

- 8.190 A combination of the ornithology surveys, desktop and consultation data confirmed that Peregrine were not nesting/holding territory within the proposed wind farm site, the wider Mid Moile Site or the 1km buffer, during either 2020 or 2021. However, a pair were nesting within the core study area during both 2020 and 2021, with the nest approximately 2.1km from the wind farm redline boundary. Given the distance

between this nest site and the proposed wind farm, disturbance during the operational period on nesting Peregrine is considered to be **negligible**.

- 8.191 Of the Peregrines recorded during the VP surveys, only eight flights were within the turbine swept area. Based on this, it is considered that the risk of collision, between Peregrines and the proposed turbines is low.
- 8.192 The operational period of the windfarm would therefore have a **minor impact** on Peregrine, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Merlin

- 8.193 A combination of the ornithology surveys, desktop and consultation data confirmed that Merlin were not nesting/holding territory within the proposed wind farm site or the wider Mid Moile Site, during either 2020 or 2021. However, a pair were nesting within the core study area, during both 2020 and 2021, with the nest approximately 1.5km from the wind farm redline boundary. Given the distance between this nest site and the proposed wind farm, disturbance during the operational period on nesting Merlin is considered to be **negligible**.
- 8.194 Of the Merlin flights recorded during the VP surveys none were recorded within the turbine swept area. Six flights were recorded within the turbine area, but all of these were at a height below the collision risk window (<30m). Based on this, it is considered that the risk of collision, between Merlin and the proposed turbines is very low.
- 8.195 The operational period of the windfarm would have a **minor impact** on Merlin, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Waders

Oystercatcher

- 8.196 No Oystercatchers were found to be breeding within the proposed wind farm site or the wider Mid Moile Site. However, up to three pairs of Oystercatcher were recorded breeding within the core study area, with the nearest nesting birds being approximately 1.9km from the proposed wind farm redline boundary. It is therefore considered that disturbance during the operational phase would have a **negligible impact** on breeding Oystercatchers.
- 8.197 No Oystercatcher flights were recorded over either the turbine swept area or the wider Mid Moile Site during the VP surveys. Based on this, it is considered that the risk of collision between Oystercatchers and the proposed turbines is very low.
- 8.198 The operational period of the windfarm would have a **negligible impact** on Merlin, a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Golden Plover

- 8.199 Golden Plover did not nest within the proposed wind farm or the core study area. Therefore, the proposed wind farm will cause **no effect** on breeding Golden Plover from disturbance during the operational period.
- 8.200 Golden Plover flights were recorded within the turbine swept area on just one occasion, a flock of four, during the VP surveys. Given that this amounts to a total of just four flights, during the 24 months of October 2019 to September 2021, then it is considered that the risk of collision between Golden Plover and the proposed turbines is low.
- 8.201 The operational period of the wind farm would have a **minor impact** on Golden Plover, a species of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Lapwing

- 8.202 No Lapwing were found to be breeding within the proposed wind farm site or the wider Mid Moile Site. However, two pairs of Lapwing were recorded breeding within the 1km buffer around the Mid Moile Site in both 2020 and 2021. The nearest of these nesting pairs was approximately 1.2km from the proposed wind farm redline boundary. Given the distance of the proposed wind farm from the above pairs, it is considered that disturbance during the operational period, would have **no impact** on breeding Lapwing.
- 8.203 Vantage Point surveys recorded Lapwing flights within the turbine swept area on eight occasions, totalling 11 individual flightlines. Given that this amounts to a total of just 11 flights, during the 24 months of October 2019 to September 2021, then it is considered that the risk of collision between Lapwing and the proposed turbines is low.
- 8.204 It is considered that the operational phase of the wind farm, on Lapwing, would have a **minor impact** on a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Snipe

- 8.205 One pair of Snipe was recorded breeding within the wider Mid Moile Site in 2020, with two pairs in the wider site in 2021. The 2020 pair was approximately 475m from the proposed wind farm redline boundary, whilst the 2021 pairs were 475m and 500m from the wind farm redline boundary. Given the distance of the proposed wind farm from the above pairs, it is considered that disturbance during the operational period on breeding Snipe would have an **intermediate impact**.
- 8.206 Six Snipe flights were recorded over the turbine area during the VP surveys. However, only two of these were at a height that puts them within the turbine swept area, and thus at risk of collision. The other six flights were below collision risk height (<30m). It is therefore considered that the risk of collision, between Snipe and the proposed turbines is low.
- 8.207 The operational period of the wind farm would have an **intermediate impact** on Snipe, a feature of **moderate sensitivity**, resulting in a **moderate/minor effect** which is **not significant**.

Curlew

- 8.208 No Curlew bred within the proposed wind farm or the wider Mid Moile Site during either 2020 or 2021. However, four pairs were recorded breeding within the 1km buffer in 2020, with three pairs in the 1km buffer in 2021. The nearest of these pairs was approximately 1.25km from the wind farm redline boundary. Given this distance, it is considered that the proposed wind farm would cause **no effect** on breeding Curlew during the operational period.
- 8.209 Ten Curlew flights were recorded within the turbine swept area during the VP surveys, with another two flights below collision risk height (<30m). It is therefore considered that the risk of collision, between Curlew and the proposed turbines, is low.
- 8.210 The operational period of the wind farm would have a **minor impact** on Curlew, a feature of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Gamebirds

Black Grouse

- 8.211 No Black Grouse were recorded within the core study area during the October 2019 to September 2021 ornithology surveys. It is therefore considered that disturbance during the operational phase would have **no effect** on Black Grouse.

Owls

Barn Owl

- 8.212 No Barn Owl nested within the proposed wind farm site, or the wider Mid Moile Site, in either 2020 or 2021. However, a combination of surveys and consultation confirmed that a pair of Barn Owl bred, in both 2020 and 2021, within the core study area, with the nest site over 1.6km from the proposed wind farm redline boundary. As a result of the distance between the breeding location and the development site, disturbance during the operational period on nesting Barn Owls would be **negligible**.
- 8.213 No Barn Owl flights were recorded within the turbine swept area during the VP surveys. It is therefore considered that the risk of collision, between Barn Owl and the proposed turbines, is very low.
- 8.214 The operational period of the windfarm would have a **negligible impact** on Barn Owl, a species of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Long-eared Owl

- 8.215 A pair of Long-eared Owl bred in the wider Mid Moile Site, in the same area in both 2020 and 2021, being approximately 640m from the proposed wind farm. Another pair of Long-eared Owl was recorded in the 1km buffer around the Mid Moile Site, but just in 2021. This pair was approximately 1.2km from the proposed wind farm. Given the distance of the proposed construction works from these two territories, it is considered

that disturbance during the operational period on breeding Long-eared Owl would be a **minor impact**.

8.216 No Long-eared Owl flights were recorded within the turbine swept area during the VP surveys undertaken to date. It is therefore considered that the risk of collision, between Long-eared Owl and the proposed turbines, is very low.

8.217 The operational period of the wind farm would have a **minor impact** on Long-eared Owl, a species of **low sensitivity**, resulting in a **minor/negligible effect** which is **not significant**.

Nightjar

8.218 No Nightjars were recorded within the core study area during the October 2019 to September 2021 ornithology surveys. It is therefore considered that both disturbance during the operational phase of the wind farm and potential collision with the turbines will have **no effect** on Nightjar.

Passerines

Common Crossbill

8.219 Seven pairs of Common Crossbill bred in the wider Mid Moile Site in 2020, with ten pairs in the wider site in 2021. The nearest of these pairs was approximately 190m from the proposed wind farm. Given the proximity of the proposed wind farm to some of the Crossbill territories, it is considered that disturbance during the operational period on breeding Common Crossbills would be an **intermediate impact**.

8.220 No Common Crossbill flights were recorded within the turbine swept area during the VP surveys. It is therefore considered that the risk of collision, between Common Crossbill and the proposed turbines, is very low.

8.221 The operational period of the wind farm would have an **intermediate impact** on Common Crossbill, a receptor of **moderate sensitivity**, resulting in a **moderate/minor effect** which is **not significant**.

Collision Risk Modelling

8.222 All flightlines recorded during the October 2019 to September 2021 VP surveys were assigned to one, or more, of three height bands, with these three height bands reflecting the proposed turbine characteristics at the time of survey. These three height bands were: <30m, 30-200m and >200m. With the proposed turbines at Mid Moile now being 230m tall (to the blade tip) these height bands now no longer reflect the characteristics of the proposed turbine. During the production of both this Chapter and the Ornithology Technical Appendix, it was decided that, in order to provide a robust assessment of flightlines within/over the proposed wind farm, all flightlines from the upper two height bands that passed over/through the Turbine Swept Area (inclusive of a 500m buffer around this area) would be considered to be within the Collision Risk Window. All flightlines within the <30m height band passed under the turbine swept area.

8.223 Eleven species were recorded flying through the Turbine Swept Area during the October 2019 to September 2021 VP surveys: Barnacle Goose, Pink-footed Goose, Greylag Goose, Hen Harrier, Red Kite, Goshawk, Peregrine, Golden Plover, Lapwing, Curlew and Snipe. Table 8.10 provides a summary of all flights of these species through/over the Turbine Swept Area (whether they were at the <30m, 30-200m or >200m height bands) for the whole two years of VP survey. Table 8.10 also provides a value for the total number of flights through the Turbine Swept Area (at the 30-200m and >200m height bands), plus the number of seconds of flight, for each of the species, through the Turbine Swept Area (again at the upper two height bands).

Table 8.10: Total number of flights, and seconds of flight, through Turbine Swept Area.

Species	No. flights through/over Turbine Swept Area (TSA) at:			Total no. flights through TSA (30-200m & >200m)	Total no. seconds of flight through TSA (30-200m & >200m)
	<30m	30-200m	>200m		
Barnacle Goose	-	-	41	41	9,922
Pink-footed Goose	-	-	55	55	5,775
Greylag Goose	-	3	1	4	207
Hen Harrier	11	1	-	1	58
Red Kite	3	5	1	5	244
Goshawk	-	1	2	2	532
Peregrine	-	2	7	8	432
Merlin	6	-	-	-	-
Golden Plover	-	4	-	4	192
Lapwing	-	10	3	11	414
Curlew	2	8	-	10	165
Snipe	6	2	-	2	20

8.224 Collision risk modelling was not undertaken on any target species due to the low number of flights recorded within the “risk window” (area within the outermost turbines plus blades at rotor sweep height) and therefore it did not warrant undertaking further analysis as collision risk was unlikely to be significant.

Decommissioning Phase

8.225 It is extremely difficult to evaluate the potential effects decommissioning could have on important bird populations after the lifespan of the wind farm. In addition, it is possible that after 35 years the avian community may have altered significantly.

8.226 In the absence of mitigation the effects of decommissioning are likely to be similar to those of the construction phase, with these potential effects likely to be temporary. Bird surveys will be required prior to decommissioning works commencing to identify breeding Schedule 1 species and other bird nests within the planned work areas. These would be carried out to best practice methodology, guidance and legislation at that time.

8.227 However, if comparable with the construction phase, then impacts of the decommissioning phase on bird populations, as predicted by this assessment, will have a **negligible to intermediate impact** on features of **low to high sensitivity**. These impacts will produce a **negligible to minor/moderate effect**, which are all **not significant**.

Micro-siting

8.228 There would be no change in the ornithological assessment if the turbines, or other site infrastructure such as crane pads or access tracks, are micro-sited to a maximum distance of 100 m in any direction from the proposed locations.

Cumulative Effects

8.229 Wind developments within 20 km of the proposed Mid Moile Wind Farm, which have the potential to add cumulative impact are shown in Table 8.11. In order to undertake the cumulate assessment each wind farm EIA was searched for and in its absence the Non-technical Summary (NTS) was used to gain ornithological impacts from developments which are currently in planning, consented or operational. However, for some of the wind farms both the EIA and NTS were not available in the public domain.

Table 8.11: Wind Farm Developments/Applications within 20km of Mid Moile Wind Farm which have the Potential to add Cumulative Effects.

Wind Farm	Size	Status	Rational
Glen App	11 turbines	Operational	Within 10km of Mid Moile: NTS available
Stranoch	20 turbines	Consented	Within 10km of Mid Moile: EIA available
Arcleoch	60 turbines	Operational	Within 10km of Mid Moile: no EIA or NTS available
Chirmorie Variation 2	21 turbines	Consented	Within 10km of Mod Moile: EIA available
Arcleoch Extension	13 turbines	Consented	Within 20km of Mid Moile: EIA Ornithology Chapter available
Knocknain	1 turbine	Operational	Within 20km of Mid Moile: no EIA or NTS available
North Rhins	11 turbines	Operational	Within 20km of Mid Moile: no EIA or NTS available
Barlockhart Moor	4 turbines	Operational	Within 20km of Mid Moile: no EIA or NTS available
Carscreugh	18 turbines	Operational	Within 20km of Mid Moile: NTS available
Glenchamber	11 turbines	Operational	Within 20km of Mid Moile: NTS available

Wind Farm	Size	Status	Rational
Artfield Fell	15 turbines	Operational	Within 20km of Mid Moile: no EIAR or NTS available
Balmurrie Fell	7 turbines	Operational	Within 20km of Mid Moile: no EIAR or NTS available
Artfield Forest	12 turbines	Operational	Within 20km of Mid Moile: NTS available
Airies	14 turbines	Operational	Within 20km of Mid Moile: no EIAR or NTS available
Airies II	Not known	Scoping	Within 20km of Mid Moile: no documents available
Killgallioch	96 turbines	Operational	Within 20km of Mid Moile: no EIAR or NTS available
Killgallioch Extension	9 turbines	Consented	Within 20km of Mid Moile: EIAR available
Mark Hill	28 turbines	Operational	Within 20km of Mid Moile: no EIAR or NTS available

Table 8.12: Summary of Effects of Wind Farms within 20km of Mid Moile Wind Farm on Hen Harrier.

Wind Farm	Effects on Hen Harrier	Significant/Not Significant
Mid Moile	Minor effect at both construction & operational phases	Not significant
Glen App	No significant effects	Not significant
Stranoch	No significant effects	Not significant
Arcleoch	No data available	-
Chirmorie Variation 2	No adverse effects on integrity of Glen App & Galloway Moors SPA. Breeding Hen Harrier would not be compromised.	No significant
Arcleoch Extension	No affect	Not significant
Knocknain	No data available	-
North Rhins	No data available	-
Barlockhart Moor	No data available	-
Carscreugh	No effect on Glen App & Galloway Moors SPA or breeding Hen Harriers	Not significant
Glenchamber	No effect	Not significant
Artfield Fell	No data available	-
Balmurrie Fell	No data available	-
Artfield Forest	No significant effect	Not significant

Wind Farm	Effects on Hen Harrier	Significant/Not Significant
Airies	No data available	-
Airies II	No data available	-
Killgallioch	No data available	-
Killgallioch Extension	No effect	Not significant
Mark Hill	No data available	-

8.230 Even with the development of all of the operational, consented and proposed wind farms within 20km of Mid Moile, the level of cumulative impact on Hen Harriers is considered to be of low spatial and long-term temporal magnitude. The residual cumulative effect is therefore considered to be of minor, and thus Not Significant, in the context of the EIA Regulations. This is further strengthened by many of the above projects Habitat Management Plans, providing more attractive habitat away from the turbines and, in some cases, reducing habitat suitability close to the turbines.

Glen App & Galloway Moors SPA

8.231 The Mid Moile proposed wind farm site lies immediately adjacent to the Glen App & Galloway Moors SPA. The qualifying feature of the SPA is breeding Hen Harrier.

8.232 Hen Harrier were recorded within the wind farm core study area during both the breeding and non-breeding/wintering seasons.

8.233 Assessment within this chapter considers that construction of the proposed wind farm would cause a **minor impact** on breeding Hen Harriers, a feature of **high sensitivity**, resulting in a **minor effect** which is **not significant**. It is also considered that disturbance during the construction period would have a **minor impact** on foraging Hen Harriers (both during the breeding and non-breeding season), a feature that is of **high sensitivity**, through displacement. This would in turn result in a **minor effect** which is **not significant**.

8.234 Assessment also considered that the operational period of the proposed wind farm would have a **minor impact** on breeding and non-breeding Hen Harrier, a feature of **high sensitivity**, resulting in a **minor effect** which is **not significant**.

8.235 Given the assessment that the proposed wind farm will have a minor effect on both breeding and non-breeding Hen Harriers, it is considered that the Proposed Development will only have a **minor effect** on the qualifying feature of the Glen App & Galloway Moors SPA. This minor effect is **not significant**.

Loch of Inch & Torrs Warren SPA and Ramsar Site

8.236 The Mid Moile proposed wind farm site lies approximately 8.3km to the north of the Loch of Inch & Torrs Warren SPA and Ramsar Site. The two qualifying features of the SPA and Ramsar are non-breeding/wintering Greenland White-fronted Geese and non-breeding/wintering Hen Harrier.

- 8.237 Given the distance of the Proposed Development from the SPA/Ramsar, it is considered that the Proposed Development will have no impact on the habitats present with the SPA/Ramsar.
- 8.238 During the VP surveys no Greenland White-fronted Geese were recorded flying over either the proposed wind farm or the wider Mid Moile Site. In addition, no Greenland White-fronted Geese were recorded, within or over the Mid Moile Site, or a 2km buffer around the Site, during any of the other surveys undertaken.
- 8.239 Hen Harrier were recorded within the wind farm core study area during both the breeding and non-breeding/wintering seasons.
- 8.240 Assessment within this chapter considers that construction of the proposed wind farm would cause a **minor impact** on breeding Hen Harriers, a feature of **high sensitivity**, resulting in a **minor effect** which is **not significant**. It is also considered that disturbance during the construction period would have a **minor impact** on foraging Hen Harriers (both during the breeding and non-breeding season), a feature that is of **high sensitivity**, through displacement. This would in turn result in a **minor effect** which is **not significant**.
- 8.241 Assessment also considered that the operational period of the proposed wind farm would have a **minor impact** on breeding and non-breeding Hen Harrier, a feature of **high sensitivity**, resulting in a **minor effect** which is **not significant**.
- 8.242 Given the lack of records of Greenland White-fronted Goose, during the ornithology surveys, and the assessment that the proposed wind farm will have a minor effect on both breeding and non-breeding Hen Harriers, it is considered that the Proposed Development will have **no effects** on the qualifying features of the Loch of Inch and Torrs Warren SPA/Ramsar.

Summary of Effects

- 8.243 The effects of the proposed windfarm on VORs, without mitigation, are shown in Table 8.13 below. The significance of impact on any of the ornithological receptors is, at most, **moderate/minor adverse effect**.

Table 8.13: Assessment of the effects of the development prior to mitigation.

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Construction Phase				
Barnacle Goose: disturbance during construction	Moderate	No effect	Short-term	No effect
Pink-footed Goose: disturbance during construction	Moderate	No effect	Short-term	No effect

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Greylag Goose: disturbance during construction	Moderate	Minor	Short-term	Minor
Teal: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Goosander: disturbance during construction	Low	Negligible	Short-term	Negligible
White-tailed Eagle: disturbance during construction	High	Negligible	Short-term	Negligible
Hen Harrier: disturbance during construction	Very High	Minor	Short-term	Minor
Goshawk: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Red Kite: disturbance during construction	Moderate	Minor	Short-term	Minor
Peregrine: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Merlin: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Oystercatcher: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Golden Plover: disturbance during construction	Moderate	Minor	Short-term	Minor
Lapwing: disturbance during construction	Moderate	Minor	Short-term	Minor
Snipe: disturbance during construction	Moderate	Intermediate	Short-term	Moderate/minor
Curlew: disturbance during construction	Moderate	Minor	Short-term	Minor
Black Grouse: disturbance during construction	Moderate	No effect	Short-term	No effect
Barn Owl: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Long-eared Owl: disturbance during construction	Low	Minor	Short-term	Minor/negligible
Nightjar: disturbance during construction	Moderate	No effect	Short-term	No effect

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Common Crossbill: disturbance during construction	Moderate	Intermediate	Short-term	Moderate/minor
Operational Phase				
Barnacle Goose: displacement during operation	Moderate	Negligible	Permanent	Negligible
Barnacle Goose: collision during operation	Moderate	Negligible	Permanent	Negligible
Pink-footed Goose: displacement during operation	Moderate	Negligible	Permanent	Negligible
Pink-footed Goose: collision during operation	Moderate	Negligible	Permanent	Negligible
Greylag Goose: displacement during operation	Moderate	Minor	Permanent	Minor
Greylag Goose: collision during operation	Moderate	Minor	Permanent	Minor
Teal: displacement during operation	Moderate	Negligible	Permanent	Negligible
Teal: collision during operation	Moderate	Negligible	Permanent	Negligible
Goosander: displacement during operation	Low	Negligible	Permanent	Negligible
Goosander: collision during operation	Low	Negligible	Permanent	Negligible
White-tailed Eagle: displacement during operation	High	Negligible	Permanent	Negligible
White-tailed Eagle: collision during operation	High	Negligible	Permanent	Negligible
Hen Harrier: displacement during operation	Very High	Minor	Permanent	Minor
Hen Harrier: collision during operation	Very High	Minor	Permanent	Minor
Goshawk: displacement during operation	Moderate	Minor	Permanent	Minor
Goshawk: collision during operation	Moderate	Minor	Permanent	Minor

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Red Kite: displacement during operation	Moderate	Minor	Permanent	Minor
Red Kite: collision during operation	Moderate	Minor	Permanent	Minor
Peregrine: displacement during operation	Moderate	Minor	Permanent	Minor
Peregrine: collision during operation	Moderate	Minor	Permanent	Minor
Merlin: displacement during operation	Moderate	Minor	Permanent	Minor
Merlin: collision during operation	Moderate	Minor	Permanent	Minor
Oystercatcher: displacement during operation	Moderate	Negligible	Permanent	Negligible
Oystercatcher: collision during operation	Moderate	Negligible	Permanent	Negligible
Golden Plover: displacement during operation	Moderate	Minor	Permanent	Minor
Golden Plover: collision during operation	Moderate	Minor	Permanent	Minor
Lapwing: displacement during operation	Moderate	Minor	Permanent	Minor
Lapwing: collision during operation	Moderate	Minor	Permanent	Minor
Snipe: displacement during operation	Moderate	Intermediate	Permanent	Moderate/minor
Snipe: collision during operation	Moderate	Intermediate	Permanent	Moderate/minor
Curlew displacement during operation	Moderate	Minor	Permanent	Minor
Curlew: collision during operation	Moderate	Minor	Permanent	Minor
Black Grouse: displacement during operation	Moderate	No effect	Permanent	No effect
Black Grouse: collision during operation	Moderate	No effect	Permanent	No effect

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Barn Owl: displacement during operation	Moderate	Negligible	Permanent	Negligible
Barn Owl: collision during operation	Moderate	Negligible	Permanent	Negligible
Long-eared Owl: displacement during operation	Low	Minor	Permanent	Minor/negligible
Long-eared Owl: collision during operation	Low	Minor	Permanent	Minor/negligible
Nightjar: displacement during operation	Moderate	No effect	Permanent	No effect
Nightjar: collision during operation	Moderate	No effect	Permanent	No effect
Common Crossbill: displacement during operation	Moderate	Intermediate	Permanent	Moderate/minor
Common Crossbill: collision during operation	Moderate	Intermediate	Permanent	Moderate/minor
Decommissioning Phase				
Barnacle Goose: disturbance during construction	Moderate	No effect	Short-term	No effect
Pink-footed Goose: disturbance during construction	Moderate	No effect	Short-term	No effect
Greylag Goose: disturbance during construction	Moderate	Minor	Short-term	Minor
Teal: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Goosander: disturbance during construction	Low	Negligible	Short-term	Negligible
White-tailed Eagle: disturbance during construction	High	Negligible	Short-term	Negligible
Hen Harrier: disturbance during construction	Very High	Minor	Short-term	Minor
Goshawk: disturbance during construction	Moderate	Negligible	Short-term	Negligible

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Red Kite: disturbance during construction	Moderate	Minor	Short-term	Minor
Peregrine: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Merlin: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Oystercatcher: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Golden Plover: disturbance during construction	Moderate	Minor	Short-term	Minor
Lapwing: disturbance during construction	Moderate	Minor	Short-term	Minor
Snipe: disturbance during construction	Moderate	Intermediate	Short-term	Moderate/minor
Curlew: disturbance during construction	Moderate	Minor	Short-term	Minor
Black Grouse: disturbance during construction	Moderate	No effect	Short-term	No effect
Barn Owl: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Long-eared Owl: disturbance during construction	Low	Minor	Short-term	Minor/negligible
Nightjar: disturbance during construction	Moderate	No effect	Short-term	No effect
Common Crossbill: disturbance during construction	Moderate	Intermediate	Short-term	Moderate/minor

Mitigation

- 8.244 As no potentially significant effects have been predicted it is not considered necessary to include any mitigation measures.
- 8.245 However, Energiekontor is committed to maintaining and improving the ornithological value of the Site and surrounding area and thus the following ornithological mitigation would therefore be implemented as part of the Proposed Development.

Breeding Birds

- 8.246 In order to minimise the risk of harming or disturbing breeding birds, vegetation clearance works will not be undertaken during the breeding season (1st March to 31st

August inclusive) unless a checking survey by an appropriately qualified ornithologist has shown active nests to be absent immediately prior to the start of works. Such prohibited works would also include stripping of areas of low/ground vegetation, soil stripping works and off-track vehicle movements to ensure ground nesting species such as Lapwing, Skylark and Meadow Pipit are not adversely affected.

Hen Harrier

- In order to ensure that any pairs of Hen Harrier holding territory/nesting, within either the proposed wind farm site, the wider Mid Moile Site, or the 1km buffer around the Site, are not displaced during construction works, all work within the vicinity of any nests will be undertaken under the direction of a Hen Harrier Method Statement. This method statement will include the following elements:
- A suitably qualified ornithologist will be appointed, prior to any site construction works being commenced, to survey the proposed wind farm site, the wider Mid Moile Site and the 1km buffer, for territorial/nesting Hen Harrier during every breeding season that construction works continue.
- If a Hen Harrier nest is located then a 750m buffer zone will be established around the nest within which no construction works will take place during the Hen Harrier nesting season (March - August inclusive).
- In recent years, both the breeding population and productivity of Hen Harriers within the Glen App and Galloway Moors SPA have declined. It is proposed to implement monitoring of the breeding population of Hen Harriers within the Mid Moile Core Study Area, following operation of the wind farm. Monitoring would include the identification of any breeding attempts and subsequent surveillance to assess factors influencing breeding productivity. The duration and frequency of the monitoring programme will be discussed and agreed with NatureScot.

Merlin

- In order to ensure that any pairs of Merlin holding territory/nesting, within either the proposed wind farm site, the wider Mid Moile Site, or the 1km buffer around the Site, are not displaced during construction works, all work within the vicinity of any nests will be undertaken under the direction of a Merlin Method Statement. This method statement will include the following elements:
- A suitably qualified ornithologist will be appointed, prior to any site construction works being commenced, to survey the proposed wind farm site, the wider Mid Moile Site and the 1km buffer, for territorial/nesting Merlin during every breeding season that construction works continue.
- If a Merlin nest is located then a 750m buffer zone will be established around the nest within which no construction works will take place during the Merlin nesting season (March - August inclusive).

Management of Wind Farm to reduce suitability for foraging raptors.

8.247 The following habitat management measures will be incorporated into the proposed Mid Moile Wind Farm Site. It is considered that these measures will help to limit the suitability of the Site, which will be developed from commercial forestry to commercial

forestry with key-holed turbines, to foraging raptors and owls, specifically Hen Harrier, Merlin and Short-eared Owl. In summary these measures will include:

- The ground vegetation will be managed to a height of 30cm or less, in any permanent, large, open areas that are within 500m of turbines. This will reduce the likelihood of Hen Harriers nesting, and associated aerial courtship behaviour, around turbines.
- Forest restructuring will be planned in such a way as to reduce any open foraging corridors connecting existing breeding areas to proposed turbines.
- Measures will be employed to achieve more rapid canopy closure in any restocked areas close to turbines (e.g. replanting at higher stocking densities and targeted use of fertiliser). This would help reduce opportunities for both foraging and nesting by reducing the time that felled coupes remain open.

8.248 Raptors will be dissuaded from nesting close to turbines through human presence or artificial deterrents. However, such deterrents will need to be stopped if bird behaviour suggests a breeding attempt is likely.

References

- Balmer, D.E., Gillings, S., Caffrey, B.J., Swann, R.L., Downie, I.S. & Fuller, R.J. 2013. *Bird Atlas 2007-11: the breeding and wintering birds of Britain and Ireland*. BTO books, Theford.
- Bibby, C.J., Burgess, N.D. & Hill, D.A. 2000. *Bird Census Techniques*. Second edition. Academic Press, London.
- Brides, K., Mitchell, C. & Auhage, S.N.V. 2020. *Status and distribution of Icelandic-breeding geese: results of the 2019 international census*. Wildfowl & Wetlands Trust Report, Slimbridge.
- Brown, A.F. and Shepherd, K.B. 1993. A Method for Censusing Upland Breeding Waders. *Bird Study* 40: 189-195.
- Cadbury, C.J. 1981. Nightjar census methods. *Bird Study* 28: 1-4.
- Calladine, J., Garner, G., Wernham, C. and Thiel, A. 2009. The influence of survey frequency on population estimates of moorland breeding birds. *Bird Study* 56: 381-388.
- Chartered Institute of Ecology and Environmental Management. 2019. *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Version 1.1 – Updated September 2019.
- Conway, G.J. *et al.* 2007. Status and distribution of European Nightjars in the UK in 2004. *Bird Study* 54: 98-111.
- Currie, F. & Elliott, G. 1997. *Forests and Birds: A Guide to Managing Forests for Rare Birds*. Forest Authority, Cambridge & Royal Society for the Protection of Birds, Sandy.
- Dougall, T.W., Holland, P.K. & Yalden, D.W. 2004. A revised estimate of the breeding population of Common Sandpipers in Great Britain and Ireland. *Wader Study Group Bulletin* 105: 42-46.
- Eaton, M. & the Rare Breeding Birds Panel. 2021. Rare breeding birds in the UK in 2019. *British Birds* 114: 646-704.
- Eaton, M., Holling, M. & the Rare Breeding Birds Panel. 2020. Rare breeding birds in the UK in 2018. *British Birds* 113: 737-791.
- Etheridge, B. & Baines, D. 1995. *Instructions for the Black Grouse Survey 1995/6: a Joint RSPB/GCT/JNCC/SNH Project*. Unpublished.
- Ewing, S.R. *et al.* 2011. Breeding status of the Merlin in the UK in 2008. *Bird Study* 58:379-389.
- Frost, T.M. *et al.* 2019. Population estimates of wintering waterbirds in Great Britain. *British Birds* 112:130-145.

Gilbert, G., Gibbons, D.W. & Evans, J. 1998. *Bird Monitoring Methods*. The Royal Society for the Protection of Birds, Sandy.

Gillings, S. & Fuller, R.J. 2009. How many Eurasian Golden Plovers and Northern Lapwings winter in Great Britain? *Wader Study Group Bulletin* 166: 21-28.

Hall, C., Crowe, O., McElwaine, G., Einarsson, O., Calbrade, N. & Rees, E. 2016. Population size and breeding success of the Icelandic Whooper Swan *Cygnus cygnus*: results of the 2015 international census. *Wildfowl* 66: 75-97.

Hardy, J., Crick, H., Wernham, C., Riley, H., Etheridge, B. & Thompson, D. 2013. *Raptors A Field Guide For Surveys and Monitoring*. Third edition. The Stationery Office Limited, Edinburgh.

Hayhow, D.B., Benn, S. Stevenson, A., Stirling-Aird, P.K. & Eaton, M.A. 2017. Status of Golden Eagle in Britain in 2015. *Bird Study* 64:281-294.

Henderson, B.H. (ed). 2018. *Birds in Dumfries and Galloway: Dumfries & Galloway Bird Report (No. 28) 2017*. Scottish Ornithologists' Club, Dumfries & Galloway Branches.

Henderson, B.H. (ed). 2020. *Birds in Dumfries and Galloway: Dumfries and Galloway Bird Report (No. 29) 2018*. Scottish Ornithologists' Club, Dumfries & Galloway Branches.

Henderson, B.H. (ed). 2021. *Birds in Dumfries and Galloway: Dumfries and Galloway Bird Report (No. 30) 2019*. Scottish Ornithologists' Club, Dumfries & Galloway Branches.

Holling, M. & the Rare Breeding Birds Panel. 2012. Rare breeding birds in the UK 2010. *British Birds* 105: 352-416.

Holling, M. & the Rare Breeding Birds Panel. 2019. Rare breeding birds in the UK in 2017. *British Birds* 112:706-758.

Morris, A., Burgess, D., Fuller, R.J., Evans, A.D. & Smith, K.W. 1994. The status and distribution of nightjars (*Caprimulgus europaeus*) in Britain in 1992. *Bird Study* 41: 181-191.

Musgrove, A.J., Austin, G.E., Hearn, R.D., Holt, C.A., Stroud, D.A. & Wotton, S.R. 2011. Overwinter population estimates of British waterbirds. *British Birds* 104: 364-397.

Musgrove et al. 2013. Population estimates of birds in Great Britain and the UK. *British Birds* 106: 64-100.

O'Brien, M. 2004. Estimating the number of farmland waders breeding in the UK. *International Wader Studies* 14: 135-139.

Pearce-Higgins, J., Stephen, L., Langston, R., Bainbridge, I. & Bullman, R. 2009. The distribution of breeding birds around upland wind farms. *Journal of Applied Ecology*, 46: 1323-1331.

Pearce-Higgins, J., Stephen, L., Douse, A & Langston, R. 2012. Greater impacts of wind farms on bird populations during construction than subsequent operation: results of a

multi-Development site and multi-species analysis. *Journal of Applied Ecology*, 49: 386-394.

Ruddock, M. & Whitfield, D.P. 2007. *A Review of Disturbance Distances in Selected Bird Species*. Natural Research (Projects) report to Scottish Natural Heritage.

Scottish Natural Heritage. 2006. *Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas*. SNH Guidance Note Series.

Scottish Natural Heritage. 2017. *Recommended bird survey methods to inform impact assessment of onshore windfarms*. Scottish Natural Heritage.

Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D. & Win, I. 2021. The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

Toms, M.P., Crick, H.Q.P. & Shawyer, C.R. 2001. The status of breeding Barn Owls in the UK 1995-97. *Bird Study* 48: 23-37.

Wilson, M.W. *et al.* 2018. The breeding population of Peregrine Falcon in the UK, Isle of Man and Channel Islands in 2014. *Bird Study* 65:1-19.

Woodward, I., Aebischer, N., Burnell, D., Eaton, M., Frost, T., Hall, C., Stroud, D. & Noble, D. 2020. Population estimates of birds in Great Britain and the United Kingdom. *British Birds* 113: 69-104.