Glenvernoch Wind Farm

Environmental Impact Assessment Report
Volume I
Chapter 8: Ornithology

October 2024

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APPENDICES

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 The Proposed Wind Farm does not lie within any sites or areas designated or recognised for their international or national ornithological value. However, the Glenvernoch proposed Wind Farm lies 370m south-west of the Wood of Cree Site of Special Scientific Interest (SSSI). The Wood of Cree SSSI, although primarily designated for habitat and botanical reasons, also supports a moderately rich breeding bird assemblage. The wind farm also lies approximately 18km to the north-east of the Glen App and Galloway Moors Special Protection Area (SPA). This SPA is designated for its breeding population of Hen Harrier. There are predicted to be no significant effects on either the SSSI or the SPA from the proposed Glenvernoch Wind Farm.

8.3 The assessment identified 16 Valued Ornithological Receptors present within the proposed wind farm site or the core study area. These were: Goosander, Osprey, Goshawk, Red Kite, Hen Harrier, Peregrine, Merlin, Oystercatcher, Golden Plover, Lapwing, Snipe, Curlew, Common Sandpiper, 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 **minor** during both the construction and operational phases of the proposed wind farm. 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 Glenvernoch Wind Farm during the period of April 2021 to March 2023. 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 Glenvernoch 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 Glenvernoch Site as these surveys were undertaken prior to the layout of the Proposed Development being finalised. However, the data presented within this Chapter is discussed with regard to three different areas. The combined breeding bird data uses the wider Glenvernoch Site, plus 1km and 2km buffers, whilst the vantage point survey data uses both 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) and the Collision Risk Window, which is the Turbine Swept Area at height bands 30-150m and >150m. The boundaries of 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 and the Dumfries & Galloway Raptor Study Group (D&GRSG), in order to obtain further information regarding the presence and distribution of key bird species within the Proposed Wind Farm Site and surrounding area.

Desk Study

8.16 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 2022, Warren 2023 and Warren 2024).

Field Surveys

8.17 A summary of the ornithological surveys undertaken in Year 1 (April 2021 – March 2022) and Year 2 (April 2022 – March 2023) 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 Glenvernoch in Year 1 & Year 2

Survey	Year 1 (2021-2022)		Year 2 (2022-2023)	
	Summer: April – September 2021	Winter: October 2021 – March 2022	Summer: April – September 2022	Winter: October 2022 – March 2023
Vantage Point Surveys	✓	✓	✓	✓
Moorland Bird Surveys	✓		✓	
Black Grouse Surveys	✓	✓	✓	✓
Raptor & Owl Surveys	✓		✓	
Nightjar Surveys	✓		✓	

Vantage Point Surveys

8.18 Vantage Point (VP) Surveys were undertaken from two 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.

8.19 The methodology for VP Surveys was derived from SNH guidelines (SNH 2017). A total of 144 hours of VP Surveys has been undertaken at each of the four VP locations, as follows:

- 36 hours at each VP location during the summer of Year 1 (April – September 2021);
- 36 hours at each VP location during the winter of Year 1 (October 2021 – March 2022);
- 36 hours at each VP location during the summer of Year 2 (April – September 2022); and
- 36 hours at each VP location during the winter of Year 2 (October 2022 – March 2023).

8.20 For full details of the VP watches, including methodologies, survey timings, weather conditions, target species etc., refer to Technical Appendix 8.1.

Moorland Bird Survey

8.21 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 Glenvernoch 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

8.22 Surveys for lekking, and non-lekking, Black Grouse were undertaken, of suitable areas within the wider Glenvernoch Site, and a 1.5km buffer, during both Year 1 and Year 2: April to early-May 2021 and March to early-May 2022. 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

8.23 Species-specific surveys (for raptors, owls and wildfowl etc.) were undertaken, of all suitable habitats within the wider Glenvernoch Site and a 2km buffer, during both Year 1 and Year 2: April to August 2021 and March to August 2022. 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

8.24 Specific nocturnal surveys for Nightjar (and other nocturnal species) were undertaken, of all suitable habitats within the wider Site and a 2km buffer, during Year 1 and Year 2: June to August 2021 and June to August 2022. The survey methods used for Nightjar are based on Cadbury (1981) and Morris *et al.* (1994) and are detailed in Gilbert *et al.* (2000).

8.25 The above nocturnal surveys were augmented by the use of remote digital acoustic recorders. Two of these acoustic recorders were rotated around the wider Glenvernoch Site, to provide as wide coverage of the site as possible, continuously during the months of April-August 2021 and April-August 2022.

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 Glenvernoch Wind Farm.

Baseline Studies

8.31 Baseline studies are conducted within the identified zone of influence of the proposed Glenvernoch Wind Farm. To provide necessary context to the ornithological community present on or adjacent to the proposed wind farm 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	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. Any regularly occurring, globally threatened species. 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. A regularly occurring, nationally significant population/number of any internationally important species.
National	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. 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). A regularly occurring population of a nationally important bird species that is threatened or rare in the county or region.
Regional/County	A regularly occurring significant population/number of any bird species important at a regional/county level. 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. Sites of ornithological conservation importance that exceed the district selection criteria but that fall short of SSSI selection guidelines.
Local	Areas identified in a Local BAP or the relevant natural area profile for their ornithological value. Local Nature Reserves selected on Parish/Local ornithological criteria. Significant numbers/population of a locally important bird species e.g. one which is listed on the Local BAP. Any bird species, populations or assemblages of local importance.
Low	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.

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 (*Cygnus Cygnus*), Golden Eagle (*Aquila chrysaetos*), White-tailed Eagle (*Haliaeetus albicilla*), Honey Buzzard (*Pernis apivorus*), Osprey (*Pandion haliaetus*), Marsh Harrier (*Circus aeruginosus*) and Hen Harrier (*Circus cyaneus*). 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 BoCC5 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.

Significance of Effect

8.39 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 EcIA.

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

8.40 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.

8.41 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.

8.42 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.

Reversibility

8.43 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

8.44 All operational and consented wind farm developments, plus those currently in planning, within 20km of the proposed Glenvernoch 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 (September 2024). No cut-off date was used for the ornithological data that was included within the cumulative assessment.

Baseline Conditions

Designations

8.45 The Proposed Development does not lie within any sites or areas designated or recognised for their international or national ornithological value.

8.46 However, the Glenvernoch Wind Farm lies approximately 370m south-west of the Wood of Cree Site of Special Scientific Interest (SSSI). The Wood of Cree SSSI, although primarily designated for habitat and botanical reasons, also supports a moderately rich breeding bird assemblage.

8.47 The Glenvernoch Wind Farm also lies approximately 18km east of the Glen App and Galloway Moors Special Protection Area (SPA). The qualifying feature of the SPA is detailed in Table 8.7 below.

8.48 An average of 10 breeding females annually (1994-1998) comprising 2% of the GB breeding population

Table 8.7: Qualifying features of the Glen App and Galloway Moors SPA.

Qualifying Feature	Designation	Description	Status
Hen Harrier (breeding)	SPA/Ramsar	An average of ten breeding females annually (1994-1998) comprising 2% of the GB breeding population	Favourable maintained (as of July 2008)

Consultation

Royal Society for the Protection of Birds

8.49 The RSPB Scotland Conservation Data Management Unit held no data, on any key species, that had been recorded within 2km of the Glenvernoch proposed Wind Farm (6km for Golden Eagle), between 2017 and 2023.

Dumfries & Galloway Raptor Study Group

8.50 The Dumfries and Galloway Raptor Study Group were able to supply details of ten Barn Owl sites, that have been recorded within either the wider Glenvernoch Site, or a 2km buffer around the Site between 2012 and 2020. Full details of these records are provided within Technical Appendix 8.1.

Desk Study

8.51 A search of various resources, including the Dumfries & Galloway Bird Reports, identified eight species that had been recorded within the vicinity of the proposed Glenvernoch Wind Farm: Whooper Swan, Scaup, Smew, Osprey, White Stork, Sand Martin, Spotted Flycatcher and Waxwing. Full details of these records are included within Technical Appendix 8.1.

Field Surveys

8.52 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.

8.53 A total of 17 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

Goosander

8.54 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 (Warren 2024).

8.55 During both the 2021 and 2022 breeding seasons, no Goosander bred within either the proposed wind farm site or the wider Glenvernoch Site. However, two pairs bred on the River Cree/Loch of Cree (within the 1km buffer around the Glenvernoch Site) in both 2021 and 2022, with another pair on the Water of Minnoch (in the 2km buffer) in 2021. A total of four individual Goosander flights were recorded through the Collision Risk Window during the April 2021 to March 2022 VP surveys, with a further eight individual flights over the wider Glenvernoch Site in the same time period.

8.56 The proposed wind farm site is considered to be of Low value for Goosander.

Raptors

Osprey

8.57 Osprey is included on the Annex 1, Schedule 1, Amber List and Scottish Biodiversity Lists. The UK breeding population of Osprey is at least 246 pairs (Eaton *et al.* 2023). Approximately 12 pairs of Osprey bred in Dumfries & Galloway in 2021 (Eaton *et al.* 2023; Warren 2023).

8.58 Osprey did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Site, during either the 2021 or 2022 breeding seasons. No Osprey flights were recorded within either the Collision Risk Window or over the wider Glenvernoch Site. However, four single Osprey flights were recorded over the 1km buffer around the Glenvernoch Site, during VP surveys: in July 2021, August 2021, September 2021 and July 2022.

8.59 The proposed wind farm site is considered to be of Low value for Osprey.

Goshawk

8.60 Goshawk is included on the Annex 1 and Schedule 1 Lists. The UK breeding population of Goshawk is approximately 813 pairs (Eaton *et al.* 2023). Goshawk is a resident breeder in Dumfries & Galloway, with an expanding and increasing population. An estimated 50 pairs nest in the county in most years (Eaton *et al.* 2023), with 37 confirmed pairs in 2021 (Eaton *et al.* 2023, Warren 2023).

8.61 Goshawk did not breed within the proposed wind farm site, the wider Glenvernoch Site, or the 1km buffer during either the 2021 or 2022 breeding seasons. However, a pair was on territory within the 2km buffer around the Glenvernoch Site, in 2021. No Goshawk flights were recorded through the Collision Risk Window during the VP surveys, but two individual

flights were recorded over the wider Glenvernoch Site, with a further three flights over the 1km buffer.

8.62 The proposed wind farm site is considered to be of Low value for Goshawk.

Red Kite

8.63 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 135 pairs nesting in 2021 (Warren 2023).

8.64 Red Kite did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Site during either 2021 or 2022. During the April 2021 to March 2023 VP surveys, a total of six individual Red Kite flights were recorded through the Collision Risk Window, with a further ten individual flights over the wider Glenvernoch Site in the same time period.

8.65 The proposed windfarm site is considered to be of Low value for Red Kite.

Hen Harrier

8.66 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.* 2023). Approximately ten pairs of Hen Harrier bred in Dumfries & Galloway in 2021 (Eaton *et al.* 2023, Warren 2023).

8.67 Hen Harrier did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Site, during either the 2021 or 2022 breeding seasons. Vantage Point surveys recorded no Hen Harrier flights over/through the Collision Risk Window between April 2021 and March 2023. However, four Hen Harrier flights were recorded over the wider Glenvernoch Site during this period, with a further two Hen Harrier flights within the 1km buffer. It is considered that Hen Harrier are occasionally using the Glenvernoch area as part of a wider winter foraging area, and thus rarely occur within the Site. As such, the proposed wind farm site is considered to be of Low value for Hen Harrier.

Peregrine

8.68 Peregrine is included on the Annex 1, Schedule 1 and Scottish Biodiversity Lists. The UK breeding population of Peregrine is approximately 1,701 pairs (Wilson *et al.* 2018; Eaton *et al.* 2023). Peregrine is a resident breeder in Dumfries & Galloway, with at least 64 pairs nesting in 2021(Eaton *et al.* 2023, Warren 2023).

8.69 Peregrine did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Glenvernoch Site during either 2021 or 2022. Seven individual Peregrine flights were recorded over the Site during the VP surveys: two within the Collision Risk Window and the other five over the wider Glenvernoch Site.

8.70 The proposed windfarm site is considered to be of Low value for Peregrine.

Merlin

8.71 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; Eaton *et al.* 2023). Merlin is a scarce resident breeder in Dumfries & Galloway, with six pairs nesting in 2021 (Eaton et al. 2023, Warren 2023).

8.72 Merlin did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around Glenvernoch during either 2021 or 2022. Just one Merlin flight was recorded through the Collision Risk Window, during the VP surveys, with a further three individual flights over the wider Glenvernoch Site.

8.73 The proposed wind farm site is considered to be of Low value for Merlin.

Waders

Oystercatcher

8.74 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 (Warren 2024).

8.75 No Oystercatchers nested within the proposed wind farm site during 2021 or 2022. However, during both 2021 and 2022, a single pair of Oystercatcher was found to be nesting within the wider Glenvernoch Site, with another three pairs within the 1km buffer. Five Oystercatcher flights were recorded through the Collision Risk Window, during the VP surveys, with another five flights over the wider Glenvernoch Site.

8.76 The proposed wind farm site is considered to be of Local value for Oystercatcher.

Golden Plover

8.77 Golden Plover is a Scottish Biodiversity Species. The UK breeding population of Lapwing is estimated to be approximately 42,500 pairs (Woodward *et al.* 2020; Balmer *et al.* 2013) and the wintering population approximately 410,000 individuals (Woodward *et al.* 2020). Golden Plover is a scarce upland breeding species in Dumfries & Galloway, but a common wintering species on the coast (Warren 2024).

8.78 No Golden Plover nested, or held breeding territory, within the proposed wind farm site, during either 2021 or 2022. However, a pair were confirmed to have bred within the wider Glenvernoch Site during 2021, but not in 2022. No further pairs were recorded within the 1km buffer, during either 2021 or 2022. During the April 2021 to March 2023 VP surveys, two Golden Plover flights were recorded within the Collision Risk Window, with a further 24 over the wider Glenvernoch Site.

8.79 The proposed windfarm site is considered to be of Local value for Golden Plover.

Lapwing

8.80 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 (Warren 2024).

8.81 In 2021, two pairs of Lapwing nested within the proposed wind farm site, with a further two pairs in the wider Glenvernoch Site and another two pairs in the 1km buffer. In 2022, one pair nested within the proposed wind farm site, two pairs in the wider Glenvernoch Site and two pairs in the 1km buffer. During the April 2021 to March 2023 VP surveys, ten Lapwing flights were recorded through the Collision Risk Window, with a further 14 flights over the wider Glenvernoch Site.

8.82 The proposed windfarm site is considered to be of Local value for Lapwing.

Snipe

8.83 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 (Warren 2024).

8.84 In 2021, three pairs of Snipe nested within the proposed wind farm site, with a further four pairs in the wider Glenvernoch Site and another two pairs in the 1km buffer. In 2022, two pairs nested within the proposed wind farm site, three pairs in the wider Glenvernoch Site and two pairs in the 1km buffer. During the April 2021 to March 2023 VP surveys, eight Snipe flights were recorded through the Collision Risk Window, with a further seven flights over the wider Glenvernoch Site.

8.85 The proposed wind farm site is considered to be of Local value for Snipe.

Curlew

8.86 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 declining severely as a breeding species in Dumfries & Galloway (Warren 2024), although it also remains a common passage and winter visitor.

8.87 No Curlew nested, or held breeding territory, within the proposed wind farm site, in either 2021 or 2022. However, both breeding seasons saw two pairs in the wider Glenvernoch Site and a further two pairs in the 1km buffer. During the April 2021 to March 2023 VP surveys, ten Curlew flights were recorded through the Collision Risk Window, with a further eight flights over the wider Glenvernoch Site.

8.88 The proposed wind farm site is considered to be of Local value for Curlew.

Common Sandpiper

8.89 Common Sandpiper is included on the BoCC5 Amber List. The UK breeding population of Common Sandpiper is estimated to be approximately 13,000 pairs (Dougall *et al.* 2004) and the wintering population just 52 individuals (Frost *et al.* 2019). Common Sandpiper is a common breeding summer visitor to rivers, Lochs and coasts in Dumfries & Galloway (Warren 2024).

8.90 No Common Sandpiper nested within the proposed wind farm site, or the wider Glenvernoch Site, during either the 2021 or 2022 breeding seasons. However, one pair of Common Sandpiper nested on the River Cree (within the 1km buffer) in both 2021 and 2022. No Common Sandpiper flights were recorded through the Collision Risk Window, or the wider Glenvernoch Site, during the VP surveys.

8.91 The proposed wind farm site is considered to be of Low value for Common Sandpiper.

Game birds

Black Grouse

8.92 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 (Warren 2024).

8.93 No Black Grouse were recorded within the proposed wind farm site, the wider Glenvernoch Site or a 2km buffer during the period of April 2021 to March 2023 inclusive. Specific Black Grouse surveys, in April-May 2021 and March-May 2022, to record lekking birds, did not produce any records of such.

8.94 The proposed wind farm site is considered to be of Low value for Black Grouse.

Owls

Barn Owl

8.95 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 (Warren 2024).

8.96 No Barn Owls nested within the proposed wind farm site during either 2021 or 2022. However, in both 2021 and 2022, two pairs of Barn Owl nested within the wider Glenvernoch Site, with further pairs in both the 1km and 2km buffers. No Barn Owl flights were recorded through the Collision Risk Window, or the wider Glenvernoch Site, during any of the VP surveys.

8.97 The proposed wind farm site is considered to be of Local value for Barn Owl.

Long-eared Owl

8.98 The UK breeding population of this under-recorded species is estimated to be over 1,800 pairs (Woodward *et al.* 2020, Eaton *et al.* 2023). Long-eared Owl is considered to be an

uncommon breeding resident in Dumfries & Galloway (Warren 2024), although again it is under-recorded in the county. Survey work undertaken for the proposed Glenvernoch 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.

8.99 No Long-eared Owls were recorded within the proposed wind farm site or the wider Glenvernoch Site, during either the 2021 or 2022 breeding seasons. However, during the 2021 breeding season a total of four pairs were recorded during survey work: two pairs in the 1km buffer and another two pairs within the 2km buffer. In 2022 only one pair of Long-eared Owl were found; a pair within the 1km buffer. No Long-eared Owl flights were recorded through the Collision Risk Window, or the wider Glenvernoch Site, during the VP surveys. The proposed wind farm site is considered to be of Local value for Long-eared Owl.

Nightjar

Nightjar

8.100 Nightjar is included on the Annex 1 and BoCC5 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 (Warren 2024). During 2021, at least 52 'churring' male Nightjars were recorded from 17 locations in Dumfries & Galloway (Warren 2023).

8.101 No Nightjars were recorded within the proposed wind farm site, the wider Glenvernoch Site or the 1km buffers during either 2021 or 2022. However, during the 2021 breeding season, three 'churring' males were recorded within the 2km buffer. No Nightjars were recorded from within the 2km buffer in 2022. No Nightjar flights were recorded through the Collision Risk Window, or the wider Glenvernoch Site, during the VP surveys.

8.102 The proposed wind farm site is considered to be of Local value for Nightjar.

Passerines

Common Crossbill

8.103 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 (Warren 2024).

8.104 No breeding Common Crossbills were confirmed within the proposed wind farm site or the wider Glenvernoch Site during 2021 or 2022. However, during the 2021 breeding season seven pairs were found within the 1km buffer, with five pairs in this buffer in 2022.

8.105 The proposed wind farm site is considered to be of Local value for Common Crossbill.

Modifying Influences

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

Information Gaps

8.107 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

8.108 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

8.109 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.

8.110 A summary of effects, without mitigation measures, is provided in the table at the end of this section (Table 8.10).

Construction Phase

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

8.112 Complex mosaic of acidic grassland, blanket bog, mire and rush pasture habitats

Habitat Modification

8.113 The proposed wind farm site is currently a mosaic of acid grassland, blanket bog, mire and rush pasture habitats, all of which are lightly grazed by sheep. As a part of the construction phase, approximately 45ha of the above mosaic of habitats will be cleared as a result of constructing turbine foundations and other infrastructure. This clearance will result in a direct permanent loss of breeding/foraging habitat.

8.114 Such habitat clearance has the potential to disturb breeding birds and damage or destroy bird nests, eggs or young of ground nesting species. It is an offence under the WCA to kill or injure any bird, or to damage or destroy bird nests, eggs or young. As a number of ground nesting species were recorded breeding within the wider Glenvernoch Site, mitigation measures will be implemented to ensure compliance with the legislation.

Disturbance and Displacement

Wildfowl

Goosander

8.115 No Goosander were found to be breeding, or wintering, within the proposed wind farm site or the wider Glenvernoch Site. Two pairs of Goosander were recorded breeding within the 1km buffer around the Glenvernoch Site. The nearest of these pairs, to the proposed wind farm, was on the River Cree/Loch Cree, approximately 760m from the nearest proposed construction.

8.116 It is considered that disturbance during the construction phase would have **no effect** on Goosander, with regard to either breeding or wintering birds.

Raptors

Osprey

8.117 There were no records of Osprey, either grounded birds or flying birds, from within either the proposed wind farm or the wider Glenvernoch Site during the 2021 or 2022 surveys. Four separate Osprey were recorded from within the 1km buffer, during the VP surveys, but these were all of overflying birds. There will therefore be **no effect** on nesting Osprey from disturbance during the construction period.

8.118 Neither breeding or non-breeding Osprey are likely 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.

Goshawk

8.119 No Goshawk bred within either the proposed wind farm site, the wider Glenvernoch Site or the 1km buffer, in either 2021 or 2022. However, surveys confirmed that a pair of Goshawk were on territory, in 2021, within the 2km buffer. This pair is approximately 2.3km from the nearest proposed development. As a result of the distance between this breeding location and the proposed development site, disturbance during the construction period on nesting Goshawks is considered to be **negligible** and thus **not significant**.

8.120 Two Goshawk flights were observed over the wider Glenvernoch 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.

Red Kite

8.121 A combination of surveys and consultation confirmed that no Red Kites were nesting within the proposed wind farm site, the wider Glenvernoch Site or a 2km buffer around Glenvernoch, in either 2021 or 2022. Given the lack of nest sites within 2km of the proposed development site, disturbance during the construction period, on nesting Red Kites, is considered to be **none** and thus **not significant**.

8.122 Red Kites were observed in flight, over either the turbine swept area or the wider Glenvernoch Site, on 16 occasions between April 2021 and March 2023. Although Red Kites are not nesting within 2km of the proposed wind farm site, they are using the area for foraging, albeit infrequently. 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.

8.123 Red Kite did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Site during either 2021 or 2022. During the April 2021 to March 2023 VP surveys, a total of six individual Red Kite flights were recorded through the Collision Risk Window, with a further ten individual flights over the wider Glenvernoch Site in the same time period.

Hen Harrier

8.124 The only records of Hen Harrier during all the ornithology surveys was of six individual flights, within either the wider Glenvernoch Site or the 1km buffer. Hen Harrier did not breed within the proposed wind farm site, the wider Glenvernoch Site, or a 2km buffer around the Site during either 2021 or 2022. There will therefore be **no effect** on nesting Hen Harrier from disturbance during the construction period.

8.125 It is considered that non-breeding/wintering Hen Harrier occasionally use the Glenvernoch area (including the wider Glenvernoch Site) as part of a wider winter foraging area, and thus rarely occur within the Site. 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.

Peregrine

8.126 A combination of surveys and consultation confirmed that no Peregrine bred, in either 2021 or 2022, within the proposed wind farm site, the wider Glenvernoch Site or a 2km buffer around this site. It is therefore considered that there will be **no effect** on nesting Peregrines from disturbance during the construction period.

8.127 Peregrines were observed in flight, over either the proposed wind farm or the wider Glenvernoch Site, on seven occasions between April 2021 and March 2023. Given this low incidence of flights, 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.

Merlin

8.128 A combination of surveys and consultation confirmed that no Merlin bred, in either 2021 or 2022, within the proposed wind farm site, the wider Glenvernoch Site or a 2km buffer around this site. It is therefore considered that there will be **no effect** on nesting Merlin from disturbance during the construction period.

8.129 Wintering and migrant Merlin are unlikely to regularly hunt within, or adjacent to, the proposed wind farm site. This was demonstrated by the VP surveys, during which only four individual flights were recorded from either the proposed wind farm or the wider Glenvernoch Site. Wind farm construction would therefore have a **negligible impact** on a feature of **moderate 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.

Waders

Oystercatcher

8.130 No Oystercatchers were found to be breeding within the proposed wind farm site. However, a single pair was recorded breeding within the wider Glenvernoch Site, with another three pairs in the 1km buffer around the Site. The pair of Oystercatcher within the wider Site were approximately 180m from the nearest construction, whilst the pairs within the 1km buffer were either on the eastern edge of Loch Ochiltree (1km from the nearest construction) or along the River Cree/Loch of Cree (760m from the nearest construction). Just ten Oystercatcher flights were recorded over either the proposed wind farm or the wider Glenvernoch Site during the VP surveys. It is 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

8.131 No Golden Plover were found to be breeding within the proposed wind farm site. However, a single pair was recorded breeding within the wider Glenvernoch Site, with this pair approximately 240m from the nearest construction. During the VP surveys just two Golden Plover flights were recorded over the proposed wind farm, with a further 24 flights over the wider Glenvernoch Site. It is 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.

Lapwing

8.132 During the 2021-2022 breeding surveys one-two pairs of Lapwing nested within the proposed development site, with a further two pairs in the wider Glenvernoch Site. Construction of the proposed wind farm would cause the one-two pairs in the

development site to be displaced outwith the wind farm, into the wider Glenvernoch Site or further afield, as well as some potential disturbance to those two pairs within the wider Glenvernoch Site. Disturbance during the construction period would therefore have a **minor impact** on the local breeding Lapwing population (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

8.133 During the 2021-2022 breeding surveys two-three pairs of Snipe nested within the proposed development site, with a further three-four pairs in the wider Glenvernoch Site. Construction of the proposed wind farm would cause the two-three pairs in the development site to be displaced outwith the wind farm, into the wider Glenvernoch Site or further afield, as well as some potential disturbance to those pairs within the wider Glenvernoch Site. Disturbance during the construction period would therefore have a **minor impact** on the local breeding Snipe population (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.

Curlew

8.134 During the 2021-2022 breeding surveys no Curlew nested within the proposed development site, although two pairs did nest within the wider Glenvernoch Site. The nearest of these pairs, within either year, was 120m from the nearest proposed wind farm construction. Construction of the proposed wind farm would see some potential disturbance, and maybe even displacement, to these Curlew pairs. Disturbance during the construction period would therefore have a **minor impact** on the local breeding Curlew population (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.

Common Sandpiper

8.135 There were no Common Sandpiper flights recorded over the proposed wind farm or the wider Glenvernoch Site. Likewise, no Common Sandpipers were found to be breeding within the proposed wind farm site or the wider Glenvernoch Site. One pair of Common Sandpiper was recorded breeding within the 1km buffer around the Site, being approximately 600m from the nearest proposed construction. It is therefore considered that disturbance during the construction phase would have **no effect** on Common Sandpiper.

Game Birds

Black Grouse

8.136 No Black Grouse were recorded within the core study area during the April 2021 to March 2023 ornithology surveys. It is therefore considered that disturbance during the construction phase would have **no effect** on Black Grouse.

Owls

Barn Owl

8.137 A combination of surveys and consultation confirmed that no Barn Owls nested within the proposed wind farm site, during either 2021 or 2022, although two pairs were present within the wider Glenvernoch Site in both 2021 and 2022. No Barn Owl flights were recorded within either the turbine swept area or the wider Glenvernoch Site. Construction of the proposed wind farm would see some potential disturbance, and maybe even displacement, to these two Barn Owl pairs. Disturbance during the construction period would therefore have a **minor impact** on the local breeding Barn Owl population (a feature of **moderate sensitivity**), resulting in a **minor effect** which is **not significant**.

Long-eared Owl

8.138 Long-eared Owls were recorded from the Core Study Area during both the 2021 and 2022 breeding seasons. There were no Long-eared Owl flights recorded over the proposed wind farm or the wider Glenvernoch Site. However, in 2021 four pairs of Long-eared Owl bred in the core study area, two pairs in the 1km buffer and another two pairs in the 2km buffer. The two pairs in the 1km buffer were 775m and 1.25km from the nearest proposed wind farm construction. In 2022 just one pair of Long-eared Owl was found within the core study area, a pair within the 1km buffer. This pair was located 1.1km from the nearest proposed wind farm construction. Given the distance of the proposed construction works from these 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.

Nightjars

Nightjar

8.139 No Nightjar were recorded from within the proposed wind farm, the wider Glenvernoch Site or a 1km buffer around this Site, during any of the April 2021 to March 2023 ornithology surveys. It is therefore considered that disturbance during the construction phase would have **no effect** on Nightjar.

Passerines

Common Crossbill

8.140 During 2021-2022 no Common Crossbills bred within either the proposed wind farm or the wider Glenvernoch Site. However, between five and seven pairs of Common Crossbill bred within the 1km buffer, with the nearest of these pairs being 650m from the proposed wind farm construction. Given the distance of the proposed construction works from these territories, it is considered that disturbance during the construction period on breeding Common Crossbills, 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.

Operational Phase

Disturbance, Displacement and Collision

8.141 This section summarises and evaluates the significance of the potential effects on birds (without mitigation measures) during the 40-year operational period of the Development. Both displacement and collision effects on VORs are considered within this section.

8.142 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.

8.143 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).

8.144 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 sheep and cattle farm, inclusive of an active farm/farmyard (Glenvernoch Farm) within the wider Glenvernoch Site boundary. There are no footpaths within the wider Glenvernoch Site, although the Southern Upland Way skirts the western boundary of the wider Site and a minor road, to Glenvernoch Farm, cuts across the northern tip of the wider Site. Current levels of background human activity within the proposed wind farm site boundary are likely to be low. 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

Goosander

8.145 The nearest breeding Goosanders to the proposed wind farm are on the River Cree/Loch Cree, approximately 760m from the proposed wind farm site. Given this distance, it is considered that disturbance from the operational wind farm on breeding Goosander would be minimal. The impact, on a receptor of **low sensitivity**, would be **negligible**, resulting in a **negligible** effect which is **not significant**.

8.146 During the VP surveys, a total of four Goosander flights were recorded within the Collision Risk Window. Given that this amounts to just 0.01 Goosander flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021

to March 2023), then it is considered that the risk of collision between Goosander and the turbines is low.

8.147 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

Osprey

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

8.149 The only Ospreys recorded during the VP surveys were four individual birds recorded over the 1km buffer, and therefore outside both the proposed wind farm site and the wider Glenvernoch Site. Based on this, it is considered that the risk of collision with the proposed turbines is very low.

8.150 The operational period of the Development would therefore have a **negligible impact** on Osprey, a feature of **high sensitivity**, resulting in a **negligible effect** which is **not significant**.

Goshawk

8.151 A combination of ornithology surveys and consultation confirmed that Goshawk were not nesting/holding territory within the proposed wind farm or the wider Glenvernoch Site. However, one pair bred approximately 2.3km from the proposed operational turbines in 2021. As a result of the distance between this breeding pair and the proposed wind farm, operational disturbance on nesting Goshawks from the wind farm is considered to be **negligible** and thus **not significant**.

8.152 Of the Goshawk flights recorded during the VP surveys none were within the Collision Risk Window, although two flights were recorded over the wider Glenvernoch Site. Based on this, it is considered that the risk of collision, between Goshawk and the proposed turbines is very low.

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

Red Kite

8.154 A combination of ornithology surveys and consultation confirmed that Red Kite were not nesting/holding territory within the proposed wind farm, the wider Glenvernoch Site or a 2km buffer around the Glenvernoch Site, in either 2021 or 2022. Given the lack of nest sites within 2km of the proposed wind farm site, disturbance during the operational period, on nesting Red Kites, is considered to be **none** and thus **not significant**.

8.155 During the VP surveys, a total of six Red Kite flights were recorded within the Collision Risk Window. Given that this amounts to just 0.02 Red Kite flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Red Kite and the turbines is low.

8.156 The operational period of the wind farm would have a **minor impact** on Red Kite, a feature of **high sensitivity**, resulting in a **minor effect** which is **not significant**.

Hen Harrier

8.157 A combination of ornithology surveys and consultation confirmed that Hen Harrier were not nesting/holding territory within the proposed wind farm, the wider Glenvernoch Site or a 2km buffer around the Glenvernoch Site, in either 2021 or 2022. Given the lack of nest sites within 2km of the proposed wind farm site, disturbance during the operational period, on nesting Hen Harrier, is considered to be **none** and thus **not significant**.

8.158 Of the Hen Harrier flights recorded during the VP surveys none were within the Collision Risk Window, although four flights were recorded over the wider Glenvernoch Site. Based on this, it is considered that the risk of collision, between Hen Harrier and the proposed turbines is very low.

8.159 The operational period of the wind farm would have a **negligible impact** on Hen Harrier, a feature of **high sensitivity**, resulting in a **negligible effect** which is **not significant**.

Peregrine

8.160 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 Glenvernoch Site or the core study area. It is therefore considered that the wind farm will cause **no effect** on breeding Peregrine from disturbance during the operational period.

8.161 Of the Peregrines recorded during the VP surveys, seven flights were over the proposed wind farm site or the wider Glenvernoch Site. Of these, only two flights were within the Collision Risk Window. Given that this amounts to <0.01 Peregrine flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Peregrine and the turbines is low.

8.162 The operational period of the wind farm would therefore have a **negligible impact** on Peregrine, a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Merlin

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

8.164 Of the Merlins recorded during the VP surveys, four flights were over the proposed wind farm site or the wider Glenvernoch Site. Of these, only one flight was within the Collision Risk Window. Given that this amounts to <0.01 Merlin flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Merlin and the turbines is low.

8.165 The operational period of the wind farm would have a **negligible impact** on Merlin, a feature of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Waders

Oystercatcher

8.166 Oystercatcher did not nest within the proposed wind farm. However, a pair bred within the wider Glenvernoch Site, with another three pairs in the 1km buffer around the wider Site. The pair of Oystercatcher within the wider Site were approximately 180m from the wind farm, whilst the pairs within the 1km buffer were either on the eastern edge of Loch Ochiltree (1km from the wind farm) or along the River Cree/Loch of Cree (760m from the wind farm). Given the distance, between the operational wind farm and the nesting Oystercatchers, it is considered that disturbance from the operational wind farm on breeding Oystercatcher would be minor. A **minor impact**, on a receptor of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

8.167 Of the Oystercatchers recorded during the VP surveys, ten flights were over the proposed wind farm site or the wider Glenvernoch Site. Of these, five flights were within the Collision Risk Window. Given that this amounts to 0.02 Oystercatcher flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Oystercatcher and the turbines is low.

8.168 The operational period of the wind farm would have a **minor impact** on Oystercatcher, a species of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Golden Plover

8.169 No Golden Plover were found to be breeding within the proposed wind farm site. However, a single pair was recorded breeding within the wider Glenvernoch Site, with this pair approximately 240m from the wind farm. Given the distance, between the operational wind farm and Golden Plover pair, it is considered that disturbance from the operational wind farm on breeding Golden Plover would be minor. A **minor impact**, on a receptor of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

8.170 Of the Golden Plovers recorded during the VP surveys, 26 flights were over the proposed wind farm site or the wider Glenvernoch Site. Of these, just two flights were within the Collision Risk Window. Given that this amounts to <0.01 Golden Plover flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Golden Plover and the turbines is low.

8.171 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

8.172 During the 2021-2022 breeding surveys one-two pairs (in 2021 and 2022 respectively) of Lapwing nested within the proposed wind farm, with a further two pairs in the wider Glenvernoch Site. Operation of the proposed wind farm would cause the one-two pairs in the wind farm site to be displaced outwith the wind farm, into the wider Glenvernoch Site or further afield. Operation of the wind farm may also cause some potential disturbance to those two pairs within the wider Glenvernoch Site. Disturbance during the operational period would therefore have a **minor impact** on the local breeding Lapwing population (a feature of **moderate sensitivity**), resulting in a **minor effect** which is **not significant**.

8.173 During the April 2021 to March 2023 VP surveys, ten Lapwing flights were recorded through the Collision Risk Window, with a further 14 flights over the wider Glenvernoch Site.

8.174 Of the Lapwing flights recorded during the VP surveys, 24 were over the proposed wind farm site or the wider Glenvernoch Site. Of these, ten flights were within the Collision Risk Window. Given that this amounts to 0.03 Lapwing flights, within the Collision Risk Window, for every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Lapwing and the turbines is low.

8.175 The operational period of the wind farm would have a **minor impact** on Lapwing, a species of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Snipe

8.176 During the 2021-2022 breeding surveys two-three pairs of Snipe (in 2021 and 2022 respectively) nested within the proposed wind farm, with a further three-four pairs in the wider Glenvernoch Site. Operation of the proposed wind farm would cause the two-three pairs in the wind farm site to be displaced outwith the wind farm, into the wider Glenvernoch Site or further afield. Operation of the wind farm may also cause some disturbance to those pairs within the wider Glenvernoch Site. Disturbance during the operational period would therefore have a **minor impact** on the local breeding Snipe population (a feature of **moderate sensitivity**), resulting in a **minor effect** which is **not significant**.

8.177 During the VP surveys, 13 Snipe flights were recorded over either the proposed wind farm site or the wider Glenvernoch Site. Of these, eight flights were within the Collision Risk Window. Given that this amounts to 0.03 Snipe flights, within the Collision Risk Window, for

every hour of survey (288 hours of VP survey during the 24 months of April 2021 to March 2023), then it is considered that the risk of collision between Snipe and the turbines is low.

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

Curlew

8.179 No Curlew nested within the proposed wind farm site during 2021 or 2022. However, two pairs nested within the wider Glenvernoch Site, in both years. The nearest of these pairs, within either year, was 120m from the wind farm. Operation of the wind farm may see some disturbance, and maybe even displacement, to these two Curlew pairs. Disturbance during the operational period may therefore have a **minor impact** on the local breeding Curlew population (a feature of **moderate sensitivity**), resulting in a **minor effect** which is **not significant**.

8.180 During the April 2021 to March 2023 VP surveys, ten Curlew flights were recorded through the Collision Risk Window, with a further eight flights over the wider Glenvernoch Site. These ten flights, through the Collision Risk Window, amount to 0.03 Curlew flights for every hour of VP survey (288 hours of VP survey during the 24 months of April 2021 to March 2023). It is therefore considered that the risk of collision between Curlew and the turbines is low.

8.181 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**.

Common Sandpiper

8.182 Common Sandpiper did not nest within the proposed wind farm, or the wider Glenvernoch Site, during either 2021 or 2022. However, one pair did nest within the 1km buffer around the wider Site in both 2021 and 2022. This pair was approximately 600m from the wind farm. Given this distance, it is considered that the proposed wind farm would cause **no effect** on breeding Common Sandpipers during the operational period.

8.183 No Common Sandpiper flights were recorded either through the Collision Risk Window, or over the wider Glenvernoch Site, during the VP surveys. It is therefore considered that the risk of collision, between Common Sandpiper and the proposed turbines, is very low.

8.184 The operational period of the wind farm would have a **negligible impact** on Common Sandpiper, a species of **moderate sensitivity**, resulting in a **negligible effect** which is **not significant**.

Black Grouse

8.185 No Black Grouse were recorded within the core study area during the April 2021 to March 2023 ornithology surveys. It is therefore considered that both disturbance during the operational phase of the windfarm and potential collision with the turbines will have **no effect** on Black Grouse.

Owls

Barn Owl

8.186 No Barn Owls nested within the proposed wind farm during either 2021 or 2022. However, two pairs did nest within the wider Glenvernoch Site. Operation of the proposed wind farm would see some potential disturbance, and maybe even displacement to these two Barn Owl pairs. Disturbance during the operational period would therefore have a **minor impact** on the local breeding Barn Owl population (a feature of **moderate sensitivity**), resulting in a **minor effect** which is **not significant**.

8.187 No Barn Owl flights were recorded within the Collision Risk Window during the VP surveys. It is therefore considered that the risk of collision, between Barn Owl and the proposed turbines, is very low.

8.188 The operational period of the wind farm would have a **minor impact** on Barn Owl, a species of **moderate sensitivity**, resulting in a **minor effect** which is **not significant**.

Long-eared Owl

8.189 No Long-eared Owls were recorded breeding within the proposed wind farm, or the wider Glenvernoch Site during either 2021 or 2022. However, between four pairs (in 2021) and one pair (in 2022) bred within the 1km and 2km buffers. The nearest of these pairs annually were 775m and 1.1km from the proposed wind farm, in 2021 and 2022 respectively. Given this distance, it is considered that the proposed wind farm would cause **no effect** on breeding Long-eared Owls during the operational period.

8.190 No Long-eared Owl flights were recorded from within the Collision Risk Window during the VP surveys. It is therefore considered that the risk of collision, between Long-eared Owl and the proposed turbines, is very low.

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

Nightjars

Nightjar

8.192 No Nightjar were recorded from within the proposed wind farm, the wider Glenvernoch Site or a 1km buffer around this Site, during any of the April 2021 to March 2023 ornithology surveys. It is therefore considered that disturbance during the operational phase of the wind farm would have **no effect** on Nightjar.

Passerines

Common Crossbill

8.193 During 2021-2022 no Common Crossbills bred within either the proposed wind farm or the wider Glenvernoch Site. However, between five and seven pairs of Common Crossbill bred within the 1km buffer, with the nearest of these pairs being 650m from the proposed wind farm. Given the distance of the proposed wind farm from these territories, it is considered that disturbance during the operational period on breeding Common Crossbills, a receptor of **moderate sensitivity**, would be **minor**, resulting in a **minor effect** which is **not significant**.

8.194 No Common Crossbill flights were recorded from within the Collision Risk Window during the VP surveys. It is therefore considered that the risk of collision, between Common Crossbill and the proposed turbines, is very low.

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

Collision Risk Modelling

8.196 All flightlines recorded during the April 2021 to March 2023 VP surveys were assigned to one, or more, of three height bands, with these three height bands reflecting the proposed turbine characteristics: turbines up to 200m tall to the blade tip. These three height bands were: <30m, 30-220m and >220m. During the production of both this Chapter and the Ornithology Technical Appendix, all flightlines from the middle height band (30-220m) 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 Collision Risk Window, whilst all flightlines within the >220m height band passed over the Collision Risk Window.

8.197 Ten species were recorded flying through the Collision Risk Window Area during the March 2021 to April 2023 VP surveys: Goosander, Red Kite, Hen Harrier, Peregrine, Merlin, Oystercatcher, Golden Plover, Lapwing, Snipe and Curlew. Table 8.8 provides a summary of all flights of these species through/over the Turbine Swept Area (whether they were at the <30m, 30-220m or >220m height bands) for the whole two years of VP survey. Table 8.8 also provides a value for the total number of flights through the Collision Risk Window (through Turbine Swept Area at the 30-220m height band), plus the number of seconds of flight, for each of the species, through the Collision Risk Window.

Table 8.8: Total number of flights, and seconds of flight, through Turbine Swept Area and Collision Risk Window.

Species	No. flights through/over Turbine Swept Area at:			Total no. flights through CRW (30-220m)	Total no. seconds of flight through CRW (30-220m)
	<30m	30-220m	>220m		
Goosander	-	4	3	4	39
Red Kite	3	6	1	6	93
Peregrine	-	2	2	2	26
Merlin	1	1	-	1	10
Oystercatcher	2	5	-	5	46
Golden Plover	-	2	4	2	20
Lapwing	4	10	-	10	101
Snipe	2	8	-	8	48
Curlew	2	10	2	10	113

8.198 Collision risk modelling was not undertaken on any target species due to the low number of flights recorded within the Collision Risk Window and therefore it did not warrant undertaking further analysis as collision risk was unlikely to be significant.

Decommissioning Phase

8.199 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.

8.200 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.

8.201 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 minor impact** on features of **low to high sensitivity**. These impacts will produce a **negligible to minor effect**, which are all **not significant**.

Micro-siting

8.202 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

8.203 Wind developments within 10 km of the proposed Glenvernoch Wind Farm, which have the potential to add cumulative impact are shown in Table 8.9. In order to undertake the

cumulate assessment each wind farm EIAR 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 EIAR and NTS were not available in the public domain.

Table 8.9: Wind Farm Developments/Applications within 10km of Glenvernoch Wind Farm which have the Potential to add Cumulative Effects.

Wind Farm	Size	Status	Rational
Blair Hill	22 turbines	Scoping	2km SE of Glenvernoch: scoping report available
Kilgallioch Extension	9 turbines	Consented	5.3km W of Glenvernoch: EIAR available
Kilgallioch	96 turbines	Operational	5.8km W of Glenvernoch: no EIAR or NTS available
Airies	14 turbines	Operational	7.9km W of Glenvernoch: no EIAR or NTS available
Gass	19 turbines	Consented	10km SW of Glenvernoch: no EIAR or NTS available

8.204 This EIAR chapter concludes that the construction and operation of the Glenvernoch Wind Farm would have a minor effect on six species: Red Kite, Golden Plover, Lapwing, Snipe, Curlew and Barn Owl. The cumulative effects of the proposed Glenvernoch Wind Farm and the five above wind farms, on these six species, is detailed in tables 8.10-8.15 below.

Table 8.10: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Red Kite.

Wind Farm	Effects on Red Kite	Significant/Not Significant
Glenvernoch	**No effect on nesting kites. Minor effect on foraging kites.**	**Not significant**
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

Table 8.11: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Golden Plover.

Wind Farm	Effects on Golden Plover	Significant/Not Significant
Glenvernoch	**Minor effect on nesting Golden Plover, causing possible displacement of a pair.**	**Not significant**

Wind Farm	Effects on Golden Plover	Significant/Not Significant
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

Table 8.12: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Lapwing.

Wind Farm	Effects on Lapwing	Significant/Not Significant
Glenvernoch	**Minor effect on nesting Lapwings, causing displacement of 1-2 pairs.**	**Not significant**
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

Table 8.13: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Snipe.

Wind Farm	Effects on Snipe	Significant/Not Significant
Glenvernoch	**Minor effect on nesting Snipe, causing displacement of 2-3 pairs.**	**Not significant**
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

Table 8.14: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Curlew.

Wind Farm	Effects on Curlew	Significant/Not Significant
Glenvernoch	**Minor effect on nesting Curlew, causing possible displacement of 2 pairs.**	**Not significant**
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

Table 8.15: Summary of Effects of Wind Farms within 10km of Glenvernoch Wind Farm on Barn Owl.

Wind Farm	Effects on Barn Owl	Significant/Not Significant
Glenvernoch	**Minor effect on nesting Barn Owl, causing possible displacement of 1-2 pairs.**	**Not significant**
Blair Hill	Survey still on going with no detailed assessment in the scoping report	-
Kilgallioch Extension	No adverse effects.	Not significant
Kilgallioch	No data available	-
Airies	No data available	-
Gass	No data available	-

8.205 Even with the development of all of the operational, consented and proposed wind farms within 10km of Glenvernoch, the level of cumulative impact on Red Kite, Lapwing, Snipe, Curlew and Barn Owl 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.

Glen App and Galloway Moors SPA

8.206 The Glenvernoch proposed wind farm site lies approximately 18km east of the Glen App and Galloway Moors Special Protection Area (SPA). The qualifying feature of the SPA is breeding Hen Harrier.

8.207 Given the distance of the proposed wind farm from the Glen App and Galloway Moors SPA, it is considered that the proposed development will have no impact on the habitats present with the SPA.

8.208 A combination of ornithology surveys and consultation confirmed that Hen Harrier were not nesting/holding territory within the proposed wind farm, the wider Glenvernoch Site or a 2km buffer around the Glenvernoch Site, in either 2021 or 2022. Of the Hen Harrier flights recorded during the VP surveys none were within the Collision Risk Window, although four

flights were recorded over the wider Glenvernoch Site. Based on this, it is considered that the risk of collision, between Hen Harrier and the proposed turbines is very low.

8.209 Given the low incidence of records of Hen Harrier during the ornithology surveys, as well as the distance from the SPA (18km), it is considered that the proposed Glenvernoch Wind Farm will have **no effects** on the qualifying features of the Glen App and Galloway Moors SPA.

Summary of Effects

8.210 The effects of the proposed windfarm on VORs, without mitigation, are shown in Table 8.16 below. The significance of impact on any of the ornithological receptors is, at most, **minor adverse effect.**

Table 8.16: 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				
Goosander: disturbance during construction	Low	None	Short-term	None
Osprey: disturbance during construction	High	Negligible	Short-term	Negligible
Goshawk: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Red Kite: disturbance during construction	Moderate	Minor	Short-term	Minor
Hen Harrier: disturbance during construction	High	Negligible	Short-term	Negligible
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	Negligible	Short-term	Negligible
Lapwing: disturbance during construction	Moderate	Minor	Short-term	Minor
Snipe: disturbance during construction	Moderate	Minor	Short-term	Minor
Curlew: disturbance during construction	Moderate	Minor	Short-term	Minor

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Common Sandpiper: disturbance during construction	Low	None	Short-term	None
Black Grouse: disturbance during construction	Moderate	None	Short-term	None
Barn Owl: disturbance during construction	Moderate	Minor	Short-term	Minor
Long-eared Owl: disturbance during construction	Low	Minor	Short-term	Minor/negligible
Nightjar: disturbance during construction	Moderate	None	Short-term	None
Common Crossbill: disturbance during construction	Moderate	Minor	Short-term	Minor
Operational Phase				
Goosander: displacement during operation	Low	Negligible	Permanent	Negligible
Goosander: collision during operation	Low	Negligible	Permanent	Negligible
Oprey: displacement during operation	High	None	Permanent	None
Osprey: collision during operation	High	Negligible	Permanent	Negligible
Goshawk: displacement during operation	Moderate	Negligible	Permanent	Negligible
Goshawk: collision during operation	Moderate	Negligible	Permanent	Negligible
Red Kite: displacement during operation	Moderate	None	Permanent	None
Red Kite: collision during operation	Moderate	Minor	Permanent	Minor
Hen Harrier: displacement during operation	High	None	Permanent	None
Hen Harrier: collision during operation	High	Negligible	Permanent	Negligible
Peregrine: displacement during operation	Moderate	None	Permanent	None
Peregrine: collision during operation	Moderate	Negligible	Permanent	Negligible

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Merlin: displacement during operation	Moderate	None	Permanent	None
Merlin: collision during operation	Moderate	Negligible	Permanent	Negligible
Oystercatcher: displacement during operation	Moderate	Minor	Permanent	Minor
Oystercatcher: collision during operation	Moderate	Minor	Permanent	Minor
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	Minor	Permanent	Minor
Snipe: collision during operation	Moderate	Minor	Permanent	Minor
Curlew displacement during operation	Moderate	Minor	Permanent	Minor
Curlew: collision during operation	Moderate	Minor	Permanent	Minor
Common Sandpiper displacement during operation	Low	None	Permanent	None
Common Sandpiper: collision during operation	Low	Negligible	Permanent	Negligible
Black Grouse: displacement during operation	Moderate	None	Permanent	None
Black Grouse: collision during operation	Moderate	None	Permanent	None
Barn Owl: displacement during operation	Moderate	Minor	Permanent	Minor
Barn Owl: collision during operation	Moderate	None	Permanent	None

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Long-eared Owl: displacement during operation	Low	Negligible	Permanent	Negligible
Long-eared Owl: collision during operation	Low	None	Permanent	None
Nightjar: displacement during operation	Moderate	None	Permanent	None
Nightjar: collision during operation	Moderate	None	Permanent	None
Common Crossbill: displacement during operation	Moderate	Minor	Permanent	Minor
Common Crossbill: collision during operation	Moderate	None	Permanent	None
Decommissioning Phase				
Goosander: disturbance during construction	Low	None	Short-term	None
Osprey: disturbance during construction	High	Negligible	Short-term	Negligible
Goshawk: disturbance during construction	Moderate	Negligible	Short-term	Negligible
Red Kite: disturbance during construction	Moderate	Minor	Short-term	Minor
Hen Harrier: disturbance during construction	High	Negligible	Short-term	Negligible
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	Negligible	Short-term	Negligible
Lapwing: disturbance during construction	Moderate	Minor	Short-term	Minor
Snipe: disturbance during construction	Moderate	Minor	Short-term	Minor

Receptor & Summary of Predicted Effect	Sensitivity of Feature	Magnitude of Impact	Duration of Pre-mitigation Effect	Significance of Effect
Curlew: disturbance during construction	Moderate	Minor	Short-term	Minor
Common Sandpiper: disturbance during construction	Low	None	Short-term	None
Black Grouse: disturbance during construction	Moderate	None	Short-term	None
Barn Owl: disturbance during construction	Moderate	Minor	Short-term	Minor
Long-eared Owl: disturbance during construction	Low	Minor	Short-term	Minor/negligible
Nightjar: disturbance during construction	Moderate	None	Short-term	None
Common Crossbill: disturbance during construction	Moderate	Minor	Short-term	Minor

Mitigation

8.211 As no potentially significant effects have been predicted it is not considered necessary to include any mitigation measures.

8.212 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

8.213 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.

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, Thetford.

Bibby, C.J., Burgess, N.D. & Hill, D.A. 2000. *Bird Census Techniques.* Second edition. Academic Press, London.

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.

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. 2023. Rare breeding birds in the UK in 2021. *British Birds* 116: 615-676.

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.

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.

Henderson, B.H. (ed). 2022. *Birds in Dumfries and Galloway: Dumfries and Galloway Bird Report (No. 31) 2020.* 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.

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.

Warren, J. (ed). 2023. *Birds in Dumfries and Galloway: Dumfries and Galloway Bird Report (No. 32) 2021.* Scottish Ornithologists' Club, Dumfries & Galloway Branches.

Warren, J. (ed). 2024. *Birds in Dumfries and Galloway: Dumfries and Galloway Bird Report (No. 33) 2022.* Scottish Ornithologists' Club, Dumfries & Galloway Branches.

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.