



# Chapter 9

## Ornithology

# Table of contents

<b>Executive Summary</b>	<b>4</b>
<b>9.1 Introduction</b>	<b>5</b>
<b>9.2 Legislation, Policy and Guidance</b>	<b>5</b>
9.2.1 Legislation	5
9.2.2 Policy	5
9.2.3 Guidance	6
<b>9.3 Scope and Consultation</b>	<b>6</b>
9.3.1 Consultation and Scoping Responses	6
9.3.2 Effects Scoped Out	15
<b>9.4 Approach and Methods</b>	<b>17</b>
9.4.1 Study Areas	17
9.4.2 Desk Study	17
9.4.3 Target Species	17
9.4.4 Field Surveys	18
9.4.5 Assessment Methodology	22
9.4.6 Avoidance, Mitigation, Compensation and Enhancement	25
9.4.7 Cumulative Effects	25
9.4.8 Limitations to Assessment	26
<b>9.5 Baseline Conditions</b>	<b>26</b>
9.5.1 Statutory Designated Sites for Nature Conservation	26
9.5.2 Non-Statutory Designated Sites for Nature Conservation	27
9.5.3 VP Flight Activity Surveys	27
9.5.4 Moorland Breeding Bird Surveys	28
9.5.5 Annex 1/Schedule 1 Raptor and Owl Searches	28
9.5.6 Breeding Diver Searches	28
9.5.7 Breeding Diver Focal Breeding Loch Watches	28
9.5.8 Breeding Black Grouse Surveys	29
9.5.9 Prey Transects	29
9.5.10 Cumulative Developments	29
9.5.11 Future Baseline	30
9.5.12 Evaluation of Ecological Features	30
<b>9.6 Assessment of Effects</b>	<b>34</b>
9.6.1 Embedded Mitigation	34
9.6.2 Pre-Construction Surveys	35
9.6.3 Construction Environmental Management Plan	35
9.6.4 Ecological Clerk of Works (ECoW)	35
9.6.5 Potential Effects – Construction	36
9.6.6 Cumulative Effects	39
9.6.7 Mitigation, Compensation and Enhancement	39
9.6.8 Potential Effects – Decommissioning	40
9.6.9 Potential Effects – Operational	40

---

9.6.10	Further Survey Requirements and Monitoring	45
9.6.11	Summary of Predicted Effects	45
9.6.12	Information to Inform a Habitats Regulations Appraisal	47
<b>9.7</b>	<b>Statement of Significance</b>	<b>48</b>
<b>9.8</b>	<b>References</b>	<b>49</b>

## FIGURES

Figure 9.1: Ornithological Statutory Designated Sites for Nature Conservation;

Figure 9.2a: Existing Ornithological Records;

Figure 9.3a: Vantage Point Flight Activity Survey Plan (Year 1);

Figure 9.3b: Vantage Point Flight Activity Survey Plan (Year 2);

Figure 9.4: Breeding Bird Survey Plan;

Figure 9.5: Prey Transects Plan;

Figure 9.6a: Target Species Flight Activity Raptors and Owls (Year 1);

Figure 9.6b: Target Species Flight Activity Other Species (Year 1);

Figure 9.6c: Target Species Flight Activity Raptors and Owls (Year 2);

Figure 9.6d: Target Species Flight Activity Other Species (Year 2); and

Figure 9.7: Moorland Breeding Bird Survey Results.

# Chapter 9

## Ornithology

### Executive Summary

1. An assessment of the potential impacts upon ornithological features as a result of the Earraghail Renewable Development (RED) (hereafter 'the proposed Development') has been undertaken in accordance with the Chartered Institute for Ecology and Environmental Management (CIEEM) guidance '*Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*' (2018; Version 1.1 – Updated September 2019).
2. Baseline ornithological conditions to inform the design and assessment of the proposed Development have been established through a desk study review of existing information and ornithological field surveys, informed through consultation with NatureScot, species specialists and ornithological recording groups.
3. The following ornithological features have been scoped into assessment:
  - Knapdale Lochs Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI);
  - Golden eagle;
  - Hen harrier;
  - Red-throated diver; and
  - Black grouse.
4. Knapdale Lochs SPA and SSSI was considered in detail in the assessment given the distance between the Site and these designated sites is within the core foraging range for the qualifying feature (breeding black-throated diver). No black-throated divers were recorded during surveys. Information to inform a Habitat Regulations Appraisal (HRA) is provided, with no evidence found during surveys to suggest the integrity of the designated sites would be affected by the proposed Development.
5. Baseline studies have established the Site and/or adjacent habitats are used by key ornithology species golden eagle, hen harrier, red-throated diver and black grouse.
6. Evidence of nesting of these species has been considered in scheme design of the proposed Development, with appropriate stand-off buffer zones between turbines and nest sites adopted. Furthermore, embedded mitigation and pre-construction checks will ensure that features such as black grouse lek sites are protected from works associated with the proposed Development. With such measures adopted, no significant effects upon these species are predicted to occur during the construction phase of proposed Development.
7. Collision risk modelling (CRM) for golden eagle and hen harrier have been carried out, which has determined annual mortality rates of 0.393 for golden eagle and 0.057 for hen harrier. The mortality rate for golden eagle is considered to be an over-estimation based on recently published research on displacement effects of windfarms on golden eagles, and such effects are detailed in the Golden Eagle Topographical (GET) Modelling which is also considered in this chapter.
8. The cumulative assessment has found no evidence that there will be any cumulative or in-combination effect of the proposed Development during the construction and operational phases on the key bird species.
9. With proposed mitigation measures, no significant residual effects upon any important ornithological feature are predicted to occur.
10. The proposed Development provides the opportunity to deliver significant habitat improvements within the Site, which will have benefits for ornithology, including peatland and heathland restoration and native woodland planting. A Habitat

Management Plan (HMP) has therefore been prepared (**Technical Appendix 8.5**) which will be submitted to Argyll and Bute Council (A&BC) for approval.

## 9.1 Introduction

11. This Chapter describes and evaluates the baseline ornithology interests of the Site and surrounding area.
12. It then presents an assessment of the potential effects of the proposed Development upon important ornithological features and where necessary details mitigation and/or compensation measures required to offset any potentially significant adverse effects.
13. Where appropriate, enhancement proposals are also outlined to provide beneficial management for ornithological species and interests within the Site as part of the proposed Development.
14. Baseline ecological conditions and an assessment of the potential effects of the proposed Development upon ecological features is presented separately in **Chapter 8**. Baseline conditions and an assessment of potential effects in relation to Forestry are presented in **Technical Appendix 15.1**.
15. **Technical Appendix 9.2** (and **Confidential Figures 9.2.1-9.2.5**) which accompany this chapter contain confidential information pertaining to sensitive species, and will not be made publicly available, but will be made available to NatureScot, Argyll and Bute Council and RSPB.

## 9.2 Legislation, Policy and Guidance

16. In the preparation of this Chapter, reference has been made to the following key pieces of legislation, policy and guidance.

### 9.2.1 Legislation

- the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017;
- the Conservation of Habitats and Species Regulations 2017, (the Habitats Regulations)<sup>1</sup>;
- the Wildlife and Countryside Act 1981;
- the Wildlife and Natural Environment (Scotland) Act 2011; and
- the Nature Conservation (Scotland) Act 2004.

### 9.2.2 Policy

- Scottish Planning Policy (SPP) 2014 - identifies that biodiversity is important because it provides natural services and products which we rely on, that it is an important element of sustainable development and makes an essential contribution to the economy and cultural heritage of Scotland. All Public Bodies in Scotland, including planning authorities, have a duty to 'further the conservation of biodiversity' under the Nature Conservation (Scotland) Act 2004 and the SPP highlights that this should be reflected in development plans and development management decisions;
- Scottish Government Planning Advice Note 60: Planning for Natural Heritage 2008 - provides details on how development and the planning system can contribute to the conservation, enhancement, enjoyment and understanding of Scotland's natural environment and encourages developers and planning authorities to be positive and creative in addressing natural heritage issues; and
- the Argyll and Bute Local Development Plan 2015 - provides the local planning framework for the Argyll and Bute Council (A&BC) area, excluding the Loch Lomond and Trossachs National Park area. It contains a number of policies relating to development and land use in Kintyre. Those relevant to this assessment include:
  - o Policy LDP3 - Supporting the Protection, Conservation and Enhancement of our Environment; and
  - o Policy LDP6 – Supporting the Sustainable Growth of Renewables.

<sup>1</sup> The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019.

- In addition to the LDP, A&BC have adopted Supplementary Guidance (March 2016) and additional Supplementary Guidance (December 2016) with respect to Renewable Energy. The following Supplementary Guidance policies are potentially relevant:
  - SG LDP Sustainable – Sustainable Siting and Design Principles;
  - SG LDP ENV1 – Development Impact on Habitats, Species and our Biodiversity;
  - SG LDP ENV2 – Development Impact on European Sites; and
  - SG LDP ENV4 – Development Impact on Sites of Special Scientific Interest (SSSIs) and National Nature Reserves.

### 9.2.3 Guidance

- the Scottish Biodiversity List (SBL) (Scottish Government, 2020);
- Argyll and Bute Biodiversity Action Plan 2010-2015 (Argyll and Bute Biodiversity Action Plan, 2010);
- Argyll and Bute Planning Service – A biodiversity technical note for planners and developers (2017);
- ‘Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine’ (CIEEM, 2018);
- ‘Recommended bird survey methods to inform impact assessment of onshore wind farms’ (SNH, 2017);
- ‘Assessing Connectivity with Special Protection Areas (SPAs)’ (SNH, 2016);
- ‘Assessing Significance of Impact From Onshore Windfarms on Birds Outwith Designated Areas’ (SNH, 2018a);
- ‘Assessing the Cumulative Impact of Onshore Wind Energy Developments’ (SNH, 2012);
- ‘Assessing the Cumulative Impact of Onshore Wind Farms on Birds’ (SNH, 2018b);
- ‘Windfarms and Birds – Calculating a Theoretical Collision Risk Assuming No Avoiding Action’ (SNH, 2000);
- ‘Avoidance Rates for the onshore SNH Wind Farm Collision Risk Model’ (SNH, 2018c);
- ‘Natural Heritage Zones Bird Population Estimates’ (Wilson *et al.*, 2015); and
- ‘Fifth Birds of Conservation Concern’ (Stanbury *et al.*, 2021).

## 9.3 Scope and Consultation

### 9.3.1 Consultation and Scoping Responses

17. A request for pre-application advice and EIA Scoping Opinion was submitted to ECU in May 2020. Further details on scoping are provided in **Chapter 6**.
18. In addition, consultation with species specialist and ornithological recording groups was also undertaken to identify any existing ornithological information for the Site and the surrounding area.
19. Consultation responses of relevance to ornithology were received from the following:
  - NatureScot;
  - Argyll and Bute Council;
  - North Ayrshire Council;
  - Royal Society for the Protection of Birds (RSPB);
  - Argyll Biological Records Centre (ABReC) via Highland Biological Recording Group (HBRG);
  - Argyll Raptor Study Group (ARSG); and
  - Forestry and Land Scotland (FLS).

20. **Table 9.1** provides a summary of key issues raised by consultees and where these are addressed in this Chapter, if required.

**Table 9.1 Summary of Consultation Responses**

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
NatureScot	2 <sup>nd</sup> July 2020 – Scoping opinion	In agreement with proposed scope of surveys but required clarity on	Noted. Recorded activity levels will be used to determine requirement for

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
<p>Catriona Laird Area Officer (Mid Argyll and Kintyre)</p>		<p>the Vantage Point (VP) locations and visibility.</p> <p>Agreed that no additional survey work for migratory wildfowl would be required, but advised that should frequent activity be recorded, this should be revised. Agreed that connectivity with the Kintyre Goose Roosts Special Protection Area (SPA) is unlikely due to distance, but a Habitats Regulations Appraisal (HRA) may be required if significant feeding or flight activity is recorded through the Site.</p> <p>Advised that key issues to be addressed as part of the EIA process are ornithological impacts, including direct impacts on a golden eagle territory and other Schedule 1 bird species.</p> <p>Due to the proximity to golden eagle range, range modelling may be required. Furthermore, as potential loss of range for golden eagles <i>Aquila chrysaetos</i>, a draft Habitat Management Plan (HMP) should be submitted to accompany the EIA Report.</p> <p>Sufficient information will need to be gathered to undertake a cumulative assessment at the Natural Heritage Zone (NHZ) 14 level for all species. Advised that further consultation with themselves and the RSPB is undertaken to determine the most up to date populations, where relevant.</p> <p>The Site is within foraging range of black-throated divers <i>Gavia arctica</i> from Knapdale Lochs Site of Special Scientific Interest (SSSI)/ SPA, so sufficient information to inform a HRA will be required.</p> <p>Advised that two years of survey</p>	<p>additional VP survey hours during migration period, and whether a HRA may be required to assess potential connectivity with the Kintyre Goose Roosts SPA (see <b>Section 9.3.2.1</b>).</p> <p>Considered in <b>Section 9.6</b> of this Chapter.</p> <p>Golden eagle GET modelling has been undertaken and the HMP to accompany this application will consider potential habitat enhancement for golden eagles.</p> <p>The assessment has been completed based on the most recent documented NHZ14 estimates (<b>Section 9.6</b>).</p> <p>Information to inform a HRA is included in <b>Section 9.6.12</b>.</p> <p>Two years of survey data have been</p>

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
		<p>data would be appropriate for the Site.</p> <p>All infrastructure should be shown on the flight activity survey figures.</p> <p>A number of nest sites of Annex 1 /Schedule 1 bird species are known, and the ARSG should be consulted to ensure VPs are not located where they could disturb nesting birds.</p> <p>VP surveys should not be undertaken at same time as forestry operations.</p> <p>Consideration should be given to whether bird activity during surveys is influenced by the Inveraray to Crossaig Overhead Power Line construction works.</p> <p>The construction and operation of the Inveraray to Crossaig Overhead Power Line may need to be considered within the cumulative assessment.</p>	<p>collected.</p> <p>Infrastructure shown on flight activity figures (<b>Figures 9a. to 9d.</b>).</p> <p>ARSG and FLS have both provided up to date information regarding known Annex 1/Schedule 1 species nest sites. Coordination with raptor groups and FLS ensured that surveys did not disturb nesting birds (see <b>Section 9.4.2</b>).</p> <p>Prior to Site visits, consultation was made with FLS to ensure surveys were timed outside periods of major forestry operations.</p> <p>Surveys were coordinated with FLS. No disturbance caused by construction works from the Inveraray to Crossaig Overhead Power Line was recorded during any of the surveys.</p> <p>The Inveraray to Crossaig Overhead power line crosses the access route in the north-west, but the power line is typically &gt; 3 km from the Site.</p> <p>It is understood for the Inveraray to Crossaig Overhead Power Line that construction works commenced in May 2021, forestry works are due for completion in October 2021 and project completion is anticipated in November 2023. Given construction works are due for completion in the short-term construction works associated with the Inveraray to Crossaig Overhead Power Line development are not considered in the cumulative assessment.</p> <p>Operational effects of the new power line are also not considered relevant to the cumulative assessment, given the works are an upgrade to an existing/historic power line. The power line development is therefore not considered in the cumulative</p>



Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
		<p>Impacts of solar array, battery energy storage system (BESS) and aviation lighting will need to be considered.</p> <p>Land to the north of the B8001 has been previously subjected to windfarm assessment including the Cnoc an Fhionn Windfarm. Advises that confidential survey report shows golden eagles make more use of forestry than may be expected. Recommended contacting Vattenfall for the data.</p>	<p>assessment (see <b>Section 9.4.7</b>).</p> <p>The extent of the solar array area and BESS is small and both areas are within the vicinity of the wind turbines. As these small-scale elements are part of the proposed Development, it is appropriate to consider the proposed Development in its entirety for the purposes of the assessment (see <b>Section 9.4.7</b>).</p> <p>The impact of aviation lighting is considered in <b>Chapter 7</b>, and is considered specifically in relation to birds in <b>Section 9.6.1</b>.</p> <p>The potential for golden eagles to use forestry to forage on, and close to, the Site given this information, have been considered in the assessment of foraging habitat loss (see <b>Section 9.6.5.2</b>).</p> <p>Vattenfall were approached to seek to obtain the data but have not agreed to do so. Regardless, the raw data is considered to have limited benefit for the present assessment given the age of that survey data and the collection of two years of contemporary baseline data for the proposed Development. As stated above, as a precaution, the potential for eagles to use forestry to forage on/close to is considered in this assessment.</p>
	<p>5<sup>th</sup> October 2020 – Additional post-scoping consultation</p>	<p>NatureScot considered the VP locations and their viewsheds to be inadequate. Requested these to be reassessed to minimise risks of effects on bird activity and to provide adequate coverage of the proposed turbine array.</p> <p>Accepted that NatureScot may consider a 3 km viewshed in this instance.</p> <p>NatureScot suggest that revised VPs and viewsheds should be</p>	<p>On completion of Year 1 VP surveys, VP locations were moved to provide greater level of coverage, for Year 2 VP surveys (see <b>Section 9.4.8</b>).</p> <p>VP viewsheds have remained at 2 km for all surveys in Year 1 and Year 2 to ensure continuity and in accordance with NatureScot guidance (SNH, 2017).</p> <p>Further consultation was undertaken to ensure agreement with amended</p>

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
		<p>agreed with them prior to further survey work commencing.</p> <p>NatureScot considered the survey data up to March 2020 as unsuitable for assessment. Similarly, because of the issues with VP coverage of the Site, subsequent survey data undertaken since March 2020 may not be adequate either.</p> <p>NatureScot recommend a full two years of survey is undertaken for the key species present at this Site.</p> <p>Data from nearby windfarm proposals (Cnoc an Fhionn and Kennacraig of which neither were submitted into planning) can be used to help context the Site and bird sensitivity but is too old to be used to inform the layout design.</p>	<p>VP locations (see consultation with NatureScot dated 29<sup>th</sup> January 2021).</p> <p>Survey data up to March 2020 has been included in the assessment, but another year of VP surveys have been undertaken October 2020 – November 2021 from the new VP locations with the improved coverage, to ensure two years of survey data have been gathered (see <b>Section 9.4.4.2</b>).</p> <p>Two years of ornithology survey data have been collected for key species, with up-to-date desk study information also gathered (see <b>Section 9.4.4</b>).</p> <p>Extensive desk study information has been gathered, and ornithology survey results from other windfarms have been considered in the cumulative assessment (see <b>Table 9.10</b>). Survey data from the Cnoc an Fhionn has been requested from Vattenfall, but they have not agreed.</p>
	<p>29<sup>th</sup> January 2021 – Additional post-scoping consultation</p>	<p>Agreed that VP coverage from revised VP locations is better than the coverage from original VP locations but noted that full coverage of all turbines (and turbine buffer zones) is not achieved. NatureScot acknowledged that the Site is challenging to survey due to difficult topography and high levels of woodland cover.</p> <p>Two years of ornithology survey data a likely requirement from NatureScot from the revised VP locations. This should be extended to include a second year of breeding raptor and owl searches, black grouse <i>Tetrao tetrix</i> searches and diver surveys.</p>	<p>Limitations to survey coverage are considered and justified in <b>Section 9.4.8</b>.</p> <p>Two years of ornithology surveys have been undertaken to include breeding raptor and owl searches, black grouse searches and diver surveys (see <b>Section 9.4.4</b>).</p> <p>Two years of VP surveys have been undertaken, with the second year of VP surveys undertaken from the revised VP locations and the first year of VP surveys undertaken from the previous VP locations. Although it is acknowledged that this is not explicitly in accordance with NatureScot's</p>

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
			recommendations, the issue is discussed in <b>Section 9.4.8</b> .
	30 <sup>th</sup> September 2021 – Additional post-scoping consultation	Provided the most recent golden eagle NHZ 14 population estimate.	Used in the assessment concerning golden eagles (see <b>Section 9.6</b> ).
Argyll and Bute Council  Arlene Knox Senior Planning Officer	25 <sup>th</sup> June 2020 – Scoping opinion	<p>The Council's Local Biodiversity Officer has confirmed that the range and approach to surveys is appropriate.</p> <p>Stated that migratory VP watches, foraging geese distribution surveys and targeted surveys of woodland and moorland passerines should not be scoped-out and should be considered in the assessment.</p> <p>Outlined that additional VP flight activity survey efforts should be undertaken to support initial surveys.</p> <p>In agreement with the cumulative assessment and including nearby windfarms and that there are no new non-wind energy developments at present which require consideration in this assessment.</p> <p>Suggested that the Tarbert Natural History Society may hold some information.</p>	<p>No action required.</p> <p>Given the Site is forested there is no potential for migratory/wintering geese to forage onsite, so foraging geese distribution surveys are not considered necessary. VP survey hours were weighted towards the migration periods to capture any movements of migratory geese. This was agreed with NatureScot (scoping response dated 2<sup>nd</sup> July 2020).</p> <p>Passerines are widely accepted as not being subject to population level impacts from wind developments (in accordance with NatureScot guidance; SNH, 2017) and as such there is no recent precedent for assessing them. Further information is provided in <b>Section 9.3.2.2</b>.</p> <p>Additional VP hours were undertaken, and these were weighted towards for example the autumn migration given the potential key species that may over-fly the Site (see <b>Section 9.4.4.2</b> and <b>Technical Appendix 9.1</b>).</p> <p>No non-windfarm developments at present that require consideration in the assessment (see <b>Table 9.10</b> for list).</p> <p>Relevant records and information from the society provided to the ABRcC/HBRG (see <b>Section 9.4.2</b>).</p>
North Ayrshire Council	Un-dated – Scoping opinion	In agreement that designated sites will be considered in the assessment.	Considered in the assessment (see <b>Section 9.6</b> ).

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
Thom Ledingham  Planning Officer			
RSPB Scotland  Name of respondent redacted; Louise Gunstensen Senior Conservation Planner copied into response	26 <sup>th</sup> June - Scoping opinion	<p>Stated that the assessment must assess the potential impact on a number of species of conservation concern, including black-throated diver, red-throated diver <i>Gavia stellata</i>, golden eagle, hen harrier <i>Circus cyaneus</i>, merlin <i>Falco columbarius</i>, short-eared owl <i>Asio flammeus</i> and black grouse. Considered that the proposed Development is unlikely to impact on Greenland white-fronted goose <i>Anser albifrons</i>, but this does require consideration.</p> <p>Advised that by locating turbines within forestry (ideally within ~500 m) would minimise biodiversity impacts, particularly as the open upland habitats support important breeding species assemblages and having a 500 m setback would reduce potential for golden eagle displacement.</p> <p>All surveys should follow the NatureScot guidance, and should cover a period of 2 years, particularly for those species of conservation concern. Data should be collected up to and through the proposed Development application process, to ensure the most up to date breeding season has been surveyed.</p> <p>Where there are gaps in the survey data due to the COVID-19 virus outbreak, this will need to be fully justified in the assessment, and two years of survey data will ensure that there is at least one full year of breeding season of more standard data for comparison.</p>	<p>Potential impacts on these key species are considered in the assessment (see <b>Sections 9.3.2 and 9.6</b>).</p> <p>Incorporated into the proposed Development design, with all turbines located in commercial forestry, and most at least 500 m from the forestry edge.</p> <p>Ornithology survey data has been collected for a period of two years, supplemented by up-to-date desk study information for key species such as Schedule1 raptors from relevant study groups and FLS.</p> <p>Two survey years have been completed, and after a slight deficit in VP hours in March 2020, due to the COVID-19 pandemic, in particular additional VP hours were carried out in May 2020 to address this.</p>

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
		<p>Noted that surveys started prior to the scoping exercise, so before stakeholders were able to comment on the survey requirements.</p> <p>In agreement that a HRA should be provided for the Knapdale Lochs SPA in relation to black-throated divers. Added that if survey data shows usage/records of Greenland white-fronted geese a HRA should be considered for the Kintyre Goose Roosts SPA.</p> <p>Requested investigation of the usage of the survey area by nesting and foraging golden eagles. Considered that further modelling and detailed surveys may be required depending on distance from core ranges and potential impacts on eagles. Habitat enhancement within a HMP should benefit golden eagles.</p> <p>Potential impacts on hen harriers of the proposed Development, through increased turbine collision, need consideration in the assessment.</p> <p>RSPB would expect buffers of at least 500 m to be applied around diver lochs/lochans. Cumulative impacts on divers should be considered, along with wider safeguarding measures for Argyll diver populations.</p> <p>RSPB stated that turbines should not be located within 500 m of known black grouse lek sites, and habitat enhancement for the species should be part of a HMP.</p> <p>Stated that an assessment of cumulative effects from land use</p>	<p>Although year 1 surveys were initiated prior to scoping exercise, since the scoping extensive consultation with stakeholders has been undertaken to ensure satisfaction and agreement with the survey scope and effort. All key species have been considered.</p> <p>Information to inform a HRA is provided in <b>Section 9.6.12</b> with regards Knapdale Lochs SPA.</p> <p>No Greenland white-fronted geese were recorded during survey period so HRA not considered a requirement.</p> <p>Golden eagle GET modelling (<b>Technical Appendix 9.4</b>) has been undertaken, and a HMP is provided (<b>Technical Appendix 8.5</b>).</p> <p>Considered in the assessment.</p> <p>Buffers have been implemented into scheme design. Cumulative impacts on divers have been considered in the assessment.</p> <p>Buffers have been implemented into scheme design. Habitat enhancement for black grouse does form part of the outline HMP.</p> <p>Cumulative effects have been considered (see <b>Section 9.4.7</b>).</p>

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
		change should be considered. Detailed survey work may be required if work undertaken highlights issues that merit further consideration.	
Tarbert and Skipness Community Council (TSCC)  No details provided in the letter, but anticipated to be Bob Chicken, Planning Convenor	4 <sup>th</sup> September 2020 – Scoping opinion	Request the measures that will be adopted to protect golden eagles during and after construction.  Questions the use of survey data if there are gaps in it due to restrictions caused by COVID-19 virus outbreak.  Requested that the potential for works during the construction phase to impact ornithological interests of designated sites for nature conservation to be considered.  Advised that operational effects (such as displacement) on birds by the proposed Development are considered.	Assessment of impacts on golden eagle, and mitigation are in <b>Section 9.6</b> .  Most ornithology surveys were carried out throughout the COVID-19 pandemic but VP survey hours were reduced particularly in March 2020. To address this deficit, additional VP hours were carried out in May 2020 (see <b>Section 9.4.8</b> ).  Considered in assessment (see <b>Section 9.6</b> ).  Considered in assessment (see <b>Section 9.6</b> ).
ABReC via HBRG	10 <sup>th</sup> May 2020 – Data request	Provided existing records of non-statutory designated sites, protected and notable ornithological species within 2 km of the Site.	Records are included within the relevant Technical Appendices and are summarised in <b>Section 9.4.2</b> .
RSPB	11 <sup>th</sup> May 2020 – Data request	Provided existing records of ornithological species within 2 km of the Site, extended to 6 km for eagle records.	Records are included within the relevant Technical Appendices and are summarised in <b>Section 9.4.2</b> .
ARSG	28 <sup>th</sup> April 2020 – Data request	Provided existing records of breeding and roosting raptor and owl species within 2 km of the Site, extended to 6 km for eagle breeding and roosting records.	Records are included within the relevant Technical Appendices and are summarised in <b>Section 9.4.2</b> .
FLS	9 <sup>th</sup> April 2020 – Data request	Provided existing records of protected and notable ornithological species on FLS land on, and adjacent to, the Site.	Records are included within the relevant Technical Appendices and are summarised in <b>Section 9.4.2</b> .
	8 <sup>th</sup> and 26 <sup>th</sup> June 2021 – Data request	Provided updates of the status of the known golden eagle nest close to Site.	Records are included within the relevant Technical Appendices and are summarised in <b>Section 9.4.2</b> .

Consultee	Date of response and type of consultation	Summary of Key Issues	Where addressed in Chapter
			<b>Section 9.6.5.2</b> also references some information provided by FLS on 26 <sup>th</sup> June 2021.

### 9.3.2 Effects Scoped Out

25. Where ornithological features are not considered sufficiently important to warrant a detailed assessment, or where they will not be significantly affected on the basis of baseline information, these are ‘scoped out’ of the assessment with justification for exclusion provided. Mitigation measures may however still be outlined as appropriate to reduce and/or avoid any potentially adverse effects upon ‘scoped out’ features or to ensure legislative compliance (such as protecting active nest sites, given these are protected under the provisions of the Wildlife and Countryside Act 1981 (as amended)).

26. As such, the assessment presented within this Chapter considers the effects upon designated sites for nature conservation and ornithological features which are considered ‘important’ on the basis of relevant guidance and professional judgement.

#### 9.3.2.1 Designated Sites for Nature Conservation

27. In review of Sitelink<sup>2</sup>, the Site is located within 10 km of three statutory designated sites for nature conservation with ornithological interests, and one statutory designated site for nature conservation with qualifying migratory goose interests out to 20 km (see **Table 9.2** and **Figure 9.1**). Distances specified within **Table 9.2** are from the application boundary to the designation boundary at its nearest point.

**Table 9.2: Statutory Designated Sites for Nature Conservation**

Site	Distance and Orientation	Ornithological Qualifying Interests
Knapdale Lochs SSSI	8.34 km north-west	Black-throated diver (breeding).
Knapdale Lochs SPA	8.34 km north-west	Black-throated diver (breeding).
Arran North Mountain SSSI	9.06 km south	Breeding bird assemblage (including, golden plover, dunlin, hen harrier, raven, peregrine falcon, golden eagle, red-throated diver and ptarmigan).
Kintyre Goose Roosts SPA	14.49 km south-west	Greenland white-fronted goose (non-breeding).
Kintyre Goose Roosts Ramsar	14.49 km south-west	Greenland white-fronted goose (non-breeding).

30. Knapdale SSSI and SPA are designated for breeding black-throated diver. Given the Site is within the maximum known foraging range for black-throated divers (up to 10km) in accordance with NatureScot guidance (SNH, 2016), the assessment within this chapter will consider the potential for significant effects upon the Knapdale SPA and SSSI qualifying interests. Accordingly, an “*Information to Inform a Habitats Regulations Appraisal*” is provided to collate relevant information pertaining to impacts upon Knapdale SSSI and SPA (see **Section 9.6.12**).

31. The Arran North Mountains SSSI is 9.06 km from the Site so is outside the core foraging range for the cited qualifying species which form the breeding bird assemblage (red-throated diver – typically <8 km, golden eagle – 6 km, peregrine falcon – 2 km, hen harrier – 2 km, golden plover – 3 km and dunlin – 500 m), in accordance with NatureScot guidance (SNH, 2016). No likely significant effects upon the qualifying interests of this site would therefore be anticipated, and as such effects upon this designation are therefore scoped out of this assessment.

32. In accordance with NatureScot guidance (SNH, 2016), as the Site is 14.49 km from the Kintyre Goose Roost SPA/Ramsar, the Site is located beyond the maximum core foraging range for the qualifying interest of the Kintyre Goose Roost

<sup>2</sup> <https://sitelink.nature.scot/home>.

SPA/Ramsar (Greenland white-fronted goose – 8 km). Furthermore, no Greenland white-fronted geese were recorded during the surveys. No likely significant effects upon the qualifying interests of these sites would therefore be expected to occur, and as such effects upon these designations are scoped out of this assessment.

33. In a review of information provided by ABReC, there are no non-statutory designated sites for nature conservation with ornithological qualifying interests located within 2 km of the Site. Due to the spatial separation of the Site from such designations and the absence of any likely pathways for connectivity, potential effects upon non-statutory designated sites for nature conservation within ornithological interests are scoped out of the assessment.

34. Sites with ecological qualifying interests are considered separately in **Chapter 8** and sites with geological and hydrological qualifying interests considered in **Chapter 10**.

### 9.3.2.2 Ornithological Species

35. Some species are scoped out of detailed assessment on the basis of their widespread abundance or presence in numbers of very low importance as identified from field surveys and desk studies. Such species are also not considered a priority for assessment in accordance with NatureScot guidance (2018a).

36. There were low numbers of wetland species (waterfowl and waders) during the surveys and records returned from the desk study. Activity recorded during VP flight activity surveys was consistently low ( $\leq 4$  flights) for all wetland species, and breeding territories comprised of only one teal *Anas crecca*, one snipe *Gallinago gallinago* and one common gull *Larus canus* territory. Open habitats used by these birds, including for nesting, will be largely unaffected by the proposed Development. Therefore, these bird groups are scoped out of the assessment.

37. The following Annex 1/Schedule 1 raptors and owls are scoped out of detailed assessment, although considered in relation to legislative protections:

- merlin – 3 flights during VP flight activity surveys, with only one in the collision risk zone;
- osprey – 1 flight during VP flight activity surveys, outside the collision risk zone;
- peregrine falcon – 2 flights during VP flight activity surveys, with only one in the collision risk zone; and
- short-eared owl – 2 flights during VP flight activity surveys, both outside the collision risk zone.

38. For all these species there were too few flights in the collision risk zone to warrant collision risk modelling.

39. Desk study records identify that peregrine falcon, merlin and barn owl are known to hold territories within the wider surrounding area, however no evidence suggesting nesting within 2 km of the Site was recorded during surveys. Given the very low activity recorded and lack of breeding evidence, these species are scoped out of the assessment.

40. A short-eared owl nest was recorded west of the Site in 2020, >500 m from the nearest turbine. Short-eared owl flight activity during the surveys was low in 2020, with only two flights recorded outside the collision risk zone, and in 2021 no short-eared owl activity was recorded at all. Embedded mitigation (see **Section 9.6.1**) informed by pre-construction surveys (see **Section 9.6.2 and 9.6.4**) will prevent disturbance to this species by the proposed Development, and to ensure legal compliance in relation to nesting birds. The open habitats used for nesting and foraging short-eared owls will be largely unaffected by the proposed Development, with all turbines located in sub-optimal commercial conifer plantation. The forest will be key-holed rather than clear-felled, which will reduce the potential for encouraging short-eared owl into the Site during the operational stage. With embedded mitigation measures and given the low levels of activity of short-eared owl, the species is scoped out of the assessment.

41. Consideration is however, afforded to the provision of precautionary mitigation to ensure legislation compliance with regards the protection afforded to peregrine falcon, merlin, barn owl and short-eared owl under the Wildlife and Countryside Act 1981, as relevant.

42. It is generally considered that passerine species (small perching birds) due to their short lifespans and high productivity rates are not sensitive to potential population level effects at windfarm sites (SNH, 2017) and are scoped out of the assessment.



## 9.4 Approach and Methods

### 9.4.1 Study Areas

43. The study areas within which baseline ornithological information to inform the design and assessment of the proposed Development has been collected comprised the Site, extended to appropriate distances in accordance with relevant good practice guidance.
44. The main breeding and wintering bird assessment and study area has comprised areas out to at least 500 m beyond the Application boundary (as shown in **Figures 9.1 to 9.7**), extended up to 6 km for specific species as per current NatureScot guidance (SNH, 2017).
45. The study areas adopted for desk study and field surveys are provided in **Technical Appendix 9.1** and illustrated on **Figures 9.1 to 9.7**.

### 9.4.2 Desk Study

46. A desk study was undertaken to obtain existing information on the presence of designated sites for nature conservation with qualifying ornithological features, protected and notable ornithological species within proximity to the Site as follows:

- Statutory Designated Sites for Nature Conservation with qualifying ornithological features: within 10 km of the Site (extended to 20 km for designated sites with migratory geese qualifying features);
- Non-statutory Designated Sites for Nature Conservation with ornithological interests: within 2 km of the Site; and
- Existing records of protected and notable ornithological species; within 2 km of the Site, extended to 6 km for eagles (where applicable).

47. The following key sources of information were consulted:

- Sitelink;
- NatureScot;
- ABReC via HBRG;
- ARSG;
- RSPB; and
- FLS.

48. In addition, publicly available EIA documentation for the Sheirdrim Renewable Energy Development (Argyll and Bute Planning Ref. 19/02424/S36) was also reviewed, together with additional peer reviewed literature and publicly available sources where relevant and referenced where appropriate.

49. In summary, the desk study undertaken to inform the scope and approach to field surveys and assessment identified the presence of sensitive breeding raptor and owls, black grouse and red-throated diver within proximity to the Site.

50. Full details and results of the desk study undertaken are provided in **Technical Appendix 9.1** and **Technical Appendix 9.2**.

51. **Technical Appendix 9.2** contains confidential information pertaining to sensitive species, and will not be made publicly available, but will be made available to NatureScot, Argyll and Bute Council and RSPB.

### 9.4.3 Target Species

52. Initial desk study, together with consultation with NatureScot, established a broad overview of likely ornithological features within, and in close proximity to the Site.

53. Target species for survey and recording were therefore drawn from the following lists adopting a precautionary approach:

- Annex 1 of the EC Birds Directive;
- Schedule 1 of the Wildlife and Countryside Act 1981; and
- Red-listed Birds of Conservation Concern (Stanbury *et al.*, 2021).

54. Target species included all Annex 1 and Schedule 1 raptor and owl species, all waders, all wildfowl (including greylag goose and pink-footed goose), terns, divers, herons, egrets and woodland grouse.
55. The broad selection of target species for survey and recording included qualifying interests for identified designated sites for nature conservation (**Table 9.2**) and for which core foraging ranges in accordance with current NatureScot guidance (SNH, 2016), overlap the Site. This included breeding black-throated diver qualifying interests of the Knapdale Lochs SPA and SSSI and for which core foraging ranges of up to 10 km are stated (SNH, 2016).
56. Gulls and commoner raptor species including buzzard *Buteo buteo*, kestrel *Falco tinnunculus* and sparrowhawk *Accipiter nisus*, were also not identified as target species given their general widespread number and abundance but were recorded as secondary species during Vantage Point (VP) Flight Activity Surveys (detailed below). Observations of these species made during Moorland Breeding Bird Surveys and Breeding Raptor and Owl Searches were also noted.
57. No further target species were identified.

#### 9.4.4 Field Surveys

58. Detailed knowledge of ornithology activity and the presence of notable and protected ornithological species has been derived from field surveys.
59. The following field surveys have been completed between 2019-2021 to inform the assessment:
- vantage point (VP) flight activity surveys;
  - moorland breeding bird surveys (MBBS);
  - annex 1/schedule 1 breeding raptor and owl searches;
  - breeding diver searches;
  - breeding diver focal loch watches;
  - breeding black grouse surveys; and
  - prey transects.

60. Full details are provided in **Technical Appendix 9.1**.

61. Current NatureScot guidance (SNH, 2017) recommends that a minimum of two years of ornithological surveys are carried out to inform the assessment of windfarm developments, unless it can be demonstrated that a shorter period of survey is sufficient.

62. The collated dataset therefore provides two years of ornithological survey data, collected within the most recently available five-year window of survey opportunity, prior to the undertaking of assessment. Further information on the data set is provided in **Section 9.4.8**.

##### 9.4.4.1 Field Survey Personnel

63. All field surveys were completed by highly experienced, reputable and professional ornithologists fully conversant in established bird survey methodologies for proposed wind turbine developments.

64. Full details of field surveyors and effort completed are provided in **Technical Appendix 9.1** and **Technical Appendix 9.2**.

##### 9.4.4.2 Vantage Point Flight Activity Survey

65. Vantage point (VP) flight activity surveys were commenced at the Site in September 2019 and concluded in November 2021. Surveys were conducted from two different sets of VP locations during this time, defined as follows:

- Year 1: September 2019 – September 2020; and
- Year 2: October 2020 – November 2021.

66. The following broad height bands (HT) were used in the field between September 2019 – September 2020 (year 1):

- HT 1: 0 – 20 m;
- HT 2: 20 – 180 m; and

- HT 3: > 180 m.
67. Following design iterations of the proposed Development, the following broad height bands (HT) were used in the field between October 2020 – November 2021 (year 2):
- HT 1: 0 – 20 m;
  - HT 2: 20 – 150 m;
  - HT 3: 150 - 180 m; and
  - HT 4: > 200 m.
68. VP locations were altered on completion of Year 1 surveys to improve visual coverage of the required VP study area comprising the proposed turbine locations and a 500 m buffer, as per current NatureScot guidance (2017). A total of six VP locations as shown in **Figure 9.3a** were used in Year 1, and four VP locations as shown in **Figure 9.3b** were used in Year 2.
69. Visible areas from each viewshed are illustrated in **Figures 9.3a** and **9.3b** and are further detailed in **Technical Appendix 9.1**.
70. **Tables 9.3i** and **Table 9.3ii** provide a summary of watch effort (hours) completed at each VP location between September 2019 and November 2020 ('Year 1') and December 2020 and November 2021 ('Year 2').
71. Survey effort in each year typically exceeded the minimum 72 hours per VP location with a minimum of 36 hours from at least two non-breeding and two breeding seasons, as recommended in current NatureScot guidance (2017). Slight reductions in VP hours at some VP locations during the 2020 breeding season were unavoidable following access restrictions due to the COVID-19 virus pandemic, although all efforts were made to increase VP hours in subsequent survey months when restrictions eased. This is addressed further in **Section 9.4.8**. Further ornithology surveys beyond November 2021 are not anticipated.
72. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.

**Table 9.3: VP Flight Activity Survey Summary – Year 1.**

VP	Period of consecutive survey	No. of watch hours
1	September 2019 – April 2020	48
	<b>Total VP1</b>	<b>48</b>
2	September 2019 – November 2020	99
	<b>Total VP2</b>	<b>99</b>
3A	September 2019 – November 2020	97
	<b>Total VP3A</b>	<b>97</b>
4	September 2019 – November 2020	99.5
	<b>Total VP4</b>	<b>99.5</b>
5	September 2019 – November 2020	99
	<b>Total VP5</b>	<b>99</b>
6	September 2019 – November 2020	90
	<b>Total VP6</b>	<b>90</b>

**Table 9.4: VP Flight Activity Survey Summary – Year 2.**

VP	Period of consecutive survey	No. of watch hours
2	December 2020 – November 2021	93
	<b>Total VP2</b>	<b>93</b>

VP	Period of consecutive survey	No. of watch hours
3B	December 2020 – November 2021	93
	<b>Total VP3B</b>	<b>93</b>
7	December 2020 – November 2021	93
	<b>Total VP7</b>	<b>93</b>
11	December 2020 – November 2021	93
	<b>Total VP11</b>	<b>93</b>

79. In accordance with current NatureScot guidance (SNH, 2017), flight lines were mapped for all target species observed passing through the VP study area. Details of species, number of birds, flight height (in height bands), duration and direction were noted on standardised recording forms and field plans.
80. Target species for recording included all Annex 1 and Schedule 1 breeding raptor and owl species, all waders, all wildfowl (including greylag goose and pink-footed goose, but excluding mallard and feral species), terns, herons, egrets and woodland grouse as observed during field surveys.
81. Secondary species were also recorded in approximately 15-minute summary intervals, noting the number of birds present and general behaviour to build an overall picture of activity.
82. Secondary species included all commoner raptors (including buzzard, kestrel and sparrowhawk), mallard, all gulls and feral species.
- 9.4.4.3 Moorland Breeding Bird Survey**
83. MBBS was undertaken in 2020.
84. The study area has provided coverage of all suitable habitats within the Site and out to 500m (see **Figure 9.4**), as per current NatureScot guidance (SNH, 2017).
85. The methodology employed for the surveys followed the Brown and Shepherd (1993) method for censusing upland breeding waders, based upon the recommendations set out in Calladine *et al.* (2009) as recommended in NatureScot guidance (SNH, 2017). The methodology is suitable for moorland and open country species including, waders, skuas, gulls, red grouse and some wildfowl species however, incidental observations of any raptors, owls or notable passerines were also recorded.
86. The survey comprised a series of staggered visits between April and July 2020. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.
87. Specific surveys of woodland passerines were not undertaken, and surveys were principally concentrated around the open habitat within the Site. Surveys of woodland passerines as per current NatureScot guidance (SNH, 2017) are not generally required however, all notable species (such as crossbill species) were recorded where observed.
- 9.4.4.4 Annex 1/Schedule 1 breeding raptor and owl searches**
88. Searches for Annex 1/Schedule 1 breeding raptors and owls were undertaken in 2020 and 2021 with reference to species-specific methodologies outlined in Hardey *et al.* (2009) as per current NatureScot guidance (SNH, 2017).
89. The study area has provided coverage of all suitable habitat features for breeding raptor and owl species within the Site, out to at least 2 km, extended to 6 km for eagle species (see **Figure 9.4**).
90. Searches comprised a series of staggered survey visits through the core breeding season March to July in both survey years. Searches were undertaken by way of walkovers and stationary observations over suitable habitat features including open heath, crags, slopes and woodland. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.
91. Given the extent of the study area and terrain, survey visits were typically completed by a small team of surveyors.

#### 9.4.4.5 Breeding diver searches

92. Searches for breeding divers were undertaken in 2020 and 2021, April to July. The study area has provided coverage of all suitable waterbodies within the Site and out to at least 1 km (see **Figure 9.4**).
93. Searches of all potentially suitable waterbodies were undertaken with reference to survey techniques outlined in Gilbert *et al.* (1998) as per NatureScot guidance (SNH, 2017). Searches sought to establish breeding occupancy by red-throated and black-throated diver and to determine breeding outcomes where possible.
94. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.

#### 9.4.4.6 Breeding diver focal loch watches

95. Where breeding occupancy was confirmed, focal watches overlooking occupied breeding lochans were undertaken to record incoming and outgoing flights of provisioning adult divers during the incubation and chick-rearing periods (July to August) in accordance with NatureScot guidance (SNH, 2017).
96. Watches were conducted from VP2 and VP4 used for VP flight activity surveys in 2020, with watches undertaken from VP2 in 2021 (see **Confidential Figure 9.2.4**).
97. Survey effort aimed to record a total of 20-30 incoming and outgoing flights, or sufficient activity to identify any regular flight patterns occurring over the Site, between occupied breeding lochans and foraging areas.
98. A total of 24 hours of targeted observation, were conducted from VP2 and VP4 in 2020, and 15 hours of targeted observation, were conducted from VP2 in 2021. This prioritised survey effort during the hours of dusk and dawn, when adult birds are likely to be most active.
99. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.

#### 9.4.4.7 Breeding black grouse surveys

100. Searches for and counts of black grouse leks sites, were undertaken in 2020 and 2021. The study area has provided coverage of all suitable habitats within the Site and out to at least 1.5 km (see **Figure 9.4**).
101. Searches for lek sites were undertaken with reference to survey techniques outlined in Gilbert *et al.* (1998) as recommended in current NatureScot guidance (SNH, 2017), comprising at least one visit between the last week in March and mid-May.
102. During searches all areas of suitable habitat (e.g., open moorland, woodland edges and tracks) were visited around dawn. All black grouse observed were recorded, with leks more than 200 m apart treated as separate leks.
103. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.
104. Given the extent of the study area and terrain, survey visits were generally completed by a small team of surveyors.

#### 9.4.4.8 Prey transects

105. Prey transects to provide baseline information on the range and levels of prey items for golden eagle (and additional Annex 1/Schedule 1 breeding raptors and owls) were carried out to inform the appropriateness of habitat management proposals as part of mitigation and/or enhancement measures for the proposed Development.
106. Surveys were undertaken in March, June and August 2021 to establish the presence of potential prey items (to include voles, deer, red grouse) for key raptor and owl species. Evidence of prey included direct observation, and indirect evidence such as droppings, prints or rodent runs.
107. In order to survey representative habitats within (and adjoining) the Site, four 1 km transects selected using aerial maps, were walked with prey species evidence recorded in 20 x 50 m intervals, with the transects shown in **Figure 9.5**.

108. Full details of survey effort, including start and finish times, surveyors used and weather conditions are provided in **Technical Appendix 9.1**.

#### 9.4.5 Assessment Methodology

109. The assessment presented within this Chapter has been undertaken in accordance with the CIEEM guidelines (CIEEM, 2018) and considers the following main potential impacts upon ornithological features associated with the construction and operation of the proposed Development:

- designated sites - potential direct and indirect impacts upon designated sites for nature conservation;
- mortality / injury / collision - incidental loss of life or injury to ornithological species; and
- disturbance / displacement of ornithological species - disturbance and displacement of species; loss, damage or disturbance to their breeding, foraging or wintering habitat.

110. The potential effects are considered as a result of the proposed Development alone and cumulatively, in-combination with other onshore wind developments.

111. The assessment includes the following stages:

- determination and evaluation of important ornithological features;
- identification and characterisation of impacts;
- outline of mitigating measures to avoid and reduce significant effects;
- assessment of the significance of any residual effects after such measures; and
- identification of appropriate compensation measures to offset significant residual effects.

##### 9.4.5.1 Determining Importance

112. Relevant European, national and local guidance has been referred to in order to determine the importance of ornithological features.

113. Particular reference has been made to current NatureScot guidance on “Priority” bird species for assessment, when considering the development on onshore windfarms in Scotland, which includes Schedule 1 species of the Wildlife and Countryside Act 1981 and species on Annex 1 of the Birds Directive (SNH, 2018a).

114. In addition, importance has also been determined using professional judgement and taking account of the results of baseline surveys, desk study and the importance of features within the context of the Regional geographic area.

115. For the purposes of this assessment the importance of an ornithological feature is considered within a defined geographical context from Local to International, as outlined in **Table 9.5**.

116. It should be noted that importance does not necessarily relate solely to the level of legal protection that a feature receives and ornithological features may be important for a variety of reasons, such as their connectivity to a designated site, rarity of species or the geographical location of species relative to their known range.

117. Similarly, whilst a particular feature may be associated with a nearby internationally designated site, the feature is not automatically assigned a value of “International” importance.

**Table 9.5: Geographical Scale of Ornithological Feature Importance**

Importance	Definition
International	An internationally designated site e.g., a Special Protection Area (SPA) and/or Ramsar site or proposed / candidate site (e.g., pSPA).  A regularly occurring species present in internationally important numbers (>1 % of its biogeographic population) listed under Annex I of the EU Birds Directive, or regularly occurring migratory species listed under Annex II of the EU Birds Directive connected to an internationally designated for this species.

Importance	Definition
National	A nationally designated site e.g., a Site of Special Scientific Interest (SSSI).  A regularly occurring species present in nationally important numbers (>1 % of its Scottish population) and listed as a UK BAP, SBL priority species Red-listed bird of Conservation Concern (Stanbury <i>et al.</i> , 2021) and listed under Schedule 1 of the Wildlife and Countryside Act 1981 or Annex 1 of the Birds Directive.
Regional	A regularly occurring species present in regionally important numbers i.e. >1 % of its relevant Natural Heritage Zone (NHZ) population (Wilson <i>et al.</i> , 2015) or appropriate alternative and listed as a UK BAP, SBL priority species Red-listed birds of Conservation Concern (Stanbury <i>et al.</i> , 2021) or listed on Schedule 1 of the Wildlife & Countryside Act or Annex 1 of the Birds Directive.
Local	All other species that are widespread and common and which are not present in regionally or nationally important numbers, but which do contribute to the local breeding/wintering bird assemblage.

#### 9.4.5.2 Characterising Impacts

120. Once identified, potential impacts are described making reference to the following characteristics as appropriate:

- adverse or beneficial;
- extent;
- magnitude;
- duration;
- timing;
- frequency; and
- reversibility.

121. The assessment only makes reference to those characteristics relevant to understanding the nature of an impact and determining the significance of effect. For the purposes of this assessment the temporal nature of potential impacts are described as follows:

- Negligible: <12 months;
- Short-term: for 1-5 years;
- Medium-term: for 5-10 years;
- Long-term: 10-30 years; and
- Permanent: >30 years.

122. The criteria used to determine the magnitude of impact are set out in **Table 9.6**.

123. It is important to note that, where reference is made to population level effects to assess magnitude (e.g. at the Regional NHZ population level), the most recently published population estimates used are considered to be guides.

124. In addition, it will often be impossible to equate an impact to an actual population loss. For example, where birds may be displaced from a renewable energy development as a result of construction or operational activities, such a loss may be temporary or may reasonably result in the relocation of birds to suitable habitats elsewhere within the Site, immediate or wider area. Where uncertainty arises, a precautionary approach has been adopted.

125. As such, professional judgement, on the basis of best available evidence, has been used to inform the assessment of impacts presented within.

**Table 9.6: Impact Magnitude**

Magnitude	Definition
Very High	The effect (either on its own or in-combination with other proposals) may result in the permanent

Magnitude	Definition
	total or almost complete loss of a designated site and/or species status or productivity. E.g. Affecting >80 % of the relevant Regional NHZ population.
High	The effect (either on its own or in-combination with other proposals) may adversely affect the conservation status of a designated site and/or species population, in terms of the coherence of its ecological structure and function (integrity), across its whole area, that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest. E.g. Affecting 30 %-80 % of the relevant Regional NHZ population.
Medium	The effect (either on its own or in-combination with other proposals) would not adversely affect the conservation status of a designated site and/or species, but some element of the functioning might be affected and impacts could potentially affect its ability to sustain some part of itself in the long term. E.g. Affecting >10 %-30 % of the relevant Regional NHZ population.
Low	Neither the above or below applies, but some observable adverse effect is evident on a temporary basis or affects the extent of a species abundance in the local area. E.g. Affecting 1 %-10 % of the relevant Regional NHZ population.
Negligible	A very slight (indiscernible) reduction in a species status or productivity and/or no observable effect. e.g. Affecting <1 % of the relevant Regional NHZ population.
Beneficial	The effects are considered to be beneficial to a species or designated sites nature conservation status.

#### 9.4.5.3 Determining Significance

128. For the purposes of assessment, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important features' or for biodiversity in general.
129. Significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution) and are identified on the basis of magnitude, professional judgment and best available evidence.
130. CIEEM guidelines (2018) note that "*A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects can be lawfully permitted following EIA procedures.*"
131. For the purposes of this assessment, significant effects are primarily expressed with reference to the most recently published Regional NHZ population level (or suitable alternative), in line with NatureScot's interests of a species status at wider spatial levels (SNH, 2018). The significance of effects at other geographical scales is also expressed where appropriate on a precautionary basis and where sufficient information allows a meaningful assessment.
132. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect has been assumed as a precautionary approach. Where uncertainty exists, this is acknowledged.
133. Where the ecological assessment proposes measures to mitigate adverse effects on ornithological features, a further assessment of residual ecological effects, taking into account any ornithological mitigation recommended, has been undertaken.
134. CIEEM guidelines (2018) do not recommend the sole use of a matrix table as commonly set out in EIA Report Chapters to determine 'significant' and 'non-significant' effects. For the purposes of this assessment presented herein, **Table 9.7** sets out adapted CIEEM terminology and equivalent in the context of the EIA Regulations.



Table 9.7: Thresholds of Significance

Thresholds of Significance		
Significant	Major Adverse/Beneficial	A medium or high, medium or long-term adverse or beneficial effect upon the integrity of an ornithological feature at a National (Scottish) or International level.
	Moderate Adverse/Beneficial	A high or very high, long-term or permanent adverse or beneficial effect upon the integrity of an ornithological receptor at a Regional (NHZ) level (or suitable alternative) or above.
Non-significant	Minor Adverse/Beneficial	A low or medium, short-term or long-term adverse or beneficial effect upon the integrity of an ornithological receptor at a Regional (NHZ) level (or suitable alternative) or below.
	Negligible Adverse/Beneficial	A negligible or low adverse or beneficial effect upon the integrity of an ornithological feature, typically at a site level or below.

#### 9.4.6 Avoidance, Mitigation, Compensation and Enhancement

136. The mitigation hierarchy has been adopted to avoid, mitigate and compensate for potential ornithological impacts as a result of the proposed Development:

- avoidance is used where an impact has been avoided e.g., through changes in design;
- mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ;
- compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible; and
- enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

#### 9.4.7 Cumulative Effects

137. Potentially significant ornithological effects can result from individually insignificant but collectively significant actions of developments taking place over a period of time or concentrated in a near location.

138. Cumulative impacts have therefore been assessed with reference to NatureScot (SNH, 2018) guidance for important ornithological receptors subject to a detailed assessment. The list of wind farms considered for cumulative assessment was also considered for the Golden Eagle Topographical (GET) modelling (see **Technical Appendix 9.4**).

139. The cumulative assessment includes consideration of:

- existing windfarm developments, either operational or under construction; and
- consented windfarm developments, awaiting implementation.

140. Those developments which are in planning or have been withdrawn and/or refused are not considered.

141. Small windfarm developments, including those with three turbines or less, have also been scoped out as applications for such developments do not generally consider the potential for impacts upon ornithological receptors in sufficient detail.

142. With regard to the spatial extent of the cumulative assessment, NatureScot (SNH, 2018) guidance recommends that cumulative effects should typically be assessed at the relevant Regional NHZ population level. All developments within the Kintyre peninsula (and out to 20 km), mirroring the list considered for the GET modelling, are considered for the purposes of an assessment of cumulative effects and these are listed within **Table 9.10**.

143. Other non-wind developments are not considered in the cumulative assessment. This includes Inveraray to Crossaig Overhead Power Line (see **Table 9.1** for an explanation for omitting this development from assessment) and formation of a borrow pit for extraction of hard rock and siting of ancillary infrastructure for the Port Ann-Crossaig overhead line project (21/01154/MIN) in the north of the Site. A decision is pending the borrow pit development, but it is understood that if granted, construction phases will not clash with the proposed Development. The works for the borrow pit are considered localised and inconsequential so are not considered in the cumulative assessment. Furthermore, the BESS and proposed solar array areas

for the proposed Development are small-scale elements and instead of considering each element alone, it is appropriate to consider the proposed Development in its entirety for the purposes of the assessment.

#### 9.4.8 Limitations to Assessment

144. Limitations are discussed within the **Technical Appendix 9.1**. No limitations considered likely to significantly affect the assessment presented within this Chapter are identified.
145. The original extent of the site boundary considered during ornithology surveys was more extensive than the application boundary shown in **Figures 9.1 to 9.7**, with the southern boundary extending out by approximately 1 km to include a larger area of commercial conifer plantation. The previous boundary in the north extended out to a maximum of approximately 2 km to the west from the access route, and the eastern extreme included Tarbert Wood Special Area of Conservation (SAC) and Tarbert to Skipness Coast Site of Special Scientific Interest (SSSI) (as shown in **Figure 9.4**). The Site was subsequently reduced to the application boundary as shown in **Figures 9.1 to 9.7**. Although the application boundary has altered over the course of the survey period (reduced in extent in June 2021), the study areas for all ornithology surveys were covered, given the extent of the Site was at its greatest when these were undertaken.
146. Gaps in the VP coverage in Year 1 were addressed for Year 2 VP flight activity surveys when coverage of the VP study area was improved following consultation with NatureScot. Some gaps are unavoidable given the Site topography, heavy forestry cover and limited access to adjacent offsite land (despite repeated attempts requesting access) which may have improved VP coverage; however, this is not uncommon and is not considered to represent a substantive limitation to the data or subsequent assessment of effects. In consultation with NatureScot, there was agreement that VP coverage for the Year 2 VP flight activity surveys was an improvement on Year 1 (see **Table 9.1**). All with the exception of one turbine location is adequately covered from the VPs used in Year 2, with additional VP coverage of the open moorland habitat to the north of the turbine layout, to provide baseline information of the flight activity of target species through open habitats on the Site's periphery. Given the shortcomings of VP viewshed coverage in Year 1, collision risk modelling analysis has been undertaken for Year 2 VP survey data only.
147. MBBS were carried out 2020 but were not replicated in 2021 given it was determined that the proposed Development (turbines and infrastructure) would be predominantly concentrated in forestry and thus open habitats would be typically unaffected by the proposed Development.
148. Adverse weather conditions in February 2020 and restrictions in March and April 2020 due to the COVID-19 pandemic lockdown meant the number of hours of survey at some of the VPs was notably reduced. However, all efforts were made to address any deficit in VP hours in subsequent months (May 2020).
149. The GET Model (see **Technical Appendix 9.4**), is based on a previous turbine layout within the Site (which extended to 14-turbines). Given the results of the GET model are therefore based on a greater Proposed Development area, the results are considered 'worst-case scenario' and precautionary, although in the context of the scale at which GET modelling assesses effects on golden eagle, the reduced extent of the Proposed Development and any resulting reduction of effects on eagles, than those reported in the GET model, are considered inconsequential.
150. Overall, the field survey data collected is considered to provide a reasonable and proportionate representation of target bird species activity over two years across the Site and is subsequently adequate for the purposes of impact assessment.

## 9.5 Baseline Conditions

151. This Section provides a summary of baseline ornithological conditions obtained through desk study, consultations and field surveys.

### 9.5.1 Statutory Designated Sites for Nature Conservation

152. This Section should be read with reference to **Figure 9.1**.

153. There are three statutory designated sites for nature conservation designated by virtue of their ornithological qualifying interests located within 10 km of the Site, comprising Knapdale Lochs SPA and SSSI to the north-west and Arran North Mountains SSSI to the south.

154. Kintyre Goose Roosts SPA and Ramsar is located within 20 km of the Site.

### 9.5.2 Non-Statutory Designated Sites for Nature Conservation

155. There are no non-statutory designated sites for nature conservation identified within 2 km of the Site.

### 9.5.3 VP Flight Activity Surveys

156. Target Species flight activity recorded during the VP survey period from all VPs is summarised in **Table 9.8i** and **Table 9.8ii** for Year 1 and Year 2, respectively.

157. The total number of all flights, total number of birds recorded and the total flight time, from all VP locations combined is presented. This includes some flights which were detected outside of the VP study area and which are not at-risk of collision.

158. Detailed flight records are presented in **Technical Appendix 9.1**, with flight lines illustrated in **Figures 9.6a** to **9.6d**.

**Table 9.8i: Target Species Flight Activity Summary – Year 1**

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (seconds)
Whooper swan	1	8	312
Greylag goose	3	29	10,993
Teal	2	4	124
Black grouse	1	1	8
Red-throated diver	50	70	13,407
Hen harrier	35	38	6,065
Golden eagle	46	54	8,310
Osprey	1	1	199
Golden plover	1	24	13,248
Jack snipe	1	1	42
Snipe	4	4	1,221
Short-eared owl	2	2	108
Merlin	1	1	71
Peregrine falcon	2	2	128

162. Detailed flight records are presented in **Technical Appendix 9.1**, with flight lines illustrated in **Figures 9.6a** to **9.6d**.

**Table 9.8iii: Target Species Flight Activity Summary – Year 2.**

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (seconds)
Whooper swan	1	1	204
Greylag goose	2	4	178
Black grouse	1	1	21
Red-throated diver	10	17	1,915
Grey heron	1	1	26
Hen harrier	44	48	4,714

Species	Total No. of Flights	Total No. of Birds	Total Flight Time (seconds)
Golden eagle	76	81	22,291
Honey buzzard	2	2	403
Merlin	2	2	180

### 9.5.3.1 Collision Risk Mortality

166. Calculations of collision mortality risk have been undertaken for golden eagle and hen harrier based on Year 2 survey data. No other target species recorded during VP flight activity surveys between December 2020 and November 2021 (Year 2) had three or more 'at risk' flights, with resulting collision risks reasonably concluded as being inconsequential. No calculations of collision mortality risk were undertaken based on Year 1 survey data, given the shortcomings in VP viewshed coverage.
167. Predicted collision mortality is summarised in **Table 9.9** and full details are presented in **Technical Appendix 9.3**.

**Table 9.9: Predicted Collision Mortality Summary.**

Species	Season	Annual Seasonal Mortality	40 Year Seasonal Mortality
Golden eagle	Year 2 (December 2020 – November 2021)	0.393	15.72
Hen harrier	Year 2 (December 2020 – November 2021)	0.057	2.27

### 9.5.4 Moorland Breeding Bird Surveys

169. The MBBS study area was found to support a modest moorland breeding bird assemblage (maximum of one pair of teal, one pair of snipe and one pair of common gull). The teal and snipe territories were in the open habitat to the north of the Site, with the snipe along the access route and the teal territory associated with Loch na Machrach Bige. The common gull territory was associated with Loch na Machrach Moire in the north of the Site. Approximate locations of these breeding waders and gull species are illustrated in **Figure 9.7**.
170. A small number of common crossbill breeding territories were also recorded in suitable woodland habitat within the study area. Common crossbill is likely to breed widely within suitable habitats of the Site.

### 9.5.5 Annex 1/Schedule 1 Raptor and Owl Searches

171. Several species of raptor and a single species of owl were recorded during breeding raptor and owl searches undertaken in 2020 and 2021. Additional observations of species during moorland breeding bird surveys also assisted in clarifying the occurrence of breeding species within the Site and immediate surrounding area.
172. One hen harrier and one short-eared owl nest site were identified in 2020, with a one golden eagle nest site identified in 2021. All three nest sites are outside the Site. These locations are sensitive and are presented in **Technical Appendix 9.2** and **Confidential Figure 9.2.2**.

### 9.5.6 Breeding Diver Searches

173. Searches of waterbodies for evidence of breeding divers in 2020 identified four breeding pairs of red-throated divers within the study area.
174. In 2021, one breeding red-throated diver pair was recorded on a waterbody within the study area.
175. No records of black-throated divers were made during 2020 or 2021 surveys.
176. The locations of breeding red-throated diver sites together with information into breeding success are considered confidential and as such are detailed within **Technical Appendix 9.2** and illustrated on **Confidential Figure 9.2.3**.

### 9.5.7 Breeding Diver Focal Breeding Loch Watches

177. Focal watches over-looking occupied red-throated diver lochans in 2020 recorded a total of 24 red-throated diver flights.

178. Focal watches over-looking occupied red-throated diver lochans in 2021 recorded a total of 12 red-throated diver flights.

179. Given the sensitivity of the information, further details of diver flight activity associated with breeding lochans are provided within **Technical Appendix 9.2** and illustrated on **Confidential Figure 9.2.4**.

#### 9.5.8 Breeding Black Grouse Surveys

180. Searches for black grouse lek sites undertaken in 2020 and 2021 identified a total of 11 lek sites of varying sizes across open habitat within the study area. However, not all of the lek sites identified were used regularly between or within survey years. The study area is considered to support a number of mobile leks with small numbers of males (each lek contained 1-3 males).

181. The locations of black grouse lek sites together with the numbers of lekking males present are considered confidential and as such are detailed within **Technical Appendix 9.2** and illustrated on **Confidential Figure 9.2.5**.

#### 9.5.9 Prey Transects

182. Prey transects in Spring, Summer and Autumn 2021 identified that the most abundant prey types for raptors, such as golden eagle is deer and voles. Voles were particularly abundant in the more open habitats, while deer was more abundant than voles with more forested habitats.

#### 9.5.10 Cumulative Developments

183. The assessment presented within this Chapter considers only those operational, under construction and consented developments which could potentially contribute to significant cumulative effects in-combination with the proposed Development.

184. With regard to the spatial extent of the cumulative assessment, NatureScot guidance (SNH, 2012 and 2018b) recommends that cumulative effects should typically be assessed at the relevant Regional NHZ scale, unless there is a reasonable alternative.

185. In this case, the undertaking of an in-combination assessment of potential impacts at the NHZ scale would entail the consideration of a very large number of other wind farm developments. Guidance (SNH, 2012) does therefore recognise that access to relevant data for other developments may be limited and therefore a meaningful assessment of cumulative effects is not always possible. Given that relevant data for many of the wind farm developments located within the relevant NHZs is unlikely to be readily available, the results of any cumulative assessment at the NHZ scale would therefore not allow any meaningful conclusions to be drawn.

186. An alternative approach has therefore been adopted for the purposes of this assessment and in accordance with the criteria for GET modelling (see **Technical Appendix 9.4**), with a search area out to 20 km, used to determine the spatial extent over which the cumulative assessment is undertaken.

187. Wind energy developments located within the Kintyre peninsula and out to 20 km are considered for the cumulative assessment and these developments are summarised in **Table 9.10**. This has ensured that the same wind farm developments are considered as used for the GET modelling (see **Technical Appendix 9.4**). The only exception is the omission of Kilchamaig Farm and Gartnagrenach Farm from the cumulative assessment as these windfarms are  $\leq 3$  turbines which are not required to be considered, in accordance with SNH guidance (2018b), and the inclusion of Sheirdrim in the cumulative assessment.

188. Those developments, currently at the design and/or scoping stage are not included as it is as yet unknown whether they will progress to full planning status and relevant information is likely to be unavailable. Similarly, those developments which have been withdrawn and/or refused are also not considered.

**Table 9.10: Other Windfarm Developments Considered for Cumulative Effects**

Development	Status	Distance from the Site (km)	No. of Turbines
Allt Dearg (incl. Srondoire)	Operational	14.6 km	12 + 3

Development	Status	Distance from the Site (km)	No. of Turbines
Community turbines)			
Airigh	Consented	11.3 km	14
Freasdail	Operational	5.4 km	11
Eascairt	Consented	7.1 km	13
High Constellation	Consented	14.0 km	10
Cour	Operational	15 km	10
Sheirdrim	Application Submitted/At Inquiry	6.7 km	19

### 9.5.11 Future Baseline

193. In the absence of the proposed Development, assuming a 'do-nothing' scenario or gap between baseline surveys and the commencements of construction activities for the proposed Development, changes in baseline ornithology conditions (i.e., distributions and populations) are most likely to result from large scale habitat modifications within or surrounding the Site due to local land management practices, principally comprising forestry workings.
194. The coniferous plantation woodlands over much of the Site are likely to be felled and restocked with further commercial crops in accordance within the existing forestry plan discussed further in **Technical Appendix 15**.
195. Local levels of breeding raptor, owl and diver activity on and within proximity to the Site would be expected to continue at comparable levels with those recorded during field surveys and highlighted by desk study records. Numbers of lekking black grouse, the number and distribution of lek sites would reasonably be anticipated to be maintained at a low population level, on the basis of available open habitat. Numbers of breeding wetland species (such as wader) are likely to remain low given the availability of suitable open habitat. All such species would be affected by levels of forestry cover and populations could be anticipated to fluctuate.
196. In summary, in the absence of the proposed Development baseline ornithological conditions within the Site are unlikely to change significantly within the next 40 years.

### 9.5.12 Evaluation of Ecological Features

197. An evaluation of ornithological features established during baseline studies is provided in **Table 9.11**.
198. For the purposes of this assessment, those features which are assigned a local (or less than local) value are scoped out of the assessment. Furthermore, and as detailed in **Section 9.3.2** all other designated sites are scoped out of assessment, due to spatial segregation not overlapping with the core foraging range of qualifying species.

Table 9.11: Evaluation of Ornithological Features

Ornithological Feature	Legislative Protection / Conservation Status <sup>3</sup>	Evaluation	Justification
Knapdale Lochs SSSI and SPA	Habitat Regulations	International/ National	The distance between the designated sites and the Site overlaps the foraging range of the qualifying feature breeding black-throated diver.  Knapdale Lochs SSSI and SPA are scoped into the assessment.
Red-throated diver	Habitat Regulations - Annex 1, WACA-Sch1, SBL, LBAP	Regional	A total of 60 red-throated diver flights were recorded during VP Flight Activity Surveys and six red-throated diver breeding lochs were identified in 2020 (three of which reached at least the nesting stage), and one of the breeding lochs also in use in 2021. Desk study records provide information into known red-throated diver breeding lochs.  Red-throated diver is scoped into the assessment.
Golden eagle	Habitat Regulations - Annex 1, WACA-Sch1, Sch1A, & SchA1, SBL, LBAP	Regional	A total of 122 golden eagle flights were recorded during VP Flight Activity Surveys (with 44 in the collision risk zone in Year 2) and an active golden eagle eyrie was identified during the 2021 survey. Desk study records provide information into golden eagle eyrie sites, including alternative sites.  Golden eagle is scoped into the assessment.
Hen harrier	Habitat Regulations - Annex 1, WACA-Sch1 & Sch1A, BoCC – Red, SBL, LBAP	Regional	A total of 79 hen harrier flights were recorded during VP Flight Activity Surveys (with 7 in the collision risk zone in Year 2) and an active hen harrier nest site was identified during the 2020 survey (but with no breeding evidence in 2021).  Hen harrier is scoped into the assessment.
Black grouse	Habitat Regulations - Annex 1, BoCC – Red, SBL, LBAP	Regional	A total of 11 black grouse lek sites were recorded within the study area. Desk study identified a number of additional black grouse lek sites.

<sup>3</sup> Table Key: status

Habitat Regulations-Annex 1 – listed on Annex 1 of the Birds Directive which are considered, post-Brexit, by ‘Habitat Regulations’;

WACA-Sch1 – listed on Schedule 1 of the Wildlife and Countryside Act (as amended);

WACA-Sch1A – listed on Schedule 1A of the Wildlife and Countryside Act (as amended);

WACA-SchA1 – listed on Schedule A1 of the Wildlife and Countryside Act (as amended);

BoCC – Birds of Conservation Concern listing (Stanbury *et al.*, 2021);

SBL – listed on the Scottish Biodiversity List and considered by the Scottish Ministers to be of principal importance for biodiversity conservation; and,

LBAP – listed as a priority species within the Argyll and Bute Biodiversity Action Plan.

Ornithological Feature	Legislative Protection / Conservation Status <sup>3</sup>	Evaluation	Justification
			Black grouse is scoped into the assessment.
Whooper swan	Habitat Regulations - Annex 1, BoCC – Amber, SBL	<Local	<p>Only two flights (total of 9 birds) was recorded during VP Flight Activity Surveys, with no flights in the collision risk zone in Year 2, and no further records. A modest number of flights (13) were reported in review of the Sheirdrim surveys, with no further desk study records returned for the species.</p> <p>Whooper swan is scoped out of the assessment.</p>
Greenland white-fronted goose	Habitat Regulations - Annex 1, BoCC – Red, LBAP	<Local	<p>No records during surveys. A small number of winter roost lochs were identified in review of the Sheirdrim surveys, with no further desk study records returned for the species.</p> <p>Greenland white-fronted goose is scoped out of the assessment.</p>
Greylag goose	WACA-Sch1 <sup>4</sup> , BoCC – Amber	<Local	<p>Only five flights (1 in the collision risk zone in Year 2) were recorded during VP Flight Activity Surveys, with no further records. A modest number of flights (13) were reported in review of the Sheirdrim surveys, with no further desk study records returned for the species.</p> <p>Greylag goose is scoped out of the assessment.</p>
Teal	BoCC – Amber	Local	<p>Only two flights were recorded during VP Flight Activity Surveys, and one breeding territory at Loch na Machrach Bige north of the Site. No records of teal returned from the desk study.</p> <p>Teal is scoped out of the assessment.</p>
White-tailed eagle	Habitat Regulations - Annex 1, WACA-Sch1, Sch1A & SchA1, BoCC – Amber, SBL, LBAP	<Local	<p>Only one flight was recorded VP Flight Activity Surveys in Year 2, with a low number of non-breeding records (3) reported in review of the Sheirdrim surveys, and one non-breeding record returned from the desk study.</p> <p>White-tailed eagle is scoped out of the assessment.</p>
Osprey	Habitat Regulations - Annex 1, WAC-Sch1, BoCC – Amber, SBL, LBAP	<Local	<p>Only one flight was recorded during VP Flight Activity Surveys, with no further records. A modest number of records of osprey (14) were reported in review of the Sheirdrim surveys (but no breeding evidence), with a further one adult osprey in flight returned from the desk study.</p> <p>Osprey is scoped out of the assessment.</p>
Merlin	Habitat Regulations - Annex 1, WACA-Sch1, BoCC – Amber,	Local	<p>Only three flights (1 in the collision risk zone in Year 2) were recorded during VP Flight Activity Surveys, with no further records. A modest number of records of merlin (2)</p>

<sup>4</sup> In Outer Hebrides, Caithness and Sutherland and Wester Ross only.



Ornithological Feature	Legislative Protection / Conservation Status <sup>3</sup>	Evaluation	Justification
	SBL, LBAP		were reported in review of the Sheirdrim surveys (but no breeding evidence), with further records of former historic nest sites returned from the desk study.  Merlin is scoped out of the assessment.
Peregrine falcon	Habitat Regulations - Annex 1, WACA-Sch1, SBL, LBAP	Local	Only two flights were recorded during VP Flight Activity Surveys. A modest number of records of peregrine (8) were reported in review of the Sheirdrim surveys (but no breeding evidence), with a record of a suspected nest site >7 km from Site returned from the desk study.  Peregrine falcon is scoped out of the assessment.
Short-eared owl	Habitat Regulations - Annex 1, BoCC – Amber, SBL, LBAP	Local	Only two flights were recorded during VP Flight Activity Surveys, with further limited localised flight activity close to a nest site identified off-site (> 500 m from nearest wind turbine) during the 2020 surveys (and no nest site in 2021).  A modest number of records of short-eared owl (15) were reported in review of the Sheirdrim surveys (but no breeding evidence), with no further records returned from the desk study.  Due to the flight behaviour of this species with the majority of flights at a low level and below the blade sweep of modern turbines, and the fact the wind turbines will be key-holed into the forestry and so not within suitable short-eared owl habitat, impacts on this species are highly unlikely and so short-eared owl is scoped out of the assessment.
Honey buzzard	Habitat Regulations - Annex 1, S1, BoCC – Amber, SBL	Local	Only two flights were recorded during VP Flight Activity Surveys, with no further records during surveys. No records were reported in review of the Sheirdrim surveys, and no further desk study records. Honey buzzard is scoped out of the assessment.
Golden plover	Habitat Regulations - Annex 1, SBL, LBAP	<Local	Only one flight (of 24 birds) was recorded during VP Flight Activity Surveys, with no further records. A modest number of records were reported in review of the Sheirdrim surveys, with no further desk study records returned for the species. The habitat on-site is unsuitable for the species, and there are no designated sites with breeding golden plover as a qualifying feature within 10 km of the Site.  Golden plover is scoped out of the assessment.
Barn owl	WACA-Sch1, SBL	Local	No records during the surveys, but a nest site reported in review of the Sheirdrim surveys, and a nest site returned from the desk study north of the access route. The nest site is a sufficient distance from the access route (~ 700

Ornithological Feature	Legislative Protection / Conservation Status <sup>3</sup>	Evaluation	Justification
			m) for disturbance impacts to be unlikely.  Barn owl is scoped out of the assessment.
All other waders	-	Local	Consisting of four flights of snipe recorded during VP Flight Activity Surveys and a breeding territory along the access route, and one flight of jack snipe recorded during VP Flight Activity Surveys, with no further records.  A review of the Sheirdrim surveys revealed low numbers of breeding lapwing and curlew, and modest numbers of snipe, jack snipe and woodcock during the winter months. Further records from the desk study returned a non-breeding oystercatcher.  All other waders are scoped out of the assessment.
All other commoner raptors, wildfowl, gulls, herons and passerines	-	Local	Modest numbers of grey heron, gulls (including a common gull breeding territory at Loch na Machrach Moire on-site), common raptors (including buzzard and kestrel) and passerine (including common crossbill) were recorded during the surveys.  All other commoner raptors, wildfowl, gulls, herons and passerines are scoped out of the assessment.

## 9.6 Assessment of Effects

203. This Section presents the assessment of effects upon designated sites for nature conservation and important ornithological features, based on the information outlined in **Chapter 3** for a 40-year operational life, in the absence of non-embedded mitigation and following the implementation of industry standard good practice measures.

### 9.6.1 Embedded Mitigation

204. The proposed Development has been subject to a number of design iterations and evolution in response to constraints identified as part of the baseline studies, intended to reduce environmental effects (see **Chapter 2** for further details).

205. The following design considerations have been incorporated to avoid or minimise adverse effects upon ornithological features:

- wind turbines were located within lower conservation value conifer plantation forestry, where the importance of habitat important ornithological features, and therefore activity rates are likely to be low;
- the design layout process has taken into consideration breeding golden eagle, hen harrier and short-eared owl, applying an appropriate buffer between nest sites and wind turbines (and infrastructure where possible) and locating wind turbines within low value conifer plantation (1.5 km buffer, 500 m and 500 m buffers applied respectively around nest sites for these species). The process took into consideration golden eagle flight activity survey results and GET model predictions;
- all waterbodies used by breeding red-throated divers were buffered by at least 500 m from wind turbines (and infrastructure where possible);
- all black grouse lek sites recorded during baseline surveys were buffered by at least 500 m from wind turbine locations and infrastructure, extending to 750 m for construction works April/May; and

- east and west flight corridors for red-throated divers to the north of the Site was maintained by locating wind turbines in the conifer plantation further south.

206. Aviation lighting design to be used for the proposed Development is detailed in **Chapter 7**. The results of the VP Flight Activity Surveys recorded low number of wildfowl, suggesting movements of passage migrant birds through, and near, the Site are limited. Furthermore, most night time migrants are likely to be flying higher than the maximum tip height (Kerlinger & Moore, 1989 and Krüger & Garthe, 2001) and the red lighting is unlikely to cause a significant attraction (Evan *et al.*, 2007). The aviation lighting will be sensitively designed (including embedded mitigation such dimming in good visibility and using modern lights with tightly focused beams to reduce light spill), which will minimise any potential to increase collision risk. Further details are provided in **Chapter 7**.

### 9.6.2 Pre-Construction Surveys

207. All wild birds in the UK are protected under Section 1 of the Wildlife and Countryside Act 1981, which makes it an offence to intentionally or recklessly kill, injure or take any wild bird or take, damage or destroy the nest (whilst being built or in use) or its eggs. In all wild birds listed on Schedule 1 of the Act receive additional legal protection which makes it an offence to intentionally or recklessly disturb these species while building a nest or in, on or near a nest containing eggs or young; or to disturb their dependent young.

208. Site clearance activities, where commenced during the core breeding bird season (March to August inclusive), will therefore be subject to a pre-clearance survey by a competent ornithologist to identify any active wild bird nests. Should any active nests be found, works will only proceed under the advice of the appointed ornithologist. Work exclusion buffers around identified nest sites would be implemented where necessary in accordance with best available species guidance applicable at the time and/or as agreed in consultation with NatureScot.

209. A Bird Protection Plan (BPP) would be in place prior to the onset of construction activities. The BPP will describe survey methods for the identification of the sites used by Schedule 1 birds and will detail protocols for the prevention, or minimisation, of disturbance of birds as a result of activities associated with the proposed Development. The developed BPP would be overseen by the ECoW (see **Section 9.6.4**).

210. In line with the developed BPP, to avoid potential disturbance to breeding Schedule 1 and Schedule 1A species, all areas within at least 600 m of Site clearance activities will be surveyed in advance of works being commenced during the core breeding season (1st March to 31st August, inclusive), to identify any nesting locations for such species. In the event that an active nest or roost is discovered within the 600 m radius, a disturbance risk assessment will be prepared under the BPP and if necessary, work exclusion buffers around identified nest sites will be established in accordance with best available species guidance applicable at the time and/or as agreed in consultation with Nature Scot.

### 9.6.3 Construction Environmental Management Plan

211. Full details of construction phase mitigation measures for the proposed Development will be contained within a Construction Environmental Management Plan (CEMP). The CEMP will include all good practice construction measures, pollution prevention controls and monitoring to be implemented over the course of the construction and operation of the proposed Development in line with current industry and statutory guidance.

212. Further details of the CEMP are provided in **Chapter 8**.

### 9.6.4 Ecological Clerk of Works (ECoW)

213. A suitably qualified ECoW would be employed for the duration of the construction and reinstatement periods, to ensure ornithological interests are safeguarded, although this may not necessarily be a full-time role throughout. The role of the ECoW would include the following tasks:

- provide toolbox talks and informatives to all staff onsite, so staff are aware of the ornithological sensitivities within the Site and the legal implications of not complying with agreed working practices;
- agree and monitor measures designed to minimise damage to retained habitats;
- undertake pre-construction surveys and advise on ornithological issues and working restrictions where required; and
- complete site-supervision works as required, in relation to sensitive habitats and protected ornithological species.

## 9.6.5 Potential Effects – Construction

### 9.6.5.1 Designated Sites

214. No direct effects upon any statutory designated site for nature conservation with ornithological qualifying interests would occur as a result of the proposed Development, given the extent of spatial segregation (> 8 km) between the designated sites and the Site.
215. Potential construction effects to statutory designated sites for nature conservation are therefore considered to be of Negligible magnitude, of Negligible Adverse significance and which is Not Significant in the context of the EIA Regulations.

### 9.6.5.2 Golden eagle

216. Golden eagle is listed on Annex 1 of the Birds Directive (considered post-Brexit by the Habitat Regulations) and Schedule 1, 1A and A1 of the Wildlife and Countryside Act 1981 (as amended), is an SBL species and a priority species for the Argyll and Bute LBAP.
217. The most recent Regional NHZ golden eagle population estimate for NHZ 14 'West Argyll and Islands' provided by NatureScot is 51 pairs (see details in **Table 9.1**), with the most recent national Scottish population estimated at that time comprising a total of 443 breeding pairs, across the 21 NHZ areas (Wilson *et al.*, 2015). In 2015, an updated national golden eagle survey took place, which overall identified the national population had increased by 15 %, rising from 442 breeding pairs recorded during the previous national survey in 2003, to 503 territorial pairs in 2015 (Challis *et al.*, 2016).
218. For the purposes of this assessment golden eagle is assigned a value of Regional importance, with the presence of the identified breeding pair representing 2 % of the most recent published Regional NHZ population estimate (51 pairs). It should however be noted that this is a highly precautionary valuation given population estimates presented exclude sub-adult and juvenile birds also associated with regional populations and which is unknown. It is also understood that the golden eagle population is likely to have increased across much of its Scottish range since the 2015 survey.

### Displacement

219. The baseline surveys in 2021 identified an active golden eagle eyrie, and the desk study revealed a further two former eyrie sites and an alternative eyrie site. There was no evidence that this golden eagle pair bred in 2020, although there was a total of 122 golden eagle flights recorded during the VP Flight Activity surveys across the survey period (46 flights in Year 1 and 76 flights in Year 2). All eyrie sites are at least 1.5 km from the nearest proposed wind turbine. The eyrie sites are within the known core foraging range (6 km) of golden eagles in accordance with NatureScot guidance (SNH, 2016).
220. All known golden eyrie sites are likely to be beyond any direct construction disturbance risk (based on disturbance ranges provided in Ruddock and Whitfield, 2007). However, some research suggests some evidence for construction phase displacement of golden eagles from windfarm sites (Haworth Conservation, 2015), there may be some level of disturbance to foraging golden eagles which choose to utilise habitats in the vicinity of working areas over the course of construction works. Such impacts would however be temporary, and would constitute an effect of Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

### Habitat Loss

221. The Site is predominantly commercial conifer plantation which is generally considered sub-optimal for golden eagle foraging, with open moorland areas more likely to be regularly used by foraging eagles restricted to along the access route and adjacent to the Site. It is noted, however, based on consultation with NatureScot (see **Table 9.1**) that during the nearby Cnoc an Fhionn Windfarm ornithology surveys, golden eagles were identified as utilising forested habitats more than would typically be anticipated in this location, so foraging in forested habitats is not completely discounted. However, based on the survey results for the proposed Development there is no clear evidence that golden eagles were regularly hunting over forestry habitats, with golden eagle hunting activity recorded mainly over the open moorland habitat. Of the nine instances of golden eagles recorded as actively hunting during the survey period, seven were of individual birds hunting over the open moorland to the north of the proposed wind turbines, one record was an eagle pair hunting over open moorland to the west of the proposed wind turbines and one record was an individual bird hunting over plantation and clear-fell in August 2021. For two of the instances of eagles hunting over open moorland to the north of the proposed wind turbines, grouse species were identified as the prey species (including an eagle feeding on a suspected female black grouse, and an attempted capture of a red grouse). Furthermore, consultation with FLS on 22nd June 2021 (see **Table 9.1**) revealed that prey species found in the 2021 active golden eagle eyrie were identified as red grouse, pheasant and hooded crow. These results provide reasonable

evidence that hunting over open moorland is preferred, and that moorland species (e.g., grouse) are frequent prey items, with little evidence that the golden eagle pair are regularly utilising forestry for hunting.

222. There will be no direct loss of known or potentially suitable undisturbed nesting habitat for golden eagle. Potential direct moorland foraging habitat losses as a result of the proposed Development (restricted to access route upgrading) are also considered extremely small in the context of remaining habitats immediate to the Site and in the wider surrounding area and that likely within the range of the golden eagle territory. The GET model (see **Technical Appendix 9.4** for details) predicts no significant loss of suitable golden eagle habitat during the construction stage of the proposed Development; given such a small proportion (4 %) of suitable habitat ('GET 6 +' habitat) within the golden eagle's estimated range will be lost.
223. Overall direct habitat losses would not be considered to affect the perceived quality of the potential foraging range of the single identified breeding pair of golden eagles or result in reduced breeding success or subsequent abandonment by the pair. Similarly, use of the Site by birds not associated with the identified occupied territory, is unlikely to be by a substantial number of different birds, with baseline surveys suggesting golden eagles recorded were those of the resident breeding pair.
224. Such impacts of habitat loss for both breeding and non-breeding birds would be no more than a Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

### 9.6.5.3 Red-throated diver

225. Red-throated diver is listed on Annex 1 of the Birds Directive (considered post-Brexit by the Habitat Regulations) and Schedule 1 of the Wildlife and Countryside Act 1981, is an SBL species and a priority species for the Argyll and Bute LBAP.
226. The most recently published Regional NHZ red-throated diver population estimate for NHZ 14 'West Argyll and Islands' is 83 pairs, with the national Scottish population estimated at that time comprising a total of 1,268 breeding pairs, across the 21 NHZ areas (Wilson *et al.*, 2015).
227. For the purposes of this assessment red-throated diver is assigned a value of Regional importance, with the presence of the identified three breeding pairs representing 3.6 % of the most recently published Regional NHZ population estimate (83 pairs; Wilson *et al.*, 2015).

### Displacement

228. The baseline surveys in 2020 identified six lochans which supported pairs of red-throated divers, with confirmed breeding behaviour at three of the lochans (in 2021 one of the lochans also supported breeding red-throated divers). A total of 54 red-throated diver flights were recorded during the VP Flight Activity Survey across the survey period and a further 24 flights recorded during the Breeding Diver Focal Loch Watches in 2020. All lochans which supported confirmed breeding red-throated divers are at least 500 m from the nearest proposed wind turbine, as a 500 m buffer was adopted as part of the scheme design.
229. All known breeding red-throated diver lochans are therefore considered to be beyond any distance at which direct construction disturbance associated with the wind turbine localities could occur (based on disturbance ranges provided in Ruddock and Whitfield, 2007).
230. The access route does however pass just within 500 m of one of the breeding diver lochs, so there is potential for some level of disturbance to red-throated divers at that loch in the vicinity of working areas over the course of construction works along the access route, as there is evidence that increase human activity during construction associated with a windfarm development can disturb breeding divers (such as Halley and Hopshaug, 2007) but with no evidence of longer-term displacement effects.
231. Such impacts would be temporary, and would constitute an effect of Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

### Habitat Loss

232. There will be no direct loss of known or potentially suitable undisturbed nesting habitat for red-throated diver. Furthermore, there will no loss of red-throated diver foraging habitat.

233. Such impacts of habitat loss for red-throated diver would be no more than a Negligible magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### 9.6.5.4 Hen harrier

234. Hen harrier is listed on Annex 1 of the Birds Directive (considered post-Brexit by the Habitat Regulations) and Schedule 1 and 1A of the Wildlife and Countryside Act 1981, is an SBL species and a priority species for the Argyll and Bute LBAP.

235. The most recently published Regional NHZ hen harrier population estimate for NHZ 14 'West Argyll and Islands' is 125 pairs, based on the 2010 hen harrier survey (supplemented by data from SRSG), with the national Scottish population estimated at that time comprising a total of 501 breeding pairs, across the 21 NHZ areas (Wilson *et al.*, 2015).

236. For the purposes of this assessment hen harrier is assigned a value of Local importance, with the presence of the identified breeding pair representing 0.8 % of the most recently published Regional NHZ population estimate (125 pairs; Wilson *et al.*, 2015).

#### Displacement

237. The baseline surveys in 2020 identified an active hen harrier nest site (with no nest recorded in 2021). Furthermore, there were a total of 65 hen harrier flights recorded during the VP Flight Activity Surveys across the survey period. The nest site is at least 5 km from the nearest proposed wind turbine. The nest site is outside the known core foraging range (2 km) hen harriers in accordance with NatureScot guidance (SNH, 2016).

238. The hen harrier nest site is likely to be beyond any direct construction disturbance risk (based on disturbance ranges provided in Ruddock and Whitfield, 2007). There may be some level of disturbance to foraging hen harriers which choose to utilise habitats in the vicinity of working areas over the course of construction works. Such impacts would however be temporary, and would constitute an effect of Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### Habitat Loss

239. The Site is predominantly commercial conifer plantation which is sub-optimal for hen harriers, with open moorland areas to be used by foraging harriers restricted to along the access route and adjacent to the Site.

240. There will be no direct loss of known or potentially suitable undisturbed nesting habitat for hen harrier. Potential direct moorland foraging habitat losses as a result of the proposed Development (restricted to access route upgrading) are also considered extremely small in the context of remaining habitats immediate to the Site and in the wider surrounding area and that likely within the range of the hen harrier territory.

241. Such losses would not be considered to affect the perceived quality of the potential foraging range of the single identified breeding pair of hen harrier, or result in reduced breeding success or subsequent abandonment by the pair. Similarly, use of the Site by birds not associated with the identified occupied territory, is unlikely to be by a substantial number of different birds.

242. Such impacts of habitat loss for both breeding and non-breeding birds would be no more than a Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### 9.6.5.5 Black grouse

243. Black grouse is listed on Annex 1 of the Birds Directive (considered post-Brexit by the Habitat Regulations), is an SBL species and a priority species for the Argyll and Bute LBAP.

244. The most recently published Regional NHZ black grouse population estimate for NHZ 14 'West Argyll and Islands' is 67 lekking males, based on a single population estimate from a national survey, with the national Scottish population estimated at that time comprising a total of 3,344 lekking males, across the 21 NHZ areas (Wilson *et al.*, 2015).

245. For the purposes of this assessment black grouse is assigned a value of Regional importance, with the presence of the identified 11 lek sites representing 16 % of the most recently published Regional NHZ population estimate (67 lekking males; Wilson *et al.*, 2015).

### Displacement

246. A total of 11 black grouse leks were recorded during the 2020 and 2021 baseline surveys, although not all leks were in use over consecutive survey visits or between survey years, suggesting a number of mobile leks site supporting small numbers of black grouse. All lek sites are at least 500 m from the nearest proposed wind turbine and were located in open moorland areas adjacent to the Site and the access route.
247. Construction activities within the Site (and particularly along the access route) during the breeding season for black grouse (March to August inclusive; see SNH, 2014), have the potential to result in the disturbance to lekking males at established lek sites and brooding females. A review of disturbance distances for the species suggest that breeding female black grouse would not be passively disturbed at distances greater than 100 - 150 m and leks would not be passively disturbed at over 500 - 750 m (Ruddock and Whitfield, 2007).
248. The potential for disturbance to black grouse during the breeding season would be temporary, with effects greatest where works are undertaken within proximity (i.e., within 750 m) to known main lek sites (i.e., those regularly present and supporting larger numbers of males).
249. Adopting a precautionary approach for the purposes of assessment for black grouse, whereby assuming works will be undertaken during the breeding season and simultaneously across the Site and in the absence of alternative lek sites being available, this has the potential to result in the temporary displacement of regionally important lekking males.
250. Disturbance of black grouse during the construction phase would be considered a temporary, High adverse magnitude, of Moderate adverse significance, and which is Significant in the context of the EIA Regulations.
251. Mitigation measures are therefore proposed to avoid potential disturbance effects to lekking black grouse, over the course of construction works (see **Section 9.6.7**).

### Habitat Loss

252. The Site is predominantly commercial conifer plantation, and the open moorland areas which will be used by lekking grouse is restricted to along the access route and adjacent to the Site.
253. There will be no direct loss of known or potentially suitable undisturbed nesting habitat for black grouse. Potential direct moorland foraging habitat losses as a result of the proposed Development (restricted to access route upgrading) are also considered extremely small in the context of remaining habitats immediate to the Site and in the wider surrounding area.
254. Such losses would not be considered to affect the perceived quality of the potential lekking habitat for black grouse. Furthermore, peatland and heathland restoration will enhance the nesting habitat for black grouse (see **Technical Appendix 8.5** for the HMP).
255. Such impacts of habitat loss for black grouse would be no more than a Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

### 9.6.6 Cumulative Effects

256. No Significant effects as a result of the construction of the proposed Development are predicted to occur.
257. Other windfarm developments considered for the purposes of a cumulative assessment presented within this Chapter (see **Table 9.10**), which are already operational, are not likely to give rise to significant cumulative effects during the construction phase of the proposed Development due to the very low levels of operational activities which would reasonably be expected to occur at these sites. Three windfarm developments are consented with the nearest (Eascairt) 7.1 km, and the other two developments; Airigh and High Constellation, 11.3 km and 14 km, respectively from the proposed Development. Sheirdrim which is also considered is at 'Application submitted/at inquiry' stage, and it is 6.7 km from the proposed Development. Given the spatial segregation between the proposed Development and these windfarms, cumulative effects during the construction phase of the proposed Development are considered unlikely.

### 9.6.7 Mitigation, Compensation and Enhancement

258. Embedded mitigation and good practice measures are detailed in **Sections 9.6.1** and **9.6.2**.

259. The only significant effect upon ornithological features predicted to occur as a result of the construction of the proposed Development is the potential for displacement of lekking black grouse during construction works. Mitigation is therefore proposed to avoid disturbance of the identified lek sites for the species within proximity to construction works as detailed below.
260. Current research suggests that lekking black grouse are not passively disturbed at distances over 500 - 750 m from source (Ruddock and Whitfield, 2007). Adopting these findings, no construction works within 750 m of identified black grouse lek sites (detailed within **Technical Appendix: 9.2 Confidential Ornithology**) will be undertaken prior to 9 am in the months of April and May.
261. Pre-construction surveys will be undertaken to confirm whether the lek sites are occupied and whether the above mitigation is required. Any mitigation that is required around active lek sites, will be monitored by the ECoW to ensure there is no evidence of disturbance to black grouse by construction works.
262. This will serve to avoid construction phase disturbance to regionally important numbers of lekking males.

#### 9.6.7.1 Residual Effects

263. Providing the implementation of mitigation measures outlined herein in relation to black grouse, residual impacts upon black grouse would be of no more than Low adverse magnitude, or Minor adverse significance, non-significant in the context of the EIA Regulations.
264. No significant residual effects are predicted to occur upon any other important ecological feature as a result of the construction of the proposed Development and are thus considered Non-significant in the context of the EIA Regulations.

#### 9.6.8 Potential Effects – Decommissioning

265. Decommissioning phase effects are considered to result in no greater scope and magnitude of effects upon ornithological features than as would occur during the construction phase, albeit occurring over a shorter timescale.
266. As such, decommissioning phase effects upon ornithological features are not considered explicitly within this assessment.

#### 9.6.9 Potential Effects – Operational

##### 9.6.9.1 Designated Sites

267. The potential for indirect operational effects on/in statutory designated sites for nature conservation located within 10 km of the Site, extended to 20 km for sites for qualifying migratory geese (see **Table 9.2**) has typically been inherently avoided due to the lack of overlap between the distances of the designated sites from the Site, and the core foraging range of qualifying ornithological species.
268. The Knapdale Lochs SPA and SSSI is located 8.34 km from the Site and is within the core foraging range of the qualifying feature, breeding black-throated diver.
269. No black-throated divers were recorded during any of the surveys and as such no indirect effect on the Knapdale Lochs SPA and SSSI are predicted. Information to Inform a HRA is provided in **Section 9.6.12**.
270. Potential operational effects to statutory designated sites for nature conservation are therefore considered to be of Negligible magnitude, of Negligible Adverse significance and which is Not Significant in the context of the EIA Regulations.

##### 9.6.9.2 Golden eagle

###### Displacement

271. The baseline surveys in 2021 identified an active golden eagle eyrie, and the desk study revealed a further two former eyrie sites and an alternative eyrie site. There was no evidence that golden eagle pair bred in 2020. There were a total of 122 golden eagle flights recorded during the VP Flight Activity Surveys across the survey period. All eyrie sites are at least 1.5 km from the nearest proposed wind turbine. The eyrie site is within the known core foraging range (6 km) of golden eagles in accordance with NatureScot guidance (SNH, 2016).
272. Previous studies have found evidence of displacement of golden eagles from operational windfarms. A single long-term study of potential displacement effects upon the species at the Edinbane and Ben Aketil Windfarms on the Isle of Skye, did suggest



- the occurrence of displacement on the basis of the decrease in the spatial use of habitats within 500 m of operational turbines (Haworth Conservation, 2015). However, overall eagle flight activity was found to be highly variable between monitoring years, with potential confounding influences of differences in habitat features between onshore wind sites (e.g. topography). A second study carried out at SPR's Beinn an Tuiric Windfarm, did also identify a decrease in spatial use of the onshore wind site by golden eagle during initial years of operational monitoring, although some limited activity through turbine clusters was recorded, with only one flight through the cluster, and three flights over the windfarm (Walker *et al.*, 2005).
273. More recent and comprehensive research from analysed movements of 59 Scottish GPS-tagged golden eagles demonstrated that there is now clear evidence that golden eagles are displaced from suitable habitat as a result of operational wind developments, with eagles displaced out to 300 m from the outermost turbines (Fielding *et al.* 2021a and b). This displacement effect also includes golden eagles being deterred from using habitat in between turbines.
274. On the basis of best and currently available evidence at Scottish wind developments, displacement and loss of habitats for foraging golden eagles is calculated for areas encompassing the turbine layout and buffer out to a maximum distance of 300 m of the outermost turbine locations including the area between turbines (total of 733 ha for this proposed Development), of which only 119 ha is open GET 6+ habitat, referred to as 'good' eagle habitat (see **Technical Appendix 9.4**). The small area of GET 6+ habitat is principally habitat that is described as 'already been lost to forest'.
275. The output from the GET model is detailed in **Technical Appendix 9.4** and has assumed a precautionary 3,000 ha range of adult golden eagles in the region, and thus a total of only 4 % of the range signifying suitable habitat (GET 6+) would be lost to the proposed Development.
276. The GET model similarly reports low levels of habitat loss for dispersing golden eagles by assessing the effect out to 10 km from the proposed Development and regarding the availability of suitable eagle habitat (GET 6+).
277. The GET model concludes that there will be an insignificant loss of golden eagle habitat arising from the operation of the proposed Development and it is unlikely that the loss would create a significant impact on the extent of habitat used by the golden eagle pair. It is even less probable that it would have a significant impact on dispersing young eagles.
278. It is also unlikely that there will be a significant reduction of habitat use outside of the 300 m exclusion zone from the proposed Development.
279. Operational displacement, whilst permanent is therefore considered to be of no more than a Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### *Collision Mortality Risk*

280. CRM Analysis for golden eagle has been completed using flight activity data for the period December 2020 to November (Year 2), which predicts an annual mortality of 0.393 birds (see **Technical Appendix 9.3**). This represents 0.39 % of the most recent NHZ 14 population estimate (51 pairs, thus 102 territorial adult birds, so not accounting for unpaired and immature birds).
281. Estimated adult survival rates for golden eagle are stated as 95 % (Watson, 1997), which gives a baseline mortality of 5 % for adult birds. Assuming a Regional NHZ population estimate of 51 pairs (102 birds), the baseline mortality rate in the absence of the proposed Development would be 5 adult birds per year. The estimated annual mortality (0.393 birds) resulting from the proposed Development represents a potential 7.86 % increase in annual baseline Regional NHZ mortality.
282. It is understood that there have been four known golden eagle collision fatalities at operational wind farms in Scotland at the time of writing and therefore the potential for collisions to occur for the species over the lifetime of the proposed Development cannot be entirely precluded, but such events are considered to be extremely rare. There is no evidence to indicate that golden eagle collisions occur to such an extent that they could affect regional population levels. Recent research (Fielding *et al.*, 2021a and b) documents that golden eagles are displaced from windfarms, with 300 m considered modest for the displacement effect. It is therefore reasonable to predict that collision risk mortality from the proposed Development will be considerably lower than those estimated from CRM Analysis, given the recent advancements in our understanding of the effects of windfarms on golden eagles.

283. Overall collision mortality risks to golden eagle are therefore considered to represent no more than a Low/Medium adverse magnitude, of Minor adverse significance and which would be Non-significant at the Regional NHZ population level.

### 9.6.9.3 Red-throated diver

#### Displacement

284. The baseline surveys in 2020 identified six lochans which supported pairs of red-throated divers, with confirmed breeding behaviour at three of the lochans (in 2021 one of the lochans also supported breeding red-throated divers). Furthermore, a total of 60 red-throated diver flights were recorded during the VP Flight Activity Survey across the survey period and a further 36 flights recorded during the Breeding Diver Focal Loch Watches. All lochans which supported confirmed breeding red-throated divers are at least 500 m from the nearest proposed wind turbine.

285. Red-throated diver flights were predominantly concentrated to the north of the Site over open moorland habitat.

286. Collectively, current research suggests little clear evidence for long-term displacement effects upon red-throated divers as a result of operational windfarms, both in terms of breeding lochs and flights (i.e. barrier effects; as reviewed by Humphreys *et al.*, 2015). At Carraig Gheal Windfarm in Argyll, although the number of red-throated diver flights through the wind turbine area reduced after construction, red-throated divers nested in one lochan before and after construction just under 1 km from the nearest wind turbine. Furthermore, Furness (2015) reported evidence of breeding red-throated divers close to operational wind developments. Diver monitoring surveys for the construction of the Cour Windfarm on Mull of Kintyre (Haworth Conservation, 2016, reported in Arcus Consultancy Services Ltd, 2019; *Chapter 8 Ornithology of the 'High Constellation Wind Farm' EIA Report*) recorded red-throated divers and black-throated divers present on lochs within 500 m of a wind turbine, with adult divers nest prospecting at two such lochs.

287. Given all breeding lochans are at least 500 m from the nearest proposed wind turbine, the majority of the red-throated diver flights were > 500 m from the nearest turbine and the location of the turbines within commercial forestry, displacement of breeding divers as a result of the operation of the proposed Development is considered unlikely.

288. However, one of the breeding diver lochs is just within 500 m of the access route. Activity of maintenance vehicles during the operational phase has potential to disturb breeding divers during the breeding season April-August, although the effect is considered to be temporary and highly localised.

289. Operational displacement, whilst permanent in terms of operational wind turbines (but temporary in terms of activity of maintenance vehicles) is therefore considered to be of no more than a Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### Collision Mortality Risk

290. Although 60 red-throated diver flights were recorded during VP Flight Activity Surveys, no diver flights were recorded at-risk from collision (at collision risk height and within 290 m of turbines) in Year 2. Diver flights were almost exclusively recorded to the north of the turbine area during the VP Flight Activity Surveys (as shown in **Figure 9.6b and 9.6d**).

291. Collision risk modelling for red-throated diver has therefore not been completed due to the inconsequential levels of collision mortality risk for the species that would reasonably be predicted.

### 9.6.9.4 Hen harrier

#### Displacement

292. The baseline surveys in 2020 identified an active hen harrier nest site (with no nest recorded in 2021). Furthermore, there were a total of 65 hen harrier flights recorded during the VP Flight Activity Surveys across the survey period, and these were typically concentrated to the north of the Site in open moorland areas. The nest site is at least 5 km from the nearest proposed wind turbine. The nest site is outside the known core foraging range (2 km) hen harriers in accordance with NatureScot guidance (SNH, 2016).

293. Foraging hen harriers are generally established as having low displacement sensitivity to disturbance at operational windfarms, likely limited to within 100 m of operational wind turbines should it occur at all (Whitfield & Madders, 2006). Losses of potential sub-optimal foraging habitat (commercial forestry) would not affect the perceived quality of the potential foraging range of any identified breeding pair of hen harrier or result in reduced breeding success or subsequent

abandonment by any pair. Similarly potential use of the Site by non-breeding birds is unlikely to be by a substantial number of different birds. Although key-holing around turbines has potential to create some foraging and nesting habitat for hen harrier it is considered that given the main activity of hen harriers during surveys (north of the proposed wind turbines, with the nest site at least 5 km from the nearest proposed wind turbine) and given the key-holed areas will be typically surrounded by forestry (thus reducing the attractiveness of these areas for hen harriers), this will reduce the likelihood for birds to be active close to proposed wind turbines.

294. Operational displacement, whilst permanent is therefore considered to be of no more than a Low/Medium adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### *Collision Mortality Risk*

295. CRM Analysis for hen harrier has been completed using flight activity data for the period December 2020 to November (Year 2), which predicts an annual mortality of 0.057 birds (see **Technical Appendix 9.3**). This represents 0.02 % of the most recent NHZ 14 population estimate (125 pairs, thus 250 adult birds).
296. Estimated adult survival rates for hen harrier are stated as 81 % (Picozzi, 1984), which gives a baseline mortality of 19 % for adult birds. Assuming a Regional NHZ population estimate of 125 pairs (250 adult birds), the baseline mortality rate in the absence of the proposed Development would be 47.5 adult birds. The estimated annual mortality (0.057 birds) resulting from the proposed Development represents a potential <1 % (0.12 %) increase in annual baseline Regional NHZ mortality.
297. Overall collision mortality risks to hen harrier are therefore considered to represent no more than a Low adverse magnitude, of Minor adverse significance and which would be Non-significant at the Regional NHZ population level.

#### **9.6.9.5 Black grouse** *Displacement*

298. A total of 11 black grouse leks were recorded during the 2020 and 2021 baseline surveys, although not all leks were in use over consecutive survey visits or between survey years, suggesting a number of mobile leks site supporting small numbers of black grouse. All lek sites are at least 500 m from the nearest proposed wind turbine, and were located in open moorland areas adjacent to the Site and the access route.
299. Research into the operational displacement of black grouse from onshore wind sites remains limited. However, at several sites in Scotland, studies have shown that the abundance of lekking males at windfarm sites did not change during the operational period, although some lek sites, within 500 m of planned turbine locations, moved locally after construction (Zwart *et al.*, 2015). The same research also outlines evidence of the species occasional use of areas beneath turbines (Zwart *et al.*, 2015) and confounding factors such as habitat management and the lack of pre-construction data do however, place limitations on evidence suggesting displacement and population level effects for the species (Zwart *et al.*, 2015).
300. The locations of 'main' lek sites identified during baseline surveys has been considered as part of the evolution of scheme design for the proposed Development, and as such, no such lek site is located within 500 m of any proposed wind turbine. Operational displacement of males utilising these lek sites are therefore highly unlikely on the basis of best available evidence. Whilst the displacement of individual lekking males at 'satellite' lek sites cannot be entirely precluded, such effects would not be attributable to local population losses.
301. Activities within the Site (and particularly along the access route) associated with operational works (such as the presence and movement of maintenance vehicles) during the breeding season for black grouse (March to August inclusive; see SNH, 2014), have the potential to result in the disturbance to lekking males at established lek sites and brooding females. A review of disturbance distances for the species suggest that breeding female black grouse would not be passively disturbed at distances greater than 100 - 150 m and leks would not be passively disturbed at over 500 - 750 m (Ruddock and Whitfield, 2007).
302. The potential for disturbance caused by maintenance vehicles (particularly along the access route) to black grouse during the breeding season would be temporary, with effects greatest where activity is undertaken within proximity (i.e., within 750 m) to known main lek sites (i.e., those regularly present and supporting larger numbers of males) during the breeding season and particularly before 9 am in April and May.

303. Operational displacement, whilst permanent in terms of operational wind turbines (but temporary in terms of activity of maintenance vehicles) is therefore considered to be of no more than a Low adverse magnitude, of Minor adverse significance, and which is Not Significant in the context of the EIA Regulations.

#### Collision Mortality Risk

304. Only two black grouse flights were recorded during VP Flight Activity Surveys, with both female birds flying below collision risk height, as is typical for the species.

305. Given the low level of “at collision risk” flight activity, collision risk modelling for black grouse have not been completed due to the inconsequential levels of collision mortality risk for the species that would reasonably be predicted. The species is acknowledged as being at low risk of collision with turbine blades due to their typical low flight heights and tendency to spend much of their time on the ground.

#### 9.6.9.6 Cumulative Effects

306. The potential for significant cumulative collision risks upon relevant ornithological features are considered within this assessment of operational effects, with other windfarms on the Kintyre peninsula and out to 20 km considered (as shown in **Table 9.10** and mirroring those regarded for GET modelling, with only exception that Kilchamaig Farm and Gartnagrenach Farm are not regarded in the cumulative assessment as these are <3 turbine schemes). A summary of predicted cumulative annual collision mortality risks of hen harrier and golden eagle, including the proposed Development and other wind farm developments within 20 km (for which data was available), is provided in **Table 9.12**.

307. Figures presented for other windfarm developments have not been checked or amended to reflect avoidance rates used within this assessment.

**Table 9.12: Cumulative Collision Risk for Hen harrier and Golden Eagle**

Windfarm development	Hen harrier	Golden eagle
proposed Development	0.057 (99 % avoidance)	0.393 (99 % avoidance)
Allt Dearg (incl. Srondoire Community turbines)	0.07	0.071 & 0.021
Airigh	0	0.0658 (worst over a 3 year period, with average 0.022)
Freasdail	0	0.002
Eascairt	0.075	0.071
High Constellation	0.050	0.099
Cour	0.027	0.028
Sheirdrim	0.045	0
<b>Total</b>	<b>0.324</b>	<b>0.751</b>

311. Cumulative collision risk estimates for hen harrier are calculated at 0.324 birds per year, which represents 0.13 % of the most recently published Regional NHZ population (125 pairs, thus adult 250 birds) and a 0.68 % increase in annual baseline Regional NHZ mortality.

312. Cumulative collision risk estimates for golden eagle are calculated at 0.751 birds per year, which represents 0.74 % of the most recent Regional NHZ population (51 pairs, thus 102 birds) and a 15 % increase in annual baseline Regional NHZ mortality.

313. As detailed, there have been four known incidents of golden eagle collision fatalities at operational wind farms in Scotland at the time of writing, but the instances are considered to be extremely rare. Furthermore, recent studies (Fielding *et al.*, 2021 a and b) have documented that golden eagles are displaced from operational windfarms by 300 m. It is therefore considered

that predicted collision risk mortality of golden eagles will be considerably lower than the cumulative annual mortality of 0.751 birds, given the advancements in our understanding of the effects of windfarms on golden eagles.

314. Overall cumulative collision mortality risks to hen harrier is considered to represent no more than a Low adverse magnitude, of Minor adverse significance and which would be Non-significant at the Regional NHZ population level.
315. Given, the likely over-estimation of golden eagle annual mortality due to stronger displacement effects, as recently established (see Fielding *et al.*, 2021a and b), overall cumulative collision mortality risks to golden eagle are considered to represent no more than a Low/Medium magnitude, of Minor adverse significance and which would be Non-significant at the Regional NHZ population level.

#### 9.6.9.7 Mitigation, Compensation and Enhancement

316. No significant adverse effects upon any important ornithological feature would occur as a result of the operation of the proposed Development. As such, no additional mitigation measures are required.
317. Enhancement measures, provided as part of the HMP would however remain in place throughout the operational phase, subject to periodic review in accordance with any emerging best practice management advice. The HMP is presented in **Technical Appendix 8.5**.

#### 9.6.9.8 Residual Effects

318. No significant residual effects are predicted to occur upon any important ornithological feature as a result of the operation of the proposed Development.

#### 9.6.10 Further Survey Requirements and Monitoring

No further surveys or monitoring are proposed with the requirement for pre-construction checks for nesting birds and BPP summarised in **Section 9.6.2**.

#### 9.6.11 Summary of Predicted Effects

319. **Table 9.13** provides a summary of effects upon important ornithological features as a result of the proposed Development, together with mitigation, compensation and enhancement measures and a conclusion of residual effects.

**Table 9.13: Summary of Effects Upon Important Ornithological Features**

Feature	Predicted Effects	Good Practice Measures	Magnitude and Significance	Additional Mitigation / Compensation	Residual Significance
<b>Construction</b>					
Knapdale Lochs SSSI and SPA	Indirect effects on qualifying feature species	Avoidance via design of the proposed Development	Negligible, Negligible Adverse, Not Significant	None in addition to embedded mitigation	Not Significant
Golden eagle	Displacement	Avoidance of known golden eagle nest sites via design (and appropriate buffer of 1.5 km applied around nest sites)	Temporary, Low/Medium, Minor Adverse, Not Significant.	None required	Not Significant
	Habitat Loss	Avoidance of those most suitable foraging areas (open moorland)	Low/Medium, Minor Adverse, Not Significant.	None required. However, bog and heath restoration are included in HMP	Not Significant

Feature	Predicted Effects	Good Practice Measures	Magnitude and Significance	Additional Mitigation / Compensation	Residual Significance
Red-throated diver	Displacement	Avoidance of known diver breeding lochs via design (and appropriate buffer of 500 m applied around lochs)	Temporary, Low, Minor Adverse, Not Significant	None required	Not Significant
	Habitat Loss	None required	Negligible, Minor Adverse, Not Significant	None required. However, bog and heath restoration are included in HMP	Not Significant
Hen harrier	Displacement	Avoidance of known hen harrier nest sites via design (and appropriate buffer of 500 m applied around nest sites)	Temporary, Low/Medium, Minor Adverse, Not Significant.	None required	Not Significant
	Habitat Loss	Avoidance of those most suitable foraging areas (open moorland)	Low/Medium, Minor Adverse, Not Significant.	None required. However, bog and heath restoration are included in HMP	Not Significant
Black grouse	Displacement	Wind turbines at least 500 m from the nearest lek site.	Temporary, High, Moderate Adverse, Significant	No construction works within 750 m of identified main lek sites to be undertaken prior to 9 am in the months of April and May	Not Significant
	Habitat Loss	Avoidance of those most suitable foraging areas (open moorland)	Low/Medium, Minor Adverse, Not Significant.	None required. However, bog and heath restoration are included in HMP	Not Significant
<b>Operation</b>					
Knapdale Lochs SSSI and SPA	Indirect effects on qualifying feature species	Avoidance via design of the proposed Development	Negligible, Negligible Adverse, Not Significant	None in addition to embedded mitigation	Not Significant
Golden eagle	Displacement	Principally sub-optimal golden eagle foraging habitat to be lost, with extensive optimal habitat locally and regionally	Medium, Minor Adverse, Not Significant.	None required	Not Significant

Feature	Predicted Effects	Good Practice Measures	Magnitude and Significance	Additional Mitigation / Compensation	Residual Significance
	Collision mortality	Avoidance of those most suitable foraging areas (open moorland)	Low/Medium, Minor Adverse, Not Significant.	None required	Not Significant
Red-throated diver	Displacement	Avoidance of known diver breeding lochs via design (and appropriate buffer of 500 m applied around lochs)	Low/Medium, Minor Adverse, Not Significant	None required	Not Significant
	Collision mortality	Regular diver flight route west and east to north of the turbine area maintained	Negligible, Negligible Adverse, Not Significant	None required	Not Significant
Hen harrier	Displacement	Avoidance of known hen harrier nest sites via design (and appropriate buffer of 500 m applied around nest sites)	Low/Medium, Minor Adverse, Not Significant	None required	Not Significant
	Collision mortality	Avoidance of those most suitable foraging areas (open moorland)	Low, Minor Adverse, Not Significant	None required	Not Significant
Black grouse	Displacement	Wind turbines at least 500 m from the nearest lek site	Low, Minor Adverse, Not Significant	None required	Not Significant
	Collision mortality	Avoidance of those most suitable foraging areas (open moorland)	Negligible, Negligible Adverse, Not Significant	None required	Not Significant
<b>Cumulative</b>					
Golden eagle	Collision mortality	Avoidance of those most suitable foraging areas (open moorland)	Low/Medium, Minor Adverse, Not Significant	None required	Not Significant
Hen harrier	Collision mortality	Avoidance of those most suitable foraging areas (open moorland)	Low, Minor Adverse, Not Significant	None required	Not Significant

### 9.6.12 Information to Inform a Habitats Regulations Appraisal

327. This Section summarises information relating to the potential for Likely Significant Effects upon ornithological qualifying features of the Knapdale Lochs SPA (and SSSI) as a result of the proposed Development.

328. The potential for Likely Significant Effects upon other European sites and Ramsar sites is screened out on the basis of spatial separation of the Site from additional designations in accordance with NatureScot guidance (SNH, 2016).

329. The Knapdale Lochs SPA (and SSSI) is designated by virtue of its breeding black-throated divers (**Table 9.2**). The distance between these designated sites and the Site is within the core foraging range for the species (see SNH guidance, 2016).

330. The Conservation Objectives of Knapdale Lochs SPA are summarised in Sitelink (NatureScot<sup>5</sup>):

To avoid the deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and,

To ensure for the qualifying species that the following are maintained in the long term:

- population of the species as a viable component of the site;
- distribution of the species within site;
- distribution and extent of habitats supporting the species;
- structure, function and supporting processes of habitats supporting the species; and
- no significant disturbance of the species.

331. The proposed Development is located 8.34 km, and sufficiently distant, from Knapdale Lochs SPA (and SSSI) to preclude any potential disturbance to black-throated divers within the boundaries of the designations. No black-throated divers are known to utilise habitats within the Site or immediate vicinity, and no such use was observed during baseline ornithology surveys. As such no disturbance or displacement effects will occur for this species.

332. The proposed Development will not result in any effects upon habitats known to be used by black-throated divers. The habitats to be lost as a result of the construction of the proposed Development comprise predominantly commercial conifer plantation, unsuitable for the species.

333. No black-throated divers were recorded during VP Flight Activity Surveys, or any of the other ornithology surveys. Effects of the proposed Development on black-throated diver alone or in-combination with other wind turbine developments can therefore be discounted.

334. The proposed Development will therefore not affect the conservation objectives of the Knapdale Lochs SPA (and SSSI) and subsequently there will be no adverse effects on European site integrity.

## 9.7 Statement of Significance

335. The evolution of sensitive design together with embedded mitigation and good practice measures have avoided the potential for significant effects upon important ornithological features as a result of the proposed Development.

336. The proposed Development also provides opportunity to compensate for unavoidable sensitive habitat losses and incorporate notable habitat improvements including peatland restoration, habitat improvements for black grouse and native woodland planting, delivered by an HMP, which will benefit key ornithological species.

337. Given the demonstrable confidence of success detailed within the HMP, the proposed Development will lead to a net positive impact upon ornithological features in the long term.

---

<sup>5</sup> <https://sitelink.nature.scot/site/8520> (accessed 28th July 2021).



## 9.8 References

- Arcus Consultancy Ltd. (2019). Chapter 8 Ornithology. High Constellation Wind Farm. EIA Report – Volume 1 – Main Text. May 2019. Arcus and Blue Energy.
- Brown, A.F. and Shepherd, K.B. (1993). A Method for Censusing Upland Breeding Waders. *Bird Study*, 40, pp. 189-195.
- 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 (3), pp. 381-388.
- Challis, A., Wilson, M.W., Holling, M., Roos, S., Stevenson, A. and Stirling-Aird, P. (2016). Scottish Raptor Monitoring Scheme Report 2015. BTO Scotland, Stirling.
- CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.1 – Updated September 2019). Chartered Institute of Ecology and Environmental Management, Winchester.
- Evans W. R, Akashi Y, Altman N. S, Manville A. M., II (2007). Response of night-migrating songbirds in cloud to colored and flashing light. *North American Birds*. 60, 476–488
- Furness, R.W. 2015. A review of red-throated diver and great skua avoidance rates at onshore wind farms in Scotland. Scottish Natural Heritage Commissioned Report No. 885.
- Fielding, A.H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. and Whitfield, P. (2021a). Responses of dispersing GPS-tagged golden eagles (*Aquila chrysaetos*) to multiple wind farms across Scotland. *Ibis (Online Early Article)* <https://doi.org/10.1111/ibi.12996>.
- Fielding, A.H., Anderson, D., Benn, S., Dennis, R., Geary, M., Weston, E. and Whitfield, P. (2021b). Non-territorial GPS-tagged golden eagles *Aquila chrysaetos* at two Scottish windfarms: Avoidance influenced by preferred habitat distribution, wind speed and blade motion status. *PLoS ONE* 16(8): e0254159. <https://doi.org/10.1371/journal.pone.0254159>
- Furness, R.W. (2015). A review of red-throated diver and great skua avoidance rates at onshore wind farms in Scotland. Scottish Natural Heritage Commissioned Report No 885. Scottish Natural Heritage, Inverness.
- Gilbert, G., Gibbons, D.W. and Evans, J. (1998). *Bird Monitoring Methods*. RSPB, Sandy.
- Halley, D.J. & Hopshaug, P. 2007. Breeding and overland flight of red-throated divers *Gavia stellata* at Smøla,
- Halley, D.J. and Hopshaug, P. (2007). Breeding and overland flight of red-throated divers *Gavia stellata* at Smøla, Norway, in relation to the Smøla wind farm. NINA Report 297.
- Hardey, J., Crick, H., Wernham, C., Riley, H. and Thompson, D. (2009). *Raptors: a Field Guide to Survey and Monitoring*. (2nd Edition) The Stationery Office, Edinburgh.
- Haworth Conservation (2015). Edinbane Windfarm: Ornithological Monitoring 2007–2014. A review of the spatial use of the area by birds of prey. Haworth Conservation Ltd.
- Humphreys, E.M., Marchant, J.H., Wilson, M.W. and Wernham, C.V. (2015). Red-throated Diver (*Gavia stellata*): SWBSG Species Dossier 4. Report by BTO Scotland to SWBSG as part of Project 1403. Updated by SWBSG March.
- Kerlinger, P. and Moore, F.R. (1989). Atmospheric structure and avian migration. *Current Ornithology*. 6: 109-142
- Krüger, T. & Garthe, S. (2001). Flight altitudes of coastal birds in relation to wind direction and speed. *Atlantic Seabirds* 3: 203–216
- Picozzi, N. (1984). Sex Ratio, Survival and Territorial Behaviour of Polygynous Hen Harriers *Circus c. cyaneus* in Orkney. *Ibis*, 3, pp. 356-365.
- Ruddock and Whitfield (2007). A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects).

- 
- SNH (2000). Windfarms and Birds - Calculating a Theoretical Collision Risk Assuming no Avoiding Action. SNH Guidance Note.
- SNH (2012). Assessing the Cumulative Impact of Onshore Wind Energy Developments. Scottish Natural Heritage, Inverness.
- SNH (2014). Breeding Season Dates for Key Breeding Species in Scotland. Scottish Natural Heritage, Inverness.
- SNH (2016). Assessing Connectivity with Special Protection Areas (SPAs). Scottish Natural Heritage, Inverness.
- SNH (2017). Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. Scottish Natural Heritage, Inverness.
- SNH (2018a). Assessing Significance of Impacts from Onshore Windfarms on Birds Outwith Designated Areas. Scottish Natural Heritage, Inverness.
- SNH (2018b). Assessing the Cumulative Impact of Onshore Wind Farms on Birds. Scottish Natural Heritage, Inverness.
- SNH (2018c). Avoidance Rates for the Onshore SNH Wind Farm Collision Risk Model (September 2018, v2) Scottish Natural Heritage, Inverness.
- 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 List assessment of extinction risk for Great Britain. *British Birds*, 114, pp. 723-747.
- Walker, D., McGrady, M., McCluskie, A., Madders, M. and McLeod, D. R. A. (2005). Resident Golden Eagle ranging behaviour before and after construction of a wind farm in Argyll. *Scottish Birds*, 25: 24-40.
- Watson, J. (1997). *The Golden Eagle*. Poyser, London.
- Whitfield, D.P. and Madders, M. (2006). A Review of the Impacts of Wind Farms on Hen Harriers *Circus cyaneus* and an Estimation of Collision Avoidance Rates. Natural Research Information Note 1 (revised). Natural Research Ltd, Banchory, UK.
- Wilson, M. W., Austin, G. E., Gillings S. and Wernham, C. V. (2015). Natural Heritage Zone Bird Population Estimates. SWBSG Commissioned report.
- Zwart, M. C., P. Robson, S. Rankin, M. J. Whittingham, and P. J. K. McGowan. (2015). Using Environmental Impact Assessment and Post-construction Monitoring Data to Inform Wind Energy Developments. *Ecosphere*, 6(2), pp 26.

**ScottishPower Renewables**

320 St Vincent Street  
Glasgow  
G2 5AD

T +44 (0)141 614 0451

[EarraghailRenewableEnergyDevelopment@scottishpower.com](mailto:EarraghailRenewableEnergyDevelopment@scottishpower.com)

