

Chapter 6: Ornithology

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Executive Summary

This Ornithology chapter of the Environmental Impact Assessment ('EIA') Report assesses the likely significant effects of the Proposed Varied Development with respect to ornithology. It updates **Chapter 9: Ornithology** of the 2018 EIA Report for the Consented Development (Reference: ECU00000673), which should be read in conjunction with this chapter. This chapter should also be read in conjunction with the development description provided in **Chapter 2: Description of Development and Design Iteration** and with respect to relevant parts of **Chapter 7: Ecology and Nature Conservation**, which details the effects of the Proposed Varied Development on habitats and evaluates whether the ecological mitigation and enhancements for the Consented Development, are adequate for the Proposed Varied Development in terms of ecological receptors.

The Ornithological Impact Assessment ('OIA') presented in this chapter considers only likely changes to the conclusions of the Consented Development. Where there is unlikely to be a change to effects to any of the Important Ornithological Features ('IOFs') previously considered, these are scoped out of the OIA for the Proposed Varied Development.

No significant effects on IOFs were identified for the Consented Development in the 2018 EIA Report (MacArthur Green 2018), either alone or cumulatively.

Updated VP surveys were completed between April 2025 and May 2026 and roosting goose surveys were completed from October 2025 to May 2026. Additionally, updated desk study data relating to breeding Schedule 1 listed raptor species was obtained in March 2026. The updated survey and desk study data supplemented the existing baseline ornithology data collected between April 2012 and November 2017 and presented in the 2018 EIA Report, **Volume 2, Chapter 9: Ornithology** for the Consented Development.

Based on the updated and existing baseline information, it is considered that the assessment of effects of the Proposed Varied Development will remain largely unchanged when compared with the previously identified IOFs in the 2018 EIA for the Consented Development.

The Consented Development did not include an evaluation of turbine lighting effects. However, due to a proposed increase in turbine tip height for the Proposed Varied Development the need for aviation lighting is required and consultation responses from NatureScot (formerly Scottish Natural Heritage ('SNH')) identified the need for an assessment of the effects of turbine lighting

on Greenland white-fronted goose (*Anser albifrons flavirostris*), which is therefore presented in this chapter.

As collision risk will change due to the proposed increase in turbine tip height and associated geometry, revised Collision Risk Modelling ('CRM') has also been completed to inform a revised assessment of potential collision risk arising from the Proposed Varied Development. This was based on the 2016-17 flight activity dataset collected for the Consented Development and the 2025-26 flight activity dataset collected for the Proposed Varied Development.

Ten species were scoped into the 2018 CRM completed for the Consented Development, barnacle goose (*Branta leucopsis*), greylag goose (*Anser anser*), Greenland white-fronted goose, oystercatcher (*Haematopus ostralegus*), curlew (*Numenius arquata*), snipe (*Gallinago gallinago*), herring gull (*Larus argentatus*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), and peregrine (*Falco peregrinus*). "At-risk" flights are identified as those at potential collision height ('PCH') within the area of overlap between the Collision Risk Analysis Area ('CRAA') and relevant vantage point ('VP') viewshed. However, only one species was taken forward as an IOF and was scoped into the overall assessment: Greenland white-fronted goose.

As the minimum air gap (the distance from the ground to the lowest turbine blade sweep) for the Proposed Varied Development (50m) is larger than that for the Consented Development (19.9-32.9m) and was based on different (but overlapping) datasets, the suite of species scoped into the revised CRM differed to that scoped in for the Consented Development. Nine species were scoped into the revised CRM for the Proposed Varied Development: greylag goose, Greenland white-fronted goose, common gull (*Larus canus*), herring gull, great black-backed gull, golden eagle (*Aquila chrysaetos*), hen harrier, white-tailed eagle (*Haliaeetus albicilla*) and peregrine.

For all five species scoped into both the 2018 CRM for the Consented Development and the revised CRM for the Proposed Varied Development (greylag goose, Greenland white-fronted goose, herring gull, hen harrier and peregrine), predicted collision risk is predicted to be higher for the Proposed Varied Development compared to the Consented Development. However, the CRM for the Proposed Varied Development followed a more precautionary approach than the CRM for the Consented Development, and despite collision risk being comparatively higher it is considered to be of Low to Negligible Magnitude for all species.

However, given the High Nature Conservation Importance (NCI; defined in 2018 EIA Report, **Volume 2, Chapter 9: Ornithology** for the Consented Development) of Greenland white-fronted goose, collision risk to this species has been scoped into the detailed assessment. Additionally, due to the small size of the regional white-tailed eagle breeding population and the fact that

collision risk to this species could potentially increase in future, this has been considered in the assessment for the Proposed Varied Development presented in this chapter. Collision risk to all other species was scoped out of the detailed assessment as there was not considered to be any potential for significant effects in EIA terms.

In addition, a revised assessment of disturbance/displacement impacts on Greenland white-fronted geese roosting on Tangy Loch and breeding and foraging hen harrier, during construction and decommissioning of the Proposed Varied Development, has been completed.

An updated cumulative collision risk assessment has also been completed for Greenland white-fronted goose, using the revised CRM results for the Proposed Varied Development and CRM results from other developments in the surrounding area. The potential for the Proposed Varied Development to contribute to cumulative barrier effects on Greenland white-fronted goose has also been considered. No significant cumulative effects due to collision risk or barrier effects were identified for Greenland white-fronted goose.

No significant effects on Greenland white-fronted goose were predicted due to any impacts associated with the Proposed Varied Development, either alone or cumulatively with other developments. However, due to the importance of the local population and occasional use of Tangy Loch by large numbers of roosting birds, targeted mitigation to reduce disturbance to roosting birds in line with measures proposed for the Consented Development is considered to be applicable to and appropriate for the Proposed Varied Development, with some modifications proposed. Measures will be detailed in a Goose Protection Plan ('GPP').

Due to the proximity of the Kintyre Goose Roosts Special Protection Area ('SPA') and the potential for connectivity, Greenland white-fronted goose was also assessed under the Habitats Regulations (refer to **Volume 4, Technical Appendix 6.2: Shadow Habitats Regulations Appraisal Report for Kintyre Goose Roosts Special Protection Area (SPA)**). It was concluded that the Proposed Varied Development would not adversely affect the integrity of the SPA.

For hen harrier, following implementation of embedded mitigation detailed in a Breeding Bird Protection Plan ('BBPP') to protect all breeding birds, including Schedule 1-listed species such as hen harrier, it was concluded that there would be No Significant effects on this species.

6.1. Introduction

- 6.1.1. An assessment of impacts on ornithology was previously undertaken for the consented Tangy IV Wind Farm ('the Consented Development') in 2018 in accordance with best practice guidance and methodologies. This assessed a layout consisting of 16 turbines with a maximum tip height of 149.9m.
- 6.1.2. This chapter considers the potential for the Proposed Varied Development as described in **Chapter 2: Design Iteration and Description of Proposed Varied Development** to result in material changes to the effects identified for the Consented Development.
- 6.1.3. The assessment is supported by **Figures 6.1 – 6.22 in Volume 3a**, and **Technical Appendices 6.1 – 6.3 in Volume 4** of this EIA Report.

6.2. Scope of Assessment

- 6.2.1. The scope of this assessment and document is to:
- summarise the previously collected baseline information used to support the 2018 EIA Report for the Consented Development as well as the updated survey and desk study data for the Proposed Varied Development;
 - undertake CRM based on the new turbine parameters and recent VP survey data for the Proposed Varied Development;
 - undertake a revised assessment of the predicted collision risk effects of the Proposed Varied Development, both alone and cumulatively with surrounding developments on relevant IOFs;
 - summarise any changes in predicted collision risk effects on IOFs arising from the Proposed Varied Development compared with the Consented Development;
 - undertake an assessment of lighting effects due to the increase in turbine height for aviation lighting in accordance with Civil Aviation Authority guidance; and
 - undertake a revised assessment of cumulative barrier effects on Greenland white-fronted goose.
- 6.2.2. This chapter is supported by the Figures and Technical Appendices listed below. Which are referenced throughout the text and should be referred to in conjunction with this chapter. Figures are included within **Volume 3a** of this EIA Report, Technical Appendices are included within Volume 4 and Confidential Figures are within the confidential annex.
- Technical Appendix 6.1: Ornithology Technical Report

- Technical Appendix 6.2: Shadow Habitats Regulations Appraisal Report for Kintyre Goose Roosts Special Protection Area (SPA)
- Technical Appendix 6.3: Ornithology Confidential Annex
- Figure 6.1; Vantage Point Locations and Viewsheds at 50m
- Figure 6.2; Vantage Point Location for Roosting Goose Surveys
- Figure 6.3; Vantage Point Surveys: Wildfowl Flights, 2025 Breeding Season
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- Figure 6.21; Argyll Raptor Study Group Eagle Records within 6km (Confidential)
 - Figure 6.22: Argyll Raptor Study Group Schedule 1 Raptor Records within 2km (Confidential)
- 6.2.3. A section 36C ('S.36C') Scoping Report for the Proposed Varied Development ("the Scoping Report" (**Technical Appendix 3.1: Scoping Report**)), was submitted to statutory consultees for their consideration in June 2025. The Scoping Report set out the rationale to assess or scope out ornithological features based on the potential impacts of the Proposed Varied Development due to changes from the Consented Development.
- 6.2.4. As detailed in **Volume 2, Chapter 2: Description of Development and Design Iteration**, the Proposed Varied Development seeks to increase the maximum tip height of all 16 turbines from 149.90 metres (m) up to 200m. There would also be an increase in maximum rotor diameter from 130m up to 150m alongside associated changes to ancillary elements of the development. Additionally, as detailed in **Volume 4, Technical Appendix 5.10: Landscape and Visual Assessment of Aviation Lighting**, turbine lighting will be required due to the increased tip height.
- 6.2.5. As detailed in the Scoping Report for the Proposed Varied Development, no significant effects on IOFs were identified for the Consented Development, either alone or cumulatively at any stage of the project and it is considered that the assessment of effects of the Consented Development alone on previously identified IOFs will remain largely unchanged. However, estimated collision risk will change due to the alteration of turbine height and geometry. Therefore, a revised CRM has been completed to inform an updated assessment of potential collision risk arising from the Proposed Varied Development. This was based on updated flight activity (vantage point) surveys completed between April 2025 and May 2026 (inclusive).
- 6.2.6. Additionally, given that new collision risk data is available from other developments (including West Torrisdale, Allt Domhain, High Constellation and Eascart wind farms. These are detailed in full within the HRA presented in Technical Appendix 6.2 within Volume 4 of this EIA Report) the cumulative collision risk has also been re-assessed. The potential for the Proposed Varied Development to contribute to cumulative barrier effects on Greenland white-fronted goose has also been considered.
- 6.2.7. The 2018 EIA Report for the Consented Development did not include an evaluation of lighting effects on ornithology. However low intensity, omni-directional visible lighting (35 candela) was agreed with the Highlands and Islands Airport Limited ('HIAL') and cardinal lighting was to be included on the nacelle of turbines T1, T8 and T11. The proposed increase in turbine height

for the Proposed Varied Development necessitates further aviation lighting in accordance with Civil Aviation Authority guidance. A lighting strategy can be seen in **Volume 4, Technical Appendix 15.1: Tangy IV Wind Farm Aviation Lighting Assessment Report**. Due to the proximity of the Proposed Varied Development to the Kintyre Goose Roosts SPA, an evaluation of lighting effects on Greenland white-fronted goose has been included.

- 6.2.8. The mitigation measures proposed for the Consented Development, which were proposed to protect breeding birds and Greenland white-fronted geese, were secured through conditions attached to the deemed planning permission of the Section 36 Planning Consent.
- 6.2.9. The suitability of the mitigation for the Proposed Varied Development has been reviewed and updated where applicable.
- 6.2.10. Consultee comments on the Proposed Varied Development and relevant planning conditions associated with the Consented Development are provided in the following sections of this document. The ornithological baseline for the Consented Development and a summary of the predicted effects of the Consented Development on IOFs is also provided for context.

6.3. Consultations

- 6.3.1. Scoping Opinion comments with relevance to ornithology that were received in 2017 for the Consented Development are detailed in Chapter 9: Ornithology of the 2018 EIA Report and were fully addressed within in that chapter. The comments are also summarised in the Scoping Report for the Proposed Varied Development and are not repeated here.
- 6.3.2. NatureScot were consulted in April 2025 regarding the proposed approach to the updated OIA for the Proposed Varied Development. This was initiated prior to submission of the Scoping Report in July 2025. Comments received in response to this consultation are summarised in **Table 6.1**.
- 6.3.3. Scoping Opinion comments with relevance to ornithology that were received in response to the Proposed Varied Development Scoping Report are summarised in **Table 6.1** (as well as being included in **Technical Appendix 3.2: Scoping Opinion**).

Table 6.1: Summary of Consultation

Consultee and Date	Issue Raised	Response
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Proposed Varied Development Ornithology NatureScot Consultation

Consultee and Date	Issue Raised	Response
NatureScot (16 th June 2025)	Noted that any movement of turbines closer to Tangy Loch Site of Special Scientific Interest ('SSSI')/Special Protection Area ('SPA') would necessitate further assessment. Requested a Figure showing both the Consented Development and the Proposed Varied Development.	Figure 1.1 within the Scoping Report (Technical Appendix 3.1) was provided to NatureScot showing the layouts of both the Consented Development and the Proposed Varied Development and it was highlighted that the turbine locations for the Proposed Varied Development remain very close to the previous Consented Development layout, with the majority within accepted micro-siting distances.
	Noted that CRM would be based on flight activity data collected between 2012 and 2017. Data from 2017 used the current five-band height classification (including >151m) and that data may under-represent collision risk on taller turbines. Advised that updated CRM should use the five-height band flight classification and more recent data.	As described in section 6.4 of this chapter (paragraphs 6.4.8 and 6.4.9), the revised CRM for the Proposed Varied Development was based on VP survey data collected in 2016-17 and 2025-26. The earlier (2016-2017) surveys used five height bands (including >151m), while the later (2025-26) surveys used six height bands, with height band 5 corresponding to 150-250m and height band 6 to >250m. Flights recorded in height bands 3-5 were considered to be at PCH and, as a precautionary approach, all relevant flights recorded within these height bands were included in the revised CRM, with no adjustment made to account for the fact that some flights within height bands 3-5 may have been below or above PCH because these height bands span a greater height (41-250m or higher) than the turbine blades). Development on relevant species presented in section 6.8.7 of this chapter. Full details of the CRM methods are included in Technical Appendix 6.1

Consultee and Date	Issue Raised	Response
		of this EIA Report and a summary of the results is included in section 6.6 of this chapter.
	Advised that, given the age of the data and importance of Greenland white-fronted geese, one full season of non-breeding season bird surveys, including roost surveys, should be completed to obtain up-to-date data on the usage of Tangy Loch and surrounding waterbodies by geese.	As outlined in section 6.5 of this chapter, updated flight activity and goose roost surveys were carried out throughout the 2025-26 non-breeding season. These methods are described in full within the Technical Appendix 6.1 within Volume 4 of this EIA Report.
	It was noted that all individual Greenland white-fronted geese using the Tangy Loch and nearby lochs are considered part of the Kintyre Goose Roosts SPA population for the purposes of the HRA and that roost usage by Greenland white-fronted goose is known to vary within and between winters and across different lochs.	All Greenland white-fronted geese recorded during the surveys (and historically) were considered to be part of the SPA population for the purposes of the OIA presented in sections 6.8.7 and 6.11 of this chapter and the HRA presented in Technical Appendix 6.2 within Volume 4 of this EIA Report.
	It was also advised that NatureScot could provide annual feeding count data collected as part of the Kintyre Local Goose Management Scheme.	As the Site and surrounding area does not support foraging Greenland white-fronted geese, the OIA considered impacts on roosting birds and birds in flight.
	Noted that a significant area of commercial forestry on the Site was felled between 2020 and 2023 and that this represented a change to baseline habitat conditions and may have influenced how species such as hen harrier and golden eagle use the Site. Recommended a further season of breeding bird surveys.	It is understood that Forestry and Land Scotland ('FLS') recently felled a large area of plantation in the north of the Site that overlaps with the Proposed Varied Development, with the aim of restoring it to bog. Similarly, it is proposed in the Habitat Management Plan ('HMP') for the Consented Development (RPS, 2024) that an additional area within the Site will also be felled during construction and restored to bog. Although this may increase the attractiveness of this area to foraging raptors and certain ground-

Consultee and Date	Issue Raised	Response
		nesting birds such as hen harrier, implementation of embedded mitigation detailed in the BBPP would ensure that nesting birds and Schedule 1-listed species such as hen harrier are protected during construction and decommissioning in compliance with relevant legislation. Hen harriers will nest 200-300m from operational wind turbines (Madders & Whitfield, 2006) or closer (Ruddock & Whitfield, 2007) and evidence suggests that foraging hen harriers that foraging hen harriers have a low sensitivity to disturbance at operational wind farms (Madders & Whitfield, 2006). Additionally, since operational turbines are already present on Site, it is expected that birds will already be habituated to their presence. As such, there is not considered to be any potential for operational disturbance or displacement. Furthermore, a Golden Eagle Topographical ('GET') Model is presented in Figure 6.19 within Volume 3a of this EIA Report and predicts that there would be low levels of use of the majority of the Site and immediate surroundings by golden eagles. As outlined in section 6.4 of this chapter, VP surveys of the Site were completed throughout the 2025 breeding season and golden eagle and hen harrier were scoped into the revised CRM for the Proposed Varied Development. However, as detailed in section 6.6 of this chapter, predicted collision risk to both species was low.

Consultee and Date	Issue Raised	Response
	Advised that the scoping report and HRA should consider the potential effects of aviation lighting on SPA features taking into account cumulative effects with other consented or proposed developments.	CRM and lighting effects associated with the Proposed Varied Development on SPA features is presented in section 6.8.7 of this chapter and shadow HRA presented as Technical Appendix 6.2 within Volume 4 of this EIA Report.
Proposed Varied Development Scoping Opinion – 23rd September 2025		
Argyll and Bute council (18 th August 2025)	Noted that, in terms of National Planning Framework 4 ('NPF4') and the Argyll & Bute Local Development Plan 2 ('LDP2') and associated Supplementary Guidance, criteria against which renewable energy developments, including changes and variations to existing approved schemes, are assessed include biodiversity, including impacts on birds.	Noted. Updated planning and renewable energy policy context relevant to ornithology was considered when completing the OIA presented in this chapter.
	Advised that it was not possible to obtain advice at the time from the Council's Local Biodiversity Officer on Ornithology and any comments subsequently received would be forwarded on to the Applicant for consideration.	Noted.
	Noted there are no designated sites within the Site but there two SPAs are present within 20km: Kintyre Goose Roosts SPA and Aran Moors SPA.	Noted. An updated assessment of collision risk effects of the Proposed Varied Development on the qualifying feature of the Kintyre Goose Roosts SPA is presented in section 6.8.7 of this chapter, while an updated assessment of cumulative effects on this species are presented in section 6.11 . As outlined in Chapter 9: Ornithology of the 2018 EIA Report for the Consented Development, there

Consultee and Date	Issue Raised	Response
		is not considered to be any potential for connectivity between the Site and Arran Moors SPA. This conclusion is considered to remain valid for the Proposed Varied Development and potential effects on this SPA have been scoped out of the updated assessment.
	Agreed with this general approach outlined in the Scoping Report that the Proposed Varied Development may alter collision risk and therefore predicted impacts on key IOFs will be reviewed, and an evaluation of lighting effects will also be completed.	Noted. As outlined in section 6.4 of this chapter, updated CRM was completed for the Proposed Varied Development. The updated assessment of collision risk and assessment lighting effects is presented in section 6.8.7 of this chapter.
NatureScot (8 th September 2025)	Noted that the Proposed Varied Development lies in close proximity to the Kintyre Goose Roosts SPA, which is designated for non-breeding Greenland white-fronted goose, and that the “flyway population” of this species has declined significantly since the baseline survey data for the Consented Development were collected. Therefore, it was recommended that one full season of winter/non-breeding season survey work was carried out along with roost surveys to inform the revised assessment of impacts on this species.	As outlined in section 6.5 of this chapter, updated flight activity and goose roost surveys were carried out throughout the 2025-26 non-breeding season to inform the revised assessment of potential effects on Greenland white-fronted goose. These methods are described in full within the Technical Appendix 6.1 within Volume 4 of this EIA Report.
	Further advised that, due to declines in the Greenland white-fronted goose population, the HRA must be based on the most recent data available.	A shadow HRA for the Proposed Varied Development has been completed. This is presented as Technical Appendix 6.2 within Volume 4 of this EIA Report.
	Agreed that the CRM needed to be revised and that an assessment of	CRM and lighting effects associated with the Proposed Varied

Consultee and Date	Issue Raised	Response
	lighting effects on Greenland white-fronted goose should be scoped into the assessment as it could affect use of Tangy Loch by this species.	Development on Greenland White-fronted geese has been scoped into the revised OIA presented in section 6.8.7 of this chapter, while an updated assessment of cumulative collision risk effects on this species is presented in section 6.1.1 .
	Advised that further survey work and desk study is required. Noted that significant felling of the area to the north of the Site between 2020 – 2023 had been carried out making the area more open which may result in an increase in use of this area by a number of raptor species. Also noted that the EIA Report for the proposed Cnoc Buidhe Wind Farm, which borders the Site to the north, reported both raptor and Greenland white-fronted goose flight activity over that development site.	As outlined in section 6.5 of this chapter, further flight activity and goose roost surveys were completed in 2025-26. Additionally, records of breeding raptors were requested from the Argyll Raptor Study Group ('ARSG') to inform an updated desk study and the Cnoc Buidhe EIA Report was also reviewed for any relevant information. This data informed the revised OIA presented in section 6.8.7 of this chapter.
	Advised that the approach to assessing cumulative impacts in the SNH-commissioned report on potential impacts of additional mortality on Scottish Greenland white-fronted goose populations (Trinder, 2015) is valid, but the input data parameters for the CRM are dated and cannot be used to make assumptions about the level of impact in terms of revised CRM for the Proposed Varied Development alone and cumulatively with other developments.	It is unclear what is meant by " <i>input data parameters for the CRM</i> " or what this comment is specifically in relation to. The updated CRM calculations summarised in section 6.4 of this chapter are based on current guidance on CRM (NatureScot, 2024a).
	Advised that new pair of golden eagle has established a territory in the area within the last five years and were aware of limited information on this pair in relation to post-construction monitoring for Beinn an Tuirc Wind	Very few golden eagle flights were recorded during surveys for the Consented Development or Proposed Varied Development, with a single flight of a juvenile bird in mid-April 2017, five flights of 1-2 birds during the 2025

Consultee and Date	Issue Raised	Response
	Farm by Natural Research Projects Ltd ('NRP'). Recommended that, since this pair is known by to utilise open habitats, the Applicant contacts NRP to access existing tag data to inform an assessment of how the eagles are using the newly opened area to the north, including the Site and enable NatureScot to advise on the likely effects of range loss impacts on this pair.	breeding season and a single flight of one bird in May 2026. Thus, although it is acknowledged that the level of flight activity by this species has increased between 2017 and 2026, the level of flight activity remains low with no evidence of regular use of the Site or the area to the north (as can be seen from Figure 6.11 within Volume 3a of this EIA Report, all 2025 golden eagle flights were to the east of the Site). As noted above, it is understood that FLS recently felled a large area of plantation within the north of the Site, overlapping the Proposed Varied Development. Although this could theoretically provide new foraging habitat for golden eagles, there is evidence to suggest that golden eagles in Scotland tend to avoid turbines (e.g., Whitfield & Fielding, 2017; Fielding <i>et al.</i>, 2022). Although birds do still occasionally pass through wind farms, they tend to fly above turbine height or appear to deliberately fly through gaps between the turbine arrays (Fielding <i>et al.</i>, 2022). As operational turbines are already present on the Site, it is anticipated that birds may already be avoiding the area and increased displacement and collision risk are both considered unlikely. Furthermore, a GET Model is presented in Figure 6.19 within Volume 3a of this EIA Report and predicts that there would be low levels of use of the majority of the Site and immediate surroundings by golden eagles. Updated raptor records were also requested from the ARSG in April 2026 and the only golden eagle breeding territory was over 6.0km from the Proposed Varied Development. All nesting attempts by this pair within the

Consultee and Date	Issue Raised	Response
		last five years (2021-25) have been unsuccessful. Further details on location are presented within Technical Appendix 6.3; Confidential Annex of this EIA. An updated calculation of collision risk to golden eagle is presented in section 6.6 of this report. It was considered unnecessary to obtain NRP satellite-tag data because the existing survey and baseline data outlined in section 6.5 of this chapter are sufficient to show that there is very little use of the Site by foraging golden eagle and an assessment of range loss impacts on the pair breeding over 6km from the Proposed Varied Development is not considered to be necessary.

- 6.3.4. For reference, a summary of the Section 36 planning conditions relating to ornithological issues for the Consented Development is provided below in **Table 6.2**. These conditions correspond to consultation responses for the Consented Development and mitigation measures to reduce effects to IOFs proposed in **Volume 2, Chapter 9: Ornithology** of the 2018 EIA Report for the Consented Development.
- 6.3.5. The Applicant expects that similar conditions will be imposed for the Proposed Varied Development, and any additional mitigation identified through this OIA will be incorporated into updated plans as required.

Table 6.2: Summary of Planning Conditions of the Consented Development with Relevance to Ornithology

Planning Condition	Reason	Elements of the Planning Condition of Particular Relevance to Ornithology	Relevance to Proposed Varied Development OIA
8. Decommissioning Requirements	<i>“To ensure the decommissioning and removal of the Development in an appropriate and environmentally acceptable manner and the restoration of the site and in the interests of safety, amenity and environmental protection”</i>	<i>“(3) [...] a detailed decommissioning, restoration and aftercare plan [...] shall be submitted for the written approval of the Planning Authority in consultation with SNH and SEPA. The [...] plan shall provide updated and detailed proposals, in accordance with relevant guidance at that time, for the removal of the Development, [...], the management and timing of the works and environment management provisions which shall include (but is not limited to): [...]</i> <i>(m) a species protection plan based on surveys for protected species (including birds) carried out no longer than eighteen months prior to submission of the plan.”</i>	The Applicant expects to adhere to a similar condition for the Proposed Varied Development at the time of decommissioning.
12. CEMP	<i>“To ensure that all construction operations are carried out in a</i>	<i>“(1) No development, other than Site Investigatory Works, shall</i>	It was stated in the 2018 EIA Report, Volume 2, Chapter 9: Ornithology for the Consented

Planning Condition	Reason	Elements of the Planning Condition of Particular Relevance to Ornithology	Relevance to Proposed Varied Development OIA
	<i>manner that minimises their impact on road safety, amenity, and the environment, and that the mitigation measures contained in the EIA Report accompanying the application, or as otherwise agreed in respect of SSSIs or other sensitive habitats, are fully implemented."</i>	<i>commence until a full site specific Construction and Environmental Management Plan ('CEMP') is submitted for the written approval of the Planning Authority in consultation with SEPA and SNH.</i>	Development that measures to safeguard breeding birds during construction, including pre-construction surveys and good practice measures during construction, would be detailed in a BBPP and implemented during construction of the Consented Development. The BBPP was the subject of a separate planning condition (condition 27 below) and the Applicant expects to adhere to a similar condition for the Proposed Varied Development. It is anticipated that the BBPP would be an Appendix to the CEMP.
13. Peat Management Plan	<i>"In the interests of ensuring the conservation of peat resources and the protection of Tangy Loch SSSI."</i>	The condition is partly to protect Tangy Loch from water quality impacts arising from construction works or peat slide. This is of relevance to ornithology because the loch is a supporting habitat for Greenland white-fronted goose and part of the Kintyre Goose Roosts SPA.	The Applicant expects to adhere to a similar condition for the Proposed Varied Development, which will ensure that water quality impacts on Tangy Loch during construction are avoided.
21. Habitat Management Plan	<i>"To secure the restoration of peatland."</i>	Although the primary aim of the HMP was to restore peatlands, this will in turn create new habitat for a range of breeding and foraging upland bird species	The Applicant expects to adhere to a similar condition for the Proposed Varied Development. The creation of areas of new habitat for hen harrier

Planning Condition	Reason	Elements of the Planning Condition of Particular Relevance to Ornithology	Relevance to Proposed Varied Development OIA
		such as hen harrier. Additionally, the proposed riparian and woodland edge broadleaved planting will create enhanced habitat for woodland edge birds.	has been taken into account when completing the OIA for the Proposed Varied Development.
23. Construction and Decommissioning Hours within 1km of Tangy Loch	<i>"To avoid risk of disturbance to the over wintering population of Greenland white fronted goose."</i>	<i>"During construction and decommissioning all works within 1 kilometre of Tangy Loch are restricted to between the hours starting from one hour after dawn to one hour before dusk during the goose roosting season (30 September - 30 April)."</i>	Relevant mitigation measures were outlined within Volume 2, Chapter 9: Ornithology of the 2018 EIA Report for the Consented Development, although it is noted that the proposed restrictions to working hours outlined in the Executive Summary appear to conflict with those presented in paragraph 9.5.23. The measures proposed for the Consented Development remain broadly applicable to and appropriate for the Proposed Varied Development, with some modifications proposed. The proposed measures are outlined in section Error! Reference source not found..10 of this chapter and will be detailed in a GPP.
24. ECoW	Not stated.	<i>"(1) No development shall commence until the Planning Authority has approved in writing the terms of appointment by the Company of an independent Ecological Clerk of</i>	The Applicant expects terms to be reviewed but will be similar for the Proposed Varied Development. It is anticipated that the ECoW would oversee implementation of the GPP (planning condition 23) and the BBPP (planning condition 27) during the

Planning Condition	Reason	Elements of the Planning Condition of Particular Relevance to Ornithology	Relevance to Proposed Varied Development OIA
		<i>Works ('ECoW') in consultation with SNH and SEPA."</i>	construction phase of the Proposed Varied Development.
25. Environmental Clerk of Works Decommissioning	<i>"To secure effective monitoring of and compliance with the environmental mitigation and management measures associated with the Development."</i>	<i>"No later than-12 months after being directed to decommission the Development, the Company shall submit details of the terms of appointment by the Company of an independent ECoW throughout the decommissioning, restoration and aftercare phases of the Development to the Planning Authority for approval in consultation with SNH and SEPA. The ECoW shall be appointed on the approved terms throughout the decommissioning, restoration and aftercare phases of the Development."</i>	The Applicant expects to adhere to a similar condition for the Proposed Varied Development at the time of decommissioning. It is anticipated that the ECoW would oversee implementation of the GPP (planning condition 23) and the BBPP (planning condition 27) during the decommissioning phase of the Proposed Varied Development.
27. Breeding Bird Protection Plan (BBPP)	<i>"In the interests of nature conservation".</i>	<i>"No development shall commence until a BBPP is submitted to and approved in</i>	It was stated in the 2018 EIA Report, Volume 2, Chapter 9: Ornithology for the Consented Development that measures to safeguard breeding

Planning Condition	Reason	Elements of the Planning Condition of Particular Relevance to Ornithology	Relevance to Proposed Varied Development OIA
		<i>writing by the Planning Authority in consultation with NatureScot. Thereafter the Development shall be implemented in accordance with the duly approved plan or any subsequent variation thereof as may be approved in writing in advance by the Planning Authority."</i>	birds during construction and decommissioning would be implemented during construction and decommissioning of the Proposed Varied Development. This will include pre-construction surveys and good practice measures during construction. Pre-construction surveys will also be undertaken to check for any new breeding bird activity in the vicinity of the construction/decommissioning works. The Applicant expects to adhere to a similar condition for the Proposed Varied Development.

6.4. Assessment Methodology

Desk Study

- 6.4.1. Details of the desk-based study completed for the Consented Development are included in **Volume 4, Technical Appendix 9.1: Ornithology** of the 2018 EIA Report for the Consented Development.
- 6.4.2. To update the desk-based study results, records of breeding and roosting eagle species within 6km of the Site and other Schedule 1-listed breeding raptor species within 2km of the Site recorded during the last five years (2021-25 inclusive) were requested from the ARSG. Additionally, the ornithology chapter of the EIA Report for the proposed Cnoc Buidhe Wind Farm (Belltown Power, 2025a), which borders the Site to the north, and subsequent Additional Environmental Reports (Belltown Power, 2025b; 2026) for relevant information, particularly in relation to Greenland white-fronted goose and golden eagle. Further details of the desk study methods for the Proposed Varied Development are provided in **Volume 4, Technical Appendix 6.1** of this EIA Report.

Field Surveys

- 6.4.3. Full details of surveys completed for the Consented Development are included in **Volume 4, Technical Appendix 9.1: Ornithology** of the 2018 EIA Report for the Consented Development and are not repeated here. For ease of reference, however, a list of completed surveys is provided below.
- Flight activity ('VP') surveys (two full years of survey - April 2012 and March 2014 and 14 months of surveys between October 2016 and November 2017).
 - Scarce breeding bird surveys ('SBBS') (three years - April to August; 2012, 2013 and 2017).
 - Breeding bird surveys (two years - April to July 2012 and 2017).
 - Winter walkover surveys (six months between November 2012 and January to February 2013 and November 2016 and January to February 2017).
 - Goose roost surveys (September 2012 to February 2013 and October 2013 to February 2014).
 - Black grouse (*Lyrurus tetrix*) surveys (three years - April to May 2012, 2013 and 2017).

- 6.4.4. Additional baseline ornithology surveys were completed to support the OIA for the Proposed Varied Development over a 12-month period between April 2025 and May 2026, as outlined below.
- 6.4.5. VP surveys were completed monthly between April 2025 and mid-May 2026 (inclusive) to record flight activity by target species such as Greenland white-fronted goose over the Site and a surrounding 500m buffer. Locations of, and viewsheds from, the three VPs used for these surveys are provided within **Volume 3a, Figure 6.1** of this EIA Report.
- 6.4.6. Targeted roosting goose surveys from a single VP location overlooking Tangy Loch (shown in **Volume 3a Figure 6.2** of this EIA Report) were completed bi-monthly between October 2025 and mid-May 2026 (inclusive) to record any Greenland white-fronted goose on Tangy Loch.
- 6.4.7. Further details of the survey methods for the Proposed Varied Development are provided in full within **Volume 4, Technical Appendix 6.1; Ornithology Technical Report** of this EIA Report.

Collision Risk Modelling

- 6.4.8. Revised CRM, based on updated guidance produced by NatureScot (2024a), was completed based on turbine locations and parameters for the Proposed Varied Development and using the earlier flight activity datasets collected for the Consented Development between September 2016 and November 2017 as well as the flight activity dataset collected between April 2025 and May 2026 for the Proposed Varied Development.
- 6.4.9. Further details of the CRM methods are presented within **Volume 4, Technical Appendix 6.1** of this EIA Report. For reference, a summary of the CRAA and turbine parameters used for the Consented Development and Proposed Varied Development CRM are presented in **Table 6.3**, while bird biometric data are presented in **Table 6.4**.

Table 6.3: Summary of CRAA and Turbine Parameters for the Consented Development and Proposed Varied Development

Parameter	Consented Development	Proposed Varied Development
Number of turbines in array	16	16
CRAA (ha)*	602.38	651.61
Blade (rotor) diameter (m)	117-130	150

Parameter	Consented Development	Proposed Varied Development
Turbine radius (m)	58.5-65	75
Tower (hub) height (m)	84.9-91.4	125
Turbine height to maximum blade tip (m)	149.9	200
Air gap from ground to lowest blade sweep (m)	19.9-32.9	50
Maximum chord width (m)	3.8-4.752	4.2
Average rotation speed (rpm)	17.5-12.09	4.9-12.6
Average blade pitch (degrees)	15	.

* The CRAA for the Proposed Varied Development was calculated in GIS by drawing a concave hull around the outermost turbines and adding a 500m buffer. A slightly different approach was used to determine the CRAA for the Consented Development, which was based on GIS Delaunay triangulation from the proposed turbines with a 500m buffer added around this.

- 6.4.10. Flights recorded at PCH (50-200m) within the area of overlap between the CRAA and relevant VP viewshed are defined as “at-risk”. All VP survey flights recorded within this area that included periods at height bands within or overlapping PCH were included in the revised CRM. As these height bands (41-250m for the 2025-26 data and ≥41m for the 2016-17 data) span a greater height than the turbine blades, this is considered to be a precautionary approach.
- 6.4.11. At-risk flights by ten target species were recorded during the 2016-2017 flight activities for the Consented Development, namely barnacle goose, curlew, Greenland white-fronted goose, greylag goose, hen harrier, herring gull, merlin, oystercatcher, peregrine and snipe. Although CRM was completed for all ten species, only one was considered to be an IOF, namely Greenland white-fronted goose. All other species were scoped out of the OIA for the Consented Development.
- 6.4.12. Due to the change in turbine parameters for the Proposed Varied Development compared to that for the Consented Development and different (but overlapping) flight activity datasets used, the suite of species scoped into the revised CRM differed to that scoped in for the Consented Development. Nine species were scoped into the revised CRM for the Proposed Varied Development: greylag goose, Greenland white-fronted goose, common gull,

herring gull, great black-backed gull, golden eagle, hen harrier, white-tailed eagle and peregrine.

Assessment

- 6.4.13. Assessment methods for the Proposed Varied Development were the same as those detailed in the 2018 EIA Report, **Volume 2, Chapter 9: Ornithology** for the Consented Development and are therefore not repeated here.

6.5. Summary of Ornithological Baseline

Designated Sites

- 6.5.1. There are no statutory or non-statutory sites designated for ornithological interests within the boundary of the Proposed Varied Development (which remains the same as that for the Consented Development). However, there are two SPAs within 20km, which are outlined below.
- Kintyre Goose Roosts SPA, which is designated for Greenland white-fronted goose, is located 380m to the south-east of the Site (at the closest point). It is also a Ramsar site and includes Tangy Loch SSSI, Kintyre Goose Lochs SSSI and Rhunahaorine Point SSSI. The core foraging range of roosting Greenland white-fronted goose is 5-8 km (NatureScot, 2018). There was considered to be connectivity between the Site and the Tangy Loch, Lussa Loch and Black Loch components of the Kintyre Goose Roosts SPA and it was scoped into the OIA for the Consented Development.
 - Arran Moors SPA, which is designated for breeding hen harrier, is located 19.4km to the east, which is also a SSSI. Based on the foraging distances of nesting hen harrier (2km core range and 10km maximum range; NatureScot, 2016), there was not considered to be any connectivity between the Consented Development and this SPA and it was scoped out of the OIA. This conclusion is considered to remain valid for the Proposed Varied Development.
- 6.5.2. Further details of these designated sites are provided within **Volume 4, Technical Appendix 6.1; Ornithology Technical Report** of this EIA Report, the 2018 EIA Report for the Consented Development and the 2025 Scoping Report.
- 6.5.3. Species: Non-passerine species recorded during the desk study and/or field surveys for the Consented Development and Proposed Varied Development are summarised below in **Table 6.4**. Further details of target species recorded

during the desk study and field surveys for the Consented Development are provided within **Volume 4, Technical Appendix 9.1** of the 2018 EIA Report for the Consented Development.

- 6.5.4. Full details of target species recorded during the additional surveys completed for the Proposed Varied Development are provided in **Volume 4, Technical Appendix 6.1; Ornithology Technical Report** of this EIA Report.

Table 6.4: Summary of Target Species Registrations during Surveys for the Consented Development and Proposed Varied Development

Species	Recorded during surveys for Consented Development	Recorded during surveys for Proposed Varied Development
Wildfowl		
Barnacle goose	Recorded infrequently and in low numbers.	Not recorded.
Greylag goose	100 flights, including 21 at-risk flights.	A total of 32 flights (Volume 3a Figure 6.3 and Figure 6.4 of this EIA Report), of which 19 were “at risk”.
Greenland white-fronted goose	132 flights, including nine at-risk flights. Flight activity levels during 2012/2013 and 2016/2017 non-breeding seasons were considered to be comparable, with the majority of activity focussed around Tangy Loch and Lussa Loch, with flights predominantly between the two lochs and heading south-west away from them. Lussa Loch was considered to be the main roosting loch for this population of Greenland white-fronted goose, although birds were also recorded roosting and loafing on Tangy Loch.	Large flocks regularly recorded, the majority around Tangy Loch, predominantly heading along a north-east / south-west axis to and from the loch (Volume 3a, Figure 6.5 of this EIA Report). Seven of the flights were “at-risk”. Regularly recorded on Tangy Loch, sometimes in large numbers (up to c.1,556 birds), but did not always roost there, with birds sometimes landing on the loch for a limited period before flying towards Lussa Loch, which appeared to be the favoured roost site. The peak count of roosting birds on Tangy Loch Flights are shown in Volume 3a, was 1,315 in late March 2026. Figure 6.5 of this EIA Report.
Whooper swan (<i>Cygnus cygnus</i>)	Recorded infrequently and in low numbers.	Not recorded.

Species	Recorded during surveys for Consented Development	Recorded during surveys for Proposed Varied Development
Wigeon (<i>Mareca penelope</i>)	Not recorded.	Recorded in very low numbers (Volume 3a, Figure 6.4).
Mallard (<i>Anas platyrhynchos</i>)	Not recorded.	Recorded in very low numbers (Volume 3a, Figure 6.3 and Figure 6.4).
Teal (<i>Anas crecca</i>)	Not recorded.	Recorded in very low numbers (Volume 3a, Figure 6.4).
Ring-necked duck (<i>Aythya collaris</i>)	Not recorded.	Recorded in very low numbers (Volume 3a, Figure 6.4).
Tufted duck (<i>Aythya fuligula</i>)	Not recorded.	Recorded in very low numbers (Volume 3a, Figure 6.4).
Goldeneye (<i>Bucephala clangula</i>)	Recorded in low numbers.	Recorded in very low numbers (Volume 3a, Figure 6.4).
Grouse		
Black grouse	No flights recorded. A single small lek located 930m from the nearest Consented Development turbine was recorded in 2017, with two males but no females present during the first survey visit in mid-April, and a single female but no males present during the second survey visit in mid-May. A second lek was recorded 2.5km from the nearest turbine.	Not recorded.
Waders		
Oystercatcher	Recorded in low numbers.	A single flight of two birds (Volume 3a, Figure 6.6).
Curlew	A total of 22 flights, of which 17 were at-risk. Three breeding territories within	Not recorded.

Species	Recorded during surveys for Consented Development	Recorded during surveys for Proposed Varied Development
	500m of the Site in 2012 and two in 2017.	
Woodcock (<i>Scolopax rusticola</i>)	Recorded in low numbers.	Not recorded.
Snipe	Recorded in low numbers.	Five flights of 1-11 birds (Volume 3a, Figures 6.6 and 6.7).
Common sandpiper (<i>Actitis hypoleucos</i>)	Recorded in low numbers.	Three flights of single birds (Volume 3a, Figure 6.6).
Gulls		
Common gull	Not recorded.	A total of 119 flights (Volume 3a, Figures 6.8 and 6.10 of this EIA Report) of which 54 were “at risk”. Breeding season flights were concentrated around Tangy Loch, where birds likely bred, with a clear flight corridor to the south of the Site, along an east/west axis.
Great black-backed gull	Not recorded.	Recorded infrequently and in low numbers (Volume 3a, Figures 6.9 and 6.10 of this EIA Report) A total of 16 flights of which 9 were “at risk”.
Herring gull	Recorded in low numbers; 14 at-risk flights. Additional incidental records on Tangy Loch, and foraging birds to the north-west and south of the Site, but no evidence of breeding.	A total of 50 flights of 1-46 birds, generally to the north-west of the Site (Volume 3a, Figures 6.9 and 6.10 of this EIA Report) of which 10 were “at risk”.
Lesser black-backed gull	Not recorded.	Low levels of flight activity, of which 9 were “at-risk”.
Divers		

Species	Recorded during surveys for Consented Development	Recorded during surveys for Proposed Varied Development
Red-throated diver (<i>Gavia stellata</i>)	No at-risk flights. Low numbers fishing and loafing on Tangy Loch, but no evidence of breeding.	Not recorded.
Raptors		
Osprey (<i>Pandion haliaetus</i>)	No flights recorded. A single nest was identified over 2.5km from the nearest turbine.	No flights recorded. ARSG reported one known nest site within 2km of the Site within the last five years (Confidential Annex, Figure 6.22 of this EIA Report). Further details provided in , Technical Appendix 6.3, Confidential Annex of this EIA Report.
Golden eagle	A single flight. No records of breeding within 6km.	Six golden eagle flight lines, all within the vicinity of Tangy Loch and nearby forestry (Volume 3a, Figure 6.11 of this EIA Report) of which 4 were “at risk”. ARSG reported one known nest site over 6km from the Site within the last five years (Figure 6.21, Confidential Annex of this EIA Report). Further details are provided in Technical Appendix 6.3, Confidential Annex of this EIA Report.
Hen harrier	A total of 24 flights, including 14 that were at-risk. Suitable foraging habitat present but records of breeding within 2km. Although it was noted that felling of forestry associated with the Consented Development could create relatively small additional areas of moderately suitable habitat for foraging hen harriers, it was considered unlikely that this would generate substantial changes in the level of hen harrier activity.	A total of 29 flight lines (Volume 3a, Figure 6.12 of this EIA Report and Volume 5, Technical Appendix 6.3: Ornithology Confidential Annex of this EIA Report) of which 17 were “at risk”. Activity was concentrated in three areas. Most flights were recorded during the breeding season. This included hunting behaviours of a family group recorded in July 2025, suggesting breeding within the area. ARSG reported five territories within 2km of the Site the last five years (Volume 5, Figure 6.22 of this EIA Report). Further details of breeding season flights and ARSG records are provided in Volume 5, Technical Appendix 6.3:

Species	Recorded during surveys for Consented Development	Recorded during surveys for Proposed Varied Development
		Ornithology Confidential Annex of this EIA Report.
White-tailed eagle	Not recorded.	Three flights to the south of the Site close to Tangy Loch during the VP surveys (Volume 3a, Figure 6.11 and Figure 6.12 of this EIA Report), with an additional two flights noted during a December roosting goose survey, of which 1 was “at risk”. ARSG reported that a pair was establishing home range within 6km of the Site in 2025 (Volume 5, Figure 6.21 of this EIA Report), although no nest site had been identified. Further details are provided in Volume 5, Technical Appendix 6.3: Ornithology Confidential Annex of this EIA Report.
Short-eared owl (<i>Asio flammeus</i>)	A single record only; no records of breeding within 2km.	Not recorded.
Merlin	Recorded in low numbers; two at-risk flights. No records of breeding within 2km.	One flight of a single bird flying below PCH (Volume 3a, Figure 6.12 of this EIA Report).
Peregrine	Recorded infrequently and in low numbers. Five flights in total, four of which were at-risk. No records of breeding within 2km.	Not recorded.

6.6. Predicted Collision Risk for the Consented Development and Proposed Varied Development.

- 6.6.1. Predicted mean annual collision risk for the Consented Development and Proposed Varied Development based on 85% turbine operation time is presented in **Table 6.5**. Seasonal survey effort was used to calculate the weighted average collision estimates for the breeding and non-breeding season. Further details on CRM results for the Proposed Varied Development

can be seen in **Table 4.1 of Technical Appendix 6.1: Ornithology Technical Report**.

- 6.6.2. Note that the predicted collision rates for the Consented Development and Proposed Varied Development are not directly comparable because they are based on different (but overlapping) datasets. CRM for the Consented Development was based on VP survey data collected from April 2012 to March 2014 and October 2016 to November 2017, while the Revised CRM for the Proposed Varied Development was based on VP survey data collected from October 2016 to November 2017 and April 2025 to May 2026.
- 6.6.3. It should also be noted that collision risk values represent a worst-case theoretical scenario and potential impacts on bird populations are likely to be significantly lower than predicted because CRM is generic and based on a number of assumptions. This makes the results highly precautionary, and not necessarily realistic in ecological terms for a number of reasons. For example, CRM works on the assumption that a bird can either collide with a turbine multiple times; or collide once and be replaced instantly in the population, which is not realistic under any circumstances. Additionally, the basic model used for CRM typically assumes that turbines are operational 85% of the time.

Table 6.5: Summary of Mean Annual/ Collision Risk from the Consented Development (worst-case scenario) and Proposed Varied Development for Relevant IOFs based on 85% Turbine Operation Time

Species	Consented Development			Proposed Varied Development*		
	Mean Annual Collisions*	No. of Years per Collision*	No. of Collisions during 50-year Lifetime	Mean (and Maximum) Annual Collisions	No. of Years per Collision	No. of Collisions during 50-year Lifetime
Barnacle goose	0.0021	475.4	0.1	Not assessed	-	-
Greylag goose	0.4642	2.2	23.2	1.709 (3.05)	0.6	85.5
Greenland white-fronted goose	0.0382	26.2	1.9	0.085 (0.10)	11.8	4.3
Oystercatcher	0.0027	364.0	0.1	Not assessed	-	-
Curlew	0.0674	14.8	3.4	Not assessed	-	-
Snipe	0.0118	85.0	0.6	Not assessed	-	-

Species	Consented Development			Proposed Varied Development*		
	Mean Annual Collisions*	No. of Years per Collision*	No. of Collisions during 50-year Lifetime	Mean (and Maximum) Annual Collisions	No. of Years per Collision	No. of Collisions during 50-year Lifetime
Common gull**	-	-	-	0.350 (N/A***)	2.9	17.5
Herring gull	0.1869	5.4	9.3	0.453 (0.891)	2.2	22.7
Great black-backed gull**	-	-	-	0.332 (N/A***)	3.0	16.6
Golden eagle	Not assessed	-	-	0.035 (0.036)	28.6	1.8
Hen harrier	0.0008	1,209.4	<0.1	0.022 (0.04)	45.5	1.1
White-tailed eagle	Not assessed	-	-	0.041 (0.082)	24.4	2.1
Merlin	<0.0001	75,129.2	<0.1	Not assessed	-	-
Peregrine	0.0154	64.9	0.8	0.053 (0.107)	18.9	2.7

*Values are taken from the 2018 EIA Report for the Consented Development and are the highest mean collision risk of the five candidate turbine models that were considered (MacArthur Green, 2018).

** Not recorded as target species during the 2012-14 or 2016-2017 VP surveys (in line with NatureScot guidance that was current at the time).

***As common gull and great black-backed gull were not recorded as target species during the 2016-17 surveys, the revised CRM for the Proposed Varied Development was based on the 2025-26 VP survey data only, and therefore the maximum and mean collision risk are the same

6.6.4. Collision risk is considered to be of Low to Negligible Magnitude for all species. A summary of the NCI of each species and the proportion of the regional population that the revised mean collision risk represents is presented in **Table 6.6**.

Table 6.6: Summary of Target Species Registrations during Surveys for the Consented Development and Proposed Varied Development

Species	NCI*	Mean Annual Collision Risk for Proposed Varied Development	Regional Population Estimate (and Season/Count Type)**	Proportion of Population Mean Annual Collision Risk Represents
Greylag goose	Low	1.709	1,401 (non-breeding individuals)	0.12
Greenland white-fronted goose	High	0.085	2,300 (non-breeding individuals)	0.00
Common gull	Low	0.35	159 (adults on nests)	0.11
Herring gull	Moderate	0.453	9,372 (breeding pairs)	<0.01
Great black-backed gull	Low	0.332	679 (breeding pairs)	0.02
Golden eagle	Moderate	0.035	44 (occupied breeding territories)	0.04
Hen harrier	Moderate	0.022	125 (breeding pairs)	0.01
White-tailed eagle	Moderate	0.041	8 (territorial pairs)	0.26
Peregrine	Moderate	0,053	49 (breeding pairs)	0.05

* Based on definitions in the 2018 EIA Report for the Consented Development;

**Numbers of common gulls are based on counts on Islay and mid-Argyll reported in the 2024 Argyll Bird Report (Jardine et al., 2025); numbers of greylag geese are based on NatureScot / International goose March goose counts on Kintyre reported in Jardine et al. (2025); all other estimates are for the NHZ 14 population (Wilson et al., 2015)

6.6.5. Based on species the NCI of each species and proportion of the regional population represented by the mean collision risk for the Proposed Varied Development, collision risk to Greenland white-fronted goose and white-tailed

eagle is scoped into the detailed assessment in **section 6.9** but is not considered further for any other species.

6.7. Ornithological Features Scoped into the Assessment for the Consented Development and Proposed Varied Development

- 6.7.1. Greenland white-fronted goose was the only IOF identified at risk of potential significant effects from the Consented Development that was scoped into the assessment presented in the 2018 EIA Report.
- 6.7.2. Based on the updated baseline data and turbine parameters, the following IOFs were identified for the Proposed Varied Development: Kintyre Goose Roosts SPA and Ramsar site, Tangy Loch SSSI, non-breeding Greenland white-fronted goose, breeding white-tailed eagle and breeding hen harrier.

6.8. Summary of Effects Predicted & Mitigation Measures suggested for the Consented Development

Predicted Effects on IOFs

Statutory Sites

- 6.8.1. Potential effects of the Consented Development on the only qualifying feature of the Kintyre Goose Roosts SPA (Greenland white-fronted goose) are summarised in **Table 6.6**. Consequently, the Scottish Government, as competent authority, was required to carry out an Appropriate Assessment ('AA') in view of the site's conservation objectives for its qualifying features. Low flights of Greenland white-fronted geese were noted within the CRAA, and no at-risk flights were observed. Due to this collision risk was zero.
- 6.8.2. The AA stated that based on survey data, CRM and proposed mitigation measures the project would have a low risk of collision and disturbance risk to Greenland white-fronted goose and the Kintyre Goose Roosts SPA. Given the SPA population is currently stable it was estimated that the cumulative mortality was not at a level which would impact the SPA population.
- 6.8.3. As no physical works were proposed as part of the Consented Development that would impact the structure, function and supporting processes of habitats such as roosting lochs (Tangy Loch and Lussa Loch) SNH considered that this conservation objective would not be compromised. With the implementation of mitigation measures secured through planning conditions, it was concluded that adverse impacts on site integrity could be avoided. Based on this information, it was concluded that the Consented Development would not

adversely affect the integrity of the SPA with the implementation of mitigation measures outlined in **Table 6.7**.

Table 6.7: Summary of Predicted Effects of Consented Development on IOFs

IOF	NCI	Phase of Consented Development and Type of Impact	Magnitude and Significance of Effect	Mitigation Required	Significance of Residual Effect
Greenland white-fronted goose	High	Construction and decommissioning: displacement (due to disturbance)	Negligible effect, not significant	Yes see Mitigation and Monitoring section below.	Negligible effect, not significant
		Operation: displacement	Negligible effect, short-term, not significant	None required	Negligible effect, short term, not significant.
		Operation: collision risk	Negligible effect, not significant	None required	Negligible adverse effect, not significant

*Mitigation measures noted within the executive summary of the Consented Development appear to conflict with the restricted working hours outlined within **section 9.5.23** of the 2018 Consented Development EIA Report.

Mitigation and Monitoring

- 6.8.4. Two types of mitigation were proposed during the construction phase of the Consented Development:
- targeted measures designed specifically to avoid disturbance to Greenland white-fronted goose as stated in planning condition 23; and
 - standard good-practice measures to protect breeding birds in accordance with relevant legislation as stated in planning condition 27.
- 6.8.5. These measures are outlined within the 2023 Species Protection Plan (SPP): Birds (see **Technical Appendix 3.7b Species Protection Plan: Birds, Volume 4**).
- 6.8.6. Monitoring for Greenland white-fronted goose during the construction phase was also proposed in the 2018 EIA Report for the Consented Development (but not the SPP), as outlined below.
- During construction, a goose roost survey would be undertaken weekly between September and April to ensure there are no disturbance effects on geese roosting on either Tangy Loch or Lussa Loch and their associated commuting flights.
 - Goose flight activity monitoring via VP surveys would be carried out post-construction, in operational years 1, 2, 5, 10 and 15, to collect data on goose flight activity during the operational period.
- 6.8.7. Further information is presented in the 2018 EIA Report for the Consented Development along with the 2023 **Species Protection Plan: Birds, Technical Appendix 3.7b**.

6.9. Revised Assessment of Effects during Construction, Operation & Maintenance and Decommissioning of the Proposed Varied Development

- 6.9.1. The following impacts from the Proposed Varied Development on the Kintyre Goose Roosts SPA population of Greenland white-fronted goose have been assessed:
- disturbance/displacement of roosting birds during the construction and decommissioning phases;
 - barrier effects resulting in an alteration of typical flight paths throughout the operational phase;

- effects of turbine lighting during the operational phase; collision risk to birds during daily foraging/roosting commutes and migratory flights during the operational phase; and
- cumulative effects of the Proposed Varied Development in the context of other nearby developments.

6.9.2. The following impacts from the Proposed Varied Development on the Natural Heritage Zone ('NHZ') 14 (Argyll West and Islands) breeding hen harrier and white-tailed eagle populations:

- disturbance and displacement of breeding and foraging birds during the construction and decommissioning phases; and
- collision risk to breeding white-tailed eagle during the operational phase.

6.9.3. Further details of these effects are presented in the following sections.

Disturbance/Displacement

6.9.4. During the construction and decommissioning phases of the Proposed Varied Development there would be increased levels of activity by Site personnel, vehicles and machinery, resulting in increased levels of noise and visual disturbance. This could lead to the temporary disturbance and/or displacement of and/or roosting Greenland white-fronted geese and breeding or foraging hen harrier. The severity of potential effects depends on the following:

- timing of the works;
- magnitude of the disturbance;
- extent of displacement (both spatially and temporally);
- availability of suitable habitats in the surrounding area for any displaced birds to occupy; and
- behavioural sensitivity of bird species using a development site.

6.9.5. Given that a wind farm has been operational on the Site for over two decades and additional operational wind farms are present on the Kintyre peninsula it is reasonable to expect that Greenland white-fronted geese and hen harrier in the area have become habituated to the presence of turbines in the landscape. Furthermore, operational maintenance works will be infrequent and temporary and are expected to be limited in terms of both the area and duration. Additionally, it is likely that any operational maintenance works will take place during daylight hours when Greenland white-fronted geese are unlikely to be present. Evidence suggests that geese have a low sensitivity to disturbance at operational wind farms and maintain a buffer of just a few hundred metres. This is further discussed below under barrier effects on Greenland white-fronted goose. There is evidence to suggest that hen harriers have a low sensitivity to disturbance at operational wind farms as stated above

in Table 6 1. As such, there is not considered to be any potential for significant effects due to disturbance of roosting Greenland white-fronted geese or breeding/foraging hen harrier during the operational phase of the Proposed Varied Development and the assessment of disturbance/displacement impacts presented below therefore considers the construction and decommissioning phases only.

Greenland White-fronted Goose

- 6.9.6. Greenland white-fronted goose is included on Annex I of the Birds Directive and is Red-listed due to severe long-term declines in the non-breeding population (Stanbury et al., 2021). It is also included on the Scottish Biodiversity List ('SBL'). Birds recorded during surveys for both the Consented Development and Proposed Varied Development are considered to be associated with the nearby Kintyre Goose Roosts SPA, which is designated for this species. At the time of citation, the SPA population was estimated at 2,300 birds (1991/92-95/96 winter peak mean), which represents, 8% of the global population and 16% of the population in Great Britain (SNH, 1998). The latest assessed condition of the SPA population is "favourable maintained" (NatureScot, 2025c).
- 6.9.7. The closest infrastructure associated with the Proposed Varied Development is located approximately 380m from Tangy Loch which is part of the Kintyre Goose Roosts SPA. The recommended disturbance buffer for non-breeding white-fronted goose is 200-600m (NatureScot, 2022). Therefore, there is potential for birds roosting within the SPA at Tangy Loch to be disturbed during the construction and decommissioning phases of the Proposed Varied Development.
- 6.9.8. All other SPA lochs are located over 1km away from the Proposed Varied Development. As such, there is not considered to be any potential for Greenland white-fronted geese roosting on these lochs to be disturbed due to construction or decommissioning works and the assessment of this impact relates to birds roosting on Tangy Loch only.
- 6.9.9. As detailed in **Technical Appendix 6.1** within **Volume 4** of this EIA Report, Greenland white-fronted geese were regularly recorded on Tangy Loch (part of the Kintyre Goose Roosts SPA) during the 2025-26 non-breeding season. However, they did not always roost there, with survey results indicating that Lussa Loch was the preferred roost site. Numbers roosting on Tangy Loch ranged from 191 to approximately 1,556 birds, which represents 8.3% to 67.6% of the SPA population at the time of designation.

- 6.9.10. The Proposed Varied Development layout has changed minimally from the Consented Development. The closest elements to Tangy Loch are:
- permanent meteorological mast – 380.1m;
 - borrow pit E – 569.4m;
 - turbine 5 – 584.5m;
 - borrow pit A – 585.3m; and
 - turbine 4 – 843.7m.
- 6.9.11. All other turbines, borrow pits and meteorological masts are located over 1km from Tangy Loch.
- 6.9.12. The overall likely sensitivity of Greenland white-fronted goose to disturbance is considered to be Medium (NatureScot, 2022). A study of Greenland white-fronted geese on Islay (Griffin et al., 2020) found a clear effect of shooting disturbance on the time-energy budgets of birds, with the behavioural effects of shooting also found to be much more acute than other causes of disturbance such as road or farm vehicles or birds of prey, although road vehicles were responsible for the largest numbers of flushes. There is also some anecdotal evidence suggesting that this species avoids human activity more than other geese (Goodship & Furness, 2022).
- 6.9.13. In their response to the 2018 planning application for the Consented Development, NatureScot noted that the nearest proposed turbine to Tangy Loch was 500m, which they considered to be an acceptable buffer distance in relation to Greenland white-fronted goose and that significant displacement or disturbance of the population was unlikely (SNH, 2018). The closest Proposed Varied Development turbines and borrow pits remain over 500m from Tangy Loch. Construction works are anticipated to take 23 months, thus affecting two non-breeding seasons. The duration of the decommissioning phase of the Proposed Varied Development is unknown at this stage but is likely to be of similar or shorter duration to the construction phase.
- 6.9.14. Greenland white-fronted goose is considered to be of High NCI. Although large numbers, representing a substantial proportion of the Kintyre Goose Roosts SPA population, occasionally roosted on Tangy Loch, survey data indicated that Lussa Loch is the preferred roost site for the local population, with Tangy Loch used infrequently as a satellite roost. It is considered highly unlikely that disturbance during construction or decommissioning would lead to long-term displacement, with any birds temporarily displaced from Tangy Loch likely to roost on the nearby Lussa Loch, which is unlikely to have significant energetic costs. As such, disturbance during construction and decommissioning is considered to be Short-term and of Moderate Spatial Magnitude. This would result in a Minor Significant Effect on the Kintyre Goose

Roosts SPA Greenland white-fronted goose population, which is **Not Significant** under the EIA Regulations.

- 6.9.15. Nonetheless, given the NCI of the local Greenland white-fronted goose population and occasional use of Tangy Loch by large numbers of roosting birds, targeted mitigation to reduce disturbance to roosting birds in line with measures proposed for the Consented Development is considered to be applicable to and appropriate for the Proposed Varied Development, with some modifications proposed. Further details are provided in Section 6.9.

Hen Harrier

- 6.9.16. Hen harrier is included on Schedules 1 and 1A of the Wildlife and Countryside Act 1981 (as amended) and Annex I of the Birds Directive. It is Red-listed due to historical and more recent declines in the breeding population (Stanbury et al., 2021) and is also included on the Scottish Biodiversity List ('SBL'). The NHZ 14 breeding hen harrier population was estimated at 211 pairs in 2011 (Wilson et al., 2015).
- 6.9.17. Potentially suitable habitat for breeding, foraging and roosting hen harrier is present within 750m of the Site, which is the maximum recommended disturbance buffer for this species in NatureScot (2022) guidance. Hen harrier was recorded during the breeding and non-breeding season. As stated within the 2018 EIA Report for the Consented Development results from Tangy I Wind Farm indicated that hen harriers occasionally hunted over the area but did not breed there. Only two hen harrier flights were recorded during the 2025-26 non-breeding season VP surveys for the Proposed Varied Development. However, higher levels of flight activity were recorded during the 2025 breeding season, and although no evidence of breeding hen harrier was observed on Site, observations of a family group in July 2025 show that breeding had taken place within the surrounding area.
- 6.9.18. As stated in the 2018 EIA Report for the Consented Development, the habitat across the Site is open ground and commercial conifer plantation where felling is planned for some areas. Since the Detailed HMP associated with the Consented Development was produced in 2024 (RPS, 2024), FLS felled a large area of conifer plantation within the north of the Site for forest to bog restoration. Additional felling and peatland restoration is proposed in the north of the Site as part of the HMP for the Consented Development. This is likely to additional areas of suitable habitat for foraging hen harriers and potentially nesting and roosting birds.

- 6.9.19. Nesting and/or roosting hen harrier could therefore be at risk of disturbance/displacement during the construction and decommissioning phases of the Proposed Varied Development.
- 6.9.20. However, the risk of disturbance to any new nest or roost sites within or around the Proposed Varied Development would be avoided through implementation of the embedded mitigation detailed in the BBPP. Additionally, although foraging birds were regularly recorded during the 2025 breeding season VP surveys, birds were observed across a wide area. Given this and the fact that birds have a core foraging range of 2km from nest sites (NatureScot, 2016), it is considered that there is sufficient alternative habitat available in the wider area to support any foraging birds temporarily displaced from the Site and neighbouring areas during construction or decommissioning of the Proposed Varied Development.
- 6.9.21. Hen harrier is considered to be of Moderate NCI. Following implementation of the embedded mitigation delivered via the BBPP, disturbance during construction and decommissioning is considered to be Short-term and of Low Spatial Magnitude. This would result in a Minor Significant Effect on the NHZ 14 breeding hen harrier population, which is **Not Significant** under the EIA Regulations.

Barrier Effects on Greenland White-fronted Goose

- 6.9.22. Barrier effects can occur when birds are deterred from their usual flight routes between roosts or breeding sites and their feeding areas by a physical or perceived barrier to movement. Turbines can potentially create such barriers, displacing birds from preferred airspace and increasing energetic costs as they fly around or over wind farms (NatureScot 2025d). Some species can potentially display strong avoidance at the scale of entire arrays (macro-avoidance or displacement), taking evasive routes around wind farms rather than reacting to individual turbines or blades (NatureScot 2025a). Species may also be forced to gain altitude and fly above the turbine height. Undertaking these movements regularly has an energetic cost. Wind farms may also cause migrating birds to divert from their usual flight routes (Masden et al. 2009).
- 6.9.23. Studies at large offshore wind farms indicate that geese in flight prefer to avoid an entire turbine envelope, either by gaining height to fly over the turbines or by altering their flight path to fly around them (Plonczkier & Simms 2012). There is less evidence of barrier effects from onshore wind farms, although a recent study in Denmark showed vertical and horizontal avoidance of large turbines by geese and other large-bodied birds (Therkildsen et al., 2021). Therefore, there is potential for onshore wind farms sited between roost and

feeding sites to cause barrier effects, by increasing the energetic costs of geese forced to alter their preferred flight paths (NatureScot, 2025d).

- 6.9.24. As discussed in the EIA Report for the Consented Development, geese will fly through wind farms on occasion but have been shown to have high macro-avoidance, tending to fly around rather than through wind farms; Plonczkier & Simms, 2012). However, there is evidence that geese have a low sensitivity to disturbance at operational wind farms and maintain a buffer of just a few hundred metres (Larsen & Madsen, 2000; Madsen & Boertmann, 2008).
- 6.9.25. It is considered that Greenland white-fronted goose is the only IOF that could potentially be significantly affected by barrier effects. Barrier effects could arise for Greenland white-fronted geese which roost at the Kintyre Goose Roosts SPA, predominately Tangy Loch or Lussa Loch.
- 6.9.26. A detailed assessment of potential effects of the Proposed Varied Development on the Kintyre Goose Roosts SPA in the context of the Habitats Regulations is presented in **Volume 4, Technical Appendix 6.2: Shadow Habitats Regulations Appraisal Report for Kintyre Goose Roosts Special Protection Area (SPA)** of this EIA Report. The key findings are also relevant in the context of the EIA Regulations and informed the assessment presented below.
- 6.9.27. The Kintyre Goose Roosts SPA population of Greenland white-fronted geese can be split into two sub-populations: one which forage around Rhunahaorine Point and roost nearby or at Loch an Fhraoich and Loch Garasdale; and the other which forages at Laggan (i.e., Machrihanish) and roosts at Lussa Loch, Black Loch and Tangy Loch (SNH, 2011). Additionally, Greenland white-fronted goose also migrate over the Kintyre peninsula, with some birds spending short periods there before continuing their migration.
- 6.9.28. The Greenland White-Fronted Goose Study (GWFGS (n.d. b) reports Tangy Loch as the main roost site for geese foraging at Machrihanish, noting that “*In former times before protection, sporadic hunting at this site displaced the geese to neighbouring Lussa Loch which may still offer an alternative site*”. Data from previous surveys carried out for the Consented Development indicated that Lussa Loch appeared to be the main roost site, with Tangy Loch used infrequently. While the 2025-26 surveys for the Proposed Varied Development show more regular use of Tangy Loch by large numbers of birds, Lussa Loch still appears to be the favoured roost site.
- 6.9.29. As identified during surveys, there is an established flight and well-defined corridor to the south and south-east of the Proposed Varied Development, between roost sites at Tangy Loch and Lussa Loch and foraging areas to the south.

- 6.9.30. The GWFGS state that “*a few [Greenland white-fronted geese] fly as far as Tangy Loch to roost after feeding at Rhunahaorine*” (GWFGS, n.d.). However, based on data collected during VP surveys for both the Consented Development and Proposed Varied Developments, there was no evidence of a direct flight corridor between Tangy Loch and the north of the Site. This suggests geese roosting at Tangy Loch do not typically fly directly across the Site to reach feeding areas to the north (Rhunahaorine, Clachan, Gigha and Glenbarr). If birds do travel between Tangy Loch or Lussa Loch and northern foraging areas, they may be following an alternative route which does not pass over the turbine envelope of the Proposed Varied Development. For example, the geese may fly west or south-west from the Tangy Loch and Lussa Loch roosts, towards the coast, before flying north to reach foraging areas.
- 6.9.31. Additionally, since a wind farm has been operational on the Site since 2007 it can be assumed that Greenland white-fronted geese in the area have become habituated to turbines in the landscape and barrier effects from the Proposed Varied Development alone are considered highly unlikely.
- 6.9.32. Greenland white-fronted goose is considered to be of High NCI. Barrier effects from the Proposed Varied Development alone are considered to be Long-term and of Negligible Spatial Magnitude. This would result in a Negligible Significant Effect on the Kintyre Goose Roosts SPA Greenland white-fronted goose population, which is **Not Significant** under the EIA Regulations.

Lighting Effects on Greenland White-fronted Goose

- 6.9.33. Due to the proposed increase in turbine tip height for the Proposed Varied Development, it is a requirement in accordance with Civil Aviation Authority (2016) guidance for aviation lighting to be installed to make the turbines more visible to aircraft pilots.
- 6.9.34. Where turbine lighting is required, an assessment on the impact of birds may be required (NatureScot, 2020). As detailed in **Table 6.1**, NatureScot advised that an assessment of turbine lighting effects Greenland white-fronted geese was carried out.
- 6.9.35. For the Proposed Varied Development, five visible red and 16 infra-red hub mounted obstruction lights are required. The five turbines that will be fitted with visible lighting are
- T1;
 - T5;
 - T6;
 - T8; and
 - T11.

- 6.9.36. Further information on the proposed lighting regime is given in **Technical Appendix 15.1: Tangy IV Wind Farm Aviation Lighting Assessment Report**.
- 6.9.37. Artificial lighting is known to have both positive effects on birds (increased opportunity for activity that would normally only occur during daylight) and negative effects, including attraction to lights (phototaxis), disruption of photoperiodicity and increased opportunities for visually active predators (NatureScot, 2020).
- 6.9.38. It has been known for many years that birds are often attracted to lights, especially certain taxonomic groups and many species of nocturnal migrants (NatureScot 2020). The reasons for phototaxis are not fully known. Theories include navigation by moonlight, attraction to phosphorescence (for some seabirds) and interference with the magnetic compass of birds which may affect orientation.
- 6.9.39. There is limited published literature on the impact of lights on wind turbines on birds. Outside of the UK studies have been undertaken on the colours of lighting on turbines and their effects on collision rates. There is evidence to suggest that brightly lit turbines could cause high collision rates in poor weather conditions as stated in Huppopp et al. (2006) detailing offshore turbines. Ballasus et al. (2009) suggested that illuminated onshore turbines tend to have higher collision rates than unlighted ones.
- 6.9.40. The range of colours and modes of flashing have also been studied for collision risk. For example, a review by Kerlinger & Kerns (2003) showed that steady burning red lights on wind energy developments showed the strongest attraction of migrant bird species, whereas no large-scale fatalities occurred at wind energy developments where flashing red lights were installed. Gehring et al. (2009) studied a range of lighting on communication towers and showed that white, stroboscopic lights attracted fewest birds compared to red flashing lights and steady red lights. The authors of this study suggested that flashing versus non-flashing steady lights is a principal factor affecting the increase of collision risk and colour is a secondary consideration.
- 6.9.41. Geese are not included amongst the principal species most likely to be susceptible to elevated collision risk due to aviation lighting (NatureScot, 2020) and it is considered highly unlikely that Greenland white-fronted geese would be attracted to turbine lighting. Indeed, it is possible that the increased visibility of the turbines could result in decreased collision risk, particularly during conditions of poor visibility.
- 6.9.42. Aviation lighting also has the potential to create a barrier effect on geese flying at night. Lighting effects at wind farms have been shown to increase avoidance distances and evidence from radar studies has found that higher

altitudes are associated with nocturnal flights (Desholm & Kahlert, 2005). Geese have been found to be active at night and in poor visibility conditions, during migration and moving between roosting and foraging areas (Hill, 1992). However, as discussed above, survey results showed that few flight lines of Greenland white-fronted goose were within the turbine envelope and the Proposed Varied Development is not located along any established flight corridors between roosting and feeding areas. As such, it is considered unlikely that the turbine lighting will create a barrier effect.

- 6.9.43. In theory, there is also some potential for the turbines to affect Greenland white-fronted geese roosting on Tangy Loch, either because birds are deterred from roosting there due to disturbance associated with the increased visibility of the turbines at night and/or actual or perceived increase in predation.
- 6.9.44. Lighting will be located at hub height (approximately 150m) in order to make turbines visible to aircrafts during environmental conditions causing poor visibility such as low cloud cover on the surrounding hills. The highest levels of illumination will be at hub height, with lower levels of illumination at ground level. Light spill reaching ground level will also diminish further with increasing distance from each turbine.
- 6.9.45. Of the five turbines to be lit the closest turbine to Tangy Loch is T5 which lies approximately 584.5m away. All turbines will be lit at 200 candela (cd) intensity for 98% of the time, which will increase to 2000cd during conditions of poor visibility.
- 6.9.46. The aviation lighting on T5 would be located at approximately 288m Above Sea Level ('ASL'). Tangy Loch lies at approximately 136m ASL. This gives a 152m difference in height between the light source and the loch surface. The centre of Tangy Loch lies 840m from T5 meaning that the loch would lie below the primary beam spread of the aviation light.
- 6.9.47. However, based on the use of low intensity of the T5 lighting, and the distance between T5 and Tangy Loch, the potential for significant light spill on the loch is considered to be negligible.
- 6.9.48. Greenland white-fronted goose is considered to be of High NCI. Lighting effects from the Proposed Varied Development are considered to be Long-term and of Low Spatial Magnitude. This would result in a Minor Significant Effect on the Kintyre Goose Roosts SPA Greenland white-fronted goose population, which is **Not Significant** under the EIA Regulations.
- 6.9.49. Although no significant effects are predicted, due to the proximity of Tangy Loch the use of low-intensity aviation lighting on the closest turbine (T5) is

recommended to further reduce the potential for disturbance effects on geese roosting on Tangy Loch by minimising light spill.

Collision Risk

- 6.9.50. Birds that utilise the airspace within the CRAA at PCH during operation of the Proposed Varied Development will be at risk of collision with turbines. The risk of collision with moving wind turbine blades is related to the amount of flight activity over the Site, the topography of the Site, the species behaviour, and the ability of birds to detect and manoeuvre around rotating turbine blades.

Greenland White-fronted Goose

- 6.9.51. Geese may be vulnerable to turbine collisions because they often fly in large flocks and along predictable low-altitude commuting routes between feeding and roosting sites. Collisions are more likely to occur where turbines overlap known flyways, wetlands, or open fields that attract geese (NatureScot 2025d).
- 6.9.52. The Proposed Varied Development is located approximately 380m from Tangy Loch (at the closest point). Birds could also be at risk when arriving at or departing from the SPA during migratory periods. There is considered to be potential for birds roosting at Tangy and / or Lussa Loch within the SPA to travel through the Proposed Varied Development turbine envelope during daily commutes to/from foraging areas and/or during migratory flights. Greenland white-fronted geese commuting between Tangy Loch/Lussa Loch roost sites and foraging areas could also travel through or over the Site.
- 6.9.53. All collisions with turbines are anticipated to cause mortality. However, as described in section 6.5, the estimated collision rate of Greenland white-fronted goose was low at just 4.3 birds over the 50-year lifespan for the Proposed Varied Development. Estimated collision rates are low as many of the recorded flights, during VP surveys in 2016-17 and 2025-26, did not fly through the turbine envelope. Corresponding figures can be seen in **Volume 3a** of this EIA Report and in **Figure 9.26 of Volume 3a** of the EIA Report for the Consented Development.
- 6.9.54. The revised CRM for the Proposed Varied Development estimated an annual mortality rate of 0.103 based on the 2016-17 VP data and 0.068 per year based on the 2025-26 data, or a mean of 0.085. The mean annual collision risk corresponds to 4.3 birds over 50 years (the operational period of the Proposed Varied Development).
- 6.9.55. The highest annual estimated collision rate (0.103 based on 2016-17 data) corresponds to the potential loss of 0.004% of the Kintyre Goose Roosts SPA

Greenland white-fronted goose population at the time of citation (2,300 birds; SNH, 1998), i.e., less than 1%.

- 6.9.56. Therefore, it is considered that collision risk from the Proposed Varied Development would be of Negligible spatial magnitude, long-term and of Minor Significance on the Kintyre Goose Roosts SPA Greenland white-fronted goose population, which is Not Significant in the context EIA Regulations.

White-tailed Eagle

- 6.9.57. No white-tailed eagle flights were recorded during the 2016-17 VP surveys completed for the Consented Development and only three flights were recorded during the 2025-2026 VP surveys for the Proposed Varied Development, of which only one was at-risk. However, as white-tailed eagle was reported by the ARSG to be establishing a territory in the wider area (outwith potential disturbance distance from the Proposed Varied Development), it was scoped into the revised CRM as a precautionary approach.
- 6.9.58. As shown in **Table 6.5**, the estimated annual collision risk of white-tailed eagle based on 2025-26 VP data alone was 0.082, which represents 0.5 % of the NHZ 14 breeding population (eight pairs based on 2013 Scottish Raptor Monitoring Scheme (SRMS) data; Wilson et al., 2015). The SRMS have published trends for breeding white-tailed eagles in NHZ 14, which show that numbers of breeding pairs did not significantly change between 2009-2018 (Wilson et al., 2022), although the most recent SRMS Report shows that there were ten occupied home ranges on the Argyll mainland in 2023 (Peniche et al., 2023) and the territory reported by the ARSG is assumed to be new. This suggests that there could have been an increase in breeding white-tailed eagle numbers in NHZ 14 in recent years, although any population growth appears to be relatively slow.
- 6.9.59. Regular VP surveys were completed between April 2025 and May 2026, which includes the period when white-tailed eagles were reportedly establishing a breeding territory. The resulting data suggest that the Site is used no more than occasionally by white-tailed eagle, with no regular foraging activity observed. It is possible that collision risk could increase if birds breed at the newly establishing territory in future. This could theoretically affect breeding success for the small and expanding population within the region if a high proportion of any collision mortality were to affect territory holding adult birds. However, recent population viability analysis (PVA) completed for the proposed Corr Chnoc Wind Farm near Oban (Savills, 2025) predicted that, although there would be a minor reduction in the growth rate of the white-tailed

eagle breeding population in Argyll, it would continue to increase, even based on the worst-case scenario of five white-tailed eagle collisions per year.

- 6.9.60. White-tailed eagle is considered to be of Moderate NCI. Collision risk to this species from the Proposed Varied Development alone is considered to be Long-term and of Low Spatial Magnitude. This would result in a Minor Significant Effect on the NHZ 14 breeding white-tailed eagle population, which is **Not Significant** under the EIA Regulations.

6.10. Revised Mitigation Measures for the Proposed Varied Development

- 6.10.1. No significant effects on any IOFs are predicted for the Proposed Varied Development due to collision risk, barrier effects or effects of turbine lighting.
- 6.10.2. However, effects on Greenland white-fronted geese due to disturbance/displacement during construction and decommissioning of the Proposed Varied Development were considered to be of Minor Significance and the targeted mitigation proposed for the Consented Development is considered to be applicable to and appropriate for the Proposed Varied Development.
- 6.10.3. Similarly, the BBPP proposed for the Consented Development is also applicable to the Proposed Varied Development to ensure compliance with relevant legislation protecting all nesting birds, as well as additional protection for Schedule 1/1A breeding and/or roosting birds such as hen harrier.
- 6.10.4. As such, the proposed mitigation for the Consented Development (in line with planning condition 23) will be followed for the Proposed Varied Development with some changes which are noted below.
- 6.10.5. Additionally, due to the proximity of Tangy Loch and the regular use by Greenland white-fronted geese it is proposed that lighting intensity on T5, which is the closest turbine to the loch, is maintained at a reduced intensity of 200cd 100% of the time to minimise light spill and reduce potential disturbance to geese roosting on Tangy Loch.

Goose Protection Plan ('GPP')

- 6.10.6. The exact mitigation measures to be implemented during construction will be detailed in a GPP and will be determined post-consent in consultation with

NatureScot but will likely include the measures outlined below (which are additional to those outlined within the 2023 SPP: Birds).

- During construction and decommissioning all works within 1 kilometre of Tangy Loch are restricted to between the hours starting from one hour after dawn to one hour before dusk during the goose roosting season (30 September – 30 April).
- Before work starts, a construction schedule that avoids disturbing geese using Tangy Loch and Lussa Loch shall be prepared, submitted and approved by, Argyll and Bute Council in consultation with NatureScot. Contractors must follow the approved schedule for the entire construction period.
- Where construction works overlap with the non-breeding season, a suitably experienced ECoW will attend the Site regularly throughout the season to oversee implementation of the GPP, including any monitoring required, and identify any potential constraints to works and/or reactive mitigation needs.
- During the non-breeding season¹, construction activities, vehicle movements and other on-site operations within 1km of Tangy Loch shall normally be restricted to the hours from one hour after sunrise to one hour before sunset.
- In the event of work within 1km of Tangy Loch being required outside these hours during the non-breeding season, e.g., abnormal load deliveries, commissioning works or emergency mitigation works, one or more of the following mitigation measures will be applied, with the most appropriate measure(s) to be determined by the ECoW:
 - implementation of a minimum 600m buffer around Tangy Loch, within which construction works are excluded between sunset and sunrise;
 - a watching brief by the ECoW during any construction works within 600m of Tangy Loch to monitor any birds present for signs of disturbance; and/or
 - where signs of disturbance to roosting birds are observed by the ECoW, all works within 600m of Tangy Loch will stop as soon as it is safe to do so and will not recommence until the ECoW has confirmed the birds are no longer present.

¹ The generic non-breeding season for geese (including migratory periods) in NatureScot (2023b) guidance, but the period may be shortened by the Ecological Clerk of Works if birds arrive later than 1st September or depart before 15th May

- Where possible, any blasting taking place on Site will avoid the non-breeding season. Where this is unavoidable, blasting will only be carried out during the period from one hour after sunrise to one hour before sunset. Further details on blasting can be found in **Volume 2, Chapter 2, Section 2.6.3**.
- Use of artificial lighting in areas within 600m of Tangy Loch during the non-breeding season will be restricted to the period between sunrise and sunset, and any artificial lighting elsewhere on Site during the non-breeding season will be directed away from Tangy Loch.

Breeding Bird Protection Plan (BBPP)

- 6.10.7. The 2023 SPP: Birds will be updated to account for the fact that breeding Schedule 1-listed raptor species have been recorded in the wider area.
- 6.10.8. It is proposed that targeted surveys for breeding Schedule 1-listed raptor species (focussing on hen harrier and eagle species) will be completed during the breeding season immediately prior to construction, based on standard methods for surveying raptors detailed in Hardey et al. (2013), to inform potential requirements for targeted mitigation to protect breeding Schedule 1-listed raptors. Where construction is scheduled to commence part-way through the breeding bird season (March to August), a suitably experienced ECoW or ornithologist will advise whether surveys should commence during that breeding season or the previous breeding season, based on timing and professional judgement.
- 6.10.9. As decommissioning works are likely to be of a similar nature and duration as construction activities, the mitigation outlined above will also be implemented during the decommissioning phase, following review and update (if required) to ensure compliance with relevant guidance and legislation at the time.

6.11. Cumulative Effects

- 6.11.1. Predicted adverse effects on birds arising from the construction and operation of the Proposed Varied Development have the potential to contribute to cumulative effects upon Greenland white-fronted goose. This has been assessed below with reference to NatureScot (2025e) guidance.
- 6.11.2. Greenland white-fronted geese are considered to have a core foraging range of 5-8km (NatureScot, 2016). Therefore, developments within 8km of the

Kintyre Goose Roost SPA, including the grid connection for the Proposed Varied Development, have been scoped into the cumulative assessment.

- 6.11.3. An application for a grid connection for the Proposed Varied Development will be progressed separately via an application under S.37 of the Electricity Act 1989. This will comprise a shared use connection for the Proposed Varied Development and the proposed Cnoc Buidhe Wind Energy Hub.
- 6.11.4. The proposed shared use grid connection comprises the installation and operation of a new double circuit 132 kilovolt (kV) overhead line ('OHL') supported by steel L7 lattice towers. The 13.5km OHL will run between terminal towers located at Collusca Water and land to the east of Rhonadale, approximately 10km north-west of Campbeltown, Argyll and Bute. Further details on project description can be found in the Tangy IV Wind Farm and Cnoc Buidhe Wind Farm 132 kV OHL Shared Use Connection Environmental Impact Assessment: Scoping Report (Scottish and Southern Energy Networks ('SSEN'), 2025).
- 6.11.5. The Scoping Report for the grid connection identified a further EIA report will be carried out which will assess all effects of the proposed grid connection.
- 6.11.6. During baseline surveys for the grid connection in 2022-23, 53 Greenland white-fronted goose flights were recorded all of which were at PCH² and associated with Tangy Loch and Lussa Loch (SSEN, 2025). Visual and audial disturbance to roosting geese during the construction phase and collision risk during the operational phase were identified as potential effects on Greenland white-fronted goose in the absence of mitigation.
- 6.11.7. An assessment of potential effects of the grid connection on Greenland white-fronted goose has yet to be completed. However, the grid connection Scoping Report states that potential significant effects will be avoided wherever possible or minimised to an acceptable level through the design process, with mitigation measures recommended where appropriate to minimise any adverse effects (SSEN, 2025).
- 6.11.8. The closest known roosting loch (including Loch Arnicle, which is outwith the Kintyre Goose Roosts SPA), is Lussa Loch, located several hundred metres to the south of the grid connection. Given this and based on the understanding that appropriate mitigation will be implemented to avoid or minimise any potential construction disturbance to Greenland white-fronted geese, it is

² The height band(s) considered to be at PCH was not defined in the Scoping Report (SSEN, 2025) but is assumed to encompass the expected height range of the OHL. Post-scoping and pre-submission information from the network operator, tower heights are likely to be between 26m and 36m.

considered unlikely that the proposed grid connection would contribute to significant cumulative displacement of roosting birds.

- 6.11.9. As Greenland white-fronted goose flights were concentrated at the southern edge of the proposed OHL, it is anticipated that collision risk from the proposed grid connection alone will be low. Additionally, a study of goose flight activity in relation to distance from SPAs in Scotland (Patterson, 2015) found that 97.8% of pink-footed goose (*Anser brachyrhynchus*) flocks commuting between roost and feeding sites, or between fields within foraging areas, flew at heights above 50m, which exceeds the height of the proposed OHL. As it has a similar ecology, it seems reasonable to expect that Greenland white-fronted geese would fly at similar heights.
- 6.11.10. However, it is noted that the proposed grid connection intersects a possible (infrequently used) flight corridor between the Tangy Loch/Lussa Loch roost sites and Loch Arnicle to the north, which may occasionally be used as a satellite roost. On this basis, in the absence of mitigation, the grid connection could theoretically contribute to significant cumulative collision risk. However, it is anticipated that appropriate mitigation, such as installation of line markers on sections of the OHL, would be implemented if required to reduce collision risk to a non-significant level.
- 6.11.11. It is expected that cumulative effects of the proposed grid connection, Proposed Varied Development and other relevant developments will be included as part of the assessment for the grid connection (and presented within its EIA Report). As this would include consideration of the full dataset collected for the proposed grid connection and a detailed assessment of potential impacts arising from that development alone, it will update the cumulative assessment presented in this chapter, which is based on currently available information.
- 6.11.12. Potential cumulative effects of collision mortality, barrier to movement and disturbance/displacement on Greenland white-fronted geese from the Kintyre Goose Roosts SPA population (taking into account all relevant developments) are assessed in full within **Volume 4, Technical Appendix 6.2** of this EIA Report and are not repeated here. Based on the details presented in the HRA, it was concluded that there will be no cumulative adverse effects on site integrity ('AES'I) of the Kintyre Goose Roosts SPA.
- 6.11.13. Similarly, cumulative collision risk effects on Greenland white-fronted goose, which is of High NCI, are considered to be Long-term and of Low Magnitude. This would result in a Minor Significant effect on the Kintyre Goose Roosts SPA Greenland white-fronted goose population which is Not Significant under the EIA Regulations.

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