TECHNICAL APPENDIX 8.1: ORNITHOLOGY ASSESSMENT METHODOLOGY

8.1 Introduction

8.1.1 This Technical Appendix presents full details of the methodology and results for the ornithology field surveys conducted as part of the Environmental Impact Assessment undertaken for the Proposed Development, including references to best practice. Details are also provided on the impact assessment methodology adopted, including the criteria used for categorising impacts and evaluating the importance of features. It should be read in conjunction with **Chapter 8 (EIAR Volume 2)** and **Chapter 2 (EIAR Volume 2)**.

8.2 Methods of Baseline Data Collection

8.2.1 The Ornithology Study Area comprises an Ornithology Desk Study Area and an Ornithology Field Survey Area as shown on **Figure 8.1 (EIAR Volume 3a)** and **Figure 8.2 (EIAR Volume 3a**). The Desk Study Area included a 10 km buffer around the Proposed Development for Sites of International Importance and a 2 km buffer for the Site Boundary for Site of Local Importance. This area is considered to represent the Zone of Influence (ZOI)[1] in which impacts on ornithological features could occur.

Desk Study

8.2.2 A desk study was undertaken to collect baseline data about the Proposed Development within the Ornithology Study Area, as defined above. The following ZOI were considered:

- all statutory designated sites up to 10 km from the site, including Special Protection Areas (SPA), National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI), Ramsar sites and Important Bird Areas (IBA);
- publicly available records of internationally protected and / or nationally important bird species of conservation concern; and
- data purchased from the Lewis and Harris Raptor Study Group (LHRSG), such as hen harrier *Circus cyaneus* nesting data and Breeding Raptor Data.

8.2.3 Breeding Raptor data was purchased from LHRSG covering raptor data from the breeding seasons between 2016 and 2021. This data was purchased for the use of establishing the baseline of previous other infrastructure projects for SSEN, including Harris to Stornoway 132 kV OHL Replacement.

8.2.4 Hen harrier *Circus cyaneus* territory data was purchased from the LHRSG for the period between 2019 and 2021.

8.2.5 Hen harrier nesting data was purchased from the LHRSG for 2023.

Field Surveys 2023-2025

8.2.6 Field surveys include:

- Flight activity surveys; and
- Moorland Breeding Bird Surveys including Nesting Diver and Breeding Raptor Surveys.

Flight activity surveys – Vantage point surveys

8.2.7 A programme of Vantage Point (VP) surveys was proposed to develop an understanding of the flight patterns for the likely occurring bird species within the Ornithology Field Survey Area (defined as a 2 km buffer around the Proposed Development). VP locations were chosen following a desk-based exercise, conducted by Ramboll ornithologists experienced in developing and delivering bird surveys in Scotland, including previously on the Isle of Lewis. The number and locations of the proposed VPs were designed to provide optimal coverage, especially of open areas that have potential to be used by raptor species when hunting, displaying or using commuting routes, or to be used as commuting routes between the coast and upland lochs by diver species.

[1] The area over which ecological features may be subject to significant effects as a result of the Proposed Development and its associated activities.

8.2.8 Field surveys undertaken by Redwing ecologists[2] began in March 2023 and are ongoing until February 2025. Surveys were originally designed to cover the Proposed Development and a grid connection from Stornoway Windfarm. As the Proposed Development has evolved, surveys have been adapted to provide best coverage.

8.2.9 The VP surveys initially consisted of undertaking watches during the breeding and non-breeding seasons at one VP location in the northern part of the Site, near the southeast corner of the Proposed Peat Restoration area. One further VP location was added in March 2024 to the existing one, within the southern part of the Site, to provide a better coverage of the area potentially affected by the Proposed Development. The added VP was necessary due to a design change, where a different location was chosen as Preferred Site for the Proposed Development, the Lewis Converter Station and Substation Hub, during the site selection process. The Site was fixed in August 2024.

8.2.10 The survey locations are shown on **Figure 8.2: Ornithology Survey Locations – Vantage Point Locations (EIAR Volume 3a)**.

8.2.11 Each survey location was surveyed twice per month, with each individual survey lasting three hours. This equates to 72 hours of annual survey time from each VP survey location, which is in line with NatureScot best practice guidance.[3] Survey timings were spread evenly across the day so surveys from the same location were not undertaken at the same time in adjacent months, potentially leading to a temporal bias in results. Surveys were only undertaken in favourable weather conditions, relative to the typical weather on the Isle of Lewis.

8.2.12 Standard VP flight recording as set out in best practice guidance was used.[4] Flight heights of target species were recorded every 15 seconds for the duration of any flight seen. Every five minutes, a scan for secondary species was completed, unless a target species was being watched, in which case the secondary species scan would not be completed, and the target species would continue to be watched. Target species included birds protected by wildlife legislation, species of conservation concern or local BAP species.

Moorland Breeding Bird Surveys

8.2.13 Areas of moorland were surveyed using the Brown and Shepherd (1993)[5] methodology for censusing upland breeding waders. The Moorland Bird Survey Area was surveyed three times in 2023, once during the early breeding season (in mid-April- and early May), once in mid-breeding season (in early-May), and later in the breeding season (in early June and mid-July). Surveys were conducted between 08:30 and 18:00 and surveyors walked through the study area to within at least 100 m of all parts of the study area. At regular intervals (approximately every 100 m) the surveyor scanned with binoculars as far as terrain or weather allowed and listen for calls or song. The location and activities of all species were recorded using standard British Trust for Ornithology (BTO) codes and notations, with the following criteria for assessing breeding status:

- presence of nest, eggs and/or young, seen or heard;
- birds seen carrying Faecal sac or Food to nest or young alarm calling indicative of nest, young or territory;
- adults entering or leaving nest-site, indications of occupied nest;
- displaying or singing male present;
- distraction display or injury feigning; and
- birds aggressively defending territories.

8.2.14 The following breeding statuses of the recorded species were established based on the survey results:

- Not breeding;
- Possibly breeder;
- Probable breeding; and
- Confirmed breeding.

[2] While surveys were being undertaken Stagfire changed their operational name to Redwing Ecological Surveys
[3] NatureScot (2017) Guidance: Recommended Bird Survey Methods to Inform Impact Assessment of Onshore Wind Farms. NatureScot, Battleby
[4] Ibid
[5] A. F. Brown & K. B. Shepherd (1993) A method for censusing upland breeding waders, Bird Study, 40:3, 189-195, DOI: 10.1080/00063659309477182.

8.3 Assessment of impacts

8.3.1 This assessment has been completed following CIEEM Guidelines (2019)[6].

Criteria for Evaluating Importance of Features

8.3.2 The ornithological features (designated sites, habitats, and species) identified have been assigned an ornithological importance using the guidance set out by CIEEM which refers to a geographic scale of importance. The classification of importance assesses ornithological features in relation to their population size, diversity, rarity, fragility, typicalness, connectivity with surroundings, intrinsic value, recorded history, and potential value. The outline of how the valuation of nature conservation features has been applied at different geographical scales and to different populations of species is presented in **Table 8.1**.

Table 8.1 Geographic Conservation Importance

Importance	Example
International	Internationally designated sites including SPA, Ramsar sites, potential SPAs and potential Ramsar sites; discrete areas which meet the published selection criteria for international designation, but which are not themselves designated as such, or smaller areas which are essential to maintain the viability of a larger whole. Important Bird Areas (IBA) are included here as they are designations based on international population levels and trends though they are not statutory designations. Resident or regularly occurring populations of species which may be considered at an International/ European level[1], the loss of which would adversely affect the conservation status or distribution of the species at an International / European level. Resident or regularly occurring populations that contribute >1% of the international (European or worldwide) population.
National	Nationally designated sites including SSSI, NNR, Marine Nature Reserve; discrete areas which meet the published selection criteria for national designation, but which are not designated as such; or areas of habitat types identified in the UK Biodiversity Action Plan (BAP). Resident or regularly occurring populations of species which may be considered at the UK or National level[2], the loss of which would adversely affect the conservation status or distribution of the species across Britain or the Country. Resident or regularly occurring populations that contribute >1% of the national population.
Regional	Areas of a key habitat type identified in Regional BAPs; viable areas of key habitat identified as being of Regional importance in the appropriate Natural Heritage Zone (NHZ); or smaller areas of such habitat which are essential to maintain the viability of a larger whole. Resident or regularly occurring populations of species which may be considered at the Regional level, the loss of which would adversely affect the conservation status or distribution of the species across the Region. Resident or regularly occurring populations that contribute >1% of the regional population.
Local	A population of a species or assemblage considered locally important in the context of the immediate surrounding area. Resident or regularly occurring populations and supporting habitats of any bird species of conservation importance in the context of the immediate surrounding area.
Notes: [1]: Species protected at a European level means: bird species listed within the Birds Directive. [2]: Species protected, or which may be considered at the UK or National level means: birds listed within Wildlife and Countryside Act 1981 (as amended) Schedule 1 and / or listed for their principal importance for biodiversity in accordance with the Nature Conservation (Scotland) Act 2004 Section 2(4); species listed within the UKBAP or UK Red Data Books.	

[6] CIEEM (2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Version 1.1). Chartered Institute of Ecology and Environmental Management, Winchester.

8.3.3 A wide range of sources can be used to assign importance to ecological features, including legislation and policy. In the case of designated nature conservation sites, their importance reflects the geographic context of the designation. For example, sites designated as SPAs are recognised as being of importance at an international level. Ecological features not included in legislation and policy may also be assigned importance due to, for example, local rarity or decline, or provision of a functional role for other ecological features. Professional judgement is used to assign such importance.

Criteria for characterising impacts

8.3.4 The potential impacts upon ecological features have been considered in relation to the Proposed Development. The impacts have been assessed without consideration of any specific mitigation measures that will be employed. The assessment of likely ecological impacts has been made in relation to the baseline conditions of the ecology study area. The likely impacts of development activities upon ecological features have been characterised according to several variables detailed in **Table 8.2** have been adopted to characterise impacts.

Table 8.2 Impact characterisation

Direction	Impacts are either adverse (negative) or beneficial (positive).
Magnitude	This is defined as high, medium, low or negligible, with these being classified using the following criteria: High: Total/near total loss of a bird population due to mortality or displacement or major reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Medium: Partial reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Low: Small but discernible reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Negligible: Very slight reduction in the status or productivity of a bird population due to mortality or displacement or disturbance. Reduction barely discernible, approximating to the 'no change' situation.
Extent	The geographical area over which an impact occurs.
Duration	The time for which the impact is expected to last prior to recovery of the feature or replacement of the feature by similar resource (in terms of quality and / or quantity). This is expressed as a short term, medium term, or long-term effect relative to the ornithological feature that is impacted.
Frequency	The number of times an activity occurs will influence the resulting effect. For example, a single person walking a dog would likely be a low magnitude impact on nearby waders using wetland habitat, but numerous walkers would subject the waders to frequent disturbance, which might be an impact of medium or even high magnitude and could affect feeding success, leading to displacement of the birds and knock-on effects on their ability to survive.
Timing	The timing of an activity or change. This may result in an impact if it coincides with critical life-stages or seasons e.g. bird nesting season.
Reversibility	Irreversible impacts: permanent changes from which recovery is not possible within a reasonable time scale or for which there is no reasonable chance of action being taken to reverse it. Reversible impact: temporary changes in which spontaneous recovery is possible or for which effective mitigation (avoidance / cancellation / reduction of effect) or compensation (offset / recompense / offer benefit) is possible.

8.3.5 The assessment only describes those characteristics relevant to understanding the ecological impact and determining the significance of the effect.

Cumulative Effects

8.3.6 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects are particularly important in EcIAs as many ecological features are already exposed to background levels of threat or pressure and may be close to critical thresholds, where further impacts could cause irreversible decline and significant cumulative effects. Further impacts can also make habitats and species more vulnerable or sensitive to change.

8.3.7 Developments included in the cumulative effects assessment are the following types of future development within the same ZoI:

- Proposals for which consent has been applied;
- Projects that have been granted consent but have not yet been started or have been started but are not yet completed (i.e. under construction);
- Proposals that have been refused permission but are subject to appeal; and,
- To the extent that their details are in the public domains, proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority.

8.3.8 It may also be necessary to consider developments that are operational but whose full environmental effects are not yet known and cannot be accounted for in the baseline.

Magnitude of Impact

8.3.9 Detailed consideration of impact magnitude is a standard component of EcIA. It is incorporated to succinctly describe the scale of individual impacts. The magnitude of effects is predicted quantitatively where possible, taking into account the duration and reversibility of effects, and is considered spatially and temporally as described within Table 8.3. Effects can be adverse, neutral or beneficial.

Table 8.3 Description of spatial impact magnitudes

Spatial impact magnitude	Description
High	Major effect on the nature conservation status of the Site, habitats or species, likely to threaten the long-term integrity of the system.
Medium	Moderate effect on the nature conservation status of the Site, habitats or species, but would not threaten the long-term integrity of the system.
Low	Noticeable effects, but either of sufficiently small scale or short duration to cause no harm to the conservation status of the Site, habitats or species.
Negligible	Not expected to affect the conservation status of the Site, habitats or species under consideration in any way, therefore no noticeable effects on the ecological resource.

Significance Criteria

8.3.10 Significant effects are assessed with reference to the geographic importance of the ecological feature. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is not considered important. For example, a significant effect on a species protected by national legislation does not necessarily equate to a significant effect on its national population.

8.3.11 Table 8.4 illustrates how residual effects are determined by comparison of the sensitivity of receptors with the magnitude of predicted change. For the purposes of this assessment significant effects are [e.g. major or major/moderate].

Table 8.4: Significance Criteria

Spatial impact magnitude	Description
Major	This is a significant effect (either beneficial or adverse), as the effect is likely to result in a long term significant effect on the integrity of the receptor at a particular geographical scale.
Moderate	This is a significant effect (either beneficial or adverse), as the effect is likely to result in a medium term or partially significant adverse effect on the integrity of the receptor at a particular geographical scale.
Minor	The effect is likely to adversely affect the receptor at an insignificant level by virtue of its limited duration and/or extent, but there will probably be no effect on its integrity. This is not a significant effect.
Negligible	No discernible effect is expected as a result of the Proposed Development.