Technical Appendix 7.5: Ornithology Assessment Methodology

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1.1 Introduction

1.1.1 This Technical Appendix provides a summary of the key criteria that has been used to evaluate the significance of predicted likely effects on important ornithological receptors due to the construction and operation of the Proposed Development.

1.1.2 The Proposed Development is a renewable energy development comprised of up to eight wind turbines, a Battery Energy Storage System (BESS) and associated infrastructure adjacent to Sullom Voe Oil Terminal (SVT) and the Shetland Gas Plant in Shetland, Scotland. The assessment is based on the Proposed Development as described in **Chapter 2: Proposed Development (EIAR Volume 2)**.

1.1.3 The assessment approach undertaken within this **Chapter 7: Ornithology (EIAR Volume 2)** chapter is an accordance with best practice guidance. For the avoidance of doubt, CIEEM and NatureScot best practice guidance was followed (at the time the surveys and assessment were undertaken). The CIEEM guidance, at the time of writing, is 2018 - version 1.3, 2024[1].

1.2 Importance criteria

1.2.1 The ornithological receptors identified in the baseline studies were evaluated following best practice guidance[1]. Identifying the importance of potential ornithological receptors was the first step of the evaluation process, and those considered important were then subject to detailed survey and assessment. Those considered sufficiently widespread, unthreatened and resilient to the potential project impacts were scoped out of further assessment as per best practice guidance.

1.2.2 Ornithological receptors can be important for a variety of reasons and the rationale used to define their importance has been explained to demonstrate a robust selection and evaluation process. Importance may relate, for example, to the quality or extent of designated sites or habitats, to habitat/species rarity, to the extent to which they are threatened throughout their range, or to their rate of decline. Various characteristics contribute to the potential importance of ornithological receptors within any study area, including:

- naturalness;
- species, sub-species or varieties that are rare or uncommon, either internationally, nationally or more locally, including those that may be seasonally transient;
- ecosystems and their component parts, which provide the habitats required by important species, populations and/or assemblages;
- endemic species or locally distinct sub-populations of a species;
- size of species population;
- species in decline;
- rich assemblages of species;
- large populations of species or concentrations of species considered uncommon or threatened in a wider context; and
- species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

1.2.3 The above example attributes are drawn together under the geographical population context, which is then defined through site-specific considerations. Guidance on EcIA[1] sets out categories of ecological/ornithological or nature conservation importance that relate to a geographical framework (e.g. international through to local) together with criteria and examples of how to place a site (defined by its ecological/ornithological attributes) into these categories. It is generally straightforward to evaluate sites or species populations designated for their international or national importance (as criteria for defining these exist e.g. SSSI), but for sites or populations of regional or local importance, criteria may not be easily defined. Where possible, the potential importance of an ornithological receptor in the Study Area has been determined within a geographical context using categories outlined in **Table 7.5.1**.

1.2.4 This is typically done using a 1 % geographical population threshold metric. It should be noted that there is no fundamental biological reason to take 1 % of a population as the threshold level for establishing the level of importance of a site. Nevertheless, this percentage is widely considered to be of value in developing measures that give an appropriate level of protection to populations and has gained acceptance on this basis throughout the world. The criterion was, for example, adopted by parties involved in the Ramsar Convention 1971. Thereafter, the 1 % level of national species totals has been taken as the basis of assessment in various countries, including Britain[2].

1.2.5 The ornithological importance afforded to a species within a site or study area, is determined by the geographical population context and can also be determined according to legislative status. Some ornithological receptors are subject to a general level of legal protection through e.g. the Wildlife and Countryside Act 1981 (as amended) and others under the Birds Directive. There is no clear guidance for conservation importance of ornithological receptors other than those of statutory designated site species. The importance of other species is based on professional judgement using the characteristics outlined above. The status of potentially important receptors, such as Scottish Biodiversity List (SBL) species and species with proportionally large populations within a study area, is also taken into consideration.

1.2.6 For the avoidance of doubt, species which appear on national lists e.g. Schedule 1 of the Wildlife and Countryside Act (1981 as amended) or the SBL, are not necessarily evaluated as of national importance simply by appearing on such a list. Importance evaluation must consider the number of individuals of a species within a defined geographical context/scale, i.e. how many of a particular species are likely to be affected by the Proposed Development and what proportion of the local/regional/national population it constitutes. Legal listing or protection is a separate but important consideration.

1.2.7 In summary, the importance evaluation of ornithological receptors takes into account a multitude of attributes and is carefully considered in a site/species specific manner for potentially important target ornithological receptors.

1.3 Criteria for Evaluating Potential Impacts and Effects

1.3.1 Once the importance of an ornithological receptor has been determined, the potential impacts on that receptor are considered in terms of magnitude, extent, duration, frequency and timing, reversibility, sensitivity and whether the impact would likely be positive (beneficial), negative (adverse) or neutral. These terms are clearly explained in EcIA guidance[1], and summaries are proved in **Table 7.5.1**.

[1] CIEEM. Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine Version 1.3 updated September 2024.

[2] Stroud, D.A., Mudge G.P. and Pienkowski, M.W. 1990. 'Protecting Internationally Important Bird Sites: A Review of EEC Special Protected Area Network in Great Britain'. Nature Conservancy Council, Peterborough, UK.

Table 7.5.1: Summary of assessment criteria used following CIEEM definitions			
Term	**Term Definition**	**Category**	**Category Definition**
Geographical Importance	Categories of ornithological or nature conservation importance that relate to a geographical framework.	International	For example; >1 % of European Community (EC) population/resource of habitat that are the considered internationally important (e.g. listed on Annex 1 of the Habitats Directive); and/or species or habitats named as a designating feature within an international designated site, e.g. SPA, Ramsar.
		National	For example; >1 % of national (UK/Scotland) population/resource of habitat listed on the SBL; and/or species or habitats named as a qualifying feature within a nationally designated site, e.g. SSSI; potentially, a species or high-quality habitat linking two (or more) nationally designated sites, which are designated for that feature.
		Regional	For example; >1 % of regional population/area of habitat; potentially, a species or high-quality habitat connected to a nationally important site, or forming a link with a nationally important site, that is designated for that feature; and/or species or habitats, that are not within a designated site, but are particularly diverse or at the edge of their range.
		Local	For example; commonplace and widespread species and habitats, which, despite their ubiquity, contribute to the ecological function of the local area (local habitat networks etc). Habitats and species considered to be of local importance.
Beneficial or Adverse	Positive and negative impacts and effects should be determined according to whether the change is in accordance with nature conservation objectives and policy.	Beneficial (Positive)	A change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. This may also include halting or slowing an existing decline in the quality of the environment.
		Adverse (Negative)	A change which reduces the quality of the environment e.g. destruction of habitat, habitat fragmentation, species population.
		Neutral	Impacts and effects can also be assessed as neutral.
Extent	The extent, or zone of influence, is the spatial or geographical area over which the predicted impact/effect may occur under a suitably representative range of conditions.	N/A	N/A
Magnitude	Refers to size, amount, intensity and volume. It should be transparently quantified if possible and expressed in absolute or relative terms e.g. the amount of habitat lost, percentage change to habitat area, percentage decline in a species population.	Major	Total/near total loss of a population/habitat due to mortality or displacement. Total/near total loss of breeding productivity in a population due to disturbance, e.g. ≥50 % of population/habitat affected.
		Moderate	Moderate reduction in the status or productivity of a population/habitat due to mortality or displacement or disturbance, e.g. 10-49 % of population/habitat affected.
		Minor	Small but discernible reduction in the status or productivity of a population/habitat due to mortality or displacement or disturbance, e.g. 1-9 % of population/habitat affected.
		Negligible	Very slight reduction in the status or productivity of a population due to mortality or displacement or disturbance. Reduction barely discernible, approximating to the 'no change' situation, e.g. <1 % population/habitat affected.
Duration	Defined in relation to ornithological characteristics (such as the life-cycle). Note the duration of an activity may differ from the duration of the resulting effect caused by the activity.	Short term	Up to c. two years.
		Medium term	Between c. two and five years.
		Long term	Between c. 5 years and the lifetime of the Proposed Development.
Frequency and Timing	The number of times an activity occurs will influence the resulting effect. For example, a single person walking a dog once will have very limited impact on nearby waders using a wetland habitat, but numerous dog walkers will subject the waders to frequent disturbance and could affect their fitness, breeding success, leading to displacement and knock-on effects on their ability to survive. The timing of an activity or change may result in an impact if it coincides with critical life-stages or seasons.	N/A	N/A
Reversibility	In some cases, the same activity can cause both reversible and irreversible effects.	Irreversible	An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of mitigating action being taken to reverse it.

Table 7.5.1: Summary of assessment criteria used following CIEEM definitions			
Term	**Term Definition**	**Category**	**Category Definition**
		Reversible	A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.
Likelihood	A level of confidence (whether the predicted impact is certain, likely, possible or unlikely) can be attached to a predicted effect.	N/A	N/A
Sensitivity	Behavioural sensitivity can differ between species and between individuals of the same species. Therefore, sensitivity is likely to vary with both the nature and context of the disturbance activity as well as the experience and even 'personality' of the species. Sensitivity also depends on the activity the species is undertaking and when it is doing it. For example, a bird is likely to be less tolerant of disturbance during the breeding season than at other times of year. Thus, sensitivity changes with both space and time.	High	Species occupying remote areas away from human activities or exhibiting strong and long-lasting reactions to disturbance events. Habitats that are considered to have a slow recovery time to disturbance.
		Medium	Species that appear to be warily tolerant of human activities or exhibiting short-term reactions to disturbance events. Habitats that are considered to have a moderate recovery time to disturbance.
		Low	Species occupying areas subject to frequent human activity and exhibiting mild and brief reaction to disturbance events. Habitats that are considered to have a quick recovery time from disturbance.

1.3.2 Once these factors are considered, the likely significant effect on ornithological receptors can be determined.

1.4 Determination of Significance

1.4.1 Significance is a concept related to the weight that should be attached to predicted effects when decisions are made. For the purposes of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for important ecological/ornithological features or for biodiversity in general[1]. There could be any number of possible impacts on potentially important receptors arising from a development. However, it is only necessary to describe in detail the impacts that are considered likely to be significant. Impacts that are either unlikely to occur, or if they did occur are unlikely to be significant, can be scoped out.

1.4.2 In the context of the EIA Regulations, each likely effect is evaluated and classified as either significant or not significant, using professional judgement, evidence and best practice guidance. In this assessment, an ecologically significant effect is defined as an "*impact on the structure and function of a defined site, habitat or ecosystem and the conservation status of habitats and species (including extent, abundance and distribution). Significant effects should be qualified with reference to an appropriate geographical scale*". Thus, the geographical terms of reference at which a predicted effect may be considered significant must also be defined (e.g. an effect on a species population evaluated to be of regional importance at a given site is likely to be either significant or not at the regional level). Effects can be considered significant at a wide range of scales from international to local.

1.4.3 There is often confusion over geographical context, potentially important receptors and quantifying predicted effects and best practice guidance has often struggled to articulate this clearly. For example, if a potentially important species appears on a conservation list e.g. the SBL and there is a predicted impact, the geographical context in which the receptor is found must be considered. Therefore, the simple presence of a species on the SBL within a proposed development area does not mean that likely effects are significant at the national (Scottish) level. For that to occur, the proposed development must have a significant effect on its national population[1].

1.4.4 There are a number of approaches for determining the significance of effects on ornithological features. This includes methods for scoring and ranking impacts on the basis of artificial/subjective criteria. Results are sometimes presented in the form of a matrix. A matrix approach is commonly used in EIA by disciplines other than ornithology and ecology to assign significant residual effects to categories. CIEEM guidance[1] avoids and explicitly discourages use of the matrix approach and categorisation for ornithology and ecology. Therefore, a matrix approach has not been adopted within this chapter, with a more discursive approach adopted instead, in accordance with CIEEM best practice guidance.

1.5 Favourable Conservation Status

1.5.1 A species' conservation status is taken as the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest (which for the purposes of the Birds Directive is the EU). While the term 'favourable conservation status' (FCS) is not used in the Birds Directive, EU court cases over recent years have progressively interpreted the concept as meaningful in a Birds Directive context. FCS has also been used more recently within the Environmental Liability Directive as the basis of a test of environmental damage to protected species (including birds) and habitats. NatureScot[3] advises on its use and context in relation to birds, where guidance is much more explicit than for other species and habitats. Conservation status is considered favourable where three tests are met:

- Population dynamics indicate that the bird species is maintaining itself on a long-term basis and is therefore likely to persist in the habitat it occupies;
- The natural range of the bird species is not being reduced, nor is it likely to be reduced in the foreseeable future; and
- There is (and would continue to be) a sufficiently large habitat area to maintain its populations on a long-term basis.

1.5.2 NatureScot recommends that the concept of FCS should be applied at the level of its Scottish population, to determine whether an impact is sufficiently significant to be of concern, noting that an adverse impact on a species at a regional scale may adversely affect its national conservation status. The FCS of important ornithological receptors should be maintained following a proposed development. Whilst considering a range of potential outcomes that could arise from the Proposed Development, the assessment reports the ornithological effects that are considered likely to be significant on the basis of evidence, standard guidance and professional judgement. It is these likely significant effects (often focussed around the concept of FCS) that the Applicant is obliged to report, and that the decision maker is obliged to consider.

1.6 Requirements for Mitigation

1.6.1 Policy and guidance including National Planning Framework 4 (NPF4), the Scottish Government Draft Planning Guidance for Biodiversity (2023) and best practice EcIA guidance e.g. CIEEM[1] identifies a hierarchy of mitigation for potential ecological impacts. This is a sequential process:

- Avoid.
- Minimise.
- Restore.
- Offset/compensate.
- Enhance.

1.6.2 The wording for the mitigation hierarchy differs between NPF4, the Draft Planning Guidance for Biodiversity and CIEEM best practice EcIA guidance, but the overall principles remain similar. It is worth noting that the wording of the EIA Regulations is that "'*mitigation measures' are taken to mean any features of the development and any measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment*".

1.6.3 The term 'mitigation hierarchy' is widely used throughout NPF4 illustrating its importance in planning policy, particularly the need to demonstrate that adverse impacts are first avoided and then, wherever possible, minimised. CIEEM EcIA guidance[1] states that "*Avoiding and/or minimising negative impacts is best achieved through consideration of potential impacts of a project from the earliest stages of scheme design and throughout its development*". This approach, to avoiding potential adverse impacts within a design layout, is sometimes described as 'embedded mitigation' or 'mitigation by design'. "*Mitigation by design is particularly beneficial as there is greater certainty that it will be delivered*".

1.6.4 There is now clear policy and guidance that development plans should not just try to avoid causing likely significant effects but aim to provide biodiversity enhancement. Best practice EcIA guidance and NPF4 recommends seeking to provide overall benefits for important biodiversity over and above design requirements for avoidance, minimisation or compensation. The Scottish Government Planning Guidance for Biodiversity stated that in order for biodiversity to be 'enhanced' it would need to be demonstrated that it would be in an overall better state than before intervention, and that this would be sustained in the future.

[3] NatureScot (2025). Assessing the significance of impacts on bird populations from onshore wind farms that do not affect protected areas.

1.7 Assessment of Residual Effect Significance

1.7.1 According to CIEEM EcIA guidance[1], it is only essential to assess and report significant residual effects that remain after mitigation measures have been taken into account. However, it is good practice for the EcIA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation, particularly:

- where the mitigation proposed is experimental, unproven or controversial; or
- to demonstrate the importance of securing the measures proposed through planning conditions or obligations.

1.8 Cumulative Effects

1.8.1 Cumulative effects can result from individually small effects that can potentially create significant effects in combination. Cumulative negative effects are considered important in EcIA as ornithological features may be already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause further or irreversible decline. Cumulative negative effects can also make habitats and species more vulnerable or sensitive to change. NatureScot[4] provides specific cumulative impact assessment guidance for ornithological receptors, the key principle of which is to focus on any significant effects and in particular those that are likely to influence the outcome of the consenting process.

[4] NatureScot (2025). Assessing the cumulative impacts of onshore wind farms on birds.