March 2025

Glen Earrach Pumped Storage Hydro

Environmental Impact Assessment Report

Volume 5: Appendices
Appendix 7.1: Method for Ecological Impact Assessment

Glen Earrach Energy Ltd

Glen Earrach AECOM

Quality information

Prepared by	Checked by	Verified by	Approved by
Nick Dadds MCIEEM Jenny Davidson ACIEEM	Tony Marshall CEcol MCIEEM	Tony Marshall CEcol MCIEEM Nick Dadds MCIEEM	Victoria Deacon MCIEEM
Associate Director Senior Ecologist	Technical Director	Technical Director Associate Director	Principal Environmental Scientist

Issue History

Issue	Issue date	Details	Authorized	Name	Position
1	March 2025	Submission	DL	David Lee	Technical Director – Renewable Energy

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1. Introduction

1.1.1 This appendix accompanies **Chapter 7: Terrestrial Ecology, Chapter 8: Ornithology and Chapter 9: Aquatic & Marine Ecology** of the EIAR **(Volume 2: EIA Main Report)**. It describes the method used for the assessment of potential impacts from the Proposed Development, both in isolation and cumulatively with other plans or projects, on ecological features. Throughout this appendix, the term 'ecological feature' refers to all sites designated for nature conservation, habitats and plant and animal species. The method adopted follows the guidelines for Ecological Impact Assessment (EcIA) published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2024)[1]. These guidelines have been endorsed by, amongst others, the Institute of Environmental Management and Assessment (IEMA), the Wildlife Trusts, the Association of Local Government Ecologists (ALGE) and NatureScot.

1.1.2 The aims of EcIA are to:

- Identify relevant ecological features which may be impacted;
- Provide a scientifically rigorous and transparent assessment of the likely ecological impacts and effects of the Proposed Development. Impacts and effects may be beneficial (i.e. positive) or adverse (i.e. negative);
- Facilitate scientifically rigorous and transparent determination of the consequences of the Proposed Development in terms of national and local policies relevant to nature conservation and biodiversity, where the level of detail provided is proportionate to the scale of the Proposed Development and the complexity of its potential impacts; and
- Set out what steps will be taken to adhere to legal requirements relating to the relevant ecological features concerned.

1.1.3 The principal steps in the CIEEM approach to EcIA are summarised below:

- Baseline conditions are determined through targeted desk study and field survey to identify ecological features that are both present and might be affected by the Proposed Development (both those present at the time works begin, and for comparison, those predicted to be present at a set time in the future);
- The importance of identified ecological features is evaluated to place their relative biodiversity and nature conservation value into a geographic context, determining those that need to be considered further within the impact assessment;
- The potential impacts of the Proposed Development on relevant ecological features are described, taking into account established best practice, legislative requirements and embedded design measures;
- The likely effects (adverse or beneficial) on relevant ecological features are assessed, and where possible quantified;
- Measures to avoid or reduce any predicted significant effects, if possible, are developed in conjunction with other elements of the design (including mitigation for other environmental disciplines);
- Any residual effects of the Proposed Development and their significance are reported; and
- Scope for compensation and enhancement measures is considered. Residual effects are re-assessed once compensatory/enhancement measures have been developed.

1.1.4 Throughout the assessment, the professional judgement of experienced ecologists is applied as necessary.

1.1.5 In line with the CIEEM guidelines, the terminology used within the EcIA draws a clear distinction between the terms 'impact' and 'effect'. For the purposes of the EcIA, these terms are defined as follows:

- Impact – actions result in changes to an ecological feature. For example, tree felling activities leading to the loss of a bat roost;

[1] CIEEM (2024). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.3 – Updated September 2024. Chartered Institute of Ecology and Environmental Management, Winchester

- Effect – the outcome resulting from an impact acting upon the conservation status or structure and/or function of an ecological feature. For example, killing / injury of bats and reducing the availability of breeding habitat as a result of the loss of a bat roost may lead to an adverse effect on the conservation status of the population concerned.

2. Assessing the Importance of Ecological Features

2.1.1 Only those ecological features that are 'important' and that could be significantly affected by the Proposed Development require detailed assessment – "*it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable"* (CIEEM, 2024)[1]. This is consistent with the Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, which require investigation of likely significant effects.

2.1.2 Despite the above, this does not mean that efforts should not be made to safeguard wider biodiversity (CIEEM, 2022), and national policy documents emphasise the need to minimise impacts on and provide benefits for biodiversity from development.

2.1.3 To support focussed EcIA there is a need to determine the importance of the specific ecological features identified through the desk studies and field surveys carried out for the Proposed Development. The approach taken when establishing the importance of ecological features needs to be robust as it provides much of the rationale for the identification and further assessment of relevant ecological features. Factors which can determine the relative importance of an ecological feature can include:

- Naturalness;
- Animal or plant 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;
- Habitats that are rare or uncommon;
- Habitats that are effectively irreplaceable;
- Habitat diversity;
- Size of habitat or species population;
- Habitat connectivity and/or synergistic associations;
- Habitats and species in decline;
- Rich assemblages of plants and animals;
- Large populations of species or concentrations of species considered uncommon or threatened in a wider context;
- Plant communities (and their associated animals) that are considered to be typical of valued natural / semi-natural vegetation types, including examples of naturally species-poor communities; and
- Species on the edge of their range, particularly where their distribution is changing as a result of global trends and climate change.

2.1.4 Where available, relevant guidance is used to inform the importance of ecological features. Professional judgement is also used as appropriate when assigning importance, particularly where habitats or species are poorly known, or where guidance is lacking. Ecological features may be identified that are not included in lists of notable habitats or species, but that can be considered important on the basis of expert judgement (e.g. because of their local rarity, or because they enable effective conservation of other important features) (CIEEM, 2024)[1].

2.1.5 Requirements to comply with legislation are stated during the assessment, but legislative protection or priority listing does not necessarily translate to importance. For example, a transitory roost of a single bat would not be

afforded the same importance as a regularly-occurring maternity roost (although legal obligations must still be met), and areas of priority habitat could be unfavourably small or in poor condition and not practically restorable.

2.1.6 The importance of ecological features is described within a geographic scale. Examples of the types of ecological features which might fall into various importance categories are given in **Table 1 Importance of Ecological Features**, below, which is adapted from CIEEM (2024)[1].

2.1.7 For the purposes of this assessment, the geographical level of 'National' means Scotland, 'Regional' is defined as the area encompassed by the Northern Highlands Natural Heritage Zone (NHZ 7)[2], and 'Local' as the area within 10 km of the Proposed Development.

Table 1-1 Importance of Ecological Features

Importance	Example of ecological feature
International	• Special Protection Area (SPA), Special Area of Conservation (SAC) or Wetland of International Importance (Ramsar site), or site satisfying criteria for such designation, or feature essential to maintaining such sites. • Sustainable area (or part of a larger sustainable area) of best examples of Annex I habitat[1]. • A regularly-occurring, internationally-significant population (e.g. 1% of the international population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of internationally important species listed on Annex 1 of the Birds Directive[2] or Annex II of the Habitats Directive.
National	• Nationally designated site (or proposed site), or site satisfying criteria for such designation (e.g. Site of Special Scientific Interest (SSSI). • Sustainable area of good quality Annex I habitat not deemed to be of international importance, or of a national priority habitat, which is a significant proportion of the national resource. • Regularly-occurring nationally significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species protected under national legislation or identified as being of national importance for conservation (e.g. through listing on the Scottish Biodiversity List (SBL)). • A site supporting a regularly-occurring, nationally-significant population.
Regional	• Regionally designated nature conservation site (or proposed such site). • Sustainable area of Annex I habitat or national priority habitat not deemed to be of higher importance (e.g. lower quality, highly fragmented, small and/or low restoration potential). • Regularly-occurring regionally significant population (e.g. 1% of regional resource, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species protected by legislation or identified as being a regional priority for conservation (e.g. through a Local Biodiversity Action Plan). • A site supporting a regularly-occurring, regionally-significant population.
Local	• Priority habitat of insufficient size or quality for higher importance, or degraded with low restoration potential. • Habitat providing significant biodiversity or important ecological corridors in a local context. • Small sustainable population of notable species not qualifying for higher importance or uncommon locally. • Common, heavily managed or modified habitat. • Common and widespread species.
Negligible	• Common, heavily managed or modified habitat. • Common and widespread species.

[1] Habitat listed on Annex I of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (more commonly known as the 'Habitats Directive').

[2] Directive 2009/147/EC on the conservation of wild birds (more commonly known as the 'Birds Directive').

[2] SNH (2002). Natural Heritage Zones: A National Assessment of Scotland's Landscapes. Available from: https://digital.nls.uk/pubs/e-monographs/2020/216666906.23.pdf.

3. Describing Potential Impacts

3.1.1 Impacts may occur during the construction, operation, decommissioning and restoration phases of a development. They may be direct or indirect (also termed 'secondary'). Direct impacts are attributable to an action associated with a development. Indirect impacts are often produced away from a development or as a result of other initial impacts.

3.1.2 Likely impacts are characterised using those parameters below that are necessary to understand them:

- Direction – whether the impact will have a beneficial or adverse effect;
- Magnitude – the 'size', 'amount' or 'intensity' of an impact, described in quantitative terms as far as possible;
- Extent – the spatial or geographical area or distance over which the impact or effect occurs;
- Duration – the time over which an impact is expected to last prior to recovery or replacement (if possible) of the resource or feature. Where appropriate, ecological aspects such as lifecycles are considered. The duration of an effect may be longer than the duration of an activity or impact;
- Timing and frequency – timing is important since an impact might not occur if it avoids critical seasons or life stages. Frequency considers activity repetition, which may have greater impact; and
- Reversibility – whether the impact is temporary or permanent. A temporary impact is one from which recovery is possible or for which effective mitigation is possible and enforceable. A permanent impact is one from which recovery is either not possible, or cannot be achieved within a reasonable timescale (in the context of the feature being assessed).

3.1.3 Magnitude is independent of the value of an ecological feature. Impacts / effects can be temporary or permanent, of varying duration (short-term being less than five years, medium-term between 5-15 years, long-term 15-30 years and permanent more than 30 years), adverse or beneficial.

4. Determining Significance of Effect

4.1.1 Potential impacts on relevant ecological features are assessed and a judgement reached on whether or not the resultant effect on the 'conservation status' or structure and function is likely to be significant. This process takes into consideration the characteristics of the impact, the sensitivity of the ecological feature concerned, and the geographic scale at which the feature is considered important.

4.1.2 CIEEM (2024)[1] states that, for habitats, "*conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area*".

4.1.3 NatureScot and CIEEM define the conservation status of a species as "*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*"[3]. A species' conservation status is considered to be 'favourable' when:

- Population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats;
- The natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future; and
- There is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis.

4.1.4 CIEEM (2024)[1] states that "*for the purpose of EcIA a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' (i.e. relevant ecological*

[3] SNH. (2018). Assessing Significance of Impacts from Onshore Windfarms on Birds out with Designated Areas. Version 2 – February 2018.

features) or for biodiversity in general…In broad terms, significant effects encompass impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)".

4.1.5 The scale of the significance of an effect is assessed by determining whether the ecological integrity of a site or ecosystem, or the conservation status of a species, will be affected at the geographic levels described in **Table 1-1 Importance of Ecological Features**, above. An effect could occur at a lower geographic level than the importance assigned to that particular ecological feature (for example, an effect on a habitat or population assigned national importance may be slight and not consequential at the national level). These assessments are based on quantitative evidence where possible, and as necessary through the professional judgement of experienced ecologists.

4.1.6 Initially, the assessment of effects does not consider mitigation (avoidance or reduction) or compensation measures, except where these are explicitly embedded into the design of the Proposed Development or where they are industry-standard good practice measures required to comply with other non-ecological legislation. The assessment of residual effects takes such measures into account, with the aim that, wherever possible, residual effects are not significant or are significant at a lower geographic level than the unmitigated effects (unless beneficial).

4.1.7 Consideration is given to cumulative effects, since effects acting in-combination may have a cumulative effect exceeding that of the separate effects. Cumulative effects may arise from a combination of effects from the Proposed Development itself ('intra-project', e.g. effects at the construction and operation stages), or the combined effects from different developments ('inter-project').

4.1.8 In the broader context of the EIAR for the Proposed Development, effects on an ecological feature predicted to be significant at the Regional, National or International levels are considered to be 'Significant', whereas those predicted to be significant only at the Local or Negligible levels are considered to be 'Not Significant'.

5. The Mitigation Hierarchy

5.1.1 The identification and specification of mitigation proposals in this assessment has been conducted with regard to the principles of the mitigation hierarchy:

- Avoid ecological features where possible;
- Reduce (minimise) the magnitude of the potential impact e.g. through iterative design and/or advanced commitment to sensitive methods or timing of working (termed embedded mitigation);
- Mitigate the potential effect through the application of additional proven measures, such that the residual effect realised is reduced in magnitude (non-embedded mitigation); and
- Compensate for significant residual effects, e.g. by providing suitable habitats elsewhere. Proposals should achieve appropriate compensation in a reasonable timeframe and be legally enforceable.

5.1.2 This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. Where it is reasonably practicable to do so then attempts have been made to avoid potential impacts. Where impacts cannot be avoided then efforts have been made to limit the magnitude of the potential impact and to mitigate the resultant effects through the provision of appropriate measures. Where effects cannot be mitigated to a level where they are not significant then compensatory measures have been employed to (as far as is reasonably possible) offset any remaining adverse effects.

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