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Red John Pumped Storage Hydro Scheme

Volume 5, Appendix 6.7: Method for Assessment of Ecological Impacts

ILI (Highlands PSH) Ltd.

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Quality Information

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Table of Contents

Tables

Appendix 6.7 Method for Assessment of Ecological Impacts

6.1 Introduction

6.1.1 The assessment of potential impacts from the Red John Pumped Storage Hydro Scheme (hereafter referred to as the 'Development') on ecological features broadly follows the guidelines for Ecological Impact Assessment (EcIA) published by the Chartered Institute of Ecology and Environmental Management (CIEEM) (Ref 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 Scottish Natural Heritage (SNH). The principal steps are summarised below:

- Ecological features that are both present and might be affected by the Development are identified (both those likely to be present at the time works begin, and for the sake of comparison, those predicted to be present at a set time in the future) through a combination of targeted desk-based study and field survey work to determine the relevant baseline conditions;
- The importance of the identified ecological features is evaluated to place their relative biodiversity and nature conservation value into geographic context, and this is used to define the relevant ecological features that need to be considered further within the impact assessment process;
- The changes or perturbations predicted to result as a consequence of the Development (i.e. the potential impacts) that have the potential to affect relevant ecological features are identified and their nature described. Established best practice, legislative requirements or other incorporated design measures to minimise or avoid impacts are also described and are taken into account;
- The likely effects (beneficial or adverse) on relevant ecological features are then assessed, and where possible quantified;
- Measures to avoid or reduce any predicted significant effects, if possible, are then developed in conjunction with other elements of the design (including mitigation for other environmental disciplines). If necessary, measures to compensate for effects on features of nature conservation importance are also included;
- Any residual effects of the Development are reported; and
- Scope for ecological enhancement is considered.

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

6.1.3 This appendix serves as accompanying information to Chapter 6: Terrestrial Ecology, Chapter 7: Aquatic Ecology and Chapter 8: Ornithology (Volume 2), and covers the range of ecological and ornithological features considered in those chapters.

6.2 Assessing the Importance of Ecological Features

6.2.1 Only those ecological features that are 'important' and could be significantly affected by the project 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*" (Ref 1). This is consistent with The Town and Country Planning (Environmental Impact Assessment) (Scotland) Regulations 2017, which require investigation of likely significant effects.

6.2.2 An ecological feature is a site, habitat, or species of nature conservation value. Valuation of ecological features is subject to professional judgement, based on factors including:

- Rarity, endemicity, mobility and geographic range (particularly if this changing);
- Size / extent (e.g. large populations), rate of decline and vulnerability;
- Typicalness, species-richness, habitat diversity and connectivity / fragmentation;
- Value to other features (e.g. habitat which supports notable species); and
- Potential for restoration.

6.2.3 Existing data and criteria are considered when determining the importance of ecological features. Where these are lacking, it is necessary to apply professional judgement.

6.2.4 Valuation is not automatically affected by legislative protection or priority listing. For example, badger *Meles meles* is a strictly protected species but may only be of Local value if widespread and common (though legal requirements must still be met). Similarly, Species / Habitat Action Plans are aids to conservation and do not imply specific value since occurrences may be fragmented, atypical or otherwise in unfavourable condition. Thus, a habitat may be a national or local priority but valuation considers the amount and quality so that small areas of poor-quality habitat are not over-valued.

6.2.5 The importance of ecological features is described within a geographic scale. In this assessment, the value of ecological features has been translated from CIEEM categories to conform with the terminology used throughout the Environmental Impact Assessment (EIA). The value of ecological features adopted is shown in Table 6.1.

6.2.6 When considering geographic scale, for the purposes of this assessment 'Regional' is defined as the area encompassed by the Inverness and Nairn Local Biodiversity Action Plan (LBAP) and 'Local' is the area within 5 km of the Development. The Inverness and Nairn LBAP area has been used to define 'Regional' importance rather than the entire Highland district as the very large size of this area may have resulted in under-valuing of ecological features.

Table 6.1 Value of Ecological Features

Value[1]	Examples of Types of Ecological Feature
Very High (International)	• Internationally designated site (or candidate / proposed international site). • Regularly occurring Globally Threatened species. • Sustainable area (or part of a larger sustainable area) of Annex I habitat[2]. • A regularly occurring, sustainable population of internationally important species listed on Annex I of the Birds Directive[3] or Annex II of the Habitats Directive.
High (National)	• Nationally designated site (or site considered worthy of such designation). • Sustainable area of a national priority habitat which is a significant proportion of the resource. • Sustainable nationally-significant population (e.g. 1% of national resource) or site supporting one.
Medium (Regional)	• Sustainable area of a priority habitat which is a significant proportion of the resource. • Sustainable regionally-significant population (e.g. 1% of regional resource) or site supporting one. • Viable areas of Inverness and Nairn LBAP Priority Habitat or small areas of such habitat which are essential to maintain the viability of a larger whole. • A regularly occurring regionally significant population of a Priority Species of the Inverness and Nairn LBAP. • Regularly occurring population of bird species on the Red List of Birds of Conservation Concern (BoCC) (Ref 2).
Low (Local)	• Priority habitat not large enough for higher value, or degraded with low restoration potential. • Habitat or population which appreciably enriches the local resource. • Small sustainable population of a notable species not qualifying for higher valuation. • Regularly occurring population of bird species on the Amber List of BoCC.
Negligible (Site)	• Common, heavily managed or modified habitat, and common and widespread species.

[1] Corresponding CIEEM categories of value are provided in brackets.
[2] 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 (the 'Habitats Directive').
[3] Bird species listed on Annex I of Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive').

6.3 Identifying Impacts and Determining Magnitude

6.3.1 Impacts may occur during the construction, operation and decommissioning 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.

6.3.2 Likely impacts are characterised using those parameters below that are necessary to understand the particular ecological effect:

- 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 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).

6.3.3 Professional judgement is used to quantify the magnitude of impacts using the criteria described in Table 6.2.

Table 6.2 Criteria for Determining Magnitude

Magnitude	Definition
High	Total loss or major alteration to key elements / features of the baseline conditions such that post-Development character / composition will be fundamentally changed.
Medium	Loss or alteration to one or more key elements / features of the baseline conditions such that post-Development character / composition will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material. The underlying character / composition of the baseline condition will be similar to the pre-Development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

6.3.4 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 being between five and 15 years, long-term being 15 – 25 years and permanent being more than 30 years), adverse or beneficial.

6.4 Determining Significance

6.4.1 Under CIEEM (Ref 1) guidance there is a distinction between impact and effect. An impact is an action on an ecological feature (e.g. loss of a bat roost). An effect is the outcome of that impact on an ecological feature (e.g. effect of bat roost loss on the conservation status of the bat species).

6.4.2 Consideration is given to conservation objectives, whether processes within sites will be altered, effects on habitats and species population size / viability, and whether these will have an effect on conservation status. Conservation status includes the abundance and distribution of species, and the extent, structure and function, and typical supported species of habitats.

6.4.3 An effect (positive or negative) is significant at a specified geographical level if it affects the ecological integrity of a site or ecosystem or the conservation status of a species or habitat

at that geographical level. If not significant at the level it was considered important, an effect could be significant at a lower geographic level (for example, an effect on a national priority species may not be significant to the national population). These assessments are based on quantitative evidence where possible, and as necessary through the professional judgement of experienced ecologists.

6.4.4 Initially, the effect significance does not consider mitigation (avoidance or reduction) or compensation measures (except where these are explicitly embedded into the design). The residual effect significance 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.

6.4.5 The significance of an effect is largely a product of the interaction between the value of the ecological feature and the magnitude of impact upon it, moderated by professional judgement. Table 6.3 below provides the matrix for determining significance of ecological effects. The greater the ecological value or magnitude of impact, the more significant the effect.

6.4.6 Effects defined in Table 6.3 as Major or Moderate are considered to be significant in this assessment.

Table 6.3 Approach to Assessment of Effects

	Value				
Magnitude	**Very High**	**High**	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Moderate	Minor
Medium	Major	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Minor	Negligible	Negligible	Negligible

6.4.7 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 Development itself (e.g. effects at the construction and operation stages), or the combined effects from different developments.

6.5 References

Ref 1. CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

Ref 2. Eaton, M., Aebischer, N., Brown, A., Hearn, R., Lock, L., Musgrove, A., Noble, D., Stroud, D. and Gregory, R. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds* **104**, pp 708 – 746.

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