

APPENDIX V2-4.2: ASSESSMENT METHODOLOGY

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1. ASSESSMENT METHODOLOGY

1.1 Introduction

1.1.1 This Appendix describes the methodologies for determining baseline conditions and assessing the predicted impacts and the significance of the predicted residual effects on ecological features.

1.1.2 The methodologies described here refer only to the assessment of predicted impacts and effects relevant to the Environmental Impact Assessment under The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. The methodology relevant to the Habitats Regulations Appraisal under The Conservation of Habitats and Species Regulations 2017 (“the 2017 Habitats Regulations”) is detailed within **Appendix V2-4.7: Kinloch and Kyleakin Hills Special Area of Conservation Shadow Habitats Regulations Appraisal**.

1.1.3 The area in which the Proposed Development would be sited is shown on **Figure V1-3.1a-qq: Proposed Development** and includes areas for all temporary and permanent infrastructure, including working corridors, as well as the proposed operational corridor (within woodland areas). The area within this boundary is referred to as ‘the Site’. The Site extends for approximately 160 km from Ardmore Substation in the northwest of Skye, to Fort Augustus Substation on the mainland.

1.2 Determining Baseline

Desk Study

1.2.1 A desk study was undertaken to collate available ecological information in relation to the Site and surrounding environment. This comprised a search of available online datasets and desk study resources, and consultation with conservation organisations. The following data sources were considered as part of the determination of scope of baseline surveys and assessment:

- National Biodiversity Network (NBN) Atlas Scotland¹ for protected or notable species records within 5 km buffers of the Site from the last 15 years (i.e. 2007 and onwards);
- NatureScot Sitelink² for designated site information within 5 km of the Site;
- Ancient Woodland Inventory (AWI) (Scotland) for ancient woodland sites within 5 km of the Site³;
- Scotland’s Environment map⁴ for the Carbon and Peatland Map 2016;
- SEPA Water Environment Hub⁵ for watercourse classification;
- Highland Biodiversity Action Plan (BAP)⁶;
- Skye and Lochalsh Local BAP⁷;
- Saving Scotland’s Red Squirrels website⁸ for local species records and Priority Areas for Red Squirrel Conservation;
- Deer Distribution Survey results by the British Deer Society⁹;
- Kinloch Hills and Broadford Land Management Plan 2019-2029¹⁰ for habitat information in relation to Section 3;

¹ <https://scotland.nbnatlas.org> [Accessed March 2022]

² <https://sitelink.nature.scot/map> [Accessed February 2022]

³ <https://data.gov.uk/dataset/c2f57ed9-5601-4864-af5f-a6e73e977f54/ancient-woodland-inventory-scotland> [Accessed February 2022]

⁴ www.environment.gov.scot/maps/scotlands-environment-map/ [Accessed February 2022]

⁵ www.sepa.org.uk/data-visualisation/water-environment-hub/ [Accessed February 2022]

⁶ Highland Nature (2021). Biodiversity Action Plan 2021-2026 (Draft). Available at: <https://www.highlandenvironmentforum.info/biodiversity/action-plan/> [Accessed February 2022]

⁷ Skye and Lochalsh Biodiversity Group (2003). The Skye and Lochalsh Biodiversity Action Plan. Available at: <https://www.cbd.int/doc/nbsap/sbsap/gb-sbsap-scotland-skye-lochalsh-en.pdf>

⁸ <https://scottishsquirrels.org.uk/squirrel-sightings/> [Accessed March 2022]

⁹ <https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/> [Accessed April 2022]

¹⁰ Forestry and Land Scotland (2019). Kinloch Hills and Broadford Land Management Plan 2019-2029.

- Skye and Lochalsh Environment Forum website¹¹;
- Skye and Lochalsh Rivers Trust website¹²;
- Skye and Wester Ross Fisheries Trust 2020 review¹³;
- data recorded by Ecological Clerk of Works (ECoW) during ground investigation (GI) works, including records of protected species and assessment of watercourse habitat suitability for Freshwater Pearl Mussel (FWPM) and fish spawning at crossing locations;
- relevant reports including: SSEN (2018). Results of Protected Species Surveys (Otter) through the Kyleakin and Kinloch Hills Special Area of Conservation and Site of Special Scientific Interest. Fort Augustus – Skye Project, and Heritage Environmental Limited (HEL) (2018). Quoich to Broadford (QB1) 132 kV OHL Step Bolt Replacement Project. Otter Survey: Towers 54 – 87. A Report to Cnoclee Limited;
- incidental/anecdotal information from landowners; and
- relevant scientific literature on protected species, habitats distribution and conservation status etc.

Field Surveys

1.2.2 The following field surveys were undertaken between 2018 and 2022 to further establish the baseline ecological conditions at the Site (plus appropriate survey corridors as detailed below) to inform the assessment, and were undertaken in line with standard methodologies and best practice guidance:

- National Vegetation Classification (NVC) surveys, incorporating Phase 1 habitat characterisation, across the survey area (generally covered a 300 m survey corridor around the proposed alignment of the OHL or underground cable and associated new tracks, and a 200 m survey corridor for existing tracks and paths to be upgraded¹⁴) (**Figures V2-4.3: NVC Survey Area and Results**);
- protected species surveys focusing on badger (*Meles meles*), red squirrel (*Sciurus vulgaris*), water vole (*Arvicola amphibius*), otter (*Lutra lutra*), pine marten (*Martes martes*) and bats within a 100 m survey corridor around the OHL or underground cable alignment (i.e., 50 m survey corridor from the centreline) and associated new tracks, including a further survey corridor of 30 m for bats and red squirrel, 100 m for badger, pine marten and water vole and 200 m for otter, where suitable habitat is present e.g. along watercourses for otter (**Figures V2-4.4: Protected Species Survey Area and Results**); and
- incidental records of other protected species (such as signs or features of particular importance (i.e. potential signs of wildcat (*Felis silvestris*), or potential hibernacula for reptile)), notable species, or invasive non-native species, were also recorded during field surveys (**Figures V2-4.4: Protected Species Survey Area and Results**).

1.2.3 The full details of survey methods and results are provided within **Appendix V2--4.3: NVC and Habitats Survey Report** and **Appendix V2--4.4: Protected Species Survey Report**, with survey areas and results shown on **Figure V2-4.3: NVC Survey Area and Results** and **Figure V2-4.4: Protected Species Survey Area and Results**.

1.2.4 Surveys for great crested newt (*Triturus cristatus*) and beaver (*Castor fiber*), were scoped out due to the species being outwith the known species range and a lack of suitable habitat (see **Appendix V2-4.3: Protected Species Survey Report** for further information). Surveys for badger, red squirrel, wildcat and water vole were

¹¹ <https://www.slef.org.uk/> [Accessed April 2022].

¹² <https://slrt.org.uk/> [Accessed April 2022].

¹³ Skye and Wester Ross Fisheries Trust (2020) Review September 2020. Available at: <https://www.wrft.org.uk/habitats/home.cfm> [Accessed May 2022].

¹⁴ In many instances the survey corridors are notably larger than the distances specified here, due to the amalgamation of several survey visits to account for earlier iterations of the Proposed Development's design, layout, and route option / alignments.

scoped out of field surveys on the Isle of Skye (Sections 0, 1, 2 and 3) due to the survey area being located outwith the known range or distribution of these species (as per Mathews *et al.* (2018)¹⁵.

Watercourse Crossing Fish Habitat Survey

- 1.2.5 Fish habitat surveys were carried out at proposed underground cable watercourse crossings within Sections 2 and 6 due to the larger nature of the watercourses in these sections, greater suitability for salmon¹⁶ and potential disturbance risks related to the installation of the underground cable which is proposed for these sections only (see also consultation response from the Ness District Salmon Fisheries Board in **Volume 1, Chapter 6: Scope and Consultation**). Fish habitat surveys were scoped out of other sections (0, 1, 3, 4, 5) due to the minor (mostly shallow and peaty) and generally less suitable nature of water courses for salmon as identified during habitat suitability surveys during GI ECoW works and also confirmed through the description of watercourse crossings in **Appendix V2-6.2: Schedule of Permanent Watercourse Crossings**.
- 1.2.6 Ten watercourse crossings were surveyed in Section 2, as well as two sections of watercourse where they are close to and down-slope of the proposed underground cable. Three watercourse crossings were surveyed on the Invervigar Burn in Section 6, as well as approximately 3 km of the Invervigar burn and its headwater tributaries where it is close to the proposed underground cable.
- 1.2.7 The surveys involved gathering data on the suitability of aquatic habitats for different life stages of salmon and trout, due to substrate size and cover, as well as any potential barriers to migratory fish. The suitability of habitat for European eel was also assessed. Detailed survey methods, results and figures are included in **Appendix V2-4.5: Watercourse Crossing Fish Habitat Survey Report**.

Bryophyte and Lichen Assemblage Survey

- 1.2.8 Additional surveys were also undertaken in the Kinloch and Kyleakin Hills SAC/SSSI in Section 3 to gather detailed information on important bryophyte and lichen assemblages which are Notified Natural Features of the SSSI and important components of the western acidic oak woodland qualifying habitat of the SAC.
- 1.2.9 Detailed bryophyte (i.e., mosses, liverworts and hornworts) and lichen surveys in Section 3 were carried out in April 2022 focused on where the route falls within the boundary of the Kinloch and Kyleakin Hills SAC and SSSI. The survey covered a 100 m survey corridor for the OHL and a 60 m survey corridor for proposed new and upgraded access tracks. Further survey method details are included in **Appendix V2-4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Report** with the survey area shown on **Figure V2-4.5: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Area and Results**.

1.3 Methodology for the Assessment of Significant Effects

- 1.3.1 The significance of the predicted effects has been assessed for the Proposed Development considering the spatial and temporal magnitude of the predicted impacts and the sensitivity of important ecological features.
- 1.3.2 The assessment method follows the process set out in CIEEM (2018)¹⁷, which is in line with the *Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017*, referred to hereafter as the 'EIA Regulations'.

¹⁵ Mathews F, Kubasiewicz LM, Gurnell J, Harrower CA, McDonald RA, Shore RF. (2018) A Review of the Population and Conservation Status of British Mammals. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. ISBN 978-1-78354-494-3

¹⁶ SEPA, Fisheries Research Services, SNH (Nature Scot) Scottish Executive (Scottish Government) Managing River Habitat for Fisheries. A guide to best practice. https://www.sepa.org.uk/media/151323/managing_river_habitats_fisheries.pdf

¹⁷ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. CIEEM, Winchester

1.3.3 The assessment involves the following process:

- Identification of the potential impacts of the Proposed Development on ecological features, including both adverse and beneficial;
- considering the likelihood of occurrence of potential impacts;
- defining the nature conservation value and conservation status of the ecological features present to determine sensitivity;
- establishing the magnitude of change associated with the potential impact (both spatial and temporal);
- based on the above information, making a professional judgement as to whether or not the resultant predicted effect would be significant in terms of the EIA Regulations;
- if a predicted effect is determined to be significant, measures to avoid or reduce the significance of effects are considered;
- considering opportunities for enhancement where appropriate; and
- confirming residual predicted effects after considering mitigation (including enhancement) and, in the event the remaining residual effects are assessed as significant, considering appropriate proposals for compensation.

Valuing Ecological Features

1.3.4 The importance of ecological features for their nature conservation value is defined on the basis of the geographic context given in **Table 1.1: Approach to Valuing Ecological Features** (which follows CIEEM guidance¹⁷).

1.3.5 Determination of the level of importance of ecosystems, habitats and species is based on professional judgement and a combination of factors, such as level of protection, rarity, conservation status, population trends, and quality/extent of the feature on Site. Published evaluation criteria (e.g. the Scottish Biodiversity List (SBL)¹⁸, JNCC on selection of biological Sites of Special Scientific Interest, SSSIs¹⁹) are used where relevant.

1.3.6 Attributing a value to an ecological feature is generally straightforward in the case of designated sites, as the designations themselves are normally indicative of an importance level. For example, a Special Area of Conservation (SAC) designated under the Habitats Directive is implicitly of European (International) importance. In the case of protected species, assigning value is less straightforward as contextual information about distribution and abundance is fundamental, including trends based on historical records. This means that even though a species may be protected through legislation at a national or international level, the value of the population on site may be quite different (e.g. the Site population may consist of a single transitory animal, which within the context of a thriving local/regional/national population of a species, is therefore of local or regional value rather than national or international).

1.3.7 As per CIEEM (2018)¹⁷ guidance, it is not necessary to carry out detailed assessment on features that are sufficiently widespread, unthreatened, and resilient to effects of the Proposed Development. Ecological features affected by the Proposed Development and deemed to be of at least Local importance are termed Important Ecological Features (IEFs) and are taken forward for assessment.

¹⁸ <https://www.nature.scot/doc/scottish-biodiversity-list> [Accessed January 2022]

¹⁹ <http://jncc.defra.gov.uk/page-2303> [Accessed January 2022].

Table 1.1: Approach to Valuing Ecological Features²⁰

Importance	Description
International/European	Internationally designated site (e.g. SAC) or undesignated site meeting criteria for international designations, or qualifying species whose presence contributes to the maintenance of such a site.
	Species present in internationally important numbers (>1% of biogeographic populations).
National (UK)	A nationally designated site (SSSI, or a National Nature Reserve (NNR)), or sites meeting the criteria for national designation or qualifying species whose presence contributes to the maintenance of such a site.
	Species present in nationally important numbers (>1% UK population).
Regional	Areas of a key habitat type(s) identified in the Highland BAP ⁶ .
	Species present in regionally important numbers (>1% of Natural Heritage Zone or relevant biogeographic population).
	Areas of key habitat(s) falling below criteria for selection as a SSSI (e.g. areas of semi-natural ancient woodland larger than 0.25 hectares (ha)).
Local	Local Nature Reserves (LNR).
	Areas of semi-natural ancient woodland smaller than 0.25 ha.
	Areas of habitat or species considered to appreciably enrich the ecological resource within the local context, e.g. species-rich flushes or hedgerows. Including key habitats noted within Skye and Lochalsh LBAP.
Less than Local	Usually widespread and common habitats and species that do not meet the above criteria. Features falling below local value are not considered in detail in the assessment process.

Characterising Impacts

- 1.3.8 The magnitude of predicted impacts will be identified through professional judgement, best practice guidance and legislation, and consider the predicted degree of change (extent/scale) to baseline conditions, how the ecological features are likely to respond, and the duration, frequency/timing and reversibility of an impact. This impact can occur during construction or operation of the Proposed Development, and effects can be beneficial, neutral or adverse.
- 1.3.9 Impacts are judged in terms of magnitude in space and time. There are five levels of spatial impacts and five levels of temporal impacts as described in **Table 1.2: Definition of Spatial Impact Magnitude upon the IEFs** and **Table 1.3: Definition of Temporal Impact Magnitude upon the IEFs**.

Table 1.2: Definition of Spatial Impact Magnitude upon the IEFs

Magnitude of Impact	Definition
Very High	Would cause the loss of the majority of a feature (>80%) or would be sufficient to damage a feature sufficiently to immediately affect its viability.

²⁰ Adapted from Hill, D., Fasham, M., Tucker, G., Shewry, M and Shaw, P. (2005). Handbook of Biodiversity Methods – Survey, Evaluation and Monitoring. Cambridge University Press, Cambridge.

Magnitude of Impact	Definition
High	Would have a major impact on the feature or its viability. For example, more than 20% habitat loss or damage.
Moderate	Would have a moderate impact on the feature or its viability. For example, between 10 – 20% habitat loss or damage.
Low	Would have a minor impact upon the feature or its viability. For example, less than 10% habitat loss or damage.
Negligible	Minimal change on a very small scale; impacts not dissimilar to those expected within a 'do nothing' scenario.

Table 1.3: Definition of Temporal Impact Magnitude upon the IEFs

Magnitude of Impact	Definition
Permanent	Impacts continuing indefinitely beyond the span of one human generation (taken here as 30+ years), except where there is likely to be substantial improvement after this period in which case the category Long term may be more appropriate.
Long term	Between 15 years up to (and including) 30 years.
Medium term	Between 5 years up to (but not including) 15 years.
Short term	Up to (but not including) 5 years.
Negligible	No material effect.

Assessing Cumulative Effects

1.3.10 Cumulative effects require the assessment of impacts of the Proposed Development in combination with those from other developments, projects or activities. The context in which these effects are considered is heavily dependent on the ecology of the feature assessed. For example, for otter it may be appropriate to consider impacts specific to individual river catchments, should the distance between neighbouring catchments be sufficient to assume limited or no movement of animals between them, whereas for blanket bog the region/Natural Heritage Zone (NHZ) may be the relevant spatial scale. Therefore, where it is considered necessary, an assessment of cumulative effects will be made for each feature, appropriate to its ecology.

Significance Criteria

1.3.11 The significance of predicted effects is determined through a standard method of assessment based on professional judgement and available evidence, considering the sensitivity (nature conservation value and conservation status) of the IEF and the characterisation of impact, in a reasoned way.

1.3.12 Significant effects include those which result from impacts on the structure and function of defined sites, habitats or ecosystems and the conservation status of habitat and species (including extent, abundance and distribution)¹⁷.

1.3.13 **Table 1.4: Significance Criteria** details the significance criteria that have been used in assessing the effects of the Proposed Development.

Table 1.4: Significance Criteria

Significance of Effects	Definition
Major	Significant effect, as the impact is likely to result in a long term significant negative effect on the conservation status of the feature.
Moderate	Significant effect, as the impact is likely to result in a medium term or partially significant negative effect on the conservation status of the feature.
Minor	The impact is likely to have a negative effect on the feature at an insignificant level by virtue of its limited duration and/or extent, but there will probably be no effect on its conservation status. The level of effect would be Minor and Not Significant.
Negligible	No material effect. The effect is assessed to be Not Significant.

- 1.3.14 Using these definitions, it must be decided whether there will be any effects which will be sufficient to adversely affect the IEF to the extent that its conservation status deteriorates from that which would be expected should baseline conditions remain (i.e. the 'do nothing' scenario).
- 1.3.15 Major and moderate effects are considered to be significant within the context of the EIA Regulations.
- 1.3.16 Where significant effects are identified, mitigation and/or compensation is required to reduce or offset effects where possible. Effects that are not significant would be expected to be avoided or reduced through compliance with best practice guidance and protected species legislation.
- 1.3.17 Residual effects are characterised as either adverse, neutral or beneficial and either significant or not significant, taking account of mitigation and/or compensation proposals.

Assessment Limitations

- 1.3.18 Limitations exist regarding the knowledge base on how some species, and the populations to which they belong, may react to particular impacts. A precautionary approach is taken in these circumstances, and as such it is considered that these limitations do not affect the robustness of this assessment.
- 1.3.19 Ecological surveys are limited by factors which affect the presence of ecological features such as the time of year, migration patterns and behaviour. The baseline surveys undertaken to support the Proposed Development have not therefore provided a complete list of plants and animals present within the Site and study areas, and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.
- 1.3.20 Limitations in relation to baseline habitat surveys are detailed fully in **Appendix V2-4.3: NVC and Habitats Survey Report**. Some surveys were undertaken in months generally considered to be outside the optimal survey period for vegetation and habitats. However, the overall character and type of vegetation was still recognisable and could be accurately attributed a NVC community due to surveyor knowledge of the Site and area from other surveys throughout the year, and the persistent and still easily identifiable vegetation present in many areas. The timing of the surveys is not therefore considered to be an important limitation.
- 1.3.21 Limitations specific to baseline protected species surveys, such as weather conditions or access restrictions, are detailed in **Appendix V2-4.4: Protected Species Survey Report**.
- 1.3.22 Whilst some limitations have been identified, it is considered that there is sufficient information to enable a robust assessment of predicted effects on ecological features.

1.4 Embedded Mitigation

Iterative Design Process

- 1.4.1 The routeing and alignment selection process for the Proposed Development has taken into consideration the potential for significant effects on ecological features, and for such effects to be avoided or minimised where possible. This has continued through the EIA process, with survey data informing the siting of infrastructure and access routes to further minimise effects on habitats and species where practicable. This process is detailed in **Volume 1, Chapter 4: The Routeing Process and Alternatives**.

Pre-construction and Construction

- 1.4.2 The assessment in this EIA Report has been carried out on the basis that all works would be carried out in accordance with industry good practice construction measures, guidance and legislation. Furthermore, the Applicant has developed General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs) in agreement with statutory consultees, including SEPA and NatureScot. These are set out within **Appendix V1-3.5: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)**. The Proposed Development would be constructed in accordance with these plans.
- 1.4.3 There would be a contractual management requirement for the successful Principal Contractor to develop and implement a comprehensive and Site-specific Construction Environmental Management Plan (CEMP). This document would detail how the successful Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA Report, the Applicant's GEMPs and SPPs, statutory consents and authorisations, and industry good practice and guidance, including pollution prevention guidance. An Outline CEMP is provided within **Appendix V1-3.9: Outline CEMP**.
- 1.4.4 Any micrositing of infrastructure within the defined Limit of Deviation (LoD) will be based on a review of existing ecological data and the completion of pre-construction surveys, to take into consideration the potential for direct encroachment onto protected species features, sensitive habitats or GWDTEs, or indirect alteration of hydrological flows supporting sensitive habitats or GWDTEs. Any micrositing will also take consideration of any buffer distances on protected features identified, as detailed within the SPP.
- 1.4.5 To ensure all reasonable precautions are taken to avoid negative effects on habitats, protected species and aquatic interests, a suitably qualified ECoW will be appointed prior to the commencement of construction to advise the Applicant and the Principal Contractor on all ecological matters. The ECoW will be required to be present onsite during the construction phase and will carry out monitoring of works and briefings with regards to any ecological sensitivities on the Site to the relevant staff of the Principal Contractor and subcontractors.