Scottish & Southern Electricity Networks

TRANSMISSION

Creag Dhubh to Dalmally 275kV Connection

Environmental Impact Assessment

Volume 4 | Appendix 11.1h

Overhead Line (OHL) Woodland Report

Property: Keppochan East and Tullich

April 2022

Contents:

1 Introduction

1.1.1 This Technical Appendix (TA) presents information relevant to the Creag Dhubh to Dalmally 275kV Connection. It should be read in conjunction with the **Volume 2 – EIA Report** specifically **Chapter 11: Forestry,** for full details of the Proposed Development.

1.1.2 Scottish Hydro Electric Transmission plc (the Applicant) who, operating and known as Scottish and Southern Electricity Networks Transmission (SSEN Transmission), own, operate and develop the high voltage electricity transmission system in the north of Scotland and remote islands. Due to the growth in renewable electricity generation in the north and north-east of Scotland, upgrade of the transmission network is required in order to provide the necessary increase in transmission capacity.

1.1.3 The Applicant is proposing to apply for consent under section 37 of the Electricity Act 1989 to construct and operate a 13.3 kilometre (km) double circuit 275 kV overhead line (OHL), supported by lattice steel towers between a proposed substation at Creag Dhubh to the existing Scottish Power Energy Networks (SPEN) 275 kV OHL that runs from Dalmally to Inverarnan, near Succoth Glen, connecting via a Tie-In connection (the 'Proposed Development'). The location of the Proposed Development is shown in Figure 1.1: Location Plan and Overview (EIAR Volume 3a).

2 Purpose of this Woodland Report

2.1.1 As part of the Environmental Impact Assessment (EIA) process, it was identified that the overhead line construction and the access tracks required to construct the Proposed Development would cross a number of woodland areas within private or state owned landholdings. The landholding property boundaries are identified in **Figure 11.1 (EIAR Volume 3a)**.

2.1.2 This document provides a conceptual assessment of the woodland areas that are affected by the Proposed Development, including the requirement of woodland removal and management recommendations to mitigate the impact of the woodland removal.

2.1.3 Field surveys of the woodland areas have been undertaken and have been used to determine the various woodland characteristics in order to identify the woodland removal required and recommended. This document also sets out the area quantity (ha) to be compensatory planted to ensure no net loss of woodland is achieved.

3 Woodland Property

3.1.1 Keppochan East and Tullich forest is under private ownership and is located approximately 11 km south west of the village of Dalmally **Figure 11.1 (EIAR Volume 3a)**. The woodland property is a large area of commercial conifer woodland, with an existing forest road infrastructure. The property area straddles the A819 public road east and west, with the larger woodland area located on the west side.

3.1.2 The property is well serviced by hard metalled forest roads from the A819 public road through the main commercial conifer woodland areas. A substantial area of mixed broadleaves is situated at the north end of the property on the east side of the A819 public road, with no provision for vehicle access.

3.1.3 The main vehicle access point is located at national grid reference 'NN 100 199'.

4 Development Requirements

4.1 275kV Overhead Line

4.1.1 Reference to **Plate 4.1** and **Figure 11.1(EIAR Volume 3a)**, the sections of OHL applicable to the Keppochan East and Tullich property are from Tower 1 to the property boundary on the south side of

Tower 6 and from the A819 public road west of Tower 9 to the property boundary on the west side of Tower 10.

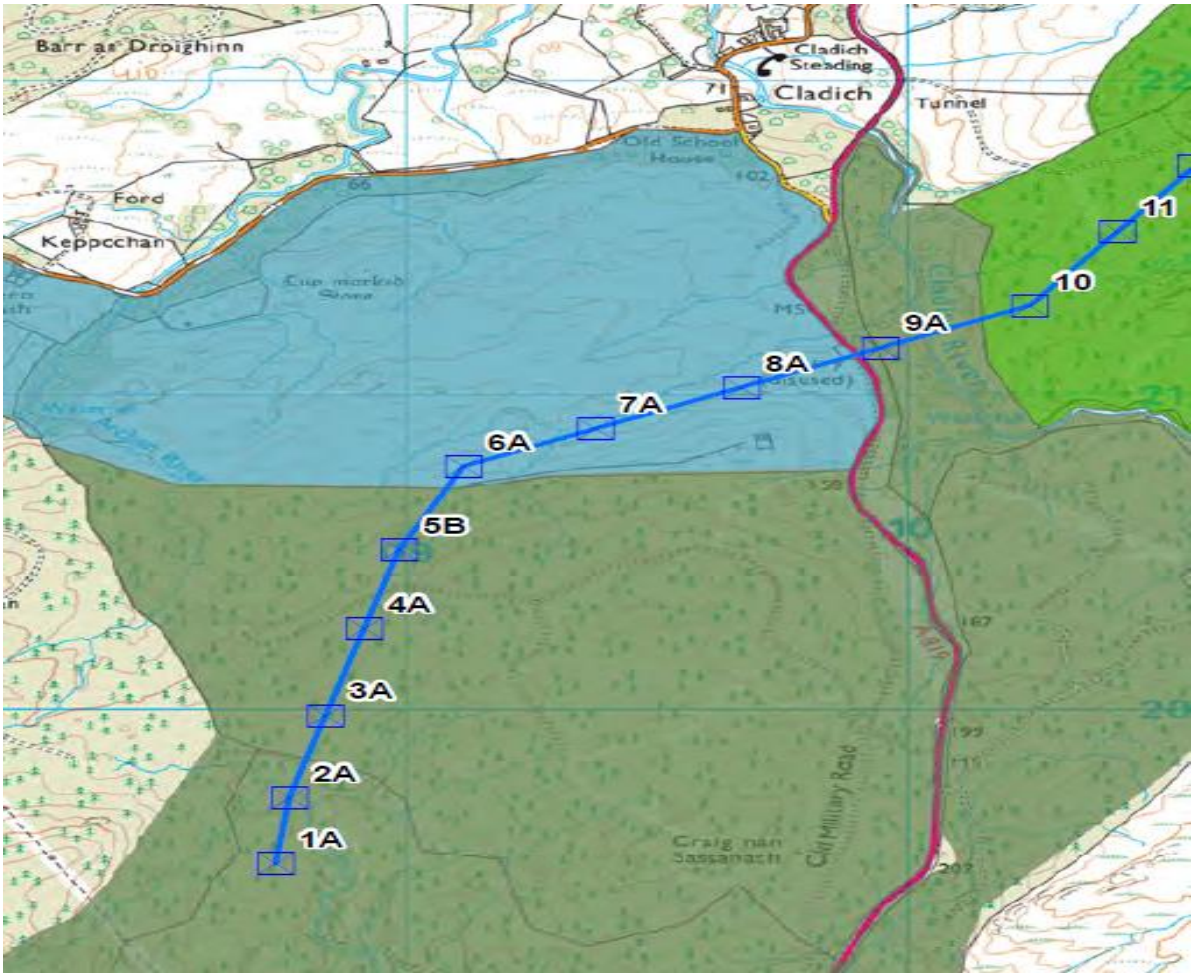

Plate 4.1: OHL T1 to T10

4.1.2 The 275kV OHL standard tower dimensions for the project have a width of 17m at the widest part (crossarm) of the tower i.e. from outside conductor to outside conductor, in addition to this the safety vicinity zone from each conductor is a 4m radius around the conductor.

4.1.3 The OHL infrastructure and minimum safety clearance distance is therefore 25m (12.5m either side of the OHL centreline) and this has been utilised to calculate the area of the operational corridor occupied by infrastructure. In some cases, such as angle towers the requirement may be slightly in excess of this distance, however the average minimum distance has been used in this assessment.

4.1.4 The study area for this assessment is based around the OC. The Applicant defines the area in which it has rights to remove woodland for the purposes of creation of new overhead lines (OHLs), resilience and maintenance of OHLs, or protection of electrical plant as required by the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002 regulations and The Electricity Act 1989. The OC is defined with reference to the distance at which a tree could fall and cause damage to the overhead line, resulting in a supply outage[1]. As a result, the final corridor width would be based on the safety distance required to allow for a mature tree falling towards the OHL at the mid-point on an OHL span between two towers, taking account of topography and tree height at maturity. Where the OC passes

[1] As specified by the 'Red Zone' set out in paragraph 41 of the Forest Industry Safety Accord. (2020) Safety Guide 804 Electricity at Work: Forestry.. [pdf] Available at: FISA 804 (ukfisa.com)

through areas of native woodland, it is noted that the width of woodland removal is likely to be reduced due to the lower height of the tree species present. The proposed OC illustrated in **Figure 11.4(EIAR Volume 3a)** has been based on the likely height of the woodland at maturity and therefore, varies in width according to the woodland type present.

4.1.5 The future plans of landowner woodland restructuring (clear fell and replant) have been reviewed.

4.1.6 The OC width that has been assessed and identified for the safe build and energisation of the new OHL through the areas of commercial conifer woodland is 85 m (42.5 m either side of the OHL centreline).

4.1.7 The OC width that has been assessed and identified for the safe build and energisation of the new OHL through the areas of native broadleaved woodland is 60 m (30 m either side of the OHL centreline). This has been assessed as a maximum OC width required at these woodland locations, with the potential of further narrowing of the OC prior to construction to allow greater tree retention.

4.2 Access Track Route Design

4.2.1 The Keppochan East and Tullich commercial conifer forest is serviced from the A819 public road by well-constructed hard metalled forest roads, regularly used for timber haulage. These forest roads will form part of the main vehicle access route for the Proposed Development **Figure 11.4(EIAR Volume 3a),** and will be subject to maintenance and upgrade works as part of the construction work scope. The existing forest roads will be utilised during the forestry works.

4.2.2 General access track tree maintenance work may be required along the existing forest road/access track in preparation for the civil engineering access track upgrade works.

4.2.3 Sections of new access track **Figure 11.4(EIAR Volume 3a)** are required to be built as part of the construction work scope, to service the OHL section Towers 1 to 5 and to Tower 9 on Keppochan East and Tullich. A part section of the new access track to Tower 8 is also required on the property. The new access track build routes are located within the 85m wide operational corridor and with three sections required outside the OHL operational corridor to link to the existing forest road/access track and to the A819 public road at Tower 9.

4.2.4 The access track new build corridor width required to be cleared through woodland is 20m wide (10m either side of centreline) **Figure 11.4(EIAR Volume 3a)**. This will increase the impact of woodland removal along new build access track routes that are outside the OHL operational corridor.

4.2.5 Stump removal and residue mulching will be required for the installation of new access tracks and at each tower location for the formation of a construction compound and temporary crane pad.

5 Woodland Characteristics

5.1.1 The property is situated on both sides of the A819 public road, east and west **Figure 11.1(EIAR Volume 3a)**. The larger woodland area is on the west side, impacted by the development project from Tower 1 to partway to Tower 6 and a section of new track build to Tower 8. The smaller woodland area is on the east side, impacted by the development project from the A819 public road to Tower 9 to partway to Tower 10, **Figure 11.4(EIAR Volume 3a)**.

5.1.2 The western woodland area impacted by the development project is an area of commercial conifer woodland with a small area of mixed broadleaved woodland. The woodland is broken up by areas of open ground integrated throughout. The conifer area has undergone significant woodland restructuring in recent years, which is continuing by the landowner through approved felling licence. Long Term Forest Plan (LTFP) maps have been drafted by the landowner, as part of the woodland

restructuring management strategy for the property. The woodland management regime is clear fell and replant, with the predominant tree species being Sitka spruce. The conifer age class ranges from young restock plantation (circa. 12 years) to mature woodland (circa. 40 years) and all of plantation origin. Pockets of tree windblow are evident within the mature conifer woodland areas.

5.1.3 The woodland ground conditions are variable on mostly peaty gley soil[2], with pockets of peat present sporadically around the site[3].

5.1.4 Although the landowner's Long Term Forest Plan felling phase and restock maps are in draft form, the restructuring proposals have been reviewed during the OHL forestry landscape assessment **Figure 11.5(EIAR Volume 3a)** and **TA Figure 11.12**.

5.1.5 A desk based study of the woodland areas was conducted, utilising web based data provided by Scottish Forestry[4] and referencing the Scottish Government's Ancient Woodland Inventory[5], to identify current woodland environmental designations and classifications.

5.1.6 The Scottish Forestry Map Viewer provides spatial data on the Native Woodland Survey of Scotland and classifies the woodland types into four categories[6],

- Native woodland
- Nearly-native woodland
- Open land habitat
- Plantations on Ancient Woodland Sites (PAWS)

5.1.7 An area of 1.68 ha of broadleaved woodland located between towers 8 to 10 including the access track corridor to tower 9, **Figure 11.4(EIAR Volume 3a)** has been identified as native woodland classification.

5.1.8 There are no formal environmental woodland designations present for the conifer woodland area.

5.1.9 The Plates 5.1 to 5.5 show the variable woodland condition impacted by the OHL operational corridor between Tower locations 1 and 2. The predominant tree species is Sitka spruce of variable age class as a result of recent woodland restructuring management by the landowner.

5.1.10 The Sitka spruce has been planted as commercial tree crop and varies from semi-mature (circa. 25 years old) to young plantation (circa. 12 years old), with integrated open ground.

5.1.11 The terrain is generally flat with extensive wet boggy ground, producing areas of 'checked' tree growth across the site. The semi-mature tree crop areas have been assessed as being tree retentions from the previous clear fell crop rotation, tree windblow is evident and the standing trees are generally unstable due to the wet ground conditions. There is minimal harvestable timber within this section of operational corridor.

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[2] Scottish Government's Scotland's soils website Home | Scotland's soils (environment.gov.scot)

[3] Scottish Government's Scotland's soils website https://soils.environment.gov.scot/

[4] Scottish Forestry Land Information Search URL: https://map.environment.gov.scot/LIS_Agri/Agri.html
Scottish Forestry Map Viewer URL: https://scottishforestry.maps.arcgis.com/apps/webappviewer/index.html?id=0d6125cfe892439ab0e5d0b74d9acc18

[5] Ancient Woodland Inventory (Scotland) URL: Ancient Woodland Inventory (Scotland) - data.gov.uk

[6] Scottish Forestry Native Woodland Survey of Scotland: Glossary of Terms; URL: Main Title (forestry.gov.scot)
Native Woodland – woods where the canopy cover is composed mainly of native species (ie over 50%).
Nearly Native Woodland - where native species make up between 40% and 50% of the canopy. These are woods that could have potential to be converted into native woodlands by altering their species mix.
Open Land Habitat – areas with <20% canopy cover of trees and shrubs adjoining a native woodland.
PAWS - Plantations on Ancient Woodland Sites. These are surveyed in the NWSS where they are recorded in the Scottish ancient woodland inventory (SAWI). These woodlands appear to have originated through natural regeneration sometime before the mid-19th century, but were later converted to planted woods.

Plate 5.1: Looking south to tower location 1.

Plate 5.2: Looking north to tower location 2.

Plate 5.3: Looking south to tower location 1.

Plate 5.4 – Looking south to tower location 1.

Plate 5.5: Looking south to tower location 2.

5.1.12 Plates 5.6 and 5.7 show the variable woodland condition impacted by the OHL operational corridor between Tower locations 2 and 3. The predominant tree species is Sitka spruce of with an area at pole stage, with pockets of open ground and wet ground conditions throughout the site. There is an area of 'checked' tree growth Sitka spruce of sparse tree stocking density mainly due to tree growth failure, resulting in integrated open ground with the new establishment of some spruce tree natural regeneration. The terrain is generally flat, with wet ground conditions throughout and areas of wet bog.

5.1.13 Timber production is limited due to the variable tree crop between Towers 2 and 3, with only small areas of harvestable timber. The measured standing timber volume ranges from approximately 100m3 to 450m3 per hectare[7].

[7] Forestry Commission (Scottish Forestry) Forest Mensuration; A handbook for practitioners (2006)

Plate 5.6: Looking south to tower location 2.

Plate 5.7: Looking north to tower location 3.

5.1.14 Plates 5.8 and 5.9 show the woodland type that is mostly characteristic of the OHL operational corridor section from Tower 3 through to the forest road north of Tower 4. The predominant tree species is Sitka spruce of mature age class, with a measured standing timber volume of approximately 450m3 per hectare. The trees are generally of good form and condition with a high volume of harvestable timber.

5.1.15 An area of wet boggy ground is present within the woodland producing 'checked' spruce tree growth with a reduced standing timber volume of approximately 100m3 per hectare.

Plate 5.8: Looking south west, on the north side of tower location 3.

Plate 5.9: Looking south to tower location 4.

5.1.16 Plates 5.10 and 5.11 show the woodland types of the OHL operational corridor section from the forest road north of Tower 4 to Tower 5 through to the woodland property boundary south of Tower 6. The area is predominantly Sitka spruce woodland of semi to mature age class, with a measured standing timber volume of approximately 450m3 per hectare. The trees are generally of good form and condition with a high volume of harvestable timber. The terrain is mostly sloped with the trees planted on ploughed furrows providing good drainage ground conditions. A small area of Sitka spruce where the ground is of poorer drainage, has a reduced growth rate with a standing timber volume of approximately 200 m^3 per hectare

5.1.17 There are small areas of open ground and recently planted mixed broadleaves as riparian woodland of approximately 3 years old adjacent to the burn. The operational corridor will be narrowed to a 60m width for the greater retention of the broadleaved trees.

Plate 5.10: Looking north to tower location 5.

Plate 5.11: Looking north to tower location 6.

5.1.18 Plates 5.12 and 5.13 show the native broadleaved woodland that is within the operational corridor situated adjacent to the A819 public road on the east and west side. The small woodland area on the west side is located on the neighbouring property of Cladich. Plate 5.14 shows a view of the woodland within the operational corridor towards Tower 10. The woodland areas are generally mixed native broadleaves of Birch, Willow and Alder of variable age class and structure. There are some conifers of non-commercial value interspersed through the broadleaved areas. The conifers that are within the 85m operational corridor will be required to be removed, with the operational corridor being narrowed to 60m wide for the broadleaved areas to increase woodland retention.

Plate 5.12: Looking west to tower location 8.

Plate 5.13: Looking east to tower location 9.

Plate 5.14: Looking east to tower locations 9 and 10.

5.1.19 Reference to the OHL forestry landscape assessment documents **TA Figures 11.5 to 11.12** identifies the woodland exposure to windthrow and includes proposed management felling coupes to achieve suitable woodland windfirm boundaries of least impact to the forest landscape.

5.1.20 The total area of management felling proposed is 50.55 ha of commercial conifer woodland. The felling of these areas are subject to Landowner agreement and by method of Scottish Forestry felling licence approval or Long Term Forest Plan formal amendment.[8]

6 Windthrow Risk Impact

6.1.1 Most of the site lies on soil classified as peaty gleys, with some pockets of peat present sporadically around the site.

6.1.2 The woodland site affected by the Proposed Development has a 'Detailed Aspect Method of Scoring' (DAMS)[9] windthrow hazard class score ranging between 13 and 19, classified as moderately to highly exposed. The local climate is classified as cool and wet.

6.1.3 These factors suggest that a moderate range of tree species can be grown on site.

6.1.4 As detailed in **Section 3** and **Figures 11.7 to 11.12**, the management felling coupes of the mature conifer woodland have been proposed to achieve suitable woodland windfirm boundaries.

6.1.5 No impact of windthrow risk will be created by the removal of the young conifer plantation areas within the OHL operational corridor and access track corridors.

6.1.6 A minimal impact of windthrow has been assessed for the native broadleaved woodland areas, due to their location, size and structure.

7 Woodland Management Impact

7.1.1 The OHL alignment will create additional challenges for the future management of the forest as it dissects existing management coupes and introduces an electrical hazard. The constraint associated with the electrical hazard will be reduced by regular maintenance of the operational corridor, which will avoid the incidences of "Red Zone" trees.[10]

7.1.2 The OHL alignment crosses the forest road network at either approximately 45 or 90 degrees and will be built to the regulatory safe height clearances above forest roads/access tracks, which will reduce the hazard in respect of future timber haulage.

7.1.3 The OHL alignment may be restrictive to future in-forest machinery access. The requirement for dedicated forestry machine OHL crossing points will be discussed with the Landowner and if required will be identified once the OHL has been constructed, thus providing a safe OHL crossing point(s) for future working within the woodland.

7.1.4 The Proposed Development will permanently remove existing mature and young conifer woodland with an area of broadleaved woodland from the operational corridor. This will reduce the forestry restructuring/planting land available within the woodland property area, as the operational corridor will be maintained clear of trees.

[8] This felling is not included within the scope of the proposed development (for the purpose of the application for consent under S37 of the Electricity Act 1989). This additional 'management felling' would be subject to a requirement for separate felling licence approval from Scottish Forestry

[9] Detailed Aspect method of Scoring (DAMS) Ref. Forest Research, "Forest Gales software programme" and Forestry Commission Leaflet 85 "Windthrow Hazard Classification"

[10] As specified by the 'Red Zone' set out in paragraph 41 of the Forest Industry Safety Accord (FISA) Safety Guide 804 Electricity at Work: Forestry (2020) FISA 804 (ukfisa.com)

7.1.5 During the construction phase, a level of disruption will be created for the undertaking of routine forestry management activities by the Landowner on the woodland property. This will be project managed through communication and agreement with the affected stakeholders.

8 Mitigation Opportunities

8.1.1 A reduced operational corridor width of 60m has been assessed for the areas of native broadleaved woodland. Prior to the construction phase these areas will be assessed for further selective felling to identify if greater tree retention can be achieved. This will be dependent on the requirements of the development project and in particular the safety of OHL wiring operations.

8.1.2 The operational corridor woodland removal area is required for the construction and functioning of the new OHL infrastructure. Opportunities will be assessed for woodland replanting within the operational corridor, the identification of suitable areas cannot be guaranteed due to the requirement of maintaining the safe energisation of the OHL. Reference to **Section 8**, will fully mitigate the operational corridor woodland removal area by replanting the area quantity (hectares) of woodland removed.

8.1.3 The management felling areas will be replanted by the Landowner, in-line with the Scottish Forestry felling licence regulations of the area felled must be replanted.

9 Woodland Removal Impact

Table 9.1 Woodland Removal for Infrastructure

Item	Woodland Type	Area
OHL	Young conifer plantation	1.52ha
	Mature conifer tree crop	7.60ha
	Native broadleaved woodland	1.26ha
Access Track Corridor	Young conifer plantation	0.73ha
	Native broadleaved woodland	0.35ha

Table 9.2 Compensatory Planting

Compensatory Planting Area	Mixed conifer or mixed broadleaves	11.46ha

Table 9.3 Woodland Removal Impact of Infrastructure

Total Loss of Woodland Area		11.46ha
Total Compensatory Planting Area		11.46ha
Total Net Loss of Woodland Area		**0.0ha**

Table 9.4 Woodland Removal for Management Felling

Item	Woodland Type	Area
Management Felling	Mature conifer tree crop	50.55ha
Replanting/Restocking	Predominantly conifer	50.55ha
Net Loss of Woodland Area		0.0ha
Note. Felling approval is via Scottish Forestry Felling Licence application process or Long Term Forest Plan application or amendment process.		

10 Compensatory Planting

10.1.1 Compensatory planting to achieve the area quantity (hectares) of woodland removal will be provided for the OHL and access track operational corridor area and will be in accordance with the Scottish Government's Control of Woodland Removal Policy[11] of no net loss of woodland.

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[11] https://forestry.gov.scot/publications/285-the-scottish-government-s-policy-on-control-of-woodland-removal/viewdocument/285