Scottish & Southern Electricity Networks

TRANSMISSION

Dunoon to Loch Long 132 kV OHL Rebuild Environmental Impact Assessment Report Volume 4 | Technical Appendix

Appendix 12.1 - Overhead Line (OHL) Woodland Report

Section 2: Forest and Land Scotland (Cnap Reamhar Wood, Ardentinny and Stronvochlan Wood, Glenfinart Forest) and Land at Glenfinart (Towers 19 to 28)

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Contents:

1 Introduction

This Technical Appendix (TA) presents information relevant to the Dunoon to Loch Long 132 kV Overhead Line (OHL) Rebuild (hereafter referred to as the 'Proposed Development'), which is being constructed to replace an existing 132 kV OHL between the same points ("the Existing Line"). It should be read in conjunction with the **Volume 2 – Environmental Impact Assessment (EIA) Report** specifically **Chapter 3: Description of the Proposed Development** and **Chapter 12: Forestry** for full details of the Proposed Development.

The location of the Proposed Development is shown in **Volume 3, Figure 1.1 Site Location.**

2 Purpose of this Woodland Report

As part of the Environmental Impact Assessment (EIA) process, it was identified that the OHL construction and the access tracks required to construct the Proposed Development would cross a number of woodland areas within private or public sector landholdings. The landholding property boundaries are identified in **Figure 12.1.2 Forestry Project Felling Map**.

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.

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

This section (known for the purposes of the forestry assessment as Section 2) of the Proposed Development mainly comprises two separate areas of commercial conifer woodland owned by Forest and Land Scotland (FLS), separated by the Glen Finart (Ardentinny to Loch Eck) minor public road and referred to in this report as Cnap Reamhar Wood, Ardentinny on the south side of the road and Stronvochlan Wood, Glenfinart Forest to the north. Two adjacent parcels of private land under different ownerships separate the two forest properties. These comprise a small area broadleaved woodland and an agricultural field, both referred to as Land at Glenfinart.

The area is located some 19 kilometres north of Dunoon. The woodlands at Cnap Reamhar and Stronvochlan form part of an extensive complex of commercial forestry within the Argyll Forest Park extending north-west along Glen Finart to Loch Eck and stretching north and south from the village of Ardentinny along the shores of Loch Long to merge with Benmore Forest near Kilmun by Holy Loch.

Both Cnap Reamhar and Stronvochlan woods are serviced by existing hard metalled forest road infrastructure accessible from the minor public road at Ardentinny village. The main vehicle access points for construction and forest management purposes are located at national grid reference 'NS 182 884' and 'NS184 879' (Cnap Reamhar) and 'NS 184 881' (Stronvochlan).

4 Development Requirements

4.1 Overhead Line

With reference to **Figure 12.1.2 Forestry Project Felling Map**, the sections of OHL applicable to each property are approximately Towers 19 to 20 (Stronvochlan Wood), Tower 23 (Land at Glenfinart – Woodland) and Towers 25 to 28 (Cnap Reamhar Wood). The OHL alignment passes over field trees between the edge of Stronvochlan Wood and Tower 21 and also between Towers 22 and 23.

The proposed OHL standard tower dimensions for the project have a width of 10m cross-arm to cross-arm, i.e. from outside conductor to outside conductor. In addition to this, the safety Vicinity Zone from each conductor is a 3.5 m radius around the conductor.

The OHL infrastructure and minimum safety clearance distance is therefore 17 m (8.5 m 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.

The study area for this assessment is based around the Operational Corridor (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) 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 outage1. 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 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 12.1.2 Forestry Project Felling Map** has been based on the likely height of the woodland at maturity and therefore, varies in width according to the woodland type present.

The future restructuring plans for the two forestry properties have been partially reviewed with reference to scheduled felling coupes. However, FLS's Forest Landscape Design Plan, approved in late 2022, was not available to review at the time of writing.

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 81 m (40.5 m either side of the OHL centreline).

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.

Additionally, this assessment takes account of tree removal associated with temporary OHL diversions required where it is deemed necessary for the route of the Proposed Development to cross or follow as closely as possible the existing OHL alignment. Under these circumstances, the width of the temporary OHL corridor through areas of both mature conifer and native broadleaved woodland is 60 m (30m either side of the temporary OHL centreline). Due to the fact that this part of the Proposed Development is only in place to facilitate construction and is removed when construction is finished, woodland removal is temporary and restocking can take place where it extends beyond the OC of the proposed OHL.

4.2 Access Track Route Design

Situated either side of Glen Finart, the commercial conifer plantations at Cnap Reamhar and Stronvochlan Woods are both serviced from the minor public road between Ardentinny and Loch Eck by a network of hard metalled forest roads that are regularly used for timber haulage. These forest roads will form part of the main vehicle access route for the Proposed Development including associated forestry works **Figure 12.1.2 Forestry Project Felling Map** and will be subject to maintenance and upgrade works as part of the construction work scope.

[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)

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

Access tracks to individual tower sites will be confined to the OHL operational corridor were possible. However, in areas where the nature of the terrain or ground conditions dictate the requirement to build new access track routes that fall outside the OHL operational corridor, the width required to be cleared is 20 m wide (10 m either side of centreline) **Figure 12.1.2 Forestry Project Felling Map**, thus increasing the impact of woodland removal in that area.

Stump removal and mulching of young trees and forest residue 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

Rising sharply from the flat valley bottom on opposite sides of Glen Finart, both Cnap Reamhar Wood and Stronvochlan Wood are managed by FLS primarily as commercial conifer plantations. However, both provide value as tourist destinations within the Argyll Forest Park and are promoted as such by FLS with a carpark at Ardentinny Beach, waymarked walking trails and numerous mountain biking opportunities in the surrounding forest. The carpark and waymarked trails are well removed from the immediate area of the Proposed Development.

Cnap Reamhar Wood was planted from 1970 onwards on bare hillside whilst much of the current tree cover at Stronvochlan Wood, part of the more extensive Glenfinart Forest, dates from the 1980's with older elements from the 1950's and earlier. Woodland management is carried out through a regime of clear felling and replanting, the dominant commercial conifer species being Sitka spruce *Picea sitchensis* with other species including Scots pine *Pinus sylvestris*, Douglas fir *Pseudotsuga menziesai*, Norway spruce *Picea abies*, larch *Larix ssp* and western hemlock *Tsuga heterphylla*. Stronvochlan Wood and the wider forest area extending up Loch Long contains a large element of native woodland including oak *Quercus ssp* and birch *Betula ssp*.

Long-term forest management must routinely contend with the challenges of *Phytophthora ramorum,* a high infectious tree disease that mainly affects larches, and the spread of invasive non-native species within the forest, specifically, *Rhododendron ponticum* and western hemlock, both of which regenerate freely in the warm, wet climate.

Cnap Reamhar Wood, Stronvochlan Wood and the wider FLS owned Glenfinart Forest is impacted by numerous Statutory Plant Health Notices (SPHN) intended to control the spread of *P. ramorum*. Felling permission for such areas are secured by FLS through the recently approved Forest Landscape Design Plan or by formal amendments to this and previous plans. Due to the sheer number of sites affected by SPHN's regionally, the key operational issue associated with the clearance of these sites is the availability of suitable harvesting contractors equipped to work the steep slopes that characterise the region.

The Proposed Development climbs strong to very steep, moderately rocky slopes on either side of Glen Finart, coinciding with generally free-draining brown earth soils on the lower slopes and, in the case of Ardentinny Forest, peaty gleyed podzols from mid-slope upwards. [2]

A desk-based study of the woodland areas was conducted utilising open-source data from NatureScot's Ancient Woodland Inventory and Scottish Forestry's Native Woodland Survey of Scotland, to identify native woodland and environmental classifications.

NatureScot's AWI revealed that within Stronvochlan Wood the entire operational corridor occupies part of an extensive area of Ancient Woodland (of semi-natural origin), partly containing mature conifer species and

[2] Scottish Government Scotland's Soil website https://map.environment.gov.scot/Soil_maps

partly mature oakwood. At Cnap Reamhar Wood, there are extensive areas of Ancient Woodland (of semi-natural origin) in the woodlands either side of the operational corridor but none within the operational corridor itself.

The Scottish Forestry NWSS classifies native woodland types in four categories, native woodland, nearly-native woodland, open land habitat and Plantations on Ancient Woodland Sites (PAWS). Reflecting the Nature Scot AWI, the NWSS identifies an extensive area of PAWS within Stronvochlan Wood including the OC and the mature native oakwood referred to above. At Cnap Reamhar Wood, the NWSS again reflects the AWI status described above.

The area of Ancient Woodland (of semi-natural origin) is 0.58 ha. There is also 3.57 ha of PAWS woodland (Ancient Woodland Sites containing exotic commercial conifers).

The OC has been reduced to a width of 60 m for all broadleaved woodland to increase opportunities for retention.

5.1 Stronvochlan Wood, Glenfinart Forest

From an area of mature broadleaves next to Clunie Burn, the Proposed Development enters a stand of mature conifers just east of Tower 19 and continues south to a forest road. The impacted crop was planted in 1990 and comprises Sitka spruce with approximately 10% western hemlock and 5% Japanese larch. The Sitka spruce is well-grown and of good form with an above average yield class of 22. The estimated standing volume of the crop is 615 m^3 per hectare. The whole area is scheduled for felling in 2024 (FLS felling coupe ref. 09075).

Plate 1 – View looking north up existing wayleave corridor. Proposed new alignment crosses felled area on left. Temporary OHL diversion impacts broadleaved Ancient Woodland (of semi-natural origin) on right.

Plate 2 – Native broadleaves next to forest road above Tower 26.

Plate 3 – Stand of mature Sitka spruce and western hemlock near proposed location of Tower 20.

Before passing over the forest road to Tower 20, the proposed OHL alignment impacts on a small area of birch before entering a stand of Sitka spruce with some 10% western hemlock planted in 1957. The spruce is again well grown and of good form with a larger average diameter as a result of regular thinning and a yield class of approximately 20. The estimated standing volume of the crop is some 965 m^3 per hectare. The area is not included in the felling coupe referred to above.

South of Tower 20, the proposed overhead line passes over another forest road and then a section of felled conifer crop before exiting the FLS landholding. The felled area is colonised by profuse three to five year old western hemlock regeneration with some Sitka spruce. Four mature Douglas firs and a small beech have been retained just below the forest road.

East of Tower 20, the Proposed Development includes a temporary overhead line diversion allowing the new alignment to retain the existing route as it crosses Glen Finart. The temporary powerline corridor is 60m wide and starts from the existing tower on the south side of the forest road, impacting a narrow section of predominantly Norway spruce planted in 1940 on the west side and on the east side a more substantial area of oak dominated native woodland dating from 1870. This area is recorded as Ancient Woodland (of semi-natural origin) in Nature Scot's Ancient Woodland Inventory.

Plate 4 – Felled area below Tower 20 containing profuse western hemlock regeneration and a few retained Douglas fir. Note broadleaved woodland in background impacted by temporary OHL diversion.

Plate 5 – Ancient oakwood with frequent birch and holly.

The Norway spruce is thinned and well- grown although conifer butt rot is a common issue with this species affecting market value. The yield class is 14 and the estimated standing volume is some 900 m^3 per hectare. The native woodland has not been measured but is estimated at some 250 m^2 per hectare. This material has a market value as firewood and potentially some sawlog material, although the timber quality is generally poor.

5.2 Land at Glenfinart (Agricultural)

As the proposed OHL alignment exits the FLS landholding, it crosses through an area of improved pasture, impacting on a small group of hawthorn trees on the edge of the field next to the FLS boundary. These trees have nominal value as firewood.

5.3 Land at Glenfinart (Woodland)

Plate 6 – Existing wayleave corridor near proposed location of Tower 23.

The proposed OHL route crosses Glen Finart Burn north of Tower 23 and impacts on a line of broadleaved trees on the southern edge, comprising common alder Alnus glutinosa, ash Fraxinus excelsior and birch Betula ssp.

The Proposed Development, including temporary OHL diversion, then impacts on a small area of mature broadleaved woodland a short distance further south, the proposed location of Tower 23. The western half of this area contains predominantly beech Fagus sylvatica and the eastern half mixed broadleaved woodland included native species including birch and occasional mature Sitka spruce individuals. The woodland has a dominant understorey of *R. ponticum*. The woodland contains approximately 75 m^3 of timber per hectare which has a market value as firewood.

5.4 Cnap Reamhar Wood, Ardentinny

Plate 7 – View south-west towards Cnap Reamhar Wood. New operational corridor climbs slope to right and roughly parallel to existing OHL.

After crossing to the south side of Glen Finart, the Proposed Development enters Cnap Reamhar Wood just after Tower 24, impacting on a band mature mixed broadleaved woodland next to the field at the foot of the slope. The proposed OHL alignment climbs steadily up the steep, north-facing slope, crossing two forest roads before emerging onto the open hill just beyond Tower 28.

Plate 8 – Crop of semi-mature Sitka spruce impacted between Towers 24 and 25.

The impacted woodland area comprises three main commercial conifer crops, all dominated by Sitka spruce. The section to Tower 26 is characterised primarily by Sitka spruce planted in 1970 with minor elements of Japanese larch, Douglas fir, western hemlock and, more rarely, Scots pine. The spruce is relatively slow growing with a yield class of 10 and average form with a standing volume of 432 m^3 per hectare.

The temporary OHL diversion referred to above runs roughly parallel with the lower part of the operational corridor and terminates just to the east of Tower 25. An area of mature mixed broadleaved woodland is impacted between the FLS property boundary and the forest road. Additionally, two areas of mature conifers on either side of the existing wayleave corridor are impacted. On the east side, this includes an area of Sitka spruce planted in 1984 (yield class 20, estimated standing volume 494 m^3 per hectares) and on the west side an area of Sitka spruce planted in 1993 (yield class 10, standing volume 168 m^3 per hectare).

The crop impacted by the operational corridor between Towers 24 and 26 and also the temporary overhead line diversion is due to be felled in 2030 (FLS felling coupe ref. 09041).

Above Tower 24, the operational corridor impacts mainly on a Sitka spruce crop planted in 1993 with small components of Douglas fir and western hemlock. The spruce has a yield class of 10 and a standing volume of 171 m^3 per hectare.

Plate 8 – Semi-mature Sitka spruce below Tower 25.

North of Towers 26 and 27 are two strips of poorly grown Sitka spruce planted in 1985 with a yield class of below 8. With a standing volume of some 57 m^3 per hectare, these trees are effectively in check and have nominal market value.

To the west of Tower 28 on the edge of the forest, there is a small area of sparsely stocked Sitka spruce planted in 1993 with a low standing volume of 85 m^3 per hectare. The stand of Scots pine to the east of Tower 28, also planted in 1993, has a standing volume of 64 m^3 per hectare. Both areas are poorly grown and likely to have nominal market value.

Plate 9 – Semi-mature Sitka spruce on steep slope below Tower 26 from forest road.

The woodland impact assessment included appraisal of woodland exposure to windblow resulting from the removal of mature trees within the operation corridor. **Figure 12.1.2 Forestry Project Felling Map** identifies proposed management felling out with the operational corridor to achieve suitable wind-firm felling boundaries and reduce impacts on forest management and forest landscape.

The total area of management felling proposed is 35.63 ha of commercial conifer woodland. This felling is not included within the scope of the Proposed Development (for the purpose of the application for consent under Section 37 of the Electricity Act 1989). This additional felling is subject to landowner agreement and it is the responsibility of the landowner to consult Scottish Forestry and obtain appropriate felling consent.

6 Windthrow Risk Impact

The proposed OHL alignment within the Forest and Land Scotland landholding climbs steep to very steep, moderately rocky slopes on either side of Glen Finart, coinciding with predominantly mineral soils that are free-draining at lower elevations. The mature woodland sites affected by the Proposed Development are classified sheltered on the lower slopes and moderately exposed on the upper slopes in terms of wind hazard. The local climate is for the most part classified as warm and moist.

These factors suggest site conditions with moderate to limited flexibility for the management and growth of trees crops. The management felling identified in **Figure 12.1.2 Forestry Project Felling Map** has been proposed to achieve suitable wind-firm boundaries and pragmatic forest management outcomes.

Therefore, increased windthrow risk is unlikely to result from removal of mature conifers within the OHL operational corridor. Additionally, the impact of wind-throw on native broadleaves is likely to be minimal due to their age, structure and general sheltered locations.

7 Woodland Management Impact

The proposed OHL alignment will create additional challenges for the future management of the forest as it dissects existing management coupes. The constraint associated with the introduction of the OHL into the forest environment will be reduced by regular maintenance of the OC, which will avoid incidences of “Red Zone” trees.[3]

The proposed OHL alignment crosses the forest road network 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.

The Existing Line is already an established feature of the forest and unlikely to significantly restrict future in-forest machinery access. However, the requirement for dedicated forestry machine OHL crossing points will be discussed with FLS 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.

[3] 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)

The Proposed Development will result in the permanent removal of existing mature and young conifer woodland and broadleaved woodland from the OC. This will reduce the productive forestry land available for planting within the woodland property area, as the OC will require to be kept clear of trees. However, this loss of ground will to some extent be ameliorated in the future as the operational corridor for the Existing Line is incorporated back into the forest area following its de-commissioning. Additionally, the tree removal required to create the temporary OHL diversion will not be permanent and can also be incorporate back into the forest area once commissioning of the proposed OHL is complete.

During the construction phase, there will be a level of disruption to the undertaking of routine forestry management activities by FLS on the woodland property. This will be project managed through communication and agreement with the affected stakeholders, principally Forest and Land Scotland them.

8 Mitigation Opportunities

A reduced OC width of 60m has been assessed for all 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 scope of the construction activities and in particular the requirement to safely install the electrical conductor (cable).

The operational corridor woodland removal area is required for the construction and operation of the new OHL infrastructure. Opportunities will be assessed for woodland replanting within the OC, the identification of suitable areas cannot be guaranteed due to the requirement of maintaining the safe energisation of the OHL. Reference to **Appendix 12.5 Compensatory Planting Strategy**, will fully mitigate the operational corridor woodland removal area by replanting the area quantity (hectares) of woodland removed.

The management felling areas (those areas outwith the OC that require to be felled) will be replanted by the Landowner in accordance with the usual legal obligations associated with Scottish Forestry Felling Permissions.

9 Woodland Removal Impact

Table 9.1 Woodland Removal for Infrastructure

Item	Woodland Type	Area
OHL	Mature conifer plantation	10.05
	Young conifer plantation	0.71
	Native broadleaved woodland	0.94
Access Track Corridor	Mature conifer plantation	1.24
	Young conifer plantation	-
	Native broadleaved woodland	-
Temporary OHL Diversion Corridor	Mature conifer plantation	0.66
	Young conifer plantation	-
	Native broadleaved woodland	0.97
Total Woodland Removal		**14.57**

Table 9.2 Compensatory Planting		
Compensatory Planting Area	Mixed conifer or mixed broadleaves	12.94

Table 9.3 Woodland Removal Impact of Infrastructure		
Total Loss of Woodland Area		14.57
Total Replanting/Restocking		1.63
Total Compensatory Planting Area		12.94
Total Net Loss of Woodland Area		**0.00**

Table 9.4 Woodland Removal for Management Felling		
Item	**Woodland Type**	**Area**
Management Felling	Mature conifer tree crop	35.63
Replanting/Restocking	Predominantly conifer	35.63
Net Loss of Woodland Area		**0.00**
Note. Felling approval is via Scottish Forestry Felling Licence application process or Long Term Forest Plan application or amendment process.		

10 Compensatory Planting

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 CoWRP[4] objective of no net loss of woodland.

[4] The Scottish Government's Policy on Control of Woodland removal, Forestry Commission (2009)

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Figure 12.1.2 - Forestry Project Felling Map

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Dunoon to Loch Long 132kV OHL Rebuild

Figure 12.1.2
Cnap Reamhar Wood, Ardentinny and Stronvochlan Wood, Glenfinart Forest Forestry Project Felling Map

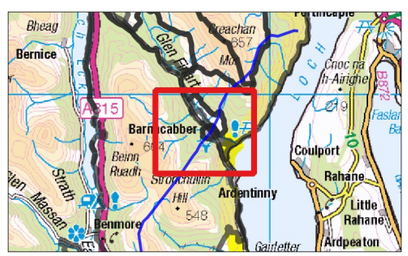
Created On: 26/01/2023

Key

- Property Boundary
- Proposed OHL Alignment
- Proposed Tower Position
- Temporary Diversion
- Temporary Diversion Structure
- 60m Temporary Diversion Corridor
- Operational Corridor

Proposed Powerline Tree Removal

- Mature Conifer - 81m Operational Corridor, 20m Track and 60m Temporary Diversion Corridors
- Young Conifer - 81m OC (<15 years old)
- Native Woodland - 60m Operational Corridor
- Native (AWI) - 60m OC and Temporary Diversion Corridor
- Management Felling
- Scattered Trees (Non-Commercial)
- Open Ground or Other Land
- Existing Track
- Proposed Retained Access Track
- Proposed Access - Temporary



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