Foyers Tree Felling

Resilience Survey and Woodland Condition Report

Landowner Scottish and Southern Electricity Network

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1. Introduction

Foyer's substation requires an extension to meet the demand for further energy generation. Scottish Woodlands have been contracted by the landowner, SSEN to carry out a woodland condition assessment on the forest resource surrounding the substation. The purpose of the assessment is to consider the likely impacts the development will have on forestry. This includes an assessment on the sensitivity of the forest resource and a determination of the impact upon them resulting from the proposed substation extension.

2. Site Location

Foyer's substation is located nearby the small village of Foyers in the Highland council area of Scotland. The village lies on the east shore of Loch Ness. It is situated around 10 miles northeast of Fort Augustus and 20 miles southwest of Inverness. The substation is located at grid reference NH508224. Scottish Woodlands assessed a block of woodland around 1.3 hectares in size.

Figure 1: Study Area

The red line illustrates the initial proposed substation extension, civil works are likely to go beyond this, but the footprint is yet to be fully determined. The area highlighted in green illustrates the woodland Scottish Woodlands were contracted to survey.

3. Plates Location Map

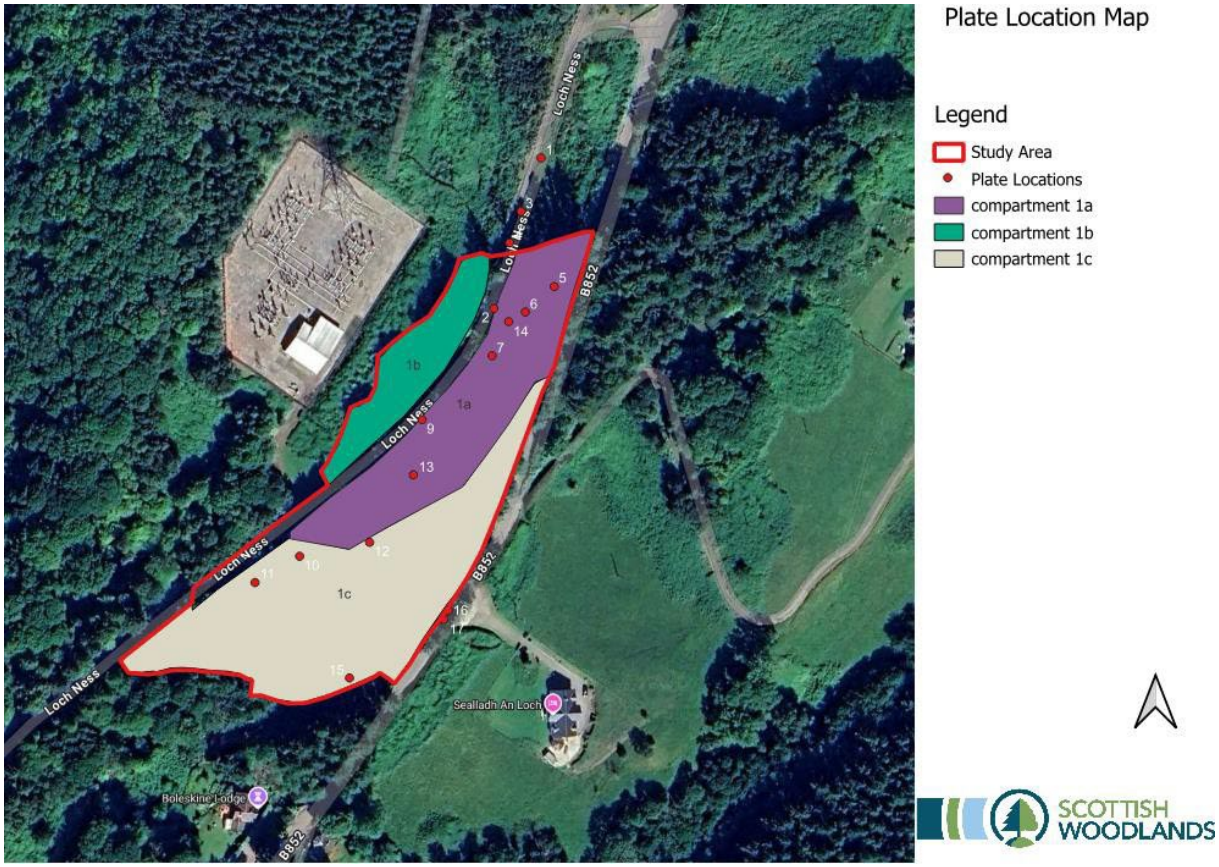

Figure 2: Plate Location Map

4. Woodland Characteristics

Plate 1: Study area 1a

Plate 1 illustrates the woodland type located within compartment 1a (designated for the purpose of this report, see Figure 2). The compartment is predominantly composed of Douglas fir with heights ranging between 34-37m tall. The surveyor noted thinning crowns, but the general condition of the trees appeared healthy. There were signs of root upheaval and weakened anchor points where the root structure was exposed (**Plate 6**). The woodland edge is 46m from the nearest conductor on a 275kv overhead transmission powerline. The understorey largely comprised coppiced oak, rowan and hazel (**Plate 5**). Silver birch was also prevalent. The risk of windthrow was low from the east and south as the block is relatively sheltered. However, the risk of windthrow from the north and northwest is moderate to high due to exposure after the proposed phase 1 felling in Forestry and Land Scotland (FLS) management plans are undertaken (Figure 3).

Plate 2: Windblow in 1a

Plate 2 illustrates the current wind damage within the compartment. Overall, this coup is healthy despite areas of windblow.

Plate 3: Study area 1b

Plate 3 illustrates the woodland type located within compartment 1b (designated for the purpose of this report, see Figure 2). This compartment is predominantly composed of mixed broadleaves (MB). The surveyor noted species such as Norway maple, Silver birch, Small leaved Lime, Douglas fir and European larch. The diameter at breast height (DBH) of the Douglas fir was 44cm. This coup is situated on an embankment weighted or biased towards the substation (**Plate 4**). The woodland edge is 23m to the substation fence and 34m to the closest infrastructure within the substation compound. The height of the MB range between 14 and 20m tall. The Douglas fir was recorded at 29.5m tall and 44m to the nearest conductor. The health of this woodland appeared to be good with no evident signs of root upheaval or decay.

Plate 4: Foyers Substation

Plate 4 illustrates the proximity of compartment 1b to the substation.

Plate 5: Coppiced MB

Plate 6: De-stabilised root base within 1a

Plate 7: Glade

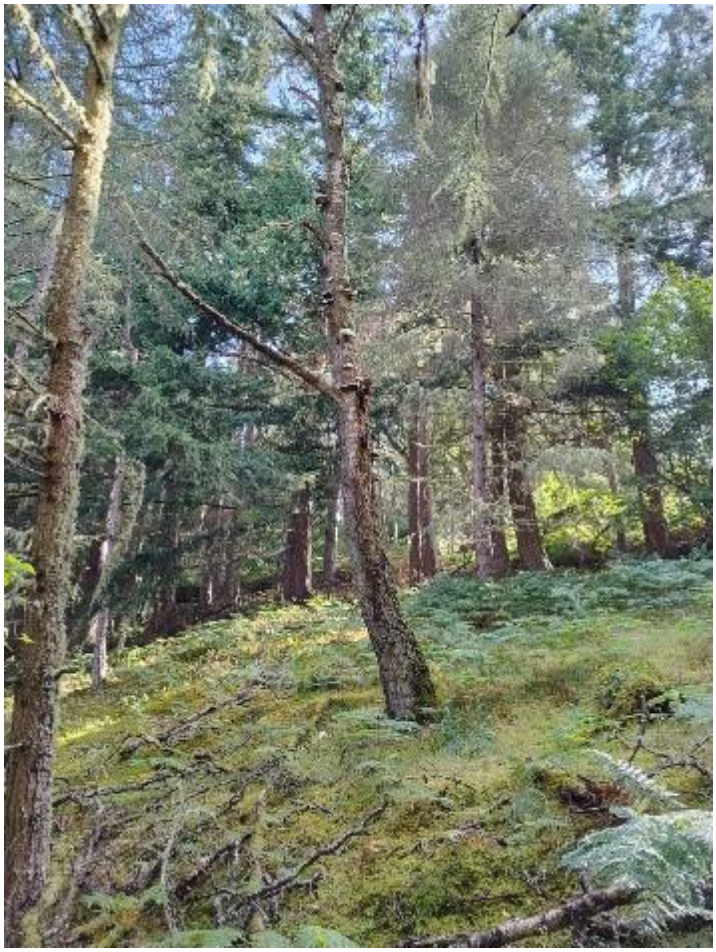

Plate 8: Fungi growth

A small glade (**Plate 7**) was noted by the surveyor where the woodland type changed from over mature Douglas fir to mature Douglas fir, Silver birch and European larch. The level of light reaching the forest floor was significant with bracken being dominant. Fungal growth was noted on several trees within this area where decay was evident as illustrated by plate 8.

Plate 9: Conifer crop on embankment

Plate 9 illustrates Sitka spruce growth on the embankment above the single-track road servicing the substation named ‘Loch Ness’. The surveyor was unable to confirm but suspected shallow rooting may be likely due to the ground conditions. The trees growing on the embankment are biased towards the single-track road (Loch Ness) which is also a popular walking route, the name of which is unknown.

Plate 10: Windblow

Plate 11: Suppressed trees blown

As illustrated by Plate 11 Sitka spruce is dominant within compartment 1c (designated for the purpose of this report, see Figure 2). The woodland does not appear to have been thinned, the understorey comprises 'spindly' suppressed spruce which has blown and died off. The area is largely composed of Sitka spruce and European larch. The majority of the trees within this section have a lean towards the northeast towards the substation.

Plate 12: Split stem - 'widow maker'

Plate 12 illustrates further existing wind damage that has occurred to the crop. A co-dominant stem has snapped and is hung up. The term ‘widow maker’ is given in these instances which refers to a detached limb or broken treetop which could cause significant harm/death if it were to fall.

Plate 13: Root structure on blown tree

Compartment 1c is largely comprised of over mature Sitka spruce. DBH measurements were taken ranging from 45 up to 75cm. The surveyor struggled to accurately measure tree heights due to the closed canopy; However, top heights were recorded around 34m tall. As illustrated by Plate 13 this area has also suffered from windthrow. Plate 13 gives an indication of the rooting which appears to be quite good. Strongs winds potentially from the non-prevailing direction and an over mature crop have likely been the cause for the windblow. Sporadic Norway maple and European larch were also noted within this section.

Plate 14: Change in crop

Plate 15: Distribution overhead powerline

An overhead distribution powerline (**Plate 15**) on wooden poles was noted at the southern end of the study area. The woodland edge is 7m parallel to the overhead powerline. At present the edge trees appear to be stable but if they were to fail, they would be within falling distance of the powerline and would cause significant damage.

Plate 16: Public Road B852 looking south

Figure 17: Public Road B852 looking north

Plates 16 and 17 show the woodland edge along the B852. The front row of spruce is between 2 and 3m from the road. A blind corner is also present opposite a residential property 'Sealladh An Loch'. This is important to recognise as visibility is poor and if trees were to fail and fall across the road a significant accident could occur.

Plate 18: Douglas fir at roadside

Plate 18 shows that there are several Douglas fir trees growing in the roadside drain along the single track 'Loch Ness' Road which services the substation. Water levels in the drain were low at the time of the visit but this could have led to shallow rooting which increases the risk of wind blow as the root structure is unable to support the tree during storm periods. Trees tend to blow from the 'sail' effect. If the trees were to fall, they would block access along the road. Due to the proximity to the road the roots will also cause damage to the running surface, splitting the tar.

Plate 19: INNS Rhododendron Ponticum

Plate 19 shows Invasive Non-Native Noxious Weeds (INNS) are present within the study area. Sporadic Rhododendron was noted and should be included within the management plan for the site. The landowner has a duty to control the population of INNS within their site boundary.

5. Windthrow Risk Impact Assessment

The site conditions at Foyers substation were classified using an online Forest Research tool, Ecological Site Classification or ESC 4. The site has been classified as warm, sheltered with a moist climate. Soils are generally of a moist moisture status with a very poor nutrient status. The site has been awarded a Detailed Aspect Method Scoring or (DAMS) windthrow exposure hazard classification score of 8.

As mentioned above in section 4 the risk of windthrow from the north and northwest is moderate to high due to exposure from non-prevailing winds after the phase 1 felling has concluded based off the FLS phase 1 felling plans as illustrated below in Figure 3.

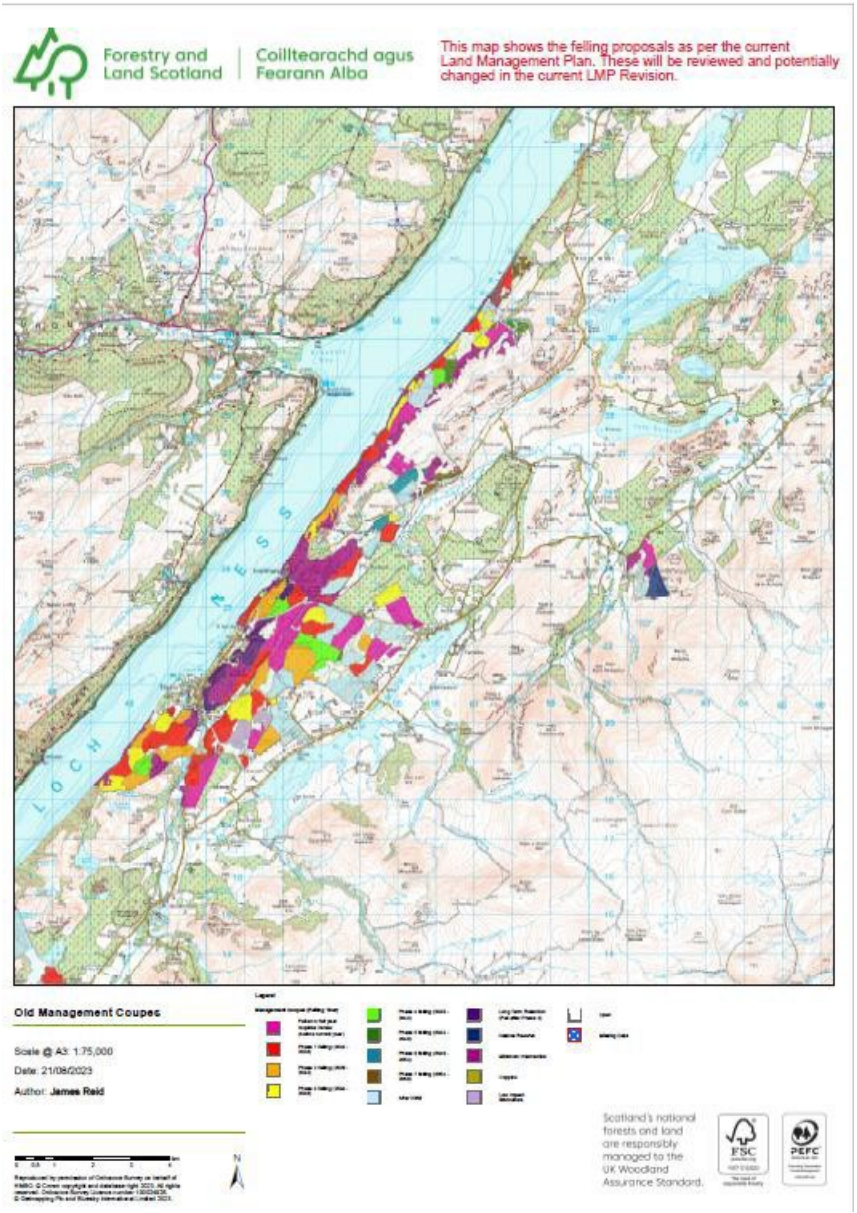

Figure 3: FLS Management Coupes

6. Recommendations

The coniferous trees within the study area are nearing a stage where they are beyond conventional harvesting size. Scottish Woodlands recommend felling the area within the next 12 months. Due to the conditions on site and the size of the area it would be recommended that the area is deer fenced and restocked with native species. It would be beneficial to plant the area with a diverse mix of broadleaves to help ensure a continuous screen from residential receptors is maintained long term and to also help promote greater resilience within the woodland. Stratified edges are encouraged along the road and substation to reduce the risks to established infrastructure. Tree shelters could also be utilised outside of the main compartments to leave access available along the foot path.

Populations of INNS should be managed and not left to increase in population.