5. FORESTRY

5.1 Introduction

This chapter provides an assessment of the significance of predicted residual effects on forest and woodland areas arising from the construction and operation of the new Crarae Substation and accompanying infrastructure located within the site boundary, also known as the 'Red Line Boundary' (RLB) (hereby referred to as 'the Proposed Development') and the associated Inveraray to Crossaig Reinforcement overhead line (OHL) tie-in operational corridor (OC) (hereby referred to as 'the Associated Development'). These two developments are together known as 'the Project'.

Annex J contains a Woodland Report which describes the woodland baseline conditions in the area of the Project, the potential windthrow risk, the short and long term potential impacts on commercial woodland, mitigation measures proposed and an assessment of the required area for compensatory planting. This chapter is also supported by Figures 1 and 2 which form part of the Annex along with the Compensatory Planting Management Strategy.

5.2 Objectives

The baseline purpose of this chapter is to:

- Describe the assessment methodology and significance criteria used in completing the impact assessment;
- Describe the potential direct and indirect effects on forestry resources associated with the Project;
- Describe the cumulative effects on the forestry resources associated with the Project;
- Describe the mitigation measures proposed to address the likely significant effects; and
- Assess the residual effects remaining following the implementation of mitigation.

The forestry landscape assessment and baseline surveys informing this Chapter has been carried out by Scottish Woodlands Ltd, in line with the UK Forestry Standard (UKFS)[1] guidance.

5.3 Guidance

The following sources have been used to obtain information:

- Crarae Substation Woodland Report;
- UKFS Guidelines;
- Argyll and Bute Woodland and Forest Strategy; and
- Site walkover surveys conducted in April and May 2022.

5.4 Methodology

5.4.1 Scope of the assessment

This chapter considers the significance of likely predicted effects of the Project on forestry, including cumulative assessment, based on the felling requirements identified for the Project as proposed by the Applicant. It defines the potential impacts on the forest structure and management of the resource, and the likely level of impact based on an assessment of the sensitivity of the affected forestry areas which may arise as a result of the Project but does not address the Long-Term Forest Plans (LTFPs) of the wider resource (outside the area identified for the Project within the Red Line Boundary, known as 'the RLB'). Any felling undertaken outside the RLB would be

[1] Forestry Commission (2017) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/687147/The_UK_Forestry_Standard.pdf

at the discretion of the landowner, and the Applicant would not have any control over this. Consequently, this assessment is limited to consideration of the effects of the Project on the present forest composition and yield.

5.4.2 Extent of the Study Area

The study area for this assessment is based around the requirement to form and maintain an Operational Corridor (OC) for the Associated Development and the requirement to fell forestry within the RLB to allow for construction of the substation and these areas have been identified by the Applicant based on requirements for construction, maintenance and operation of the Project, and any site constraints identified. As provided in terms of the Electricity Safety, Quality and Continuity Regulations (ESQCR) 2002 and Schedule 4 to the Electricity Act 1989, the Applicant has the necessary statutory powers to remove woodland for the purposes of construction and ongoing maintenance of new overhead lines and to ensure clearance and protection of electrical infrastructure and equipment.

The OCs for OHLs are defined with reference to the distance at which a tree could fall and cause damage to the OHL, resulting in a supply outage. As a result, the final OC width would be based on the safety distance required to allow for a mature tree falling towards the OHL at the mid point of an OHL span between two towers taking into consideration key factors such as gradient, topography, and crop height. The OC for a 275kV line (as is proposed in this case) is usually set to a width of 85 m. However, where going through valuable habitat such as ancient and/or native woodland, it can, depending on the tree species present, be reduced to ensure the retention of as many trees as is reasonably practicable.

5.4.3 Sensitivity, Magnitude and Significance of Effect

There are no published criteria, guidance or methodologies for the assessment of effects on forestry. As a result, the assessment is made based on professional judgement, with reference to:

- The sensitivity of the different types of woodland present in the study area, taking into consideration the degree and rate of change in the woodland, both in the recent past and that anticipated in the near future, and therefore the susceptibility/vulnerability of the woodland change; the quality of the woodland and the extent to which it is rare or distinctive, and the value attributed to the woodland through designations;
- Magnitude of change and extent of woodland removal;
- Duration and reversibility, i.e., the timescale of the effect of the Proposed Development (days/weeks/months/years) until recovery. Permanent effects are described as such, and likelihood of recovery is detailed where appropriate; and
- Adverse/beneficial, i.e., an assessment of whether the effects of the Proposed Development will be beneficial or detrimental to the feature in question. The effect of tree felling on woodland is normally considered to be of an adverse nature, however, in some areas beneficial effects may arise where the introduction of the Proposed Development allows for the removal of ecologically habitat-poor conifer plantation.

The criteria for assessing sensitivity and magnitude are outlined in **Tables 5.1** and **5.2** below, while **Table 5.3** outlines the methodology for calculating the significance of the effect.

Table 5.1 - Criteria for assessing sensitivity

Category	Description
High	Highly valued, subject of national designation, e.g. Ancient Woodland Category 1a; Particularly rare or distinctive in a national context; or Considered susceptible to small changes.

Category	Description
Medium	Valued more locally, subject to local designation; Rare or distinctive in a regional context; and/or Tolerant of moderate levels of change.
Low	Generally, more commonplace and not designated; Considered potentially tolerant of noticeable change; or Undergoing substantial development such as that their character is one of change.
Negligible	Already fundamentally changed (e.g. second rotation commercial conifer); Considered tolerant of noticeable change; or Having undergone substantial development such that their character is one of change.

Table 5.2 – Criteria for assessing magnitude of change

Category	Description
High	A noticeable change to the woodland over a wide area or an intensive change over a limited area.
Medium	Small changes to the woodland over a wide area or noticeable change over a limited area.
Low	Very small changes to the woodland over a wide area or small changes over a limited area.
Negligible	No discernible change to the woodland.

Table 5.3 – Criteria for calculating the significance of effects

Magnitude of Change ↓	Sensitivity of Woodland →			
	High	Medium	Low	Negligible
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	None
Low	Moderate	Minor	None	None
Imperceptible	Minor	None	None	None

5.4.4 Baseline Data Collection (Desk Study)

The Proposed Development RLB and the Associated Development OC, the surrounding forestry and landscape, and the proposed new access tracks (see **Figures 1** and **2**) were analysed for existing woodland cover through desk-based studies using maps and aerial photography. Web-based data on local, regional, and national designations and public access issues were also consulted.

5.4.5 Forest Walkover (Field Survey)

Forest walkover and mapping surveys were undertaken in April and May 2022, to confirm the extent of the woodland areas affected by the Project and to further assess the current woodland characteristics and the wider impacts the developments would have on the woodland resource. Photographic records were captured to provide visual samples of the woodland types and evidence of woodland characteristics throughout the RLB, see the accompanying Woodland Report in **Annex J.** An estimate of standing woodland volume of the commercial conifer resource was calculated during the forest walkover survey, see the accompanying Woodland Report in **Annex J.**

The forest walkover survey also included a visual assessment of tree health, vigour, ground conditions and existing woodland stability. Observations were also made of potential woodland windfirm boundaries, investigating the RLB, forest rides and other potential green edges as identified during the baseline desk survey.

5.4.6 Limitations and Assumptions

Consultation with the landowner on their Land Management Plans (LMPs) is ongoing in association with the woodland removal proposals of the Project

5.5 Results

5.5.1 Baseline

The Proposed Development is located within a commercial conifer plantation with an RLB area of 18.75 ha of mainly conifer thicket and recent restock with integrated open ground. The Inveraray to Crossaig Reinforcement, recently completed by the Applicant, currently connects to the existing Crarae substation northeast of the Proposed Development and will be realigned as part of the Associated Development to connect to the new substation. An 85m wayleave corridor will be cut through the commercial conifer plantations to enable the proposed alignment, and 20 m corridors will be cut to facilitate construction of new access tracks. In total, 8.03 ha of the 18.75 ha of the RLB is classified as woodland, which requires clear-felling to facilitate the construction of the Proposed and Associated Development (see **Figures 1** and **2)**.

A total of 0.15 ha of woodland removal is required to facilitate the Associated Development (see **Figures 1** and **2**).

A detailed breakdown of woodland characteristics and woodland removal requirements can be found in the Crarae Substation Woodland Report (**Annex J**).

A single primary landowner, Forestry and Land Scotland (FLS) was identified and communication will remain ongoing throughout the project.

5.5.2 Field Survey

Age classes vary throughout the conifer plantations on site, but mainly consists of thicket Sitka spruce *Picea sitchensis* approximately 15 years of age, with harvestable logs in areas. There are also smaller areas of Lodgepole pine *Pinus Contorta* and a large area of failed spruce crop to mulch. The northern-most woodland compartment, which will contain the proposed substation platform, is composed of pre-thicket Sitka spruce aged 8 to 12 years old (see **Figures 1** and **2**). The ground conditions are wet and boggy in areas across the RLB site, which has impacted tree growth rates and created ‘checked’ Sitka spruce (areas of poor quality/stunted growth timber).

The Feorlin Reservoir is situated west of the RLB, and a man-made ditch runs from the reservoir north-west of the RLB. The SUDs outfall pipeline connects into the man-made ditch. North of the Proposed Development runs Abainn Bheag an Thunns (see **Figures 1** and **2)**.

5.6 Assessment of Effects

The assessment of effects from the construction and operational phases of the Project considers the following:

- Direct construction effects: loss of areas of forest through woodland removal to create the Proposed Development substation site, ancillary infrastructure and access, and the Associated Development alignment OHL OC and access, in the context of the regional forest resource for both commercial conifer forest and ancient woodland and semi-natural woodlands;
- Indirect construction effects: increased windthrow and secondary felling agreed with landowners;
- Indirect operational effects: effects on forest management systems and restrictions on forest access; and
- Cumulative effects: combined loss of woodland from direct and indirect (secondary) felling.

5.6.1 Construction Effects

Woodland Removal

The total loss of woodland resulting from the Proposed Development has been calculated using the project Geographic Information System (GIS) and equates to 8.03 ha. However, 8.03 of off-site compensatory planting will take the total net loss of woodland to nil.

The woodland removal for the Proposed Development consists mainly of young commercial conifer plantation. The removal of thicket and pre-thicket commercial conifers has been assessed as having a high magnitude of change but a negligible sensitivity, meaning that the effect is minor and not significant.

Table 5.4 below sets out the woodland characteristics of the area affected by the Proposed Development.

Table 5.4 – Woodland characteristics of the area affected by the Proposed Development

Habitat Type	Area (ha)
Coniferous plantation (8-10-year-old pre-thicket spruce)	4.93
Coniferous plantation (12-15-year-old thicket spruce)	1.07
Coniferous plantation (15-17 years thicket spruce)	1.93
Mixed broadleaf	0.1
Total	**8.03**
Open ground with sporadic Sitka spruce regeneration	2.84

Windthrow

The windthrow risk impact of the main area of woodland removal for the substation site is generally low, due to the woodland characteristics of young conifer plantation with areas of open ground (see **Figures 1** and **2**). During the construction and associated RLB tree felling/vegetation clearance the effects in terms of windthrow will therefore be minimal as forest edges will remain stable. The windthrow effect resulting from the Proposed Development is therefore none and not significant.

5.6.2 The Proposed Development (Substation)

Construction Effects

Woodland Removal

There may be requirements for routine vegetation clearance and management along the access tracks (see **Figures 1** and **2**) and immediately adjacent to the substation to facilitate clear, safe access for operation and maintenance works. Overall, the adverse effect during operation of the Proposed Development is assessed as none and not significant.

Effects on Forest Management Systems

The introduction of a new overhead line through areas of managed forest would require a review by the landowner of their existing management system. Most large State-owned commercial forest areas have a Land Management Plan (LMP), which identifies the operations intended for the ongoing management of the forest over a 20-year period. This LMP also provides the forest owner with consents from Scottish Forestry, as the forest authority, to undertake felling and replanting of the forest over a 10-year period. The impact of the Proposed Development is therefore only in terms of individual LMPs having to be revised to address the construction of the Proposed Development and the associated tree clearance works on the future management of the site.

It is, however, anticipated that the Proposed Development will have low impacts on forest management systems, in terms of individual LTFPs having to be revised to address the construction of the substation and ancillary works, and any future tree clearance or management of the site to ensure safe access to and operation of the Proposed Development. The sensitivity of the management system has been assessed as likely to be low. The magnitude of change associated with restructuring the LTFP(s) to incorporate the felling required for the Proposed Development will likely be medium, as the site walkover suggested the area is under standard forestry management (clear-fell and restock). Additionally, there is no risk of windthrow resulting from the felling for the Proposed Development. Together, this suggests that the impacts locally on and on individual landowners is likely minor and not significant.

Restrictions on Forest Access

During forestry operations, live electrical equipment including the proposed substation and ancillary works, could restrict access to surrounding forestry as they may pose several risks in terms of adjacent tree felling operations and the extraction of timber to roadside. Loading and haulage of the timber off site can also be restricted within proximity of live electrical equipment. However, the substation site and the RLB will not be replanted with commercial forestry, so there will be no future access into the immediate site for commercial forestry purposes. The adjacent commercial forestry will lie approximately 135 m away from the proposed new substation.

The site will not be replanted; consultation with FLS confirmed that the site was unsuitable for replanting due to large areas of deep peat. Off-site compensatory planting will be carried out to offset woodland removal. The risks arising from the Proposed Development associated with access for commercial forestry purposes are assessed as none and not significant.

It is assumed that planning work for any proposed future felling would follow standard health and safety management measures and best practice, e.g., Forest Industry Safety Accord (FISA)[2] guidelines. Overall, the impact of the Proposed Development on future forestry activities is assessed as minor and not significant.

5.6.3 The Associated Development (OHL Alignment and Operational Corridor)

Construction Effects

Woodland Removal

The total loss of woodland required for the Associated Development has been calculated using the project Geographic Information System (GIS) and equates to 0.15 ha (see **Figures 1** and **2**). However, off-site compensatory planting would take the total net loss of woodland to nil.

[2] FISA (2022) Safety Guides https://ukfisa.com/Safety/Safety-Guides

The removal of thicket and pre-thicket conifers and young conifer restock has been assessed as having a high magnitude of change but a negligible sensitivity, and the effect is therefore minor and not significant.

There is also potential to manage species-rich areas of lower growing vegetation within the OC, to provide medium or long-term biodiversity enhancement. Lower growing shrubs would provide valuable habitat for local fauna and flora. The assessment of this effect is provided in **Chapter 4: Ecology and Ornithology**.

Table 5.5 – Woodland characteristics (Associated Development)

Habitat Type	Area (ha)
Coniferous plantation pre thicket (8-12-years-old)	0.15
Total	**0.15**
Open ground with sporadic Sitka spruce regeneration	**10.48**

Windthrow

The 85 m corridor for (the Associated Development) will run north of the Proposed Development, passing through Sitka spruce pre-thicket and open ground. Due to the conifers being immature the risk of windthrow to the site is low. Although the area has been classified as moderately exposed with wet ground conditions, the Sitka spruce plantations outside the OC are windfirm and the removal of conifer thicket within the OC will have no impact on the retained crop. The effect is therefore none and not significant.

Operational Effects

Woodland Removal

The operational effects on forests and woodland resulting from the Associated Development would involve periodic vegetation clearance and management to maintain the OC. Within the OC, following construction of the OHL, there would be an ongoing need to manage the growth of vegetation to facilitate access for maintenance of the overhead line and to maintain the required tree clearance zones for the safe and resilient operation of the line. The OC, after woodland removal, is deemed to be of negligible sensitivity and the impact of vegetation management is considered to represent a low magnitude of change. Overall, the adverse effect during operation is assessed as none and not significant.

Effects on Forest Management Systems

The introduction of a new overhead line through areas of managed forest would require a review by the landowner of their existing management system. Most large State-owned commercial forest areas have a Land Management Plan (LMP), which identifies the operations intended for the ongoing management of the forest over a 20-year period. This LMP also provides the forest owner with consents from Scottish Forestry, as the forest authority, to undertake felling and replanting of the forest over a 10-year period. The impact of the Associated Development is therefore only in terms of individual LMPs having to be revised to address the construction of the Associated Development and the associated tree clearance works on the future management of the site.

It is, however, anticipated that generally, the Associated Development will have low impacts on local forest management systems, in terms of individual LTFPs having to be revised to address the tree felling required for the OHL alignment OC, the associated management felling to mitigate windthrow, and any future tree clearance or management of the site to ensure safe access to and operation of the Associated Development. The sensitivity of the management system has been assessed likely to be minor. The magnitude of change associated with restructuring the LTFP(s) to incorporate the felling required for the Proposed Development will also likely be

minor. Together, this suggests that the impacts locally and on individual landowners from the Associated Development is likely minor and not significant.

Restrictions on Forest Access

During forestry operations, live electrical OHLs could restrict movements as they pose several risks in terms of adjacent tree felling operations and the extraction of timber to roadside. Loading and haulage of the timber off site can also be restricted where within proximity of OHLs. The adjacent forestry once restocked will be approximately 42.5m away from the proposed new OHL realignment, and again, it is assumed that standard health and safety management measures and best practice, e.g., FISA guidelines, will be followed during planning. The risk of the Associated Development to future forestry activities is therefore assessed as none and not significant.

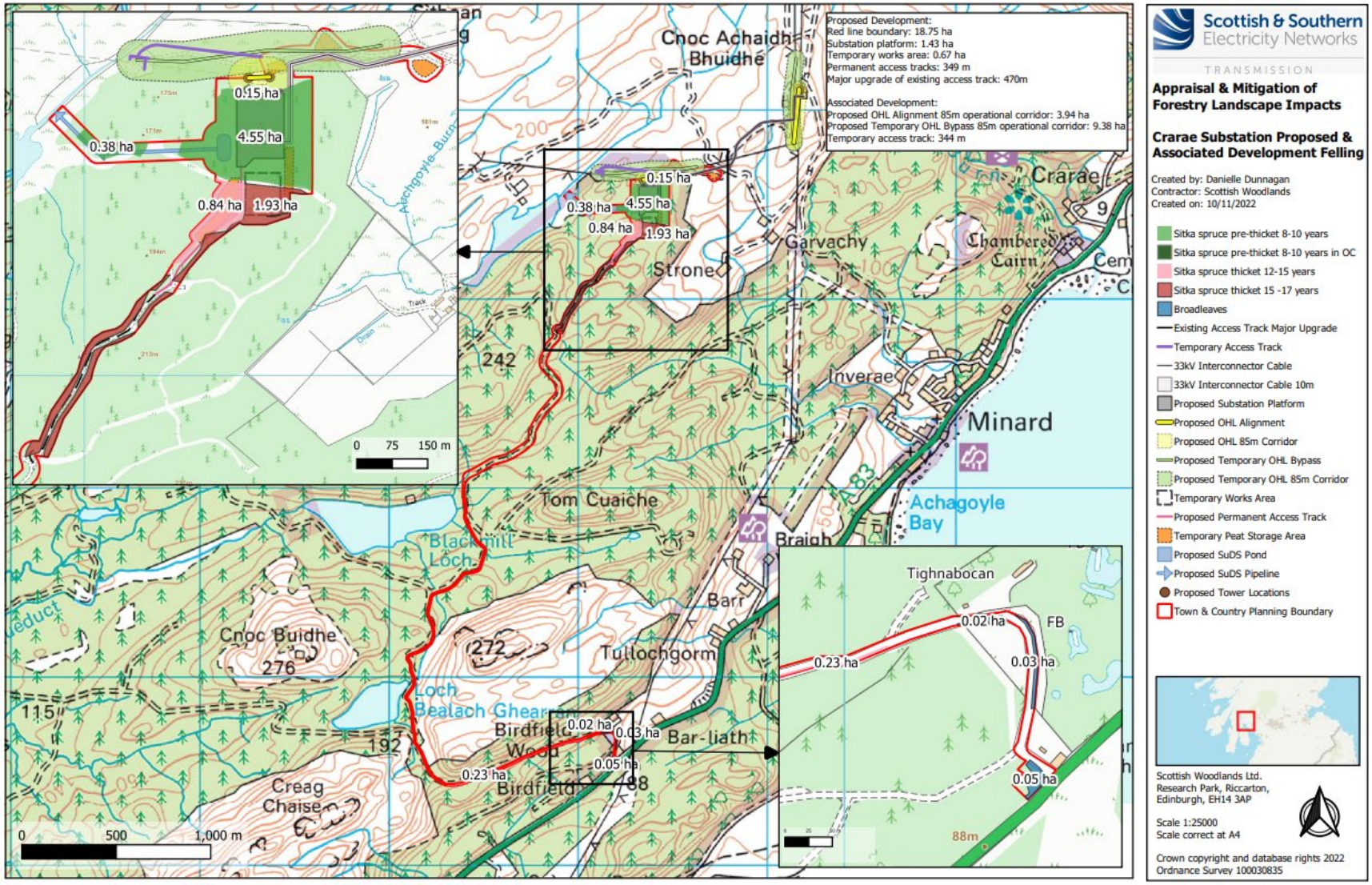
5.7 Cumulative Assessment

5.7.1 The Proposed Development and the Associated Development

Woodland Removal

The Proposed and Associated Developments will involve clearing a total of 8.03 ha of young conifer plantation and native broadleaf regeneration. Off-site planting, however, will take the total net loss of woodland to nil. The cumulative effect is assessed to have a moderate to high magnitude of change, but a negligible sensitivity due to the nature of second rotation commercial forestry. There may be minor, indirect effect on the wider woodland resource (outside the RLB) during construction as the woodland is cleared, and during operation as the new non-commercial plantation is managed, but overall, the effect is assessed as minor, short-term, and not significant. A breakdown of woodland removal can be seen in **Figure 1** below (see **Figure 2** for aerial view).

Figure 1 - Breakdown of cumulative woodland removal. Please refer to **Figure 1** in **Annex J** for a larger map.



Windthrow

In forestry there is a general commitment to fell to viable windfirm edges to minimise the risk of windthrow to retained crops. This is contrary to felling a linear 85 m wide OC, as this will expose trees that were previously sheltered and therefore increase the risk of windthrow to the retained crop. As the plantations on-site are young, no windthrow risk was identified for the Proposed or Associated Development. The resulting cumulative risk of windthrow to the site is therefore assessed as none and not significant.

Forest Management

Engagement with the landowner Forestry and Land Scotland (FLS) has been undertaken to review and discuss the Project felling and any associated forest land management plans including any impact on woodland windfirm edges. Continued management liaison will be undertaken for the duration of the Project between the Applicant and the Landowner.

5.8 Mitigation

5.8.1 Mitigation during Construction

No mitigation has been proposed as woodland removal within the RLB consists of pre-thicket and thicket commercial conifer plantations. The conifer plantations to the southwest and southeast of the RLB are of similar structure and the risk of windthrow is low. This, alongside standard good practice working methods will ensure that significant effects on ecological and hydrological receptors and the wider forest resource are avoided.

Before works commence a peatland survey should be carried out to determine the depth and significance of the area. Forestry operations will need to utilise wide flotation tracks to minimise ground disturbance and to help reduce the risks of any forest machinery being 'bogged' and causing significant ground disturbance. Extraction routes will require regular maintenance to ensure machinery remains afloat.

All loss of woodland should be fully compensated through a Compensatory Planting Scheme.

In order to address the potential significant effect on forest land-use management, the Applicant has produced a Woodland Report (Crarae Woodland Report, see **Annex J** which identifies all areas of felling required for the Proposed and Associated Developments. These reports will also be reviewed by the landowner to link in with the site's LTFP. It is crucial that the proposed felling operations comply with UKFS guidelines as this forms part of the SF approval process. This approval is required before any of the proposed felling can be carried out. In addition, the Woodland Report aims to reduce the risk of future windthrow by identifying viable windfirm edges (outside the RLB and/or OHL OC). The Crarae Substation Woodland Report did not recommend any further felling to achieve windfirm edges.

5.8.2 Mitigation during Operation

The Applicant is fully committed to meeting the Control of Woodland Removal Policy (CoWRP) objectives set out by the Scottish Government. The primary objective of this is no net loss of woodland resulting from the development. This will be achieved through a Compensatory Planting Scheme which will involve agreements with landowners within the regional land boundary of the local authority; Argyll and Bute, of where the proposed development is geographically located. Similarly, the Applicant is prepared to work with landowners as set out in the Woodland Report for the property, to address the potential effect on LTFPs or management systems.

No further operational mitigation measures have been identified.

5.9 Appraisal Summary

This chapter has considered the potential for significant effects on the forest resource, forest management and access during construction and operation. According to Argyll and Bute Woodland and Forestry Strategy the loss of woodland associated with the Proposed and Associated Developments would equate to 0.018% of the commercial plantation resource.

The loss of woodland required to facilitate the proposed development has been assessed as having a low magnitude of change. This was based on the context of the regional resource and the low sensitivity of the type of woodland present within the RLB. In terms of mitigation for woodland loss, it has been deemed acceptable that woodland loss will be recovered through a compensatory planting scheme. The felling of immature coniferous plantation required to facilitate the OC associated with the OHL realignment has been assessed to have a low significance of effect. No other mitigation has been recommended.

A summary of the appraisal of forestry is provided in **Table 6** below.

Table 5.6 – Appraisal of Forestry

Environmental Feature	Development Interaction	Mitigation Measures	Receptor Sensitivity	Magnitude of effect	Significance of effect
Conifer plantation	Mulch	Compensatory Planting	Low	Low	None

5.10 Mitigation Proposals

The key mitigation measures considered to reduce the potential effects of the Development are described in Table 7.

Table 5.7 - Mitigation Summary

Topic	Mitigation Measure	Responsible
Forestry	Compensatory Planting Scheme (to ensure no net loss of woodland)	The Applicant