

## Chapter 21: Forestry

Glossary of Terms.....	21-ii
21.1 Executive Summary .....	21-1
21.2 Introduction.....	21-2
21.3 Scope of Assessment.....	21-2
21.4 Policy, Legislation & Guidance .....	21-3
21.5 Methodology.....	21-5
21.6 Baseline Conditions .....	21-6
21.7 Potential Effects .....	21-9
21.8 Mitigation .....	21-10
21.9 Residual Effects .....	21-11
21.10 Cumulative Effects.....	21-14
21.11 Conclusions.....	21-14
21.12 References.....	21-14

### Figures

Figure 21.1a:	Forestry (Plates 1 – 4)
Figure 21.1 b:	Forestry (Plates 5 – 8)

## Glossary of Terms

Compensatory Planting	Where woodland is removed in association with The Proposed Development, the applicant is generally expected to provide planting elsewhere.
DAMS (Detailed Aspect Method of Scoring)	Gives information on the probability of damaging winds occurring at specific areas.
FDP (Forest District Design Plan)	Management plans prepared by Forestry Commission Scotland presenting information on the present and future land management decisions.
Forest Enterprise Scotland	Agency responsible for managing the National Forest Estate on behalf of the Government.
FCS (Forestry Commission Scotland)	Management and advisory body responsible for Scotland's national forest resource and tasked with the production of forest policy and guidance.
Ha (Hectares)	Unit of measurement of area.
LTR (Long Term Retention Woodland)	Trees retained for environmental benefit beyond the age or size generally adopted.
Low Impact Silviculture Systems	Area of opportunity for alternative forest management systems.
PAWS (Plantations on Ancient Woodland Sites)	A planted forest of native or non-native tree species that has been replaced the original semi-natural tree cover
Scoping Opinion	The written opinion of the determining authority as to the scope and level of detail of information to be provided in an EIA report.
Significant Effect	Effects deemed to be significant in relation to the EIA Regulations.
Windthrow	Trees that have been uprooted or broken by wind.
Yield Class	An index used in Britain of potential productivity of even-aged stands of trees. It is measured in units of cubic meters per hectare per year ( $m^3 ha^{-1} yr^{-1}$ ).

## **21 Forestry**

### **21.1 Executive Summary**

- 21.1.1 This Chapter assesses the potential effects of the Revised Coire Glas Pumped Storage Scheme (The Proposed Development) on the forestry across the site. The forests affected by The Proposed Development are all under the management of Forest Enterprise Scotland. The present and future land management are covered by Forestry Commission management planning documents; Clunes Forest Design Plan (2011 – 2021) and Garry Forest Design Plan (2013 – 2023).
- 21.1.2 Construction of The Proposed Development within the area of woodland covered by the Clunes Forest Design Plan (which would include construction of the lower reservoir works and associated access tracks), would result in the felling of some 48.69 ha of coniferous forest plantation.
- 21.1.3 Construction of The Proposed Development within the area of woodland covered by the Garry Forest Design Plan (which would include widening and realignment of forestry tracks from White Bridge), would result in the felling of a total area of approximately 13.63 ha.
- 21.1.4 The Proposed Development has been designed to avoid felling of areas classed as Long Term Retention woodland; which are trees retained for environmental benefit significantly beyond the age or size generally adopted by the woodland enterprise, and Plantations on Ancient Woodland Sites (PAWS) wherever possible. A small area of PAWS may be affected by construction of a temporary haul road between the lower reservoir works and the dam, which would require the appropriate storage and restoration of forest soils.
- 21.1.5 Where land would not be occupied by permanent infrastructure, but temporarily affected during construction, woodland loss would be replanted after construction, and this in principle, would follow the current Forest Design Plan species and design. There would however be a permanent woodland loss in the region of 21.51ha over the whole development site as a result of The Proposed Development.
- 21.1.6 As a result, there is a commitment to plant off-site, an area equivalent to the permanent woodland loss as Compensatory Planting. The Highland Council has a strong preference for planting to remain within the Highlands.

## 21.2 Introduction

21.2.1 This Chapter aims to assess the potential effects of the Revised Coire Glas Pumped Storage Scheme (The Proposed Development) on the forest in the immediate area of the works.

21.2.2 A review of the current forest status has been carried out by both visual assessment and access to Forestry Commission (Scotland) database and Forest Design Plans (FDPs).

21.2.3 This Chapter considers the effect on the forests in two locations;

- Clunes Forest (South Laggan Forest), where the lower reservoir works are positioned together with a temporary haul road connecting the lower reservoir works to the upper reservoir and dam area, which exits the forest plantation at the north east point above Loch Lochy; and
- Glengarry Forest, where widening and realigning of existing forestry tracks would occur from White Bridge to the edge of the forest plantation, and temporary site compounds and borrow pits would be located.

## 21.3 Scope of Assessment

### Scoping and Consultation

21.3.1 A Scoping Opinion was received from the Scottish Government in July 2017 and is included in Appendix 6.1. The relevant consultee for forestry was Forestry Commission Scotland (FCS). Table 21.1 summarises the relevant forestry issues raised during scoping.

**Table 21.1: Consultation Table**

Consultee	Summary Response	Comment/Action Taken
Forestry Commission (Scotland) (FCS)	FCS requested that a Forest Design Plan (FDP) be prepared and included in the EIA Report.	In the spirit of the approach taken to the conditions of consent for The Consented Development (2013), it was agreed with FCS / FES at a subsequent meeting with SSE in November 2017 (see Section 21.3.2), that a detailed FDP would be prepared at detailed design stage, rather than as part of the EIA Report.
	FCS requested that details of changes required to the current Forest Design Plan as a result of the scheme are set out.	As above, a Forest Design Plan will be drawn up which will incorporate the detail of the extent of felling and replanting relating to The Proposed Development and will describe how these fit within the Forest District FDP.
	The current District Forest Plan has commitments in restoring Plantation on Ancient Woodland Sites (PAWs) wherever possible.	The design of The Proposed Development has attempted, so far as practical, to avoid the PAWS restoration areas.
	FCS raised concerns regarding soil disturbance within PAWs.	Upgrade of existing forestry tracks within the PAWS area will maintain the integrity of the forest soils.
	An analysis needs to be undertaken to determine the area of woodland loss and how this fits with compensatory planting that will likely be required. The	Refer to Section 21.7.2 of this Chapter.

	implications of restructuring the landscape and stability of the remaining woodland should be considered.	
	Information should be provided on the reinstatement of temporary sites located within a woodland setting.	Refer to Section 21.8.4 of this Chapter.
	Information will be required in the EIA Report on how infrastructure at the lower reservoir works area will impact native woodland identified on the Ancient Woodland Inventory and the Native Woodland Survey of Scotland (NWSS) and how this will affect the UK Biodiversity Action Plan (UKBAP) priority habitat.	Refer to Section 21.8.1 of this Chapter.

21.3.2 In addition to the written scoping response, further consultation and a face to face meeting was held with FCS and Forest Enterprise Scotland (FES) on 2<sup>nd</sup> November 2017 to discuss The Proposed Development, how the forestry plantations may be affected by the works, and the implications to the current Forest Design Plans. It was agreed at the meeting that a Forest Design Plan, requested at scoping stage, would be prepared at the detailed design stage, rather than at EIA stage. The Plan would be drawn up to incorporate the detail of the extent of felling and replanting relating to the development and will describe how these fit within the Forest District Design Plan.

#### Study Area

21.3.3 The forestry plantations affected by The Proposed Development are within two distinct areas; the lower reservoir works area together with the potential new temporary haul road to connect the lower reservoir works to the upper reservoir and dam, are within an area of South Laggan Forest (Clunes FDP) on the north-west slopes above Loch Lochy with access taken from Kilfinnan. Secondly, access to the upper reservoir and dam is through part of Glengarry Forest (Glengarry FDP) at White Bridge.

#### Scope of Work

21.3.4 The assessment will refer to the extent and timing of tree felling required for The Proposed Development; the area and species which are proposed to be replanted post construction; and what area of woodland loss is consequential to The Proposed Development.

21.3.5 The assessment will consider the impact upon the existing Forest District FDPs and recognise the visual importance of the forest in the wider area. The assessment will also take notice of the Forest Design Plan Proposals for the restoration of Plantations on Ancient Woodland Sites (PAWS).

## **21.4 Policy, Legislation & Guidance**

### **The Forestry Act (1967) (as amended)**

21.4.1 The Act requires landowners to apply for a licence for the felling of growing trees, although certain types are exempt. Where full planning permission authorises the felling of trees on a development site, no further consent is required under the Forestry Act 1967 (as amended), however, the approved planning permission must expressly specify tree felling

and should be recorded on the map/plan. Felling without either a licence or other valid permission is an offence under Civil Law.

#### **UK Forestry Standard (UKFS)**

- 21.4.2 The UKFS is the reference standard for sustainable forest management in the UK. The UKFS, supported by its series of Guidelines, outlines the context for forestry in the UK, sets out the approach of UK governments to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring.

#### **Control of Woodland Removal (Forestry Commission Scotland 2009)**

- 21.4.3 The purpose of this policy is to provide direction for decisions on woodland removal in Scotland. The guiding principles are as follows:
- There is a strong presumption in favour of protecting Scotland's woodland resources;
  - Woodland removal should be allowed only where it would achieve significant and clearly defined public benefits. In appropriate cases a proposal for compensatory planting may form part of this balance;
  - Approval for woodland removal should be conditional on the undertaking of actions to ensure full delivery of the defined additional public benefits;
  - Planning conditions and agreements are used to mitigate the environmental impacts arising from development and Forestry Commission Scotland will also encourage their application to development-related woodland removal; and
  - Where felling is permitted but woodland removal is not supported, conditions conducive to woodland regeneration should be maintained through adherence to good forestry practice as defined in the UK Forestry Standard.

#### **Scottish Forestry Strategy**

- 21.4.4 The Scottish Forestry Strategy (SFS) is the Scottish Government's framework for taking forestry forward through the first half of this century and beyond. It sets out a vision of a forestry sector that is diverse and strong; in tune with the environment; employing many people in a wide range of enterprises; and providing the many other services and benefits that people need, now and for the future.
- 21.4.5 The Key Themes of SFS are:
- Climate change;
  - Timber production;
  - Business development;
  - Community development;
  - Access and health;
  - Environmental quality; and
  - Biodiversity.

## 21.5 Methodology

21.5.1 There are currently no standard criteria for assessing the sensitivity/importance and magnitude for forest felling and restocking or determining the value of woodland loss. A subjective methodology has been devised and tested among other forestry professionals as appropriate. Sensitivity/importance is relatively clear in definition whereas magnitude purely by area is far more subjective. Assessing the impact of The Proposed Development on the forest structure relies heavily on the General Forestry Practice Guide set in UK Forest Standards. The significance of an impact depends upon the sensitivity / importance of the forest area, combined with the magnitude of the impact. The criteria for assessing these, together with the resultant levels of predicted significance, is described in the following paragraphs.

### Sensitivity/Importance

21.5.2 Criteria for assessing the sensitivity / importance of a forest, is as follows:

- **High:** Ancient Semi Natural Woodland;
- **Medium:** PAWS, Long Term Retention and Natural Reserve;
- **Low:** Productive conifer plantation; and
- **Negligible:** Unplanted areas

### Magnitude of Direct Impact

21.5.3 Criteria for assessing the magnitude of impact to a forest, is as follows:

- **Large:** >40 ha;
- **Medium:** >15-40 ha;
- **Small:** >0.1-15 ha; and
- **Negligible:** <0.1 ha.

### Significance of Impact

21.5.4 The predicted significance of impact is determined by consideration of a Sites importance/sensitivity in conjunction with the magnitude of impact predicted on it. Table 21.2 summarises the criteria for assessing the significance of an impact.

**Table 21.2: Significance of Direct Impact to the Woodland Structure**

Magnitude of Impact	Sensitivity / Importance		
	High	Medium	Low
Large	Major	Major	Moderate
Medium	Major	Moderate	Minor
Small	Moderate	Minor	Negligible
Negligible	Negligible	Negligible	Negligible

### Desk Study

- 21.5.5 A desk study evaluation made use of available FDP's that cover The Proposed Development, obtained from Forestry Commission (Scotland), including:
- Lochaber Forest District Forest Design Plan: Clunes FDP 2011 – 2020;
  - Lochaber Forest District Forest Design Plan: Garry Forest 2013 – 2023;
  - National Forest Estate Scotland Sub-compartment Database (SCDB); and
  - Forestry Commission Scotland Land Information Search (LIS).
- 21.5.6 The desk study utilised the FDPs to establish the objectives and prescriptions for the forests over the periods of the relevant plans. In particular the FDPs summarise the analysis of data from survey of soils, open habitats, climate, plantations on ancient woodland sites (PAWS) and woodland stand structure. The FDPs offer information on the management decisions regarding tree stand management opportunities through thinning, the proposals for clear felling or potential for other silvicultural systems such as continuous cover forestry (CCF), along with the proposals for replanting and the restoration of PAWS. The information provided through Detailed Aspect Method of Scoring (DAMS) give the probability of damaging winds occurring for the specific locations within The Proposed Development.
- 21.5.7 In addition, aerial photography was used to assist in determining the most appropriate felling boundary proposals.

### Field Survey

- 21.5.8 A site visit was undertaken on 10<sup>th</sup> October 2017 to verify information included in the various FDP's. A visual assessment of current top height of tree stands and Yield class assessment was carried out, along with visual confirmation of windthrow hazard classification.

## **21.6 Baseline Conditions**

### **Designations**

#### Plantation on Ancient Woodland Sites (PAWS)

- 21.6.1 A planted forest of native or non-native tree species that has replaced the original semi-natural tree cover is referred to as a plantation on an ancient woodland site, usually abbreviated to PAWS. Clunes FDP describes some 219 ha of PAWS. There are areas of PAWS to the north-east of the proposed lower reservoir works area, as illustrated on Plate 1 of Figure 21.1a.

#### Native Woodland – Integrated Habitat Network

- 21.6.2 Within the Garry FDP, an area has been identified as a Caledonian pinewood regeneration zone. Within this area, smaller areas of PAWS woodland and remnant older pines can be found. Core Native Woodland areas are woods included in one or more national datasets that indicate high conservation value. The track widening, borrow pits and site compound lie within this zone, see Plate 4 of Figure 21.1a.



### Clunes Forest Design Plan (2011 – 2020)

#### Site Description and Condition

- 21.6.3 The lower reservoir works and the temporary haul road are located within the younger north end of the Clunes FDP block (between NN 253939 and NN 268953).
- 21.6.4 This is a second rotation tree crop which was replanted in the late 1980s and early 1990s. The species choice for productive conifer is predominantly Sitka spruce with other non-native conifer, as illustrated on Plate 2 on Figure 21.1a.
- 21.6.5 Photograph 21.1 and 21.2 below gives an overview of the productive conifer woodland in which the lower reservoir works would be established.



- 21.6.6 The crop within which The Proposed Development would be located is currently mid rotation and in excess of 15 m in top height. Yield class is an index used in Britain of potential productivity of even-aged stands of trees. It is based on the maximum mean annual increment of cumulative timber volume achieved by a given tree species growing on a given site and managed according to a standard management prescription. It is measured in units of cubic metres per hectare per year ( $\text{m}^3 \text{ ha}^{-1} \text{ yr}^{-1}$ ). The tree growth within this area has a Yield Class of 18-20, which signifies good growth attributed to productive conifer.
- 21.6.7 Wind exposure across the forest is measured using the Detailed Aspect Method of Scoring (DAMS) system to gauge the measure of exposure. Across the majority of the forest at altitudes below 150 m, the DAMS score is 13-14 categorising it as sheltered to increasingly exposed. Between 150 m and the upper margin of the forest at around 300-400 m, the

DAMS score increases to 15-16 which categorises it as increasingly exposed (see Plate 3 of Figure 21.1a).

- 21.6.8 Soil types within the forest range are predominately forest brown earths, humus-iron podzols and some gleys on the lower slopes up to 150 m.

#### Forest Management

- 21.6.9 The Clunes FDP describes the decision process for management of the woodland. It suggests that the area would be systematically first thinned, with extraction by cable crane, giving an option of undertaking further selective thinning in future.
- 21.6.10 Beyond this intervention management there is a plan for phased clear-felling and replanting. Aside from the small areas listed as Phase 1 felling (2009-2013), the first proposed felling dates in the area of The Proposed Development are indicated as 2034 through to beyond 2044. Within this area there is an area of Long Term Retention and areas of Natural Reserve. See extract from the Clunes FDP in Plate 5 in Figure 21.1b.

#### **Garry Forest Design Plan (2013 – 2023)**

- 21.6.11 The ‘Summary of Proposals 2013-2023’ set out in the Garry FDP, follows the key themes set out by the Scottish Government. The plan includes new planting of 130 ha of commercial conifer and 1077 ha of new native woodland, re-creation of ancient woodland through felling and natural regeneration. The FDP proposes to maintain the current levels of access around the east end of the site and is focussed on the Garry River and associated waterfalls, and to maintain access to longer routes through the mountains. The FDP pays cognisance to The Consented Scheme.
- 21.6.12 The Proposed Development requires track widening and realignment within areas of the FDP indicated as Low impact silvicultural system and planned felling between 2018 and 2022 (shown as Phase 2 in the felling plan) (see Plate 6 of Figure 21.1b). Low impact silvicultural systems areas are marked as areas of opportunity for alternative management systems to clearfell in key locations. The FDP is not descriptive as to what alternative system is proposed in the area of interest. Future species within these areas are indicated as Scots pine and spruces.
- 21.6.13 The Garry FDP indicates forestry road and track development as well as proposed new planting sites (see Plate 7 in Figure 21.1b). Forestry Commission Scotland, Land Information Search (LIS) shows the area includes National Woodland – Integrated Habitat Network and is generally also mapped as Caledonian pinewood and Caledonian pine. Within the search areas identified for borrow pits and site establishment area, Forest Enterprise Scotland have cleared the exotic conifers leaving the ground open for pinewood regeneration.

#### Modifying Influences

- 21.6.14 It is possible, but potentially unlikely, that baseline conditions would change due to catastrophic windthrow prior to the commencement of construction of The Proposed Development.

## 21.7 Potential Effects

21.7.1 Construction and operational activities, as set out in Chapter 3: Description of Development, have the potential to affect the forest landscape, as outlined below:

- Permanent direct woodland cover loss and fragmentation as a result of installation of permanent structures and associated access infrastructure (including loss of timber volume production and visual impacts);
- Temporary woodland cover loss and fragmentation as a result of installation of temporary haul road, working of borrow pits and use of site establishment areas;
- Impact on current Forest District Design Plans including areas identified as PAWS and Long Term Retention within the current Clunes FDP;
- Loss of timber volume production due to early felling; and
- Impact on recreational users (covered in Chapter 19: Land Use and Recreation).

### Permanent and Temporary Woodland Cover Loss

21.7.2 Table 21.3 below calculates the area of approximate woodland that would be felled as a result of The Proposed Development and the area that can be replanted post-construction. These calculations are for guidance only as they do not take into account the current open ground detail associated with existing roads and rides. The area measurement calculated from forest tracks is based on a preferred minimum 25 m as permanent tree to tree clearance, as illustrated in the Forestry Commission, Road Specification Guidance. The area calculations do not take into account the planned woodland loss due to the Clunes FDP redesign of the upper planting margin.

**Table 21.3: Area of Woodland to be Felled and Replanted, and area of Potential Permanent Loss of Woodland cover.**

	Area Felled (Ha)	Area Replanted (Ha)	Potential loss of woodland cover (Ha)
Upper Area	13.63	5.48	8.15
Lower Area	48.69	35.33	13.36
<b>Total potential loss of woodland cover</b>			<b>21.51</b>

### PAWS, Long Term Retention and Native Woodland

21.7.3 A small area of PAWS and a small number of trees within Long Term Retention (LTR) included in the Clunes FDP may be affected by construction of a temporary haul road between the lower reservoir works and the upper reservoir works.

21.7.4 Access track widening, borrow pits and site establishment area located within Garry Forest would occur within areas designated as National Woodland – Integrated Habitat Network, core zones for Caledonian pine regeneration.

### Timber Volume Production

- 21.7.5 Felling for The Proposed Development advances the Clunes planned felling by between 13 and 22 years, given the range of felling dates within the Clunes FDP, with a resultant loss of timber production. The felling required for track widening and realignment in the upper works coincides with planned felling (2018 – 2022), Phase 2, included in the Garry FDP.

## **21.8 Mitigation**

### **Development of Detailed Design**

- 21.8.1 The detailed design of The Proposed Development should take into consideration the forest landscape including the areas identified as PAWS and Long Term Retention within the current Clunes FDP. The aim should be to avoid felling these areas as far as possible. However, where earthworks will impinge upon the areas marked as PAWS then construction best practices must be maintained to ensure the forest soil is in a suitable condition for reinstatement.
- 21.8.2 Access track development to the upper reservoir works through Garry Forest, is largely confined to widening of the existing forest tracks with a short section of new track to avoid steep gradient. Where felling part of a compartment is required in consideration to crop stability, this should be designed through existing productive conifer plantation. The design of the tracks would avoid areas of Low Impact Silviculture. It is noted from Garry FDP that where clear felling is suggested, the exotic conifers only would be removed. The majority of Scots pine would be retained except where it is operationally problematic to do so. This principle should be followed where felling takes place for the proposed widening of existing tracks, realigned section of track access and in particular where the borrow pits and site compound are to be located.
- 21.8.3 Forest tracks are proposed to be widened to a width of approximately 8.0 m during construction, but would be reinstated post construction to the minimum width sufficient to enable heavy goods vehicles to access the dam and upper reservoir for maintenance purposes.

### **Forest Design Plan**

- 21.8.4 The felling design for The Proposed Development has been minimised to cover the works areas only, while adhering to the possible wind firm edges allowing the remainder of the plantations to be managed as described in the relevant FDP's. Replanting on site, other than ground occupied by permanent infrastructure, will follow the species and upper margins as described in the Clunes and Garry FDPs.

### **Compensatory Planting**

- 21.8.5 Where The Proposed Development requires permanent loss of woodland, the Applicant is committed to making arrangements to plant off-site the equivalent area of woodland and at least the equivalent woodland-related net public benefit, as Compensatory Planting. While the Control of Woodland Removal policy will accept compensatory planting anywhere within Scotland, The Highland Council has a strong preference for planting to remain within the Highlands. The location and detail of the new woodland creation as Compensatory Planting will follow post consent in discussion and agreement with FCS.

21.8.6 The new woodland creation will follow the current UKFS Guidelines.

#### **Monitoring / Management**

21.8.7 An operational plan will be prepared in advance of any felling and replanting taking place.

21.8.8 All felling and timber extraction would be undertaken by suitably qualified forestry operators and managers. The operations would be managed to the good practice standards detailed within UKFS Guidelines with particular emphasis in following the Forest and Water Guidelines to avert pollution incidents, avoid soil erosion and the prevention of diffuse pollution of watercourses. Forestry Commission Technical Note '*Protecting the Environment during Mechanised Harvesting Operations*' and Practice Note '*Managing Brash on Conifer Clearfell Sites*' remain relevant and will be followed.

21.8.9 All replanting would be carried out to achieve the stocking requirements following best practice using suitable quality planting stock with the required maintenance in the form of beating up, vegetation control, weevil control measures and deer management (see Plate 8 on Figure 21.1b).

### **21.9 Residual Effects**

21.9.1 A summary of how elements of The Proposed Development are considered to impact on forestry after mitigation are described below.

#### **Permanent Direct Woodland Cover Loss and Fragmentation**

##### Clunes Forest

##### *Sensitivity / Importance*

21.9.2 The sensitivity and importance of the woodland loss specifically for The Proposed Development within the area of the lower reservoir works and the new temporary haul road, is considered to be Medium due to the potential requirement to fell small areas of Long Term Retention and encroaching the PAWS area.

##### *Magnitude of Effect*

21.9.3 The total area of permanent woodland loss would be approximately 13.36 ha, which is approximately 11% of the 118ha Clunes block for this section. Therefore the magnitude of effect is considered to be Small.

##### Significance of Effect

21.9.4 It is considered that the permanent loss to the woodland area at the lower reservoir works in Clunes Forest would be **Minor**. One positive aspect is advancing the restructuring of the northern areas of the Clunes Forest ahead of the planned felling and replanting dates set out in the Clunes FDP. Arrangements would be made to plant the equivalent loss of woodland off-site, as compensatory planting, to the current UKFS.

### Garry Forest

#### *Sensitivity / Importance*

- 21.9.5 The sensitivity of tree felling in Garry Forest for the proposed upgrade of the existing forestry track is considered to be Low given the presence of the existing forestry track along the length of the route. The area which requires more extensive felling would be the construction of a short section of new realigned track, which is part of the area planned for felling within the same period as part of the Garry FDP. For the location of potential borrow pits and a construction compound are located within areas of the forest mapped as National Woodland – Integrated Habitat Network and Caledonian pinewood and should be located within areas of exotic conifer avoiding Scots pine wherever possible. The sensitivity regarding existing remnant Caledonian pine is locally High. The remaining sensitivity would be Low.

#### *Magnitude of Effect*

- 21.9.6 The total area of permanent woodland loss would be approximately 8.15 ha of Garry Forest. Therefore the magnitude of effect is considered to be Small. The impact on Caledonian pine is Small.

#### *Significance of Effect*

- 21.9.7 It is considered that the permanent loss of woodland cover in Garry Forest for widening of the existing tracks and new section of realigned track would be locally Moderate (and significant) in areas mapped as National Woodland – Integrated Habitat Network and Caledonian pinewood and **Negligible** (and not significant) elsewhere. Arrangements would be made to plant the equivalent loss of woodland off-site, as compensatory planting.

### **Temporary Woodland Cover Loss and Fragmentation**

#### Clunes Forest

#### *Sensitivity / Importance*

- 21.9.8 The temporary woodland loss for construction of the lower reservoir works and possible temporary haul road is of localised Medium sensitivity as construction of the temporary haul road encroaches within an area of PAWS and LTR. The remaining sensitivity is Low.

#### *Magnitude of Effect*

- 21.9.9 The magnitude of the impact of felling is considered Medium given that the area to be felled as a single coupe is 35.33 ha.

#### *Significance of Effect*

- 21.9.10 The significance of effect of the temporary woodland loss of Clunes Forest is considered to be locally **Moderate** (and significant) and **Minor** (and not significant) elsewhere given that clear felling and replanting is a typical silvicultural system, but the area is larger than best practice suggests. Replanting will follow the species and upper margins as described in the Clunes FDP.

### Garry Forest

#### *Sensitivity / Importance*

- 21.9.11 The sensitivity of the felling for the new section of track is Low as only part of this area of forest is planned for felling in the programme set out in the FDP. However, apart from the Forestry Commission preferred 25 m road clearance width, the remaining cleared area would be replanted.

#### *Magnitude of Effect*

- 21.9.12 The area of 5.48 ha requiring felling is Small against the scale of felling in the same area.

#### *Significance of Effect*

- 21.9.13 The significance of effect of temporary woodland loss in Garry Forest is considered **Negligible** (and not significant) given the limited felling and planned felling in the area. Replanting will follow the species as described in the Garry FDP.

### **Impact on Current FDPs**

#### *Sensitivity / Importance*

- 21.9.14 Clunes FDP will have to be revised in the area of The Proposed Development to accommodate the early felling and design. Garry FDP should require only minor adjustment. As there is potential for both PAWS and LTR to be impacted, the overall sensitivity on the FDPs is considered to be Low.

#### *Magnitude of Effect*

- 21.9.15 The overall scale of adjustment to the plans will be Medium in magnitude taking into consideration the redesigning of adjacent felling coupes.

#### *Significance of Effect*

- 21.9.16 The significance of effect of impact to the current FDPs is considered Minor.

### **Loss of Timber Volume Production**

#### *Sensitivity / Importance*

- 21.9.17 Felling for The Proposed Development would be earlier than planned in the current FDP and would reduce the growing period by some 15 to 20 years, given the 5 year phasing period within the FDP. The sensitivity is considered Low given that the timber will be of a marketable size, the mean volume per tree being in the order of 0.25 m<sup>3</sup>.

#### *Magnitude of Effect*

- 21.9.18 The reduction in timber volume available to the market from The Proposed Development area against the planned volume will be in the order of between 15,000 m<sup>3</sup> and 20,000 m<sup>3</sup>. Locally the magnitude is Medium.

### *Significance of Effect*

21.9.19 The significance is considered to be **Minor** given the latitude of felling dates within a FDP.

## **21.10 Cumulative Effects**

21.10.1 The current Clunes FDP gives felling approval for Phase 3 felling (2019 - 2023) within proximity to The Proposed Development. If this is to be carried out during the same time period as construction of The Proposed Development, further timber volume will use the same timber haulage route. Felling for construction of a new section of track to the upper works is contained within the Garry FDP Phase 2 felling (2018 – 2022) and therefore this would not be an additional area to be felled.

21.10.2 Given that the current Clunes FDP is reshaping the upper tree line there will be consequential woodland loss within this area which is additional to and not a result of The Proposed Development.

## **21.11 Conclusions**

21.11.1 The main residual effect post construction will be the loss of woodland area at the lower reservoir works due to the ground occupied by the lower control works, the permanent jetty, and administration building, and the access tunnel portals. The widening of tracks to the upper reservoir work will also result in some permanent loss of woodland cover, although they are to be reduced in line with Forestry Commission road specification. The overall impact on the integrity of the forest area is not significant.

21.11.2 Where felling has been identified to construct The Proposed Development, unless the land is occupied by permanent infrastructure, woodland would be replanted; this includes the temporary haul road. Replanting will be in line with the Garry Forest FDP and Clunes FDP future species choice. It is noted that the Clunes FDP shows a lower, more varied, upper replanting margin to avoid repeating the current linear features.

21.11.3 Positively, by felling and replanting earlier than the Clunes FDP indicates, the restructuring of this area will start sooner; however, there will be some loss of timber volume production as a result of felling at an earlier age than planned in the Clunes FDP.

## **21.12 References**

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