Chapter **8**
Forestry

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Introduction

8.1 This chapter presents the findings of the assessment of the likely significant construction and operational effects of the Kendoon to Tongland 132 kilovolts (kV) Reinforcement Project ('the KTR Project) on forestry (including Ancient and Semi-Natural woodland (ASNW) sites and the sites identified within the Native Woodland Survey of Scotland (NWSS) database as illustrated on Figure 8.1)[1], details of which are provided in Chapter 4: Development Description and Chapter 5: Felling, Construction, Operational Maintenance and Decommissioning. Effects on forestry are likely to occur as a result of the felling of trees within the required 'wayleave corridor' (including additional areas of forest clearance required for construction works including stone quarries, construction compounds and access tracks) during construction, along with the requirement to minimise the risk of subsequent windthrow (i.e. the uprooting of trees by the wind) to the newly created forest edges by the additional felling of trees to create more windfirm edges.

8.2 Details of the felling proposals are presented in Chapter 5 and the associated figures. An overview of the areas proposed to be felled for the KTR Project is repeated in this chapter.

8.3 An assessment of the likely effects of felling on the landscape resource and visual amenity is reported separately in Chapter 7: Landscape and Visual Amenity. Hydrological effects are reported in Chapter 9: Geology, Hydrology, Hydrogeology, Peat and Water Resources and effects on biodiversity in Chapter 10: Ecology[2] and Chapter 11: Ornithology. Chapter 15: Socio-economics, Tourism and Recreation considers the potential construction effects on the forestry sector.

8.4 Planning policies of relevance to the assessment reported in this chapter are provided in Chapter 6: Planning Policy Context.

Scope of the Assessment

Potential Effects Scoped in to Detailed Assessment

8.5 On the basis of the desk based and field survey work undertaken, in combination with the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, and feedback received from consultees, the following effects have been assessed in detail:

- long term loss of forest resource as a result of felling of trees within the wayleave corridor;
- loss of broadleaf woodland including ancient woodland and native woodland as a result of felling of trees within the wayleave corridor;
- loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks; and
- effects on forest management during construction and operation.

8.6 It should be noted that not all of the potential effects identified above are assessed for every connection. The potential effects scoped in and out of the assessment for each connection are summarised in Table 8.1. Full descriptions of the potential effects assessed in detail are provided below in the Assessment Methodology section below.

Potential Effects Scoped out of Detailed Assessment

8.7 Following careful consideration and using professional judgement, a number of potential effects have been 'scoped out' of the detailed assessment reported in this chapter. Some of these effects were included in the list of potentially significant effects set out in the KTR Project EIA Scoping Report (April 2017) but were subsequently assessed as unlikely to be significant during the initial assessment. Effects scoped out for all connections of the KTR Project comprise effects on shelter, effects on deer stalking, effects of windthrow, and cumulative effects as detailed below.

Effects on Shelter

8.8 Effects on shelter are typically attributed to the removal of agricultural shelterbelts in more exposed upland locations. Partial removal of some shelterbelt woodlands is proposed as part of construction of the KTR Project. However, there would be sufficient residual shelter in the area, and the likely effect of the loss resulting from construction and operation of the KTR Project is not considered to be significant.

Effects on Deer Stalking

8.9 In relation to deer stalking, the only adverse effect likely to occur as a result of the KTR Project is that which would be potentially experienced as a result of the tree felling element of the construction phase, whereby deer stalking would be interrupted. However, it is considered that the extent of the area of the forests not affected by construction of the KTR Project, which will be retained and available for deer stalking during the felling and construction phase means that significant construction effects on deer stalking are unlikely. No significant effects arising from the operation of the KTR Project are likely.

Effect of Forest Loss due to Windthrow outside the Wayleave

8.10 The area of proposed tree felling outside the wayleave required to reduce the risk of windthrow has been identified for each connection of the KTR Project and the effects of windthrow resulting from the introduction of the wayleave through areas of mature or semi-mature forest have been considered. These areas have been identified by establishing the extent of the wayleave corridor required for the construction of the KTR Project and identifying adjacent areas where there is a high risk of windthrow as a result of exposure of the retained trees. These trees are currently part of a larger forest compartment where there is an element of mutual support given. By felling the trees within the wayleave corridor, this support will be removed and a 'brown edge' will be created[3]. Over the five connections comprising the KTR Project, it is anticipated that 113.52 hectares (ha) of forest is likely to be affected by windthrow.

8.11 It is anticipated that a number of measures will be implemented within the wayleave corridor to reduce the effect of windthrow, including, wherever feasible, the restriction of the width of the felling corridor to the minimum required for the statutory safety clearances associated with the connections forming part of the KTR Project[4]. Felling boundaries will aim to follow existing stable forest edges where this can be achieved while delivering the safe construction and operational areas for the KTR Project.

8.12 SP Energy Networks (SPEN) has no mechanism to control felling and replanting/restocking within the areas vulnerable to windthrow. However, SPEN is committed to liaising with landowners to agree that these areas will be felled to mitigate the risk of forest damage through windthrow. The felling of these areas would require the agreement of the relevant landowners and would be delivered in line with a felling permission to be applied for by the landowner to Scottish Forestry (SF5) on behalf of the Scottish Ministers. It is anticipated that each felling permission would be granted subject to a condition, to ensure that the felled woodland is replanted. In terms of the Forestry and Land Management (Scotland) Act 2018 ("2018 Act") and associated regulations[6], in making a decision on any felling application, the Scottish Ministers acting through SF must have regard to their duty under section 2 to promote

[1] The aim of the NWSS was to undertake a baseline survey of all native woodlands, nearly native woodlands and Plantations on Ancient Woodland Sites (PAWS) in Scotland to create a woodland map linked to a dataset showing type, extent and condition of those woods. The ASNW comprises woods recorded as being of semi-natural origin on either the 1750 Roy maps or the first edition ordinance survey maps of 1860.

[2] It should be noted that, in relation to the areas of broadleaved woodland, the figures presented within this chapter differ from those noted in Chapter 10: Ecology due to differences in the methodology used to calculate the affected areas. Both have been informed by field surveys, but in the case of the ecology figures, these do not include areas of new broadleaved woodland planting after 2017 and for the Phase 1 habitat mapping, exclude other habitat codes, including scattered trees and dense shrub immediately adjacent to/within broadleaved woodland features. The forestry figures have been defined using the internationally recognised definition of a woodland as accepted by Scottish Forestry and The Forestry Commission (being 20% or more canopy cover) to define a woodland.

[3] In some areas, felling for the wayleave will be only part of a forest compartment and as such expose those remaining, and previously sheltered, trees to the wind. Where these trees are semi mature or mature this is described, within the forest industry, as creating a 'brown edge'. The remaining trees in these forest compartments in many cases will be less stable and as such prone to future windthrow. Due to the site-specific conditions in terms of exposure, soils, drainage, altitude and aspect, encountered within many part of the KTR Project, there is a risk of these trees either falling or failing to reach commercial maturity.

[4] Typical forest clearance requirements are illustrated on Figure 5.1.

[5] As of the 1st of April 2019 Forestry Commission Scotland, as the statutory forestry authority, changed its name to Scottish Forestry (SF). At the same time Forest Enterprise Scotland, as the land-owning element of the Forestry Commission in Scotland, changed name to Forest and Land Scotland (FLS). In this chapter the new names and their abbreviations are used for both organisations.

[6] The Felling (Scotland) Regulations 2019

sustainable forest management. In addition, SF are entitled to impose conditions in relation to the retention of, or increase in, woodland cover. SF normally expect an area which has been clear felled to be restocked and will normally attach what is referred to as a continuing condition to felling permissions to secure the restocking[7].

8.13 Should the landowner not agree to pre-emptively fell the woodland required to create a more windfirm edge (to mitigate the windthrow effects) and the trees subsequently suffer from windthrow, it is within the control of SF, on behalf of Scottish Ministers, using powers contained in the 2018 Act and associated Felling (Scotland) Regulations 2019 to issue felling and restocking directions. In terms of section 34 of the 2018 Act, if it appears to SF that felling of trees is required to prevent deterioration or further deterioration in the quality of timber comprised in the trees or to improve the growth of other trees or to prevent or reduce harm caused by the presence of the trees, it may serve a felling direction on the owner of the land requiring the felling of the trees, These powers could be exercised to address the effects of windthrow. Felling directions may also be issued subject to conditions addressing the retention of or increase in woodland cover. SF can therefore secure the replanting or restocking of woodland which has been felled.

8.14 In addition and separately, in terms of section 36 of the 2018 Act, SF may serve a restocking direction where felling is not carried out in accordance with a felling permission, a felling direction, a restocking direction, or a continuing condition on felling permission in relation to land has not been complied with.

8.15 Having regard to the duty imposed upon Scottish Ministers to promote sustainable forest management, the powers available to issue felling directions and the practice of imposing conditions on felling licenses granted under the 2018 Act, the assessment has been undertaken on the basis that any windthrow resulting from the introduction of the overhead line (OHL) wayleave would require the relevant landowner to replant the same area of forest. This is separate from any commercial imperative the landowner may have. Should the landowner agree to fell these same areas prior to windthrow occurring as part of the KTR Project then this would require the appropriate felling permission to be in place. As noted above, these permissions would normally include a similar restocking condition which would result in no net loss of forestry outside of the wayleave corridor. As such, there is deemed to be no loss of forestry from the effect of windthrow and this has been scoped out of detailed assessment.

8.16 For other disciplines, including landscape and visual amenity (Chapter 7), ecology (Chapter 10), ornithology (Chapter 11), and traffic and transport (Chapter 13) it is important to record the extent of tree felling required outwith the wayleave to address the risk of windthrow, and report the assessment of any associated likely significant indirect effects. The areas predicted to be subject to windthrow (and associated mitigation felling) are shown in Table 8.5 and summarised below (note that no felling within the windthrow areas will be required for the Carsfad to Kendoon connection or the BG Deviation):

- KTR Project total: 113.52ha (0.68% of local forest resource[8]);
- Polquhanity Glenlee (via Kendoon) (P-G via K): 20.90ha (0.12% of local forest resource);
- Earlston to Glenlee (E-G) : 0.68ha (0.01% of local forest resource); and
- Glenlee to Tongland (G-T): 91.94ha (0.55% of local forest resource).

Cumulative Effects

8.17 Figure 3.1 illustrates the other schemes considered in the cumulative impact assessment. A number of wind farms considered as part of the cumulative assessment are located in areas where tree clearance would be required. Due to the Scottish Government's policy on Woodland Removal (Scottish Government Policy on Control of Woodland Removal, 2009), it is reasonable to assume there will be no residual loss of woodland associated with these wind farm projects as the developers will require to undertake compensatory planting for any areas of felling. As such the cumulative effect on forestry of the individual connections forming part of the KTR Project, and the KTR Project as a whole (which considers the combined effects of each of the KTR Project connections as if it were arising from a single application), have been scoped out of detailed assessment.

Table 8.1: Effects Scoped in and Scoped Out

Connection	Potential Effects Scoped in to Detailed Assessment	Potential Effects Scoped out of Detailed Assessment
Polquhanity to Glenlee (via Kendoon) (P-G via K)	Direct effects during felling / construction: • Long term loss of forest resource due to felling of trees within the wayleave corridor. • Loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. • Loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks. • Effects on forest management during construction. Direct effects during operation: • Effects on forest management during operation.	• Effects scoped out of detailed assessment as noted in text above, including cumulative effects.
Carsfad to Kendoon (C-K)	Direct effects during felling / construction: • Long term loss of forest resource due to felling of trees within the wayleave corridor. • Loss of broadleaf woodland including Ancient Woodland and Native Woodland resource due to felling of trees within the wayleave corridor.	• Effects scoped out of detailed assessment as noted in text above, including cumulative effects. • There is no loss of forest resource associated with the felling of trees for the creation of construction compounds, quarries or access tracks. • The C-K connection is located within an area of minimal active forest management therefore there will be no effect on forest management as a result of construction or operation.
Earlston to Glenlee (E-G)	Direct effects during felling / construction: • Long term loss of forest resource due to felling of trees within the wayleave corridor. • Loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. It should be noted that all trees lost during construction for this connection are broadleaves and therefore the assessment of this effect is considered in the context of the point above. • Loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks.	• Effects scoped out of detailed assessment as noted in text above, including cumulative effects. • The E-G connection is located within an area of minimal active forest management therefore there will be no effect on forest management during construction or operation.
BG Deviation	Direct effects during felling / construction: • Long term loss of forest resource due to felling of trees within the wayleave corridor. • Loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. It should be	• Effects scoped out of detailed assessment as noted in text above, including cumulative effects. • There is no loss of forest resource associated with the felling of trees for the creation of construction compounds, quarries or access tracks. • The BG Deviation is located within an area of minimal active forest

[7] The position is also detailed in their application form seeking felling permission.

[8] The local forest resource is considered to be 20km from the KTR Project; this is detailed further in the section on Study Area below.

Connection	Potential Effects Scoped in to Detailed Assessment	Potential Effects Scoped out of Detailed Assessment
	noted that all trees lost during construction for this connection are broadleaves and therefore the assessment of this effect is considered in the context of the point above.	management therefore there will be no effect on forest management during construction or operation.
Glenlee to Tongland (G-T)	Direct effects during felling/ construction: • Long term loss of forest resource due to felling of trees within the wayleave corridor. • Loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. • Loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks. It should be noted that the felling associated with the access tracks for the decommissioning for the existing OHL is located on the R route only and is not assessed separately but is considered within the context of the wider felling required for the G-T assessment. Felling of broadleaves is required in seven discrete areas along the existing R route to facilitate its removal, comprising a total of 0.19ha. • Effects on forest management during construction. Direct effects during operation: • Effects on forest management during operation.	• Effects scoped out of detailed assessment as noted in text above, including cumulative effects.

Assessment Methodology

Legislation and Guidance

8.18 As there are no published criteria, guidance or methodologies in relation to the environmental impact assessment of effects on forestry, the assessment is necessarily based on professional judgement informed by available forestry plans (and supporting information), field work, local management experience, and consultation.

8.19 The assessment has however taken account of statute, national policy, guidance and advice including SF Guidance where applicable including:

- Forestry Commission (Forestry and Land Scotland) Technical paper 16 Designing Forest Edges to improve wind stability (1996);
- Forestry Industry Safety Accord (FISA) guidance note 804 Electricity at Work: Forestry (August 2013);
- Electricity Association Engineering Recommendations G55/1 Safe Working in Proximity to Overhead Electric Lines (July 2000);
- Forestry Commission guidelines in the assessment of Yield class has been utilised to assesses forest areas and establish the growth rates and productivity of the individual sites;
- The Scottish Government, (2009), Policy on the Control of Woodland Removal;
- Scottish Government's policy on control of woodland removal: implementation guidance (February 2019);
- Forestry and Land Management (Scotland) Act 2018;
- The Felling (Scotland) Regulations 2019;
- Scotland's Forestry Strategy 2019-2029;
- Data from the Scottish Natural Heritage (SNH) records on Ancient and Semi Natural Woodlands;
- UK Forestry Standard 2017[9]; and
- UK Woodland Assurance Standard[10].

Consultation

8.20 In undertaking the assessment, consideration has been given to the scoping responses and other consultation undertaken as detailed in Table 8.2.

8.21 In addition to seeking a formal Scoping Opinion, account has also been taken of information provided and requests arising from further consultation with SF, Forestry and Land Scotland (FLS) and other relevant forest landowners and managers where possible.

8.22 FLS, owning large areas of commercial forestry within the Study Area, and SF, as a key consultee serving as the forestry directorate of the Scottish Government advising on and implementing forestry policy, were both consulted in detail during the routeing and EIA stages. In relation to the EIA stage, meetings were held with both FLS as landowners and SF as the organisation overseeing the implementation of the Scottish Government's forestry policy.

8.23 Key issues discussed with FLS during the consultation included their current forest design proposals within their Land Management Plans and how the KTR Project will affect these. Comments on the loss of productive forestry, forest design, access through the forest during construction and operation, and areas at risk of windthrow were discussed in detail. FLS also engaged with other elements of the EIA in relation to the effect of the OHL on landscape, biodiversity and ornithology. As noted above, discussions were also had with individual private forest owners or their agents and similar issues were raised as by FLS.

Table 8.2: Consultation Responses

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
SF	Formal Scoping Consultation. SF has been involved in the Statutory Stakeholder Liaison Group (SSLG) This has provided ongoing updates on the proposed works. In addition, a number of meetings have been held with SF staff to update them on the status of the KTR Project.	Requested project consider the impact on ASNW and NWSS designated sites.	The chapter addresses the extent of ASNW and NWSS sites where there is any effect from the construction or operation of the KTR Project.
Scottish Government Energy Consents Unit (ECU)	Formal Scoping consultation.	Requested evidence is presented to address impact on Ancient Woodlands.	The chapter addresses the extent of ASNW and NWSS sites where there is any effect from the construction or operation of the KTR Project.
Dumfries & Galloway Council (D&GC)	Formal Scoping consultation.	Timber haulage from the KTR Project and its impact	A traffic and transport assessment has been

[9] https://forestry.gov.scot/publications/105-the-uk-forestry-standard/viewdocument

[10] Available at: http://ukwas.org.uk/

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
		on the regional roads should be considered.	undertaken and presented within Chapter 13: Traffic and Transport of the EIA Report including assessment of timber transport. SPEN will also continue dialogue with the Local Timber transport officer for South Scotland as the KTR Project progresses (see below).
Local Timber Transport Office for South Scotland (TTSS)	Meeting held in May 2018 and further email correspondence undertaken in 2019.	Will require to ensure that the transport of timber from the project follows current good practice as detailed within TTSS policy documents including ensuring the management of timber traffic to sustain the road network and minimise disruption.	The transport of timber resulting from the tree clearance associated with the project will be addressed within the traffic and transport assessment set out in Chapter 13.

Study Area

8.24 The Study Area in relation to effects of the KTR Project on forestry includes all woodland directly affected by the construction and operation of the KTR Project (i.e. within the wayleave corridor). As noted above, potential effects on the windthrow areas outside the wayleave have been scoped out of detailed assessment in the context of the possible direct effects on forestry considered for each connection as noted in Table 8.1. However, information is presented below in relation to the felling proposed as mitigation to address windthrow. This is to ensure an explicit overview of all of the felling required to facilitate construction of the KTR Project. Furthermore, to ensure that the assessments of the effects represent the maximum case, the effects of felling of the windthrow areas is considered by other environmental topics as a secondary effect.

8.25 For the purposes of the assessment, effects have been assessed in the context of the local forest resource which is considered to be appropriately represented by the area within 20km of the KTR Project. This is illustrated on Figure 8.2. This area is representative of forest cover and land uses for the larger regional forest resource within South West Scotland. By undertaking the assessment within this Study Area it also allows a maximum case scenario to be presented, as undertaking the assessment at the regional level would reduce the percentage area affected by the KTR Project.

8.26 The Study Area comprises large tracts of commercial forestry as well as blocks of broadleaf woodland and smaller scattered shelterbelts. Within these areas there are a number of areas of woodland which are included within the ASNW and NWSS data bases for native woodland sites (some of which are also identified as Plantations on Ancient Woodland Sites (PAWS)[11]). All woodlands considered as part of the assessment reported in this Chapter are shown on Figure 5.2 and an overview also shown on Figure 8.1 and Figure 8.2.

8.27 The commercial forestry affected by the KTR Project can be broadly divided into three areas:

- the area west of the A713 at Dundeugh known as Castlemaddy (Polmaddy forest), affected by the P-G via K connection (see Figure 5.2.1);
- the area from the south of the A712 (The Queens Way) and west of the A762, known as Bennan Forest, affected by the G-T connection (see Figure 5.2.7-5.2.11); and
- the area to the south of Stroan Loch/Bennan Forest known as Slogarie Forest (see Figure 5.2.11-5.2.14) and Laurieston Forest affected by the G-T connection (see Figure 5.2.15).

8.28 The majority of the commercial forestry which will be affected by the felling of trees within the wayleave corridor is owned by FLS (constituting approximately 60% of the forestry within which the KTR Project is proposed), with a number of private landowners owning the remaining forestry. The Study Area considered in the context of direct effects of the KTR Project on forestry is an 80m wide area centred on the OHL for the connections comprising the KTR Project supported on steel towers (P-G via K, BG Deviation and G-T) and 70m for the connections supported on a trident wood pole (C-K and E-G). Figure 5.2 shows the wayleave corridor for the KTR Project.

8.29 Where the KTR Project passes through mature and semi-mature forest areas identified as being of high risk of windthrow on the retained forest outwith the 70m/80m wayleave corridor, the areas at risk have been identified and considered as part of the assessment reported in this chapter. These are shown on Figure 5.2. The KTR Project also includes use of temporary areas of new stone quarries, construction compounds, and access tracks. Where these are proposed within forestry, their effects are also considered as part of the assessment.

8.30 The area of forestry affected by the KTR Project totals 356.49ha, including 163.47ha within the wayleave corridor, 113.52ha windthrow area, 7.71ha access tracks, 2.46ha site compounds, and 69.33ha quarry sites. A detailed breakdown of these areas is set out within Chapter 5 and also within the assessment below.

Desk Based Research and Data Sources

8.31 Desk based studies were undertaken using the following sources of information:

- Ordnance Survey maps at 1;25,000 and 1;50,000 scale;
- Aerial photography (dated 2017 and 2018);
- SNH, Ancient Woodland Inventory (2000);
- SF, The Native Woodland Survey of Scotland (NWSS 2014);
- FLS, Land Management Plans, Compartment schedules and maps[12];
- Private forest owners Long Term Forest Plans (LTFP) compartment schedules and maps where made available; and
- Forest Research, Forest GALES 2.5 model for predicting risk of windthrow[13] ("Forest GALES 2.5").

Field Survey

8.32 Field surveys were undertaken between August 2016 and April 2019 to supplement and verify the desk-based work and consultations and to further inform the assessment. The surveys comprised walking (where forest density allowed) along each of the proposed OHL connections which comprise the KTR Project. Forest characteristics including forest type and detailed descriptions of the area, age, species mix and stocking density, together with length of proposed connection passing through the forest, were recorded. A general assessment of site conditions was undertaken to inform the prediction of the likely risk of windthrow to the trees outwith the wayleave corridor. This was based on the professional judgement of the forestry surveyor and took into account the current forest, including an assessment of age, species and height of the trees. In addition, a range of site conditions was considered, including aspect, altitude and soil type. Reference was also made to the forest research wind risk calculating system Forest GALES 2.5.

Assessing Significance

8.33 The approach to assessing the significance of effects comprised the following stages:

- establish the existing conditions;
- identify likely forestry effects;
- assess whether each likely effect is adverse or beneficial in nature;
- assess the significance of the likely effect;
- where an effect is likely to be significant, identify measures to avoid, reduce or mitigate such significant effects; and

[11] PAWS sites are ASNW and NWSS which are currently planted with conifer species.
[12] https://forestryandland.gov.scot/what-we-do/planning
[13] https://www.forestresearch.gov.uk/tools-and-resources/forest-planning-and-management-services/forestgales/latest-version-forestgales/

- assess the significance of the residual effect following application of the mitigation measures.

8.34 The significance of an effect on forestry derives from the combination of the sensitivity of the forestry and the extent/degree of change to the forestry, i.e. the magnitude of effect.

Sensitivity

8.35 As there are no published criteria, guidance or methodologies in relation to the appraisal of sensitivity of effects on forestry, the assessment is necessarily based on professional judgement informed by available forestry plans (and supporting information), field work, local management experience and consultation.

8.36 Sensitivity has been identified on the basis of the following categories:

- Highly sensitive areas of woodland are considered to be those that are:
  - highly valued due to crop species and age, e.g. ASNW or NWSS;
  - particularly rare or distinctive; and
  - considered susceptible to small changes.
- Moderately sensitive areas of woodland are considered to be those that are:
  - valued more locally; and
  - are tolerant of moderate levels of change.
- Low sensitive areas of woodland are considered to be those that are:
  - generally, more commonplace;
  - considered potentially tolerant of noticeable change; and
  - undergoing substantial development such that their character is one of change.
- None: areas of woodland that are:
  - subject to the OHL 'oversailing' the woodland area;
  - tolerant of major changes, e.g. plantation forest where major structural changes are regular or planned as part of a normal felling cycle; and
  - with no designations and considered of no ecological or landscape value.

8.37 The sensitivity of forestry management to the effects of the wayleave felling has been determined taking additional account of:

- forest productivity (in terms of, species and crop mixture);
- accessibility in terms of ground conditions;
- current management regime, including objectives of management, and size of management unit; and
- imposition of additional safety constraints in forest areas adjacent to the line.

8.38 It should be noted that not all aspects noted above are required concurrently to define the sensitivity level, which is assigned based on professional judgement.

Magnitude

8.39 The following criteria have been used to inform the assessment of magnitude of changes as a result of the KTR Project:

- Major: a noticeable change to the woodland over a wide area or an intensive change over a limited area;
- Moderate: small changes to the woodland over a wide area or noticeable change over a limited area;
- Minor: very minor changes to the woodland over a wide area or minor changes over a limited area; and
- None: effectively no change.

Significance

8.40 Due to the inherent differences between the types of forestry effect, where possible, sensitivity and magnitude criteria have been identified using professional judgement and these have been combined to identify the significance of the effect, based on the matrix presented in Table 8.3 below.

Table 8.3: Significance Matrix

Magnitude	Sensitivity			
	High	Moderate	Low	None
Major	Major	Major	Moderate	None
Moderate	Major	Moderate	Minor	None
Minor	Moderate	Minor	None	None
None	Minor	None	None	None

8.41 All effects are considered and presented as either significant (major or moderate) or not significant (minor or none) in the context of the EIA Regulations.

Felling Requirements

8.42 The felling requirements for the KTR Project and the approach to the assessment of the following potential effects on forestry are detailed further below:

- The long-term loss of forest resource due to the felling of the wayleave corridor on the local forest resource within 20km. For this assessment the existing baseline forest and woodland resource within the Study Area is considered to comprise 16,742ha in total. Of this total area it is estimated that 14,817ha is conifer forest.
- Long term loss of broadleaf and native woodland including sites designated as ASNW and NWSS native woodland areas. Of the 16,742ha in the Study Area, 1,925ha is broadleaf woodland.
- Loss of forest resource due to felling for construction compounds, quarry sites and access tracks. For these areas of felling it is expected that they will all be replanted once the construction phase of the KTR Project is completed. It is considered that the landowners will wish to see woodland replanted and SPEN will pursue this outcome as part of its negotiations for voluntary agreements. However, as this is dependent on landowner agreement, replanting of these areas cannot be relied on as committed mitigation for the purposes of the assessment.
- Temporary effects on forest management during construction and long-term effects during operation.

8.43 The felling of approximately 242.97ha of forestry is required for construction of the KTR Project in its entirety, with the majority of the trees proposed for felling comprising Sitka spruce, the dominant species in Scottish commercial forestry. Of the 242.97ha total felling, 28.62ha is broadleaf woodland (approximately 12%); 16.36ha is PAWS registered as ASNW or NWSS (approximately 7%). The required felling area to accommodate the KTR Project is detailed in Table 8.4 below and shown on Figure 5.2.

Table 8.4: Felling Requirements by Connection

Connection	Wayleave Felling Area (ha)	Quarries (ha)	Compounds (ha)	Access Tracks (ha)	Total (ha)
P-G via K	20.69	8.09	-	1.03	29.81
C-G	0.98	-	-	-	0.98
E-G	1.70	-	-	0.20	1.90
BG Deviation	2.12	-	-	-	2.12
G-T	137.98	61.24	2.46	6.29	207.97

Connection	Wayleave Felling Area (ha)	Quarries (ha)	Compounds (ha)	Access Tracks (ha)	Total (ha)
N and R routes removal[14]	-	-	-	0.19	0.19
Total	163.47	69.33	2.46	7.71	242.97

8.44 It is important to note that Table 8.4 above approximates the felling requirements based on the existing forest baseline at the time of the survey and assessment; in some areas the trees may already have been harvested by the landowner by the time felling and construction of the KTR Project takes place. Similarly, areas recently felled may have been replanted by the time the KTR Project is constructed.

8.45 Table 8.5 provides a breakdown of the required felling for the KTR Project and also shows this for the individual connections. Table 8.6 details the areas of broadleaf woodland, including areas of ASNW and NWSS, within the wayleave corridor to be felled for each connection of the KTR Project.

Table 8.5: Breakdown of Felling Area

Connection	Long term forest loss associated with the felling of the wayleave corridor (ha)	Forest loss associated with the felling for construction compounds, quarries and construction access tracks (ha)	Temporary forest loss associated with the felling of areas at risk of windthrow (ha)
P-G via K	20.69	9.12	20.90
C-K	0.98	-	-
E-G	1.7	0.2	0.68
BG Deviation	2.12	-	-
G-T	137.98	69.99	91.94
N and R route removal	-	0.19	-
KTR Project total	163.47	79.50	113.52

Potential Effects Assessed

8.46 A detailed overview of the potential effects assessed for the relevant connections of the KTR Project is provided below. Unless otherwise stated, potential effects are negative.

Long-Term Loss of Forest Resource as a Result of Felling of Trees for the Wayleave Corridor

8.47 Creation of the wayleave corridor (in accordance with the safety requirements shown on Figure 5.1: Forest Design Concept) requires the felling of 163.47ha in total over the five connections comprising the KTR Project. As the wayleave corridor requires to be kept clear of trees which may impinge on the safety clearances for the duration of the operational life of the KTR Project, the effect is a long-term loss of the forest resource. The loss is considered reversible on the basis that, following decommissioning, the wayleave corridor could be replanted.

8.48 The assessment of the effect of the KTR Project on long-term loss of the forest resources undertaken in the context of Scottish Government policy. This policy is detailed within Scotland's Forestry Strategy 2019-2029, and includes a policy to increase new woodland planting across the country from the existing 10,000ha of new planting per annum up to 15,000ha per annum. Therefore, the long-term removal of forestry within the wayleave resulting from the KTR Project conflicts with the woodland expansion objectives.

8.49 The Scottish Government Policy on the control of woodland removal published in 2009 includes a presumption in favour of protecting Scotland's woodland resources. Woodland removal should only be permitted where it would achieve significant and clearly defined additional public benefits. Where woodland removal is associated with development, compensatory planting may form part of the balancing exercise.

8.50 With the exception of the decommissioning of the exiting N and R routes, there is permanent loss of woodland within all connections of the KTR Project as detailed within Table 8.4. The assessment presents the area of woodland loss (in ha) and the % of the local forestry resource (i.e. 20km Study Area) and makes a judgement on likely significance of the effect for each connection based on the sensitivity and magnitude criteria outlined above.

8.51 With landowner agreement, SPEN will seek to replant certain sections of the wayleave corridor and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. Specific examples of these are detailed in the relevant assessment sections below. The design opportunities for this are detailed within Appendix 5.1. While SPEN cannot commit to implementing the proposed measures noted in the Forest Design Concept (FDC), these measures will be implemented as far as possible with the agreement of the landowners. In this context, the proposed FDC measures are not considered committed mitigation, and therefore are not taken into account in the assessment reported below.

8.52 The decommissioning of N and R routes presents the opportunity to replant these areas of land where the infrastructure to be decommissioned coincide with forestry. It is anticipated that where these routes pass through commercial forestry, the replanting is most likely to occur post felling of the adjoining conifer forests due to the associated economics for replanting.

8.53 Where the existing N and R routes pass through areas of broadleaf woodland there is scope to undertake replanting at an earlier stage as the broadleaf woodland is unlikely to be clearfelled. This replanting would reduce the loss of woodland resource and in areas of ASNW/NWSS could restore important native woodland habitat.

8.54 It is important to note that, while this would be seen as valuable offsetting against the effect of the KTR Project on loss of forest resource, the decision to implement the replanting within the areas of the existing N and R routes will be made by the landowner and not SPEN as once the existing N and R routes are decommissioned. SPEN will cease to hold any land rights over these areas. As such, these measures are not considered to represent committed good practice or mitigation, and therefore are not taken into account in the assessment reported below.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland

8.55 All of the new connections forming part of the KTR Project pass through broadleaf woodland areas, some of which are designated as ASNW or are registered within the NWSS. These areas are shown on Figure 8.1. The removal of the N and R routes will result in the loss of seven discrete areas of broadleaf woodland associated with the access tracks, totalling 0.19ha. Table 8.6 details those areas of broadleaf woodland including areas of ASNW and NWSS within the wayleave corridor to be felled for each connection of the KTR Project.

8.56 The ASNW, NWSS, and PAWS woodland areas affected by the KTR Project are included within the total forest clearance figures detailed in Table 8.4 and are therefore included in the assessment of overall loss of forest resource. Potential effects associated with the loss of these sites are also assessed separately on the basis that the loss of broadleaf woodland (including areas of ASNW and NWSS registered woodlands) is deemed important by the Forestry Conservator, SF. This is reflected in the comments received within the scoping responses from SF (see Table 8.2).

8.57 The more open grown nature of the areas of broadleaf woodland has resulted in there being no need for felling of broadleaf woodland outwith the wayleave corridor as there is no windthrow risk.

8.58 The area of woodland within these designations to be felled for the wayleave corridor is 45.4ha. Of this total area 16.36ha is currently commercial conifer plantation on ancient woodland sites (PAWS). The clearance of PAWS sites of their current non-native tree species presents an opportunity to restore these areas to native woodland. This is the case for both areas within the wayleave where existing lower growing native shrubs could be maintained, and new ones established, and also for those areas outwith

[14] The felling required for the decommissioning of N and R routes is along existing access tracks located on the R route at seven discrete locations and is of such a small scale that it is not shown on Figure 5.2 and is therefore shown separately on Figure 8.3 All of the felling required for the decommissioning of N and R routes is broadleaved trees.

the wayleave corridor where there is an opportunity to restore these to native woodland, both subject to the landowner's consent. This is a positive potential effect, albeit one which SPEN does not have control over implementation. As such, while the potential for this environmental improvement is noted, it is not considered to be committed mitigation for the purposes of the assessment of residual effects for the KTR Project. As part of the ongoing dialogue with the landowners, SPEN will actively encourage the landowners with PAWS to consider the options for restoring this land to native woodland.

8.59 As noted above, within the wayleave there may be opportunities to retain shrub species where these exist. Where these are deemed to present important environmental benefits including habitat linkage across the wayleave corridor, they will be identified and retained subject to maintaining the safe clearances for construction and operation of the OHLs. Planting may also be possible with low growing shrub species which are not deemed to put the ongoing safe operation of the OHL at risk, subject to the consent of the landowner. These areas of planting will be targeted to specific areas, including areas designated as ASNW or NWSS sites. It is anticipated these sites will present suitable locations to maximise the environmental benefits of this type of planting by providing important woodland linkage and habitat protection. Specific examples of these are detailed below and also within Chapter 10.

8.60 Sensitivity of the broadleaved areas to be felled is determined using the professional judgement of the assessment team, taking account of the national conservation status of these woodlands as determined by either SNH or SF. The existing databases for the designations have been used alongside the onsite assessment of the current condition of the woodland.

8.61 Linked to the criteria set out above, the magnitude of the effect is defined as major or moderate based on the area of trees to be felled. The magnitude is considered to be minor or none where trees can be lopped/crowned instead of felled.

8.62 Using professional judgement the sensitivity and magnitude are combined to determine the significance of the effect, and determine whether it is significant or not-significant in EIA terms.

Table 8.6: Felling of ASNW/NWSS/PAWS woodland within the total area of forests shown in Table 8.5

Connection of KTR Project	Area of broadleaf woodland (including ASNW or NWSS)	Area of registered as ASNW or NWSS	PAWS Site	Tower (T) positioned within ASNW or NWSS designated sites
P-G via K	9.36	3.43	1.78	T19
C-K	0.98	0.19	-	T24
E-G	1.6	2.18	0.9	T4, T15
BG Deviation	2.35	2.26	-	T100, T101
G-T	14.56	17.95	13.68	T2, T13, T36, T37, T38, T47, T68
N and R route removal	0.19	-	-	-
KTR total	29.04	26.01	16.36	

Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.63 As detailed in Table 8.4, 7.71ha of forest has to be felled for access tracks (including the tracks for removal of N and R routes; the felling required for this is located along the R route and is considered in the assessment of effects for G-T below), 2.46ha to be felled for site compounds and 69.33ha to be felled for quarry sites. This equates to a total area of 79.50ha and is shown on Figure 5.2.

8.64 The assessment presents the area of loss as a hectare figure and also as a % of the local forestry resource (i.e. the area within 20km of the KTR Project). Using the professional judgement of the forestry advisor any loss is then considered for sensitivity and magnitude informed by the significance matrix in Table 8.3.

8.65 SPEN is committed to replanting these areas following construction (with species composition to be agreed with the landowner), subject to agreement of the landowners, which SPEN will pursue. However, as with the other planting measures discussed above, this is not considered to represent committed mitigation, and therefore is not taken into account in the assessment reported in this Chapter.

Effects on Forest Management during Construction

8.66 Felling and construction activities associated with the KTR Project could affect the extent to which normal forest management activities can be undertaken while the site is managed under Construction (Design & Management) (CDM) regulations for the KTR Project. These effects are short-term (temporary) and will generally result in the forest manager delaying their programmed felling operations until felling and construction of the KTR Project has been completed in the relevant forest block. These effects have been assessed using professional judgement of the assessment team, based on the desk and field survey findings. They have been predominately determined by the age of the forest and typical level of forest management which would normally be expected for each site. This assessment also involved consultation with the forest owner or the forest manager.

Effects on Forest Management during Operation

8.67 Future forest management effects during operation of the KTR Project include the requirement for forest managers to amend current objectives, plans and techniques for felling and restructuring the relevant forest. For private woodland owners this is achieved through obtaining approval of a LTFP from SF. For forests owned by FLS, it is achieved via the production of a Land Management Plan. In particular, the effects assessed include those on future felling and restocking requirements, and the direct effect of the presence of the OHL in terms of safe working restrictions within the forest. These effects have been assessed using the professional judgement of the assessment team and vary according to the age and consequent level of forest management required for each site.

Assessment Limitations

8.68 During site assessments, access to existing data sources for the majority of large commercial forest areas was provided by the landowners and their agents. For most broadleaf areas there was limited or no data available from the landowners. In these cases, adequate information to assess the forest was gathered from site inspections and use of the national database records for ASNW and NWSS. For the assessment of the local forest resource, data from SF data records was used.

8.69 In the limited areas where access to land was not granted for surveys, the survey was undertaken by viewing the woodland from adjacent land and public roads, supplemented by aerial photography and, where available, online forest data.

8.70 In general, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on forestry.

Future Baseline in the Absence of the Development

8.71 The assessment has been undertaken on the site baseline condition as of April 2019 when field surveys were completed, and is still considered to be valid for the purposes of the assessment. In the absence of the KTR Project the forest areas would continue to be managed by the forest owners/managers through a programme of tree felling and replanting to achieve the objectives within their Forest Plans. Under the current plans for the forest areas within which the KTR Project is located, large parts of the commercial conifer forest are semi-mature second rotation crops programmed for felling on a significant scale within the next 10-20 years. This would create a series of felling and restocking coups to develop a more diverse age and species structure in the next forest crop rotation as part of the stated policy within the respective LTFPs (for private ownership forests) and Land Management Plans (for FLS ownership areas). For areas of broadleaf woodland, both planted and native, it is assumed, from information within existing LTFPs/Land Management Plans, and from current best practice, that these areas will continue to be retained as broadleaf woodland. In most cases it is also reasonable to assume there will be little forest management intervention.

8.72 For PAWS identified within the data sources within NWSS and ASNW, the landowner will have the option to return these to native woodland, which would be considered after the felling of the current commercial timber crop. This opportunity of restoring such areas to native woodland is as per the guidelines for PAWS within the UK Forestry Standard, and is in keeping with the UK woodlands assurance standards, to maintain, enhance or restore features and areas of high conservation value.

Implications of Climate Change

8.73 The main consequences of climate change on forestry are considered to include the following:

- change to species composition and range;
- increased risk of large windthrow events;
- increased risk of forest fires;
- increase in risk of forest pathogens and pests; and
- increased risk of landslip and pollution run off from harvesting and restock sites.

8.74 Specific issues relating to the future management of the forests that will be affected by the KTR Project in relation to climate change are anticipated to include:

- A review of the species planted to address the impact of change in temperature and other weather conditions with a move towards species more adaptable to the projected future weather. These species choices will also be required to address the associated change in pests and other pathogens which are likely to increase risk to tree species.
- The risk of increased high wind events resulting in windthrow in commercial woodland is likely to be addressed by the division of larger woodland areas into smaller distinct forest blocks to assist in creating more windfirm boundaries. Current and well used ground preparation techniques are already being used to address tree stability in future crop rotations.
- More dramatic weather events and their associated risk of water runoff from forest sites, particularly post harvesting, will be addressed by individual project design and the inclusion of increased open ground adjacent to watercourses. Open ground acts as filtration for runoff from harvested site. The general breakdown of larger forest blocks into smaller distinct areas helps to reduce the scale of individual harvested site which reduces the risk of the associated runoff.

Infrastructure Location Allowance

8.75 During the pre-construction detailed design process, where possible, effects on forestry will be avoided or reduced through the refining of tower/pole and related infrastructure locations utilising the 50m infrastructure location allowance (ILA), in consultation with the forest manager/landowner.

Embedded Mitigation Measures

8.76 Prior to commencement of the EIA, the routeing process outlined in Chapter 2: The Routeing Process and Design Strategy sought to prevent or minimise effects on forestry where possible, in keeping with the Holford Rules. The rules applied to the routeing studies sought to avoid areas of forestry unless there was 'no reasonable alternative'. However, due to the large scale and central position of the areas of commercial forestry in relation to the 'fixed' connection points (i.e. the substations), the avoidance of forestry had to be balanced against other technical and environmental considerations[15]. Similarly, it has not been possible to avoid all areas listed in the Inventory of Ancient Woodland and where these areas are affected by the KTR Project this is considered in the assessment below under the heading *'Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor'*. As required by the Scoping Opinion potential biodiversity effects on Ancient Woodland are considered in Chapter 10.

8.77 During the detailed alignment and EIA stage, further design modifications were undertaken to avoid or minimise effects on forestry. Examples of this include the route changes developed during the design period when discussions with FLS in relation to the G-T connection led to modifications to the line in Bennan Forest to reduce the impact on Nightjar habitat, long-term retention woodlands, and the public forest road (Raiders Road). Changes to the design also included movement of the OHL away from areas of mature broadleaf woodland associated with a historic burial site at Slogarie, also in the vicinity of the G-T connection. At Knocknailling Estate, west of the Water of Ken, the towers and associated wayleave corridor for the P-G via K connection have been moved to the east to minimise the impact on the mature native woodland in this area.

8.78 In addition to the changes made through the design of the KTR Project to take account of potential effects on forestry, a series of good forest practice measures will be put in place through the Construction and Decommissioning Environmental Management Plan (CDEMP) to minimise the effect of the KTR Project on forestry. The assessment has been undertaken on the basis that these measures will be in place:

- Adherence to FISA guidance during felling and extraction of forestry.
- Adherence to SF Guidelines e.g. to ensure protection and enhancement of the water environment during felling and construction.
- Implementation of tree harvesting and extraction methods to ensure minimisation of soil disturbance and compaction during felling and construction.
- Restricting the width of the felling corridor to the minimum required for statutory safe clearances. This will predominately be delivered by the identification of any areas where the individual tree is of a species which can be deemed to be low growing to the extent that they can remain in parts of the wayleave corridor without conflicting with the safe construction and operation of the OHL within the wayleave corridor.
- A further opportunity for restricting the width of the wayleave corridor will be implemented where individual trees within the corridor (which will be predominately be mature broadleaf trees) can be managed through crown reduction which thereby removes the need to fell the whole tree. This will be undertaken prior to felling as part of the pre-construction final design process. Specific areas where this is proposed are detailed in the assessment below.
- SPEN will commit to working with the landowners through the construction period to facilitate ongoing forest management where possible within the constraints of safe working practices and the associated CDM working.

Polquhanity to Glenlee (via Kendoon)

Existing Conditions

8.79 From the Polquhanity terminal tower, travelling south, the P-G via K connection enters into Polmaddy Forest, owned by FLS. It passes through 1,827m of this forest, predominately through mature commercial conifer at the northern end of the forest and then through areas of young broadleaf forest at the southern end, where it exits and passes over an area of open farmland. The wayleave corridor then passes through some small areas of riparian mature broadleaf woodland into Kendoon substation. This area of broadleaf woodland at the entrance to Kendoon power station is the only area of Ancient woodland within which this connection is proposed (0.18ha area of anticipated felling). It has not been possible to avoid the Ancient Woodland due to the presence of existing OHL infrastructure and residential properties in this area.

8.80 On exiting Kendoon substation, the P-G via K connection passes over areas of open ground prior to crossing several sections of broadleaf woodland including at Knocknailing, Polharrow bridge and Barchock wood. These areas of broadleaf woodland include 0.39ha of native broadleaf woodland and 0.56ha of PAWS, as defined within the NWSS.

8.81 North of Glenlee Substation at Hag Wood the P-G via K connection passes through an area of commercial conifer forest for a distance of 117m in parallel with the existing R route (north) OHL (between 027 (R) and 08 (R)). This woodland is within the register of NWSS, however it is predominately commercial conifer planted on an ancient woodland site (PAWS). The line then enters Glenlee substation passing over the Coom burn and a riparian area of broadleaf woodland.

Construction Effects

8.82 The assessment of effects is based on the KTR Project description as outlined in Chapter 4. Tree felling proposed for this connection incorporates 20.69ha of trees within the 80m wide wayleave corridor. It is also proposed that a further 20.90ha of forestry out with the wayleave corridor would be clear felled to a

[15] Full details of the route options that have been considered can be found in the routeing studies undertaken for the project, available at www.spendgsr.co.uk.

windfirm edge to manage the potential for windthrow (albeit SPEN has no control over implementation of proposals relating to windthrow, which would be managed in consultation with the landowners).

8.83 Further construction effects on forestry associated with this connection include the felling of 1.03ha of forestry for the creation of access tracks and the felling of 8.09ha of forestry for the creation/extension of a quarry within Polmaddie forest.

8.84 Within those areas to be felled as listed above are 0.63ha of broadleaf designated as within ASNW and NWSS. There is also 1.7ha of PAWS at Hag Wood also with an ASNW/NWSS designation.

Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.85 The wayleave corridor required to provide sufficient clearance for the safe construction and operation of the P-G via K connection has been designed to a width of 80m[16]. Felling of woodland within the 80m wayleave corridor will result in the long-term loss of 20.69ha of woodland which comprises 0.12% of the local forest resource within 20km of the KTR Project.

8.86 The sensitivity of the local forest resource to this loss is moderate in that the area is considered to be tolerant to moderate change. The likely magnitude of the effect is moderate in that it is an intensive change over a limited area. As such, the likely significance of the effect is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.87 The embedded mitigation measures outlined above will be implemented within the wayleave corridor (i.e. land over which SPEN has control) to reduce the net loss of woodland resource as a result of construction of the KTR Project, including restricting the width of the felling corridor to the minimum required for statutory safe clearances.

8.88 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect Associated with Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.89 The measures likely to be most successful in managing the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not be taken into account in assessing the residual effect of the P-G via K connection as a result of the long-term loss of forestry resources due to felling of trees within the wayleave corridor. The likely residual effect remains moderate and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.90 There are a number of areas of woodland designated as ASNW and/or NWSS within the proposed 80m wayleave corridor for the P-G via K connection (as shown on Figure 8.1). These include 0.05ha of mature broadleaf adjacent to Kendoon substation, and 0.58ha of mainly young broadleaf at Knocknailing. At Hag wood there is proposed felling of 1.7ha of woodland; this includes 1.45ha of conifer forest and 0.25ha of broadleaf woodland. The reference numbers of the towers which are located within areas of ASNW and NWSS is given within Table 8.6.

8.91 The felling of a total area of 9.36ha of broadleaf woodland including ASNW and NWSS designated sites equates to 0.06% of the local broadleaf forest resource (i.e. within 20km of the KTR Project).

8.92 At Kendoon and Knocknailing the sensitivity of the broadleaf woodland affected by the P-G via K connection, including ASNW and NWSS, is high on the basis that the woodlands are in good condition and highly valued. The likely magnitude of the effect is considered to be moderate in that this is a noticeable change over a relatively small proportion of the woodlands.

8.93 At Hag wood the area of ASNW is predominately PAWS and as such considered to be of moderate sensitivity. This takes into account the opportunity for broadleaf replanting of this PAWS area by the landowner. The likely magnitude of the effect at Hag wood is minor.

8.94 Overall, the likely significance of effect as a result of the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor for the P-G via K connection is assessed as being moderate (significant in EIA terms).

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.95 The embedded mitigation measures detailed above will be implemented within the wayleave corridor (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of construction of the P-G via K connection of the KTR Project.

8.96 With landowner agreement, SPEN will seek to replant certain sections of the wayleave corridor and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

8.97 In addition, it is proposed to reduce the wayleave from 80m to 65m in the area of broadleaves at Polharrow Burn to reduce the visual impact particularly from Viewpoint 6 (Layby on A713 near Knocknalling Wood). Within the 65m wayleave will be two separate areas:

- 12.5m either side of the line within which it is proposed that no trees or shrubs are planted as this is directly under the conductors where unrestricted access is required for maintenance; and
- between 12.5-32m parts of the corridor would be planted with trees and shrubs up to 20m height which will be subject to ongoing maintenance.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.98 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the P-G via K connection on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, the likely residual effect remains of moderate significance and therefore significant in EIA terms.

Effect associated with Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.99 Felling of 9.12ha of woodland is required to accommodate the construction compounds, quarries and access tracks. This represents 0.05% of the local forest resource within 20km of the KTR Project.

8.100 The sensitivity of the local forest resource to this loss is moderate in that the area is tolerant to moderate change. The magnitude of the likely effect is moderate in that it is an intensive change over a limited area. As such the likely effect is considered to be of moderate significance and therefore significant in EIA terms).

Proposed Mitigation Associated with the Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.101 The embedded mitigation measures outlined above will be put in place for areas where there will be loss of woodland, including restricting felling to the minimum area required.

8.102 In addition, where SPEN is able to secure agreement with the landowner, replanting within felled areas will be undertaken to maximise ecological benefit where possible. For the reasons above, this can't be considered as committed good practice or mitigation and therefore is not taken into account in the assessment reported in the Chapter.

[16] Typical forest clearance requirements through areas of commercial forestry are illustrated on Figure 5.1.

Residual Construction Effects Associated with the Loss of Forest Resource Associated with the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.103 As a result of the level of control over the replanting of these areas, which will be by way of the agreement between SPEN and the landowners, the mitigation is not committed despite there being a high level of confidence that the replanting will take place. The significance of the likely residual effect is therefore considered to remain as moderate and therefore significant in EIA Terms.

Effects on Forest Management during Construction

8.104 Polmaddy forest is considered to be relatively unconstrained in terms of access for forest management whilst the P-G via K connection is being constructed. The P-G via K connection has been routed so that access to the forest for commercial woodland management can continue to meet safety requirements and be delivered without significant financial constraints. The loss of the ability to manage the forest as a result of construction of the P-G via K connection is restricted to a relatively small area of forest and it would be anticipated that this can be accommodated within a minor variation to the timing of any specific management tasks during the construction period. The magnitude of the likely effect on forest management is therefore determined to be minor. The sensitivity of the site to the effects on forest management during construction is considered to be low. As such the likely significance of the construction effect on forest management is considered to be none.

Proposed Mitigation Associated with Forest Management during Construction

8.105 As noted above, the embedded mitigation measures will be implemented, including the commitment of SPEN to work with the landowners throughout the construction period to facilitate ongoing forest management where possible within the constraints of safe working practices and the associated CDM working. Specifically, at Polmaddie forest there will be a requirement to construct suitable access points to allow forest machinery to pass safely under the OHL during and post construction.

Residual Effect on Forest Management during Construction

8.106 The likely residual effect on forestry management during construction of the P-G via K connection is considered to remain as none and therefore not significant.

Operational Effects

Operational Effects on Forest Management

8.107 The future management of the forest within which of the P-G via K connection is proposed will be affected by introduction of the line, and the associated felling requirements. This is likely to require woodland managers to amend current objectives, LTFPs, landscape design plans and management techniques for the affected forests, to incorporate the felling requirements associated with the P-G via K connection of the KTR Project.

8.108 Operational effects of the felling required for the P-G via K connection of the KTR Project on forest management processes include:

- taking account of the weakened nature of the new edge of the crop;
- requirement to re-design felling coupes;
- amendments to harvesting techniques and extraction routes to take account of the presence of the connection;
- relocation of loading areas to avoid working adjacent to overhead conductors;
- disruption to the periodic felling and removal of timber (thinning and felling) from plantations adjacent to the wayleave corridor due to the presence of the OHL, especially where access is difficult due to adverse terrain and ground conditions; and
- taking account of the presence of the OHL during re-stocking which occurs after clearfelling, and in certain areas restructuring which may be necessary to take account of landscape design considerations.

8.109 The likely operational effects of the P-G via K connection on forest management are assessed as being low in terms of sensitivity and minor in terms of magnitude as there are existing commercial forest management measures in place. As such the likely significance of this effect is considered to be none and not significant.

Proposed Mitigation Associated with Operational Effects on Forest Management

8.110 The primary mitigation of the effect of the P-G via K connection on operational forest management is associated with the initial routeing decisions. These decisions have aimed to take account of and minimise the above effects within the constraints of the overall routeing process. Whilst no significant effects have been identified that require mitigation, the following measures will be put in place once the KTR Project is operational:

- In areas where 'forwarding' underneath or adjacent to the proposed OHL is allowed, 'goal-posts' will be erected to determine and indicate the maximum safe working height[17].
- Opportunities to plant low-growing shrub species below the line and small trees such as rowan, gean, hazel, hawthorn and willow towards the edge of the OHL corridor will be considered. This planting will assist the woodland managers in their objective of increasing woodland diversity. The design and management of such planting will incorporate access routes required for maintenance of the line and comply with SPEN's safe working practices.
- Soil disturbance and compaction will be minimised during maintenance by the use of low ground pressure tree harvesting and extraction methods.
- Where appropriate, topping of trees will be restricted to removing a maximum of half of the live crown of trees so that some growth will continue and so disguise the felling line. This approach may not be suitable for older stands with shallow canopies for reasons of effectiveness – here coppicing will be considered if appropriate.
- Local drainage systems will be maintained.
- Tree clearance operations associated with maintaining clearance distance from the P-G via K connection within the wayleave will strictly adhere to the Forestry Commission publication 'Forest and Water Guidelines', version five, 2011.
- Monitoring and removal of windthrown trees will be undertaken.

8.111 In addition to the measures above, SPEN will also implement the following measures where possible, in agreement with the landowners:

- Opportunities to introduce different species (conifers, broadleaves, evergreen, deciduous, varieties of size and shape) will be taken where appropriate.
- New planting, restocking, and the management of natural regeneration will be undertaken in agreed designated areas, following negotiation with relevant landowners. This will target areas where maximum ecological advantage will be gained. This will include riparian areas and areas of existing biodiversity as set out in Appendix 5.1.
- In addition to monitoring and removal of windthrown trees, consideration will also be given to implementation of associated forest landscaping, including replanting.

Residual Operational Effect on Forest Management

8.112 The likely residual operational effect on forest management is none and therefore not significant.

Monitoring

8.113 Subject to agreement with the landowners, SPEN will commit to monitoring windthrow associated with the construction and operation of the P-G via K connection of the KTR Project in relation to compensatory measures and tree removal.

8.114 Subject to agreement with the landowners, a programme of future vegetation management will be undertaken incorporating an assessment of tree and shrub growth within and immediately adjacent to the wayleave corridor to ensure the safe operation of the P-G via K connection.

[17] Timber extraction to roadside will be by custom built six or eight wheeled 'forwarders'; the timber is carried to roadside and stacked to await onward transportation.

8.115 Post application design works to consider the benefits of additional tree felling to achieve more landscape sensitive and windfirm forest boundaries will be continued. This work will aim to reach agreement where necessary with the landowner to undertake works out with the 80m corridor as outlined in Appendix 5.1.

Carsfad to Kendoon

Existing Conditions

8.116 On exiting the Carsfad power station the wayleave corridor passes through nine small scattered areas of broadleaf woodland before entering Kendoon power station. These woodlands have a total area of 0.98ha of which there is 0.2ha designated as ASNW/NWSS. Whilst care has been taken to minimise losses, it has not been possible to avoid the areas of ASNW/NWSS entirely for this connection.

Construction Effects

8.117 The assessment of effects is based on the KTR Project description as outlined in Chapter 4. Tree felling proposed for this connection incorporates 0.98ha of trees within the 70m wide wayleave corridor. There is no requirement to address the risk of windthrow by felling outwith the wayleave corridor due to the woodland being broadleaf. No felling will be required for temporary construction compounds, quarry sites or access tracks.

Predicted Construction Effects

Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.118 The felling of this 0.98ha of broadleaf woodland is assessed as 0.006% of the local forest resource within 20km of the KTR Project. This is all mature/semi-mature broadleaf woodland.

8.119 The sensitivity of this effect is moderate as the broadleaf woodland is valued locally; the magnitude of the effect is deemed moderate as this will be a noticeable change over a limited area. As such, the long-term effect of felling the wayleave is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.120 The embedded mitigation measures outlined above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of woodland resource, including restricting the width of the felling corridor to the minimum required for statutory safe clearances.

8.121 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect Associated with Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.122 The measures likely to be most successful in managing the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not be taken into account in assessing the residual effect of the C-K connection as a result of the long-term loss of forestry resources due to felling of trees within the wayleave corridor. The likely residual effect remains moderate and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.123 There is, as stated above, 0.92ha permanent loss of broadleaf woodland associated with C-K connection of which 0.2ha is registered as ASNW/NWSS. The location of towers which fall within areas of ASNW and NWSS are given within Table 8.6. This is assessed as 0.05% of the local broadleaf woodland resource (i.e. within 20km of the KTR Project).

8.124 The sensitivity of the broadleaf woodland affected by the C-K connection, including ASNW and NWSS, is considered to be moderate as whilst the woodlands are in poor-average condition, they are recognised by national designations, and their condition could potentially be improved which would increase the sensitivity further. The likely magnitude of the effect is considered to be moderate as this will be a noticeable change over a limited area. As such, without mitigation, the significance of the effect is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.125 The embedded mitigation measures as detailed above will be implemented within the wayleave corridor, (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of construction of the C-K connection of the KTR Project.

8.126 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection are identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.127 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the C-K connection on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, the likely residual effect remains of moderate significance and therefore significant in EIA terms.

Monitoring

8.128 Subject to agreement with the landowners, a programme of future vegetation management will be undertaken incorporating an assessment of tree and shrub growth within and immediately adjacent to the wayleave corridor to ensure the safe operation of the C-K connection.

Earlstoun to Glenlee

Existing Conditions

8.129 On leaving Earlstoun power station the KTR route passes through one area of mature broadleaf woodland for a distance of 41m. The line then passes through two other broadleaf woodlands before it arrives at Hag wood immediately north of Glenlee. At Hag wood the line passes through an area of mature conifer forestry with an edge of broadleaf trees adjacent to the existing OHL and also adjacent to the proposed P-G via K OHL.

8.130 Within those areas to be felled are 1.6ha of broadleaf woodland including areas designated as within ASNW or NWSS. There is also 0.9ha of PAWS at Hag Wood which is also designated as ASNW/NWSS. Whilst care has been taken to minimise losses, it has not been possible to avoid the ASNW or NWSS sites entirely for this connection.

Construction Effects

8.131 The assessment of effects is based on the KTR Project description as outlined in Chapter 4. Tree felling proposed for this connection incorporates 1.7ha of trees within the 70m wide wayleave corridor. It is also proposed to fell a further 0.68ha of forestry out with the wayleave corridor to mitigate the potential for windthrow to take the felled edge to an existing more windfirm edge.

8.132 Further construction effects on forestry associated with this area of the KTR Project are the tree felling of 0.2ha of forestry for the creation of access tracks.

Predicted Construction Effects

Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.133 The wayleave corridor required to provide sufficient clearance for the safe construction and operation of the E-G connection has been designed to a width of 70m. Felling of woodland within the 70m wayleave corridor will result in the long-term loss of 1.7ha of forest which comprises 0.01% of the local forest resource within 20km of the KTR Project. This is all mature/semi-mature broadleaf woodland.

8.134 The sensitivity of the forest resource is considered to be moderate as the forest in this area is considered to be tolerant to moderate levels of change. The magnitude of the effect is deemed moderate as this will be a noticeable change over a limited area. As such the long-term effect of felling the wayleave is considered to be moderate.

Proposed Mitigation Associated with the Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.135 The embedded mitigation measures detailed above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of woodland resource, including restricting the width of the felling corridor to the minimum required for statutory safe clearances.

8.136 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect Associated with Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.137 The measures likely to be most successful in managing the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not be taken into account in assessing the residual effect of the E-G connection as a result of the long-term loss of forestry resources due to felling of trees within the wayleave corridor. The likely residual effect remains moderate and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.138 There is a permanent loss of 1.6ha of broadleaf woodland within the proposed wayleave corridor, of which 0.6ha is registered as ASNW/NWSS. 1.0ha is non-designated broadleaf woodland and the balance of the felled area is 0.9ha conifer PAWS woodland at Hag wood). The location of towers which fall within areas of ASNW and NWSS are given within Table 8.6. This equates to 0.05% of the local broadleaf woodland resource (i.e. within 20km of the KTR Project).

8.139 The sensitivity of the broadleaf woodland affected by the E-G connection, including ASNW and NWSS, is moderate as, whilst the woodlands are in poor-average condition, they are recognised by national designations, and their condition could potentially be improved which would increase the sensitivity further. The likely magnitude of the effect is minor as the area of trees affected is relatively small. There are two small areas of broadleaf woodland (one at Earlston substation and the other at Coom burn, north of Glenlee), which are within the NWSS database but which currently have existing OHLs passing through them. At Hag wood the area of ASNW is predominately PAWS and as such is considered to be of low sensitivity.

8.140 Overall, the likely significant effects as a result of the loss of broadleaf woodland, including Ancient Woodland and Native Woodland resource for E-G is assessed as moderate (significant in EIA terms).

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.141 The embedded mitigation measures detailed above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of construction of the E-G connection of the KTR Project.

8.142 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.143 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the E-G connection on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, the residual effect remains of moderate significance.

Effect associated with Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access

8.144 Felling of 0.2ha of woodland is required to accommodate the access track. The sensitivity of the area where the track is proposed is considered to be low as the loss of 0.2ha is a limited change over a small area. The magnitude of the effect is deemed minor as the forestry is tolerant to change. As such the long-term effect of the loss of woodland is considered to be none and therefore not significant.

yProposed Mitigation Associated with the Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.145 The embedded mitigation measures outlined above will be put in place for areas where there will be loss of woodland, including restricting felling to the minimum area required.

8.146 In addition, where SPEN is able to secure agreement with the landowner, replanting within felled areas will be undertaken to maximise ecological benefit where possible. For the reasons above, this can not be considered as committed good practice or mitigation and therefore is not taken into account in the assessment reported in the Chapter.

Residual Construction Effect Associated with the Loss of Forest Resource Associated with the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.147 As a result of the level of control over the replanting of these areas, which will be by way of the agreement between SPEN and the landowners, the mitigation is not committed. The residual effect remains as none and therefore not significant.

Monitoring

8.148 Subject to agreement with the landowners, SPEN will commit to monitoring windthrow associated with the construction and operation of the E-G connection of the KTR Project in relation to compensatory measures and tree removal.

8.149 Subject to agreement with the landowners, a programme of future vegetation management will be undertaken incorporating an assessment of tree and shrub growth within and immediately adjacent to the wayleave corridor to ensure the safe operation of the E-G connection.

8.150 Post application design works to consider the benefits of additional tree felling to achieve more landscape sensitive and windfirm forest boundaries will be continued. This work will aim to reach agreement where necessary with the landowner to undertake works out with the 70m corridor as outlined in Appendix 5.1.

BG Deviation

Existing Conditions

8.151 Heading south-west from Glenlee the route passes through broadleaf woodland for a distance of 367m. This area is all designated as NWSS and ASNW and is part of Blackbank wood which has a total area of 24.56ha, all of which has the same Native Woodland designation. Whilst care has been taken to minimise losses, it has not been possible to avoid this area of broadleaf woodland entirely for the BG Deviation given the location of the existing towers to be moved.

Construction Effects

8.152 The assessment of effects is based on the KTR Project description as outlined in Chapter 4. Tree felling proposed for this connection incorporates 2.12ha of trees within the 80m wide wayleave corridor.

8.153 There is no proposed felling outwith the wayleave corridor associated with temporary works or for addressing the risk of windthrow.

Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.154 The wayleave corridor required to provide sufficient clearance for the safe construction and operation of the BG Deviation has been designed to a width of 80m. Felling of woodland within the wayleave corridor will result in a loss of 2.12ha of forest resource. This is all mature/semi-mature broadleaf woodland which comprises 0.01% of the local forest resource (i.e. within 20km of the KTR Project).

8.155 The sensitivity of the local forest resource to this loss is moderate in that the area is considered tolerant to moderate change. The likely magnitude of the effect is moderate as this will be a noticeable change over a limited area. As such the likely significance of the effect of felling the wayleave is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.156 The embedded mitigation measures outlined above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of woodland resource as a result of the BG Deviation.

8.157 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1.

Residual Construction Effect Associated with Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.158 The measures likely to be most successful in managing the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not be taken into account in assessing the residual effect of the BG Deviation as a result of the long-term loss of forestry resources due to felling of trees within the wayleave corridor. The likely residual effect remains moderate and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.159 There is, as stated above, 2.12ha permanent loss of broadleaf woodland all of which is registered as ASNW/NWSS. This loss of broadleaf woodland is 0.1% of the local broadleaf woodland resource (i.e. within 20km of the KTR Project).

8.160 The sensitivity of the woodland affected by the BG Deviation is considered to be high in that the broadleaf woodlands are highly valued due to their good condition and designation. The magnitude of the effect is deemed moderate in that this is a notable change over a limited area. As such, without mitigation, the effect is considered to be major.

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.161 The embedded mitigation measures detailed above will be implemented within the wayleave corridor (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of the BG Deviation of the KTR Project.

8.162 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.163 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the BG Deviation on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, the residual effect is major and therefore significant in EIA terms.

Monitoring

8.164 Subject to agreement with the landowners, SPEN will commit to monitoring windthrow associated with the construction and operation of the BG Deviation of the KTR Project in relation to compensatory measures and tree removal.

8.165 Subject to agreement with the landowners, a programme of future vegetation management will be undertaken incorporating an assessment of tree and shrub growth within and immediately adjacent to the wayleave corridor to ensure the safe operation of the BG Deviation.

Glenlee to Tongland

Existing Conditions

8.166 The areas of forest within which the G-T connection are located are as follows:

- On exiting Glenlee Power Station heading south the route passes through Black bank wood for 277m while running parallel and immediately to the south of the BG route Deviation.
- Between T4 and T5 the line then passes over an area of riparian broadleaf woodland adjacent to Bucks Linn for 37m.
- At T9 the OHL enters a recently planted broadleaf woodland area for 420m.
- Between T12 and T13 the line passes over an area of mature broadleaf woodland for 5m to the south of The Queensway public road.
- At T13 the line then passes into the FLS commercial forest known as Darsalloch and Bennan Forests for 9,960m (T13 to T49).
- After passing over the River of Dee south of Stroan Loch the line enters Slogarie Forest to the south of T52. This is an area of privately-owned commercial forestry managed by Tilhill Forestry Company. The line passes for 1,260m through this ownership
- The OHL enters Bennan Hill Forest and then Laurieston Forest (both owned by FLS) over a distance of 3,610m where T61-T74 are located.
- On exiting the FLS ownership the line then passes through predominately open ground where there are areas of broadleaf woodland (T74-T75 and T78-T79).
- To the south of T84 the line enters Whireston Hill Forest for 1,080m (T84-T88).
- The line then passes over an area of open ground before passing through an area of semi-mature conifer forest for 74m (T89-T90). From this point the line passes a short section, 38m, of semi-mature conifer forest (T98-T99).
- After crossing over further open farmland the line crosses a riparian broadleaf woodland west of Argrennan Mains farm for 16m between T106 and T107.
- The line then passes over open farm ground before arriving at an area of semi-mature conifer woodland to the south of T109 (west of Park of Tongland) Between T109 and T110 the line passes through this area of woodland for 81m.
- There is no further impact on forestry south of T110 to the end point of the G-T connection at T120.

Construction Effects

8.167 The assessment of effects is based on the KTR Project description as outlined in Chapter 4. Tree felling proposed for this connection incorporates 137.98ha of trees within the 80m wide wayleave corridor. This includes 13.2ha of PAWS within Bennan forest which is conifer plantation forest in five separate locations and is recognised in the NWSS database. This site is not identified within the ASNW database however it is included within the assessment for this project as loss of ASNW. It is also proposed, with landowner agreement, to fell a further 91.94ha of forestry out with the wayleave corridor to mitigate the potential for windthrow by creating a windfirm edges.

8.168 Further construction effects on forestry associated with this connection include the felling of 6.29ha of forestry for the creation of access tracks, 2.46ha for the creation of works compounds and the felling of 61.24ha of forestry for the creation of stone quarry sites at Willshill quarry and Hindcraig quarry in Bennan Forest, and Lochenbreck and Criagelwhan quarries within Slogarie and Laurieston forests.

8.169 Within those areas to be felled as listed above are 14.56ha of broadleaf woodland including areas designated as within ASNW and NWSS. There is also 13.68ha of PAWS which also has an ASNW/NWSS designation (mainly within Bennan forest as noted above). Whilst care has been taken to minimise losses of broadleaf woodland, it has not been possible to avoid these areas entirely for the G-T connection given the length of the connection.

Long Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.170 The wayleave corridor required to provide sufficient clearance for the safe construction and operation of the G-T OHL has been designed to a width of 80m. Felling of woodland within the 80m wayleave will result in the long-term loss of 137.98 Ha of woodland which comprises 0.93% of the local forest resource within 20km of the KTR Project.

8.171 The sensitivity of the forest is considered to be moderate in that it is tolerant to moderate levels of change. The magnitude of this effect is considered to be major, as this will be a noticeable change over a relatively wide area. As such the likely significance of the effect is considered to be major (significant in EIA terms).

Proposed Mitigation Associated with the Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.172 The embedded mitigation measures outlined above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of woodland resource as a result of construction of the G-T connection, including restricting the width of the felling corridor to the minimum required for statutory safe clearances.

8.173 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect Associated with Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.174 The measures likely to be most successful in mitigating the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not been taken into account in assessing the residual effect of the G-T connection as a result of the long-term loss of forestry due to felling of trees within the wayleave corridor. The effect remains major and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.175 There are a number of areas of broadleaf woodland including areas designated as ASNW and/or NWSS within the proposed 80m wayleave (as shown on Figure 5.2). These total 14.56ha and include areas of mature broadleaf woodland at Blackbank wood immediately south-west of Glenlee substation, a newly planted mixed broadleaf plantation at Rig of Airie, areas either side of the public road running through Laurieston forest, and a number of small riparian woodland areas within open farmland. In addition to the areas of broadleaf woodland within the NWSS database, there is 13.2ha of PAWS conifer plantation forest on five separate sites within Bennan forest. This is not identified within the ASNW database however it is included within the assessment for this project as loss of ASNW. The location of towers which fall within areas of ASNW and NWSS are given within Table 8.5. This loss of broadleaf woodland is assessed as 0.75% of the local broadleaf woodland resource (i.e. within 20km of the KTR Project).

8.176 There is a wide range of broadleaf woodlands within the G-T connection of the KTR Project. The sensitivity of these areas of broadleaf, including ASNW and NWSS, it is overall considered to be high as while the woodlands are in variable condition, many are designated within the ASNW or NWSS database and therefore highly valued. The magnitude of the effect is deemed major based on the extent of the change to these areas of broadleaf woodlands. As such, without mitigation, the significance of the effect is considered to be major.

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.177 The embedded good practice measures as detailed above will be implemented within the wayleave, (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of construction of the G-T connection of the KTR Project.

8.178 With landowner agreement, SPEN will seek to replant certain sections of the wayleave and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.179 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the G-T connection on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, the likely residual effect remains of major significance and therefore significant in EIA terms.

Effect associated with Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.180 Felling required to assist in the delivery of the KTR Project which is outwith the wayleave includes 6.29ha of forestry for the creation of access tracks, 2.46ha for the creation of works compounds, and 61.24ha of forestry for the creation of stone quarry sites at Wills hill and Pulterson in Bennan forest and Lochenbreck and Criagelwhan Quarry within Slogarie and Laurieston Forests. In addition, 0.19ha of broadleaves are required to be felled for the removal of the existing R route. This represents 0.4% of the local forest resource within 20km of the KTR Project.

8.181 The sensitivity of the forest is minor as the forest is considered to be tolerant to some change. The magnitude of this effect is considered to be moderate due to the tree clearance specifically required for the quarry site (61ha) which is considered to be a noticeable change over a limited area. As such the significance of the effect is considered to be minor.

Proposed Mitigation Associated with the Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.182 The embedded mitigation measures outlined above will be put in place for areas where there will be loss of woodland, including the restriction of felling to the minimum area required.

8.183 In addition, where SPEN is able to secure agreement with the landowner, replanting within felled areas will be undertaken to maximise ecological benefit where possible. For the reasons above, this can't be considered as committed good practice or mitigation and therefore is not taken into account in the assessment reported in the Chapter.

Residual Construction Effects Associated with the Loss of Forest Resource Associated with the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.184 As a result of the level of control over the replanting of these areas, which will be by way of the agreement between SPEN and the landowners, the mitigation is not committed. The significance of the residual effect is considered to remain as minor (not significant).

Effects on Forest Management during Construction

8.185 The predominately large commercial forests affected by the G-T connection are all considered to be relatively unconstrained in terms of access for forest management and ability to meet with forest management and health and safety requirements. The OHL has been routed so that access to the forest for commercial woodland management can continue to meet safety requirements and be delivered without significant financial constraints. The magnitude of this effect on forest management is considered to be minor in that the loss of ability to manage the forest is restricted to a relatively small area of large forests, and it would be anticipated that this can be accommodated within a minor variation to the timing of any specific management tasks during the construction period. The sensitivity of the forest to this effect is considered to be low. As such it is considered that the significance of the effect on forest management during construction is none.

Proposed Mitigation Associated with Forest Management during Construction

8.186 As noted above, the embedded mitigation measures will be implemented, including through the commitment of SPEN to work with the landowners throughout the construction period to facilitate ongoing forest management where possible within the constraints of safe working practices and the associated CDM working. This will include a requirement to construct suitable access points to allow forest machinery to pass safely under the line during and post construction in various sites throughout this section where commercial forest management will continue.

Residual Effect on Forest Management during Construction

8.187 The significance of the residual effect on forest management during construction is deemed to continue to be none and therefore not significant.

Operational Effects

Operational Effects on Forest Management

8.188 The current and future management of the forest within which the G-T connection is proposed will be affected by introduction of the line and associated felling requirements. This is likely to require woodland managers to amend current objectives, LTFPs, landscape design plans and management techniques for those effected forests, to incorporate the felling requirements associated with the G-T connection of the KTR Project. In particular, the presence of the OHL will impose some restriction on forest management associated with access. To address this, SPEN will work with forest managers to follow best practice in undertaking forest operations within proximity to OHLs.

8.189 Other operational effects of the felling required for G-T part of the KTR Project on forest management processes include:

- taking account of the weakened nature of the new edge of the crop;
- requirement to re-design felling coupes;
- amendments to harvesting techniques and extraction routes to take account of the presence of the connection;
- relocation of loading areas to avoid working adjacent to overhead conductors;
- disruption to the periodic felling and removal of timber (thinning and felling) from plantations adjacent to the wayleave corridor due to the presence of the OHL, especially where access is difficult due to adverse terrain and ground conditions; and
- taking account of the presence of the OHL during that re-stocking which occurs after clearfelling, and in certain areas restructuring may be necessary to take account of landscape design considerations.

8.190 The operational effects on forest management are assessed as being low in terms of sensitivity and moderate in terms of magnitude given the extensive changes over a wide area of forest. As such the significance of this effect is deemed to be minor.

Proposed Mitigation Associated with Operational Effects on Forest Management

8.191 The primary mitigation of the effect on operational forest management is associated with the initial routeing decisions. These decisions have aimed to take account of and minimise the above effects within the constraints of the overall routeing process. Whilst no significant effects have been identified that require mitigation, the following measures will be put in place once the KTR Project is operational:

- In areas where 'forwarding' underneath or adjacent to the proposed OHL is allowed, 'goal-posts' will be erected to determine and indicate the maximum safe working height[18].
- Opportunities to plant low-growing shrub species below the line and small trees such as rowan, gean, hazel, hawthorn and willow towards the edge of the OHL corridor will be considered. This planting will assist the woodland managers in their objective of increasing woodland diversity. The design and management of such planting will incorporate access routes required for maintenance of the line and will comply with SPEN's safe working practices.
- Soil disturbance and compaction will be minimised during maintenance by using low ground pressure tree harvesting and extraction methods.
- Topping will be restricted to removing a maximum of half of the live crown of the tree so that some growth will continue and so disguise the felling line (this approach will therefore not be suitable for older stands with shallow canopies for reasons of effectiveness – here coppicing may be appropriate).
- Local drainage systems will be maintained.
- Tree clearance operations associated with maintain clearance distance from the G-T connection within the wayleave will strictly adhere to the Forestry Commission publication 'Forest and Water Guidelines', version five, 2011.
- Monitoring and removal of windthrown trees will be undertaken.

8.192 In addition to the measures above, SPEN will also implement the following measures where possible, in agreement with the landowners:

- Opportunities to introduce different species (conifers, broadleaves, evergreen, deciduous, varieties of size and shape) will be taken where appropriate.
- New planting, restocking, and the management of natural regeneration will be undertaken in agreed designated areas, following negotiation with relevant landowners. This will target areas where maximum ecological advantage will be gained. This will include riparian areas and areas of existing biodiversity as set out in Appendix 5.1.
- In addition to monitoring and removal of windthrown trees, consideration will be given to the implementation of associated forest landscaping, including replanting.

Residual Operational Effect on Forest Management

8.193 The residual operational effect on forest management considered to remain as minor and therefore not significant.

Monitoring

8.194 Subject to agreement with the landowners, SPEN will commit to monitoring windthrow associated with the construction and operation of the G-T connection of the KTR Project in relation to compensatory measures and tree removal.

8.195 Subject to agreement with the landowners, a programme of future vegetation management will be undertaken incorporating an assessment of tree and shrub growth within and immediately adjacent to the wayleave corridor to ensure the safe operation of the G-T connection.

8.196 Post application design works to consider the benefits of additional tree felling to achieve more landscape sensitive and windfirm forest boundaries will be continued. This work will aim to reach agreement where necessary with the landowner to undertake works out with the 80m corridor as outlined in Appendix 5.1.

[18] Timber extraction to roadside will be by custom built six or eight wheeled 'forwarders'; the timber is carried to roadside and stacked to await onward transportation.

KTR Project as a Whole: Assessment of Effects

Construction Effects

8.197 The assessment of effects of the KTR Project as a Whole considers the combined construction effects of all five connections of the KTR Project as outlined in Chapter 4.

8.198 Tree felling proposed during construction of the KTR Project incorporates 163.47ha of trees within the 70/80m wide wayleave corridor. As a measure against the risk of windthrow it is also proposed to fell a further 113.52ha of forestry outwith the wayleave corridor. This felling takes the felled edge to an existing windfirm edge.

8.199 Further construction effects on forestry associated with the KTR Project are the felling of 79.50ha of forestry for the creation of access tracks, construction compounds and stone quarries required during construction of the connections forming part of the KTR Project, including decommissioning of the existing R route.

8.200 The areas to be felled as listed above include 28.62ha of broadleaf woodland including areas designated as within ASNW or NWSS. There is an additional 16.36ha of PAWS which also within ASNW/NWSS designations. Whilst care has been taken to minimise the extent to which the KTR Project will require the felling of broadleaf woodland, it has not been possible to avoid this entirely.

Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.201 The wayleave corridor required to provide sufficient clearance for the safe construction and operation of the KTR Project as a Whole will result in the long-term loss of 163.47ha of woodland which comprises 1% of the local forest resource within 20km of the KTR Project.

8.202 The sensitivity of woodlands affected by any part of the whole of the KTR Project is moderate in that the woodlands are tolerant to moderate levels of change. The likely magnitude of the effect of the KTR Project is considered to be moderate in that it is likely to change 1% of the local resource and as such considered a noticeable change over a limited area. As such the likely significance of the effect of the long-term loss of forest resource due to felling of trees within the wayleave corridor is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.203 The embedded mitigation measures outlined above will be implemented within the wayleave corridor (i.e. land over which SPEN has control) to reduce the net loss of woodland resource, including restricting the width of the felling corridor to the minimum required for statutory safe clearances.

8.204 With landowner agreement, SPEN will seek to replant certain sections of the wayleave corridor and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect Associated with Long-Term Loss of Forestry Resources due to Felling of Trees within the Wayleave Corridor

8.205 The measures likely to be most successful in mitigating the effects of felling are subject to landowner agreement. As noted above, these measures do not form committed mitigation, and have not been taken into account in assessing the likely residual effect of the KTR Project as a Whole which remains moderate and therefore significant.

Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.206 There are a number of areas of woodland designated as ASNW and/or NWSS within the proposed 70/80m wayleave corridor (as shown on Figure 5.2). These comprise 28.62ha of broadleaf woodland, being a combination of native and planted woodland, 16.36ha of which are PAWS sites which are primarily located within the area affected by the G-T connection of the KTR Project.

8.207 The local resource of broadleaf woodland is estimated to be 1,925ha as such this loss equates to 1.2% of the local resource. The sensitivity of the broadleaf woodland affected by the KTR Project is considered to be high on the basis that, whilst the woodlands are in variable condition, many are designated within the ASNW or NWSS database. The likely magnitude of the effect of the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor is assessed as moderate based on the notable change over limited areas of broadleaf woodlands. As such, without mitigation, the likely significance of the effect is considered to be major (significant in EIA terms).

Proposed Mitigation Associated with the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.208 The embedded mitigation measures as detailed above will be implemented within the wayleave corridor (i.e. land over which SPEN has control) to reduce the net loss of broadleaf woodland (including ASNW and NWSS resource) as a result of construction of the KTR Project as a Whole.

8.209 With landowner agreement, SPEN will seek to replant certain sections of the wayleave corridor and the wayleave corridor edge with low growing shrub species, sourced from local seed provenance, which are not deemed to put at risk the ongoing safe operation of the line. These areas of planting will be targeted to specific areas where issues of woodland linkage and habitat protection have been identified. The design opportunities for this are detailed within Appendix 5.1, however as they require landowner agreement, they cannot be considered committed mitigation.

Residual Construction Effect as a Result of the Loss of Broadleaf Woodland including Ancient Woodland and Native Woodland Resource due to Felling of Trees within the Wayleave Corridor

8.210 The measures requiring landowner approval do not form committed mitigation, and have not be taken into account in assessing the residual effect of the KTR Project as a Whole on the loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor. Due to the net loss of broadleaf woodland, including areas of ASNW or NWSS, and as some of the proposed mitigation measures are subject to landowner approval, the likely significance of the residual effect remains major and therefore significant in EIA terms.

Effect associated with Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.211 Felling of 79.50ha of woodland is required to accommodate the construction compounds, quarries and access tracks. This represents 0.5% of the local forest resource within 20km of the KTR Project.

8.212 The sensitivity of the forestry to the loss of woodland is considered moderate in that the woodlands are tolerant to moderate levels of change. The magnitude of the likely effect is considered to be moderate in that this is a change to 0.5% of the local resource and is therefore considered a noticeable change over a limited area. As such the likely significance of the effect of the KTR Project associated with loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks is considered to be moderate (significant in EIA terms).

Proposed Mitigation Associated with the Loss of Forest Resource Associated with the Felling of Trees for the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.213 The embedded mitigation measures outlined above will be put in place for areas where there will be loss of woodland, including restriction of felling to the minimum area required for these purposes.

8.214 In addition, where SPEN is able to secure agreement with the landowner, replanting within felled areas will be undertaken to maximise ecological benefit where possible. For the reasons above, this cannot be considered as committed good practice or mitigation and therefore is not taken into account in the assessment reported in the Chapter.

Residual Construction Effects Associated with the Loss of Forest Resource Associated with the Creation of Temporary Construction Compounds, Quarries and Construction Access Tracks

8.215 As a result of the level of control over the replanting of these areas, which will be by way of the agreement between SPEN and the landowners, the mitigation is not committed. The significance of the likely residual effect will therefore remain moderate and therefore significant.

Effects on Forest Management during Construction

8.216 The large commercial forest areas which will be affected by the five connections of the KTR Project are considered to be relatively unconstrained in terms of access for forest management and ability to meet the forest management and health and safety requirements during construction. The KTR Project has

been routed so that access to the forest for commercial woodland management can continue to meet safety requirements. It is anticipated that the projected regular timber production from these forests will be delayed due to the construction of the KTR Project but that the income foregone will be in a large part replaced by the felling and timber production associated directly with the KTR Project. Access for all other forest management elements will be able to continue albeit with constraints on timing associated with a large construction project. The magnitude of the likely effect of the KTR Project on forest management is considered to be minor in that effects on forest management will be restricted to a relatively small area of large forest blocks, and it would be anticipated that this can be accommodated within a minor variation to the timing of any specific management tasks during the construction period. The sensitivity of the forest to this effect is considered to be low. As such it is considered that the likely significance of the effect of the KTR Project on forest management during construction is none.

Proposed Mitigation Associated with Forest Management during Construction

8.217 As noted above, the embedded mitigation measures will be implemented, including through the commitment of SPEN to work with the landowners through the construction period to facilitate ongoing forest management where possible within the constraints of safe working practices and the associated CDM working.

8.218 This will include a requirement to construct suitable access points to allow forest machinery to pass safely under the line during and post construction in various sites throughout this section where commercial forest management will continue.

Residual Effect on Forest Management during Construction

8.219 The significance of the likely residual effect on forest management during construction of the KTR Project is assessed as none and therefore not significant.

Operational Effects

Operational Effects on Forest Management

8.220 The future management of the forest within which the KTR Project is proposed will be affected by the introduction of the connections and the associated felling requirements. The effects will primarily be associated with the P-G via K and the G-T connections; the C-K and the E-G connections and the BG Deviation are located within areas of minimal active forest management and will not result in any notable changes to forest management. In particular, the presence of the KTR Project will impose some restriction on the forest management mainly associated with access. To address this, SPEN will work with forest managers to follow best practice in undertaking forest operations within proximity to OHLs.

8.221 Other operational effects of the KTR Project on forest management processes include:

- taking account of the weakened nature of the new edge of the crop;
- requirement to re-design felling coupes;
- amendments to harvesting techniques and extraction routes to take account of the presence of the connection;
- relocation of loading areas to avoid working adjacent to overhead conductors;
- disruption to the periodic felling and removal of timber (thinning and felling) from plantations adjacent to the wayleave corridor due to the presence of the OHL, especially where access is difficult due to adverse terrain and ground conditions; and
- taking account of the presence of the OHL during re-stocking which occurs after clearfelling, and in certain areas restructuring may be necessary to take account of landscape design considerations.

8.222 The forestry experiencing operational effects on forest management is assessed as being low in terms of sensitivity. The likely operational effects are assessed as being minor in terms of magnitude on the basis that the changes will be small and will be spread over a large area of the forest. As such the likely significance of the operational effect of the KTR Project on the forest management is assessed as minor.

Proposed Mitigation Associated with Operational Effects on Forest Management

8.223 The primary mitigation of the effect on operational forest management is associated with the initial routeing decisions. These decisions have aimed to take into account and minimise the above effects within the constraints of the overall routeing process. Whilst no significant effects have been identified that require mitigation, the following measures will be put in place once the KTR Project is operational:

- In areas where 'forwarding' underneath or adjacent to the proposed OHL is allowed, 'goal-posts' will be erected to determine and indicate the maximum safe working height.
- Opportunities to plant low-growing shrub species below the line and small trees such as rowan, gean, hazel, hawthorn and willow towards the edge of the OHL corridor will be considered. This planting will assist the woodland managers in their objective of increasing woodland diversity. The design and management of such planting will incorporate access routes required for maintenance of the line and will comply with SPEN's safe working practices.
- Soil disturbance and compaction will be minimised during maintenance by using low ground pressure tree harvesting and extraction methods.
- Topping will be restricted to removing a maximum of half of the live crown of the tree so that some growth will continue and so disguise the felling line (this approach will therefore not be suitable for older stands with shallow canopies for reasons of effectiveness – here coppicing may be appropriate).
- Local drainage systems will be maintained.
- Tree clearance operations within the wayleave will strictly adhere to the Forestry Commission publication 'Forest and Water Guidelines', version five, 2011.
- Monitoring and removal of windthrown trees will be undertaken.

8.224 In addition to the measures above, SPEN will also implement the following measures where possible, in agreement with the landowners:

- Opportunities to introduce different species (conifers, broadleaves, evergreen, deciduous, varieties of size and shape) will be taken where appropriate.
- New planting, restocking, and the management of natural regeneration will be undertaken in agreed designated areas, following negotiation with relevant landowners. This will target areas where maximum ecological advantage will be gained. This will include riparian areas and areas of existing biodiversity as set out in Appendix 5.1.
- In addition to monitoring and removal of windthrown trees, consideration will be given to the implementation of associated forest landscaping , including replanting.

Residual Operational Effect on Forest Management

8.225 The likely residual operational effect of the KTR Project on forest management is considered to remain minor and therefore not significant.

Interrelationship between Effects

8.226 Both in relation to the potential effects of the individual connections of the KTR Project and the KTR Project as a Whole, there are a number of interactions between forestry and the other disciplines considered as part of the EIA. In particular, felling of forestry has implications for the landscape and visual effects and this is considered in detail in Chapter 7. Felling of broadleaves is also of relevance in relation to effects on habitats as considered in detail in Chapter 10. Effects of felling are also considered in relation to potential effects on the water environment in Chapter 9, particularly in relation to the embedded mitigation and working methods that will be put in place to ensure that the water environment is protected during these works. Chapter 15 considers the implications of the KTR Project on forestry management operations.

Summary of Significant Effects

8.227 The assessment has identified that the likely significance of the effect of the permanent loss of local forest resource due to felling of trees for the wayleave is assessed as moderate for the KTR Project as a Whole. The possible mitigation does not reduce the level of significance as it is outwith SPEN's control and so not committed.

8.228 The likely significance of the effect of the permanent loss of broadleaf trees, including ASNW and NWSS, is considered major for the KTR Project as a Whole and therefore significant in EIA terms. The mitigation measures do not reduce the level of significance as they are subject to landowner agreement and as such is outwith SPEN's control. Such mitigation is not committed.

8.229 The likely significance of effects on forest management during construction is considered to be none for all five connections of the KTR Project.

8.230 The likely significance of operational effects on forest management for each of the connections of the KTR Project is assessed as none following mitigation.

8.231 The findings of the individual assessments are summarised in Table 8.7.

8.232 The opportunity to undertake mitigation, by replanting, for the long-term loss of forest resource due to felling of the wayleave and to mitigate the long term loss of broadleaf including ASNW and NWSS is not committed mitigation in that it is not under the control of SPEN. However, it is considered to be important mitigation and it is the intention of SPEN to achieve a robust agreement with those landowners to assist in delivery areas of low growing shrub planting within the wayleave, and also to deliver areas of replanting within the N and R routes post decommissioning.

Table 8.7: Summary of Residual Effects for the Individual Connections of the KTR Project

Likely Effect	Receptor	Connection of the KTR Project	Effect Prior to Mitigation	Likely Residual Effect
Long term loss of forest resource due to felling of trees within the wayleave corridor	Forest	P-G via K	Moderate	Moderate
		C-K	Moderate	Moderate
		E-G	Moderate	Moderate
		B-G Deviation	Moderate	Moderate
		G-T	Major	Major
		KTR as a Whole	Moderate	Moderate
Loss of broadleaf woodland including Ancient woodland and Native woodland resource due to felling of trees within the wayleave corridor	Broadleaf woodland and areas designated ASNW or NWSS	P-G via K	Moderate	Moderate
		C-K	Moderate	Moderate
		E-G	Moderate	Moderate
		B-G Deviation	Major	Major
		G-T	Major	Major
		KTR as a Whole	Major	Major
Loss of forest resource associated with the felling of trees for the creation of temporary construction compounds, quarries and construction access tracks	Forest	P-G via K	Moderate	Moderate
		KTR as a Whole	Moderate	Moderate

Figure 8.1.1: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure

- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Carsfad to Kendoon (wood pole)
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network

Access to proposed towers

- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- New access
- Working area
- Construction compound
- Potential quarry working area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)

- AWI and NWSS

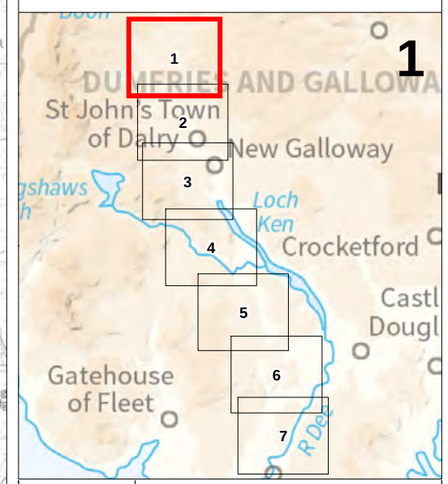
Polquhanity terminal tower

Kendoon substation

Carsfad substation

0 0.5 1 km

Map Scale @ A3: 25,000



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KTR Project
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Figure 8.1.2: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure

- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Carsfad to Kendoon (wood pole)
- Earlstoun to Glenlee (wood pole)
- Earlstoun to Glenlee (temporary wood pole)
- Glenlee to Tongland (steel lattice
- BG route deviation (steel lattice tower)
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network
- Underground cable

Access to proposed towers

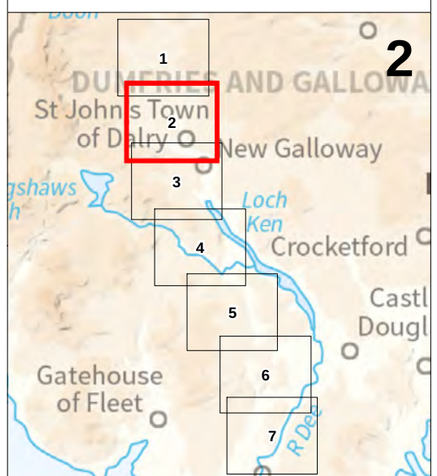
- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- Existing access
- New access
- Working area
- Construction compound
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)

- AWI and NWSS
- PAWS (Conifers)



Carsfad substation

Earlstoun substation

Glenlee substation

0 0.5 1 km

Map Scale @ A3: 25,000

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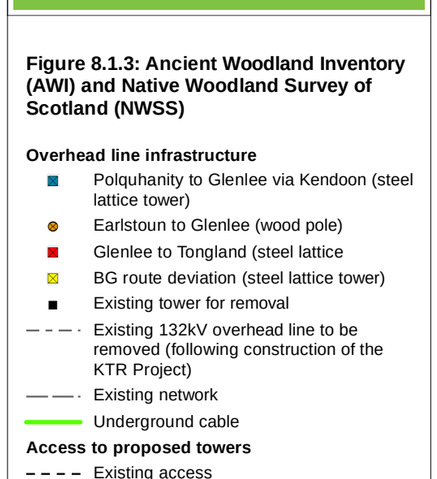
Figure 8.1.3: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure
- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Earlstoun to Glenlee (wood pole)
- Glenlee to Tongland (steel lattice)
- BG route deviation (steel lattice tower)
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network
- Underground cable

Access to proposed towers
- Existing access
- New access
- Timber extraction spur

Access to towers for removal
- Existing access
- New access
- Working area
- Construction compound
- Potential quarry working area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)
- AWI and NWSS
- PAWS (Conifers)



Glenlee substation

0 0.5 1 km

Map Scale @ A3: 25,000

KTR Project
EIA Report

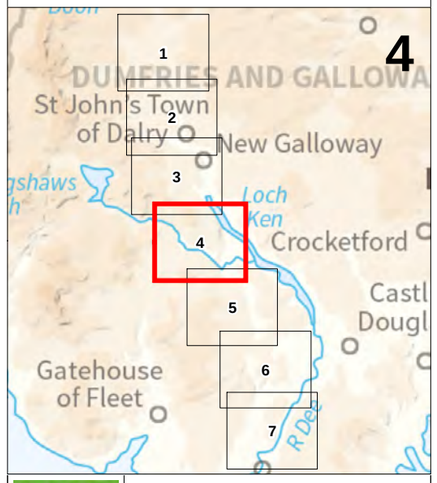
Figure 8.1.4: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure
- Glenlee to Tongland (steel lattice
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)

Access to proposed towers
- Existing access
- New access
- Timber extraction spur

Access to towers for removal
- Existing access
- New access
- Working area
- Construction compound
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)
- AWI and NWSS
- PAWS (Conifers)



0 0.5 1 km

Map Scale @ A3: 25,000

KTR Project
EIA Report

Figure 8.1.5: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure

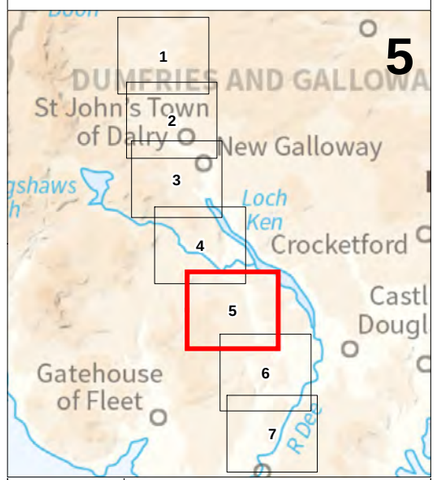
- Glenlee to Tongland (steel lattice tower)

Access to proposed towers

- Existing access
- New access
- Timber extraction spur
- Working area
- Construction compound
- Potential quarry working area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)

- AWI and NWSS
- PAWS (Conifers)



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0 0.5 1 km

Map Scale @ A3: 25,000

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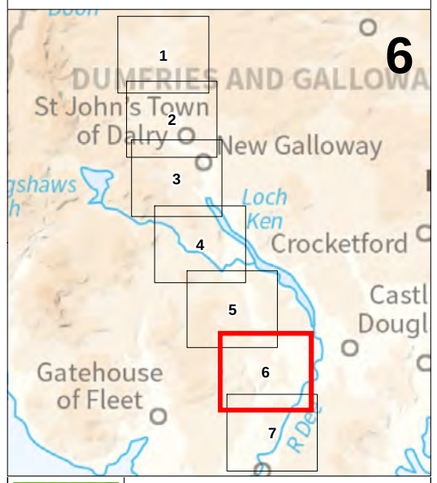
Figure 8.1.6: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure
- Glenlee to Tongland (steel lattice
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)

Access to proposed towers
- Existing access
- New access
- Timber extraction spur

Access to towers for removal
- Existing access
- New access
- Working area
- Construction compound
- Potential quarry working area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

AWI and NWSS areas to be felled for the project, Including Plantations on Ancient Woodland Sites (PAWS)
- AWI and NWSS
- PAWS (Conifers)



0 0.5 1 km

Map Scale @ A3: 25,000

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Figure 8.1.7: Ancient Woodland Inventory (AWI) and Native Woodland Survey of Scotland (NWSS)

Overhead line infrastructure

- Glenlee to Tongland (steel lattice
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network

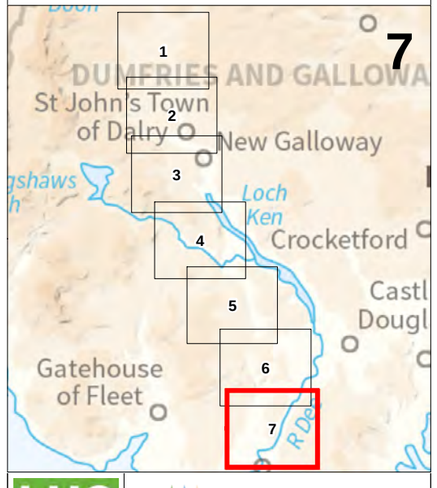
Access to proposed towers

- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- New access
- Working area
- Ancient Woodland Inventory (AWI)
- Native Woodland Survey of Scotland (NWSS)

Tongland substation



0 0.5 1 km

Map Scale @ A3: 25,000

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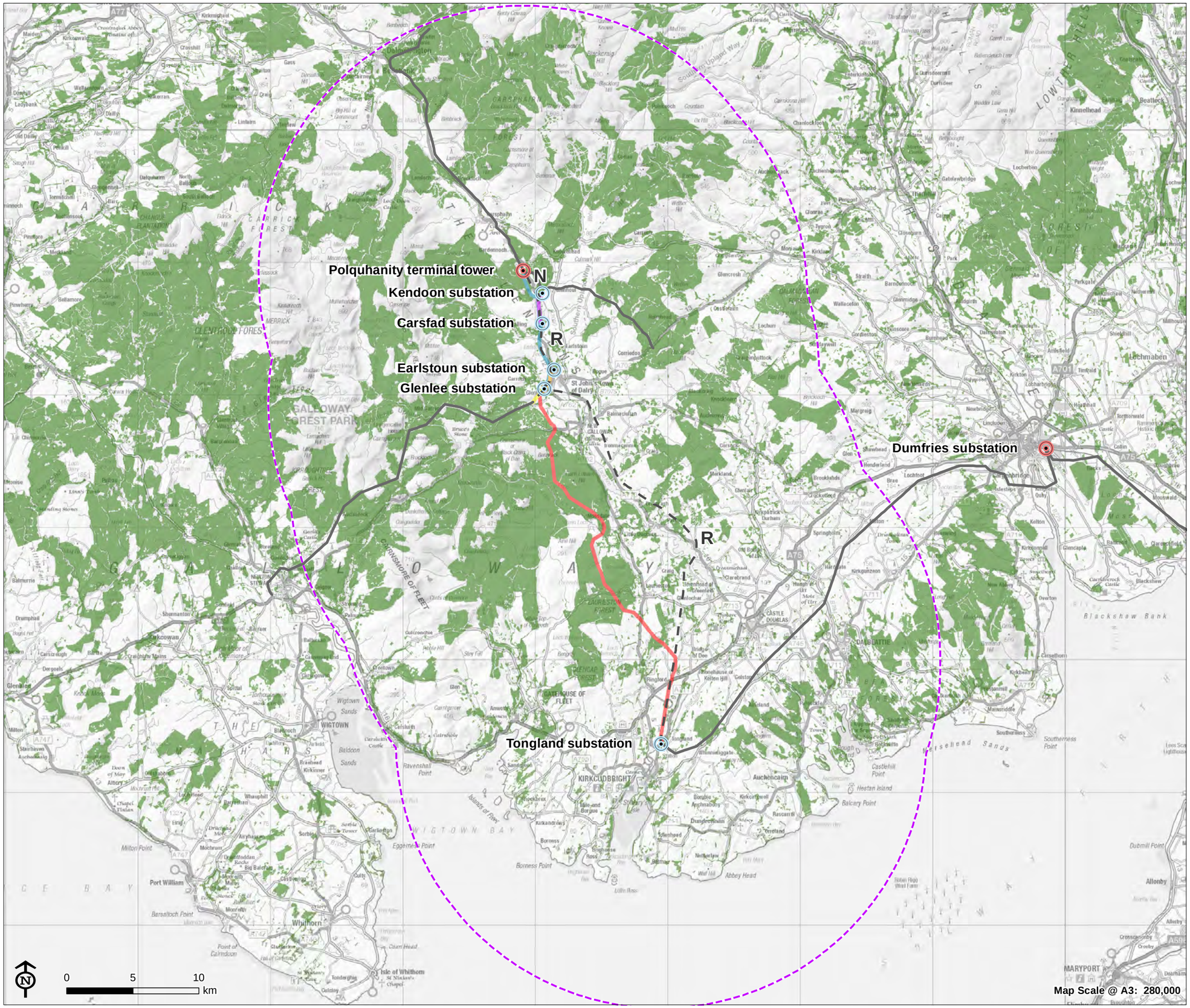
CB:JN EB:nunn_j LUCGLA FIG08-01_6120-001-r2_KTR_AWI_NWSS_25k_SmallSymbols 24/07/2020

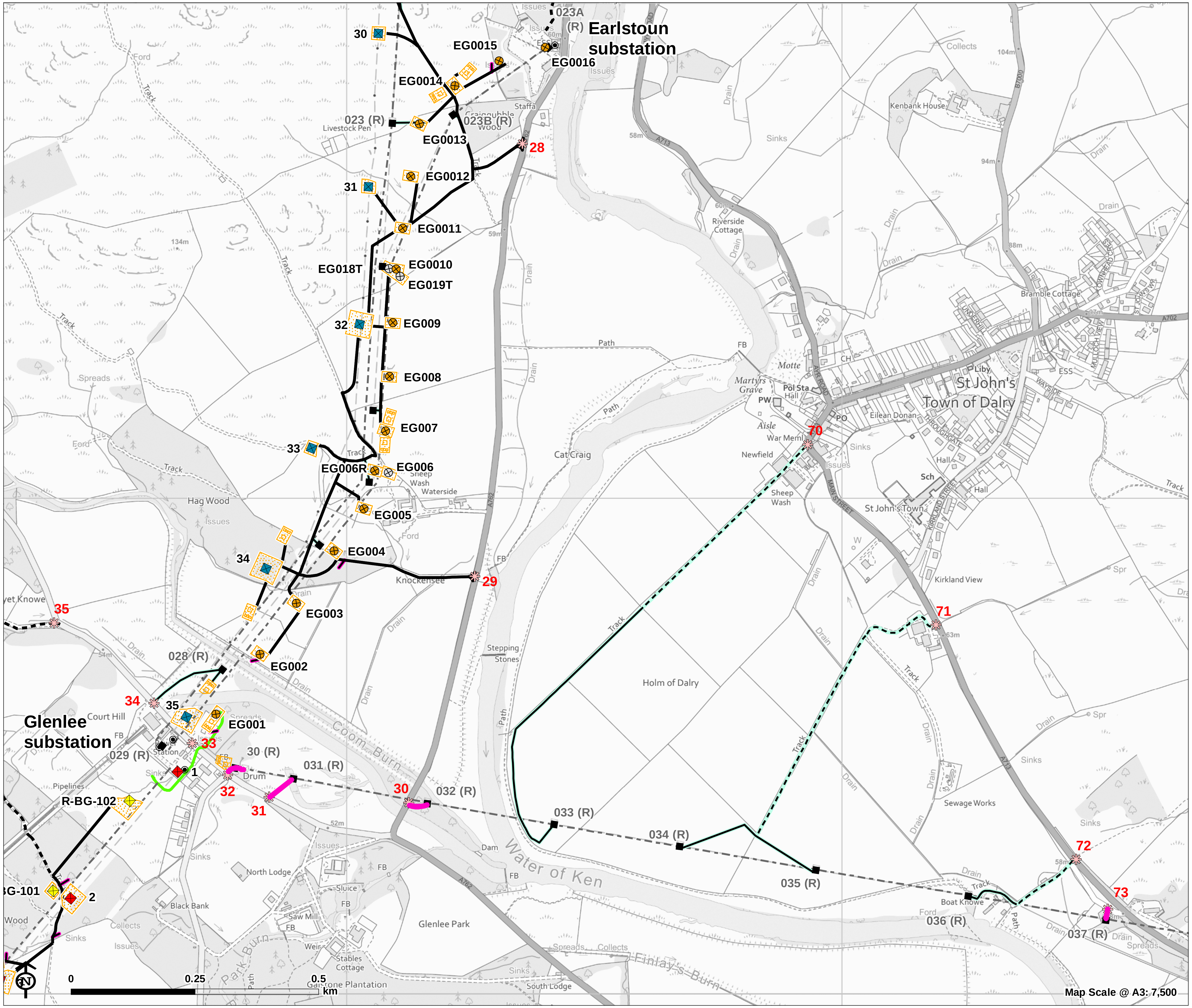
Figure 8.2: Existing Forestry Cover



- Polquhanity sealing end and terminal tower
- Substation and hydro electricity generating station
- Polquhanity to Glenlee via Kendoon
- Carsfad to Kendoon
- Earlstoun to Glenlee
- BG route deviation
- Glenlee to Tongland
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network
- 20km study areaa
- National Forestry Inventory (2018)

Note: National Forestry Inventory (2018) is only displaying land categorized as woodland. It includes areas of felling, young trees and shrubs.

Map Scale @ A3: 280,000



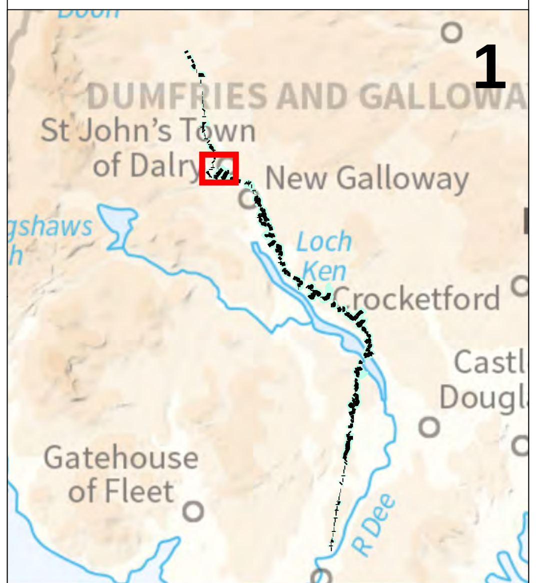


Figure 8.3.1: N and R Route Felling Required for Removal

Overhead line infrastructure
- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Earlstoun to Glenlee (wood pole)
- Earlstoun to Glenlee (temporary wood pole)
- Glenlee to Tongland (steel lattice tower)
- BG route deviation (steel lattice tower)
- Gantry
- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Underground cable
- Access point

Access to proposed towers
- Existing access
- New access
- Timber extraction spur

Access to towers for removal
- Existing access
- New access
- Working area
- N and R route removal felling

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Figure 8.3.2: N and R Route Felling Required for Removal

- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Access point

Access to towers for removal

- Existing access
- New access
- Working area
- N and R route removal felling

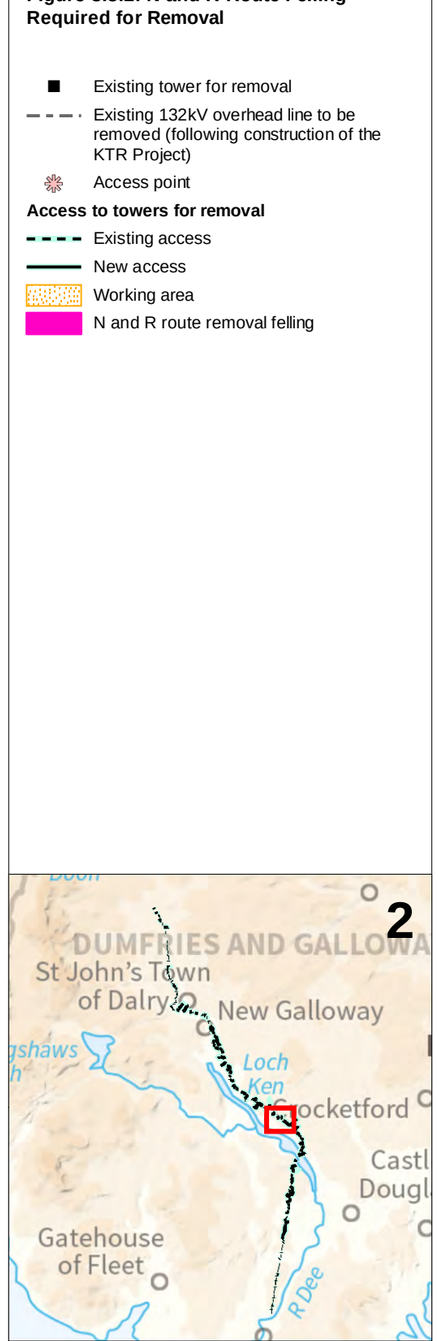

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Figure 8.3.3: N and R Route Felling Required for Removal

- Existing tower for removal
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Access point

Access to towers for removal

- Existing access
- New access
- Working area
- N and R route removal felling

Map Scale @ A3: 7,500

CB:JN EB:nunn_j LUCGLA FIG08-03_6120-001-r0_KTR_NR_ForestryRemoval 24/07/2020