Chapter **10**
Ecology

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Introduction

10.1 This chapter has been prepared by LUC and presents the findings of the assessment of the likely significant construction effects of the proposed Kendoon to Tongland 132 kilovolt (kV) Reinforcement Project ('the KTR Project') on ecology, details of which are provided in Chapter 4: Development Description and Chapter 5: Felling, Construction, Operational Maintenance and Decommissioning. The chapter presents and interprets the findings of desk-based and field studies and follows good practice methods in assessing the potential significance of effects on ecological features.

10.2 The chapter assesses effects during the construction phase of the KTR Project (including decommissioning of the existing N and R routes); potential operational effects on all ecological features have been scoped out of detailed assessment, as discussed further below.

10.3 This chapter should be considered in conjunction with the following chapters, which inform, or have been informed by, this assessment:

- Chapter 4: Development Description which sets out the components of each of the connections collectively comprising the KTR Project;
- Chapter 5: Felling, Construction, Operational Maintenance and Decommissioning which provides details of the proposed KTR Project;
- Chapter 6: Planning Policy Context which provides information in relation to nature conservation policy at the national and local level;
- Chapter 8: Forestry;
- Chapter 9: Geology, Hydrology, Hydrogeology, Water Resources, and Peat which includes further information in relation to peat and Groundwater Dependent Terrestrial Ecosystems (GWDTEs); and
- Chapter 11: Ornithology which, in assessing effects on birds, references habitat and species survey results reported in this chapter.

10.4 Appendices include the detailed findings of the desk-based and field studies that have informed this assessment. These comprise:

- Appendix 10.1: Desk Study and Legal Context;
- Appendix 10.2: Phase 1 Habitat and NVC Survey Report;
- Appendix 10.3: Protected Species Survey Report;
- Appendix 10.4: Confidential Badger Survey Report; and
- Appendix 10.5: Fish Survey Report.

Scope of the Assessment

10.5 Potential effects scoped in, and out, in the Scoping Report are detailed in Table 10.1. The Scoping Report was informed by available data, professional judgement of the EcIA Team, experience from other relevant projects, policy, guidance or standards, and feedback received from consultees.

Table 10.1: Initial Effects Scoped in and Scoped Out

Connection	Potential Effects Scoped in to Detailed Assessment	Potential Effects Scoped out of Detailed Assessment
All individual proposed new connections and removal of N and R route, and KTR as a whole[1].	• Direct effects, such as permanent loss and/or damage to terrestrial habitats, including priority habitats, during construction of overhead lines (OHL) and cables. It was proposed that this would include groundwater dependent terrestrial ecosystems (GWDTEs), if found, to be assessed in conjunction with the hydrology assessment. • Indirect effects on statutory and non-statutory sites of nature conservation importance during construction (and decommissioning of N and R routes) and operation. • Habitat fragmentation/isolation as a consequence of linear development during construction and operation. • Direct and indirect temporary loss of/damage to habitats for protected species or those of high conservation value as a result of construction. • Direct and indirect permanent loss of/damage to habitats for protected species or those of high conservation value as a result of operation. • Those species specifically included for survey and assessment include badger, bats, otter, pine marten, red squirrel, and water vole.	• Direct effects on statutory sites of nature conservation importance (on the basis that these have been avoided during routeing). • Direct operational effects on habitats or protected species, as all effects are expected to occur during the construction/decommissioning of the OHL. • Cumulative effects, on the basis that the habitat loss, and associated effects on protected species associated with the KTR Project will be so limited, it is considered highly unlikely that significant effects will occur cumulatively with other developments.

10.6 Following Scoping, extensive ecological survey was undertaken, in parallel with further consultation with relevant consultees, and further design development. Consequently, based on this data the final, refined scope of the EcIA is set out in Table 10.2.

Table 10.2: Final Effects Scoped in and Scoped Out

Connection	Potential Effects Scoped in to Detailed Assessment	Potential Effects Scoped out of Detailed Assessment
All individual proposed connections and removal of N and R route, and KTR Project as a whole.	• Construction effects on designated sites. • Construction effects on habitats of conservation concern[i]. • Construction effects on the following protected species populations: - Pine marten; - Red squirrel; - Badger; - Otter; and - Bats.	• Operational effects on all ecological features. • Construction effects on common and widespread habitats (i.e. only habitats of conservation concern[i] are addressed in this chapter). • Construction effects on Water vole. • Construction effects on Great crested newt. • Construction effects on fish and aquatic invertebrates (see Embedded Mitigation below).

10.7 Where effects on ecological features are scoped out, further information is provided in the relevant Appendices.

10.8 As outlined in Chapter 4, as mitigation for landscape and visual effects, SP Energy Networks (SPEN) are proposing to permanently underground a number of sections of existing 11kV OHL that, in the most part, runs immediately adjacent to the existing R Route (north) or within the footprint of the proposed P-G via K connection. As described in Chapter 5, the process will include the removal of the existing line and the installation of an UGC in a narrow back-filled trench, primarily within the carriageway and verge of the A713. All access to the existing OHL will be temporary, utilising low-pressure vehicles and temporary

[1] The extension to Glenlee substation and associated works is subject to a separate environmental impact assessment.

matting. These works which comprise 'enabling works', will immediately precede construction of the P-G via K connection and are anticipated to commence in spring 2022 and last approximately 8 months.

10.9 The proposed 11kV OHL removal and subsequent undergrounding are scoped out of this assessment as no likely significant effects are predicted on the basis that:

- The footprint of the OHL removal works largely overlap that of the R Route (north) removal and P-G via K connection construction. Consequently, potential effects, such as direct habitat loss and disturbance to protected species, are already captured and assessed in the EcIA presented below.
- The undergrounding works are largely proposed within the A713 carriageway/verge which is of no ecological importance in its own right. Significant effects are not predicted.
- All works associated with this part of the project will be subject to the embedded mitigation described in this chapter and, where appropriate, additional mitigation measures described in the assessment of 'Polquhanity to Glenlee (via Kendoon) Including Removal of N and R (north) Routes'.

Assessment Methodology

Legislation and Guidance

Legislation

10.10 Legislation of relevance to statutorily designated sites, protected habitats and protected species, as detailed in this assessment, includes:

- the Nature Conservation (Habitats, &c.) Regulations 1994 (as amended in Scotland);
- the Wildlife and Countryside Act 1981 (as amended in Scotland);
- the Nature Conservation (Scotland) Act 2004;
- the Protection of Badgers Scotland Act 1992 (as amended in Scotland);
- the Water Environment and Water Services (Scotland) Act 2003 (WEWS); and
- the Water Environment (Controlled Activities) (Scotland) Regulations 2011.

Guidance

10.11 Nature conservation policy or guidance of relevance to locally designated sites and habitats and species of conservation interest, as detailed in this assessment, includes:

- the Scottish Biodiversity List[ii];
- the Dumfries and Galloway Biodiversity Action Plan[iii]; and
- Scottish and Local Planning Policy and Supplementary Guidance, as detailed in Chapter 6.

10.12 Relevant guidance that informs assessment methods adopted in this chapter includes:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal, and Marine. Charted Institute of Ecology and Environmental Management (CIEEM) (2018)[iv];
- Scottish Natural Heritage, Series on Species Advice Notes for Developers[v];
- Land Use Planning System: Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTE). SEPA (2014).

10.13 Further guidance in relation to survey methods and the interpretation of ecological data is referenced in relevant Appendices, where appropriate.

Consultation

10.14 In undertaking the assessment, consideration has been given to relevant scoping responses and other consultation undertaken as detailed in Table 10.3.

Table 10.3: Consultation Responses

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
Scottish Government Energy Consents Unit (ECU) 04/10/2017	Formal Scoping Consultation	Raised that potential effects on all fish of economic and conservation value (throughout the course of the development, including construction and decommissioning stages) should be considered. Highlighted the need to consider the potential cumulative impacts on water quality and fish populations as a result of the proposal and on adjacent developments such as fish farms should be considered. Stated that contact should be made with the Dee Salmon Fishery Board.	Construction will follow pollution prevention requirements as standard (See embedded mitigation section). Standard embedded mitigation approaches will ensure protection of watercourses and are detailed in the assessment. Electro-fishing surveys were undertaken by Galloway Fisheries Trust (see Appendix 10.5). The Galloway Fisheries Trust works closely with the Dee Salmon Fishery Board and has agreed appropriate survey methods with them.
Dumfries and Galloway Council (D&GC) 03/08/2017	Formal Scoping Consultation	Stated that the section on Likely Significant and Non-Significant Effects should make it clear that the assessment of potential effects on habitats and species includes those of local importance as well as those protected/ designated/ classified at national or international level i.e. Local Priority Habitats and Local Priority Species as listed in the Dumfries and Galloway local Biodiversity Action Plan (BAP) (2009).	The Dumfries and Galloway BAP priority habitats accord with the Habitats of Conservation Concern approach adopted in this assessment. There are two exceptions to this: Conifer plantation – the ubiquity of this habitat type within both the Study Area and wider landscape means, in an EIA context, effects are unlikely to be significant. Consequently, potential effects on this habitat have been scoped out of assessment. However, included in the scope of the assessment are the protected species, namely badger, pine marten and red squirrel, which rely on this habitat type. Improved agricultural land – as above, the ubiquity of this habitat type within and beyond the Study Area is such that, within the context of EIA, potential effects are unlikely to be significant.
Marine Scotland 26/05/2017	Formal Scoping Consultation	Noted that the proposed route of the OHL is located within the Water of Ken / River Dee catchment. Advise that all fish of economic and conservation value should be considered throughout the course of the development. Noted that MS's generic scoping guidelines should be consulted in relation to the potential impacts on water quality and fish populations associated with the proposed activities. Stated that the potential cumulative impacts on water quality and fish population as a result of the proposal and adjacent developments (including fish farms) should be considered. Stated that the Dee District Salmon Fishery Board should be consulted.	Electrofishing survey conducted with Galloway Fisheries Trust. All construction will strictly follow pollution prevention requirements as standard. Appendix 5.2 sets out environmental protection measures built into the project (embedded mitigation).
Scottish Natural Heritage (SNH)	Email consultation	Stated that there should be no overlap of red squirrel or pine marten data collection with areas already	Discussion with Forest Enterprise Scotland and Forestry Commission Scotland resulted in agreement to

Consultee and Date	Scoping/Other Consultation	Issue Raised	Response/Action Taken
22/12/2017		surveyed by Forest Enterprise Scotland and Forestry Commission Scotland (now Scottish Forestry).	share data on areas covered by previous surveys to provide a more efficient collection of data. Data shared upon completion of survey work.
Scottish Environmental Protection Agency (SEPA) 25/05/2017	Pre-application consultation	North American Signal Crayfish (NASC): Due to the presence of NASC in the catchment it is essential that strict biosecurity measures are put in place to prevent spread and cross-catchment transfer. Initial mitigation information should be outlined in any planning/EIA submission. Potential effects on GWDTE should be considered.	GWDTE data was collected as part of ecological field studies and was subsequently used to inform an assessment, presented in Chapter 9. Mitigation in relation to biosecurity, as it relates to NASC, is described in this Chapter.

Study Area

10.15 The Study Area adopted in this assessment varies by ecological feature, as defined by best practice. Study Areas are detailed in Table 10.4 and shown in Figure 10.1.

Table 10.4: Study Area Description

Desk-based Studies	
Ecological Feature	Study Area
Statutory Designated Sites	Development footprint, wayleave and 5km buffer of wayleave. Where areas proposed for windthrow management were outside the wayleave, these were also subject to these buffers.
Non-Statutory Designated Sites	Development footprint, wayleave and 5km buffer of wayleave. Where areas proposed for windthrow management were outside the wayleave, these were also subject to these buffers.
Existing Protected Species Data	Development footprint, wayleave, windthrow areas and 2km buffer of wayleave. and 2km buffer of wayleave.
Field Studies	
Habitat and Vegetation Surveys	Development footprint, 80m wayleave, windthrow areas and further 100m buffer[2] (i.e. 180m corridor) for steel lattice tower OHLs. 170m corridor for wood pole OHLs and 100m for existing N and R routes to be decommissioned[3].
GWDTEs	All proposed areas requiring excavation, plus 250m buffer for >1m excavations, or 100m buffer for <1m excavations.
Protected Species (incl. bats)	Development footprint, wayleave, windthrow areas and further buffer, up to 200m from wayleave, as defined by best practice methods.
Fisheries	Representative sampling points within watercourses within and adjacent to development footprint.

10.16 In relation to existing access tracks, the nature of proposed upgrades did not warrant detailed ecological survey. Instead, brief walkover surveys were undertaken to identify any key potential ecological constraints, such as the presence of protected species resting sites.

10.17 Detailed descriptions of the Study Area, as it relates to each ecological feature, are provided in Appendices 10.2–10.5.

Desk Based Research and Data Sources

10.18 Prior to the commencement of field studies, a desk study was undertaken to identify known ecological features within the relevant Study Areas described above. Searches were made for those habitats and species agreed through consultation. The following resources were used, as detailed in Appendix 10.1:

- SNH SiteLink (statutory designated sites);
- Dumfries and Galloway Local Development Plan (Non-statutory designated sites);
- The Ancient Woodland Inventory;
- The Carbon and Peatland Map;
- National Biodiversity Network Atlas Scotland; and
- South West Scotland Environmental Information Centre.

10.19 Where appropriate, other scientific resources were referred to when determining protected species behaviour or population sizes. These resources are referenced in the chapter where appropriate.

10.20 Further information relating to the desk study method is provided in Appendix 10.1.

Field Survey

10.21 A suite of habitat and species surveys were undertaken to inform this EcIA. Field studies comprised:

- Habitat surveys, namely Phase 1 Habitat and National Vegetation Classification (NVC) (to inform GWDTE classification where necessary);
- Protected species surveys, including detailed searches for signs of:
  - Pine marten;
  - Red squirrel;
  - Badger;
  - Otter;
  - Water vole;
  - Bats; and
  - Great crested newt (Habitat Suitability only); and
  - Fish (primarily Atlantic salmon and trout).

10.22 All ecology surveys were undertaken over a two-year period, 2017-2019, in appropriate conditions and, where necessary, appropriate seasons. Detailed accounts of survey rationale and methods are provided in Appendix 10.3 and Confidential Appendix 10.4.

10.23 Although fish surveys were undertaken by Galloway Fisheries Trust in September 2017 (the full report is provided in Appendix 10.5), embedded mitigation in the form of good practice measures (e.g. buffers from riparian corridors) and standard construction phase mitigation techniques (e.g. pollution prevention measures) will avoid/minimise any anticipated significant effects on aquatic receptors, such as salmonids. This approach to aquatic mitigation will also address any biosecurity concerns around aquatic invasive non-native species, such as North American signal crayfish (NASC). As such, these aquatic receptors have been scoped out of further assessment.

Approach to GWDTE

10.24 The term 'Groundwater Dependent Terrestrial Ecosystem' (GWDTE) refers to wetland habitats that rely on groundwater for their function and viability. The concept evolved from the Water Framework Directive, transposed in Scotland through the Water Environment and Water Services Act (2003) (WEWS), and subsequent SEPA guidance[vi].

10.25 The guidance sets out those vegetation communities that at least potentially rely upon groundwater Classification as a GWDTE does not convey any ecological value on a habitat; indeed, many GWDTE habitats are common and widespread across Scotland, for example, rush mire. However, although GWDTE habitats are not necessarily of specific ecological value, the WEWS Act, and consequent guidance, requires GWDTEs to be protected wherever possible.

[2] To allow for Infrastructure Location Allowance (ILA)
[3] The N and R Route Study Areas are smaller as there is no ILA requirement.

10.26 SEPA guidance requires potential effects on GWDTEs to be fully assessed and where necessary, mitigated. It is important to understand this context because to focus the assessment on the ecological value of GWDTEs is to misunderstand their use. The assessment of potential effects should also focus on GWDTEs as a proxy for groundwater movement; i.e. the assessment should focus on the effect of the KTR Project upon the quality and quantity of groundwater supporting the GWDTE. Notwithstanding this, the ecological importance of GWDTEs as habitats in their own right must also be considered. This is addressed in this chapter.

10.27 A detailed assessment of potential effects on GWDTEs, as a proxy for groundwater movement, is provided in Chapter 9.

Determining Ecological Importance, Potential Effects and Effect Significance

10.28 The assessment undertaken in this chapter is based on methods described in 'Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Marine, and Coastal. CIEEM (2018).

10.29 The guidelines recommend that the 'importance' of a given site in relation to each of its ecological features is determined within a defined geographical context. The geographical context as it relates to the KTR Project is described in Table 10.5.

Table 10.5 Ecological Importance Criteria

Ecological Importance	Qualifying Criteria	Relevant Context
International	A Study Area is considered of international ecological importance when it supports: • An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, pSAC, Ramsar site, Biogenetic Reserve) or an area which SNH has determined meets the published selection criteria for such designations, irrespective of whether or not it has yet been notified. • A viable area of a habitat type listed in Annex 1 of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource at an international scale. • >1% of the European resource of an internationally important species, i.e. those listed in Annex 1, 2 or 4 of the Habitats Directive.	Europe
UK / National	A Site is considered of national ecological importance when it supports: • A nationally designated site (SSSI, NNR, Marine Nature Reserve) or a discrete area which SNH has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. • A viable area of a priority habitat referenced in the UK Post-2010 Biodiversity Framework or Scottish Biodiversity List, or smaller areas of such habitat which are essential to maintain the viability of that ecological resource at a national scale. • >1% of the National Resource of a regularly occurring population of a nationally important species, i.e. a priority species listed in the Scottish Biodiversity List and/or Schedules 1, 5 (S9 (1, 4a, 4b)) or 8 of the Wildlife and Countryside Act.	UK/Scotland
Regional	A Study Area is considered of regional ecological importance when it supports: • Non-statutory designated sites that represent a scale, or habitat/species assemblage, of importance across a number of counties within a recognised regional context. Non-designated sites that the designating authority has determined meet the published ecological selection criteria for designation, particularly large or represent habitat or species assemblages of importance at a regional level. • Viable and extensive areas of legally protected habitat/habitat identified in Regional BAP or County BAP, or smaller areas of such habitats that are essential to maintaining the viability of the resource at a regional scale. • Any regularly occurring population of an internationally/nationally important species or a species in a relevant policy which is important for the maintenance of the regional meta-population. • Semi-natural ancient woodland greater than 0.5ha.	South-west Scotland
County	A Study Area is considered of county ecological value when it supports: • County sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, e.g. Local Nature Conservation Sites. • Viable areas of legally protected habitat/habitat identified in Council BAP, or smaller areas of such habitats that are essential to maintaining the viability of the resource at a county scale. • Any regularly occurring population of an internationally/nationally important species or a species in a relevant County BAP which is important for the maintenance of the county meta-population. • Semi-natural ancient woodland greater than 1ha. • Networks of species-rich hedgerows.	Dumfries and Galloway
Local	A Study Area is considered of local ecological value when it supports: • Commonplace and widespread semi-natural habitats, e.g. scrub, poor semi-improved grassland, coniferous plantation woodland, intensive arable farmland, which, despite their ubiquity, contribute to the ecological function of the local area (habitat networks, etc.); • Very small, but viable, populations of internationally/nationally important species or habitats, or a species or habitat in a relevant UK/Council BAP which is important for the maintenance of the local meta-population. • Networks of linear features, including species-poor hedgerows	Study Area plus a 5km radius.
Study Area	A Study Area is considered of Study Area ecological value when it supports: • Habitats of limited ecological value, e.g. amenity grassland, but which contribute to the overall function of the application site's ecological functions. • Very small, but viable, populations of internationally/nationally important species or habitats, or a species or habitat in a relevant UK/Council BAP which is not important for the maintenance of the local meta-population.	Study Area

10.30 Following the assessment of Ecological Importance, potential effects are identified. This process involves the study of each of the proposed new OHLs and existing OHLs to be decommissioned, construction methods and timescales with a view to identifying the pathways by which ecological features may be affected. Design and programme information presented in Chapters 4 and 5 have informed this stage of the assessment. Similarly, in-built embedded mitigation and sensitive design considerations (also known as good practice measures) have been reviewed/outlined. Further information on these measures are provided in later sections of this chapter.

10.31 Potential direct and indirect effects can be grouped into the following broad types:

- Direct habitat loss;
- Severance (disruption of ecological processes through fragmentation, isolation and barriers);
- Mortality (loss of life to faunal species or populations, including designated site qualifying features, through direct contact or following pollution events, etc.);

- Disturbance (disruption to ecological processes through increased human presence, noise, vibration, etc.).

10.32 This chapter is structured such that potential effects associated with each connection i.e. new OHL or existing OHL removal are discussed separately. To avoid unnecessary repetition, as potential effects are consistent across all connections comprising the KTR Project, they are presented in the table below. For ease of reference, the table is set out by ecological feature. Note that GWDTE habitats are considered in relation to their intrinsic habitat value. Potential effects on the functionality of GWDTEs as they relate to groundwater movement is considered in Chapter 9.

10.33 Reference should be made to this table when considering potential effect significance, as presented in later sections of the chapter.

Table 10.6: Potential Effect Identification

Ecological Feature	Development Activity	Potential Effect Pathway	Potential Effect
Designated Sites	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction activity, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Changes in water quality and volume • Changes in hydrological regime of peatland habitats • Pollution event	Direct Habitat Loss Severance Disturbance
Habitats	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Changes in water quality and volume • Change in hydrological regime of peatland habitats • Pollution event	Direct Habitat Loss Severance
Pine marten	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Accidental disturbance from site staff and plant	Direct Habitat Loss Severance Mortality Disturbance
Red squirrel	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Accidental disturbance from site staff and plant	Direct Habitat Loss Severance Mortality Disturbance
Badger	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Accidental disturbance from site staff and plant	Direct Habitat Loss Severance Mortality Disturbance
Otter	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Changes in water quality and volume • Pollution event • Accidental disturbance from site staff and plant	Direct Habitat Loss Severance Mortality Disturbance
Bats	• Vegetation removal (including both wayleave clearfell and additional clearfell in windthrow areas) • Construction of temporary and permanent infrastructure • Construction, including the use of plant, equipment and presence of site staff	• Physical removal of habitat • Accidental disturbance from site staff and plant	Direct Habitat Loss Severance Mortality Disturbance

10.34 In relation to direct habitat loss, the following important design parameters should be acknowledged:

- All new access tracks will be temporary. They will comprise either bog matting, surface stone-made roads or floating roads in areas where peat deposits are present. Consequently, habitat loss will be temporary. Upon completion of works, all new (temporary) access tracks will be removed and the land restored to its original condition.
- Existing access tracks within the forest estate will be upgraded to ensure their suitability for construction activity. This will include widening by 1m on either side of the carriageway.
- While it is acknowledged that access tracks will require passing places and turning bays, the locations of these will not be known until post-consent ground investigation is completed.
- No formal access tracks are anticipated for the removal of existing OHLs along the N or R routes. Direct vehicle access will be taken over existing vegetation. Where sensitive habitat is identified, bog matting or similar will be used. However, it is acknowledged that short sections of track may be required during construction, where weather conditions dictate. Pre-construction surveys will determine any such need.

10.35 In relation to the areas of windthrow clearance, Chapter 3: Approach to the EIA explains that potential effects arising from windthrow felling are considered as 'indirect' (or secondary) effects. Chapter 8 explains that proposed windthrow areas are not within the control of SPEN but that statutory obligations requiring the replanting of these areas by landowners qualify as mitigation.

10.36 In relation to ecological features, the windthrow areas primarily relate to conifer plantation and therefore do not support habitats of conservation concern and are not considered in this respect. The ecological importance of windthrow areas relate to their ability to support terrestrial protected species, namely red squirrel, pine marten and badger. The assessment recognises that, while windthrow felling represents habitat loss in addition to that proposed for wayleaves, it is within a context of extensive wider suitable forestry habitat. The assessment of the significance of effects on red squirrel, pine marten and badger therefore include the loss of windthrow areas (indirect effects) in combination with the loss of the wayleave areas (direct effects). It should be noted that, had these areas not been included, effect significance would be unchanged, in light of the extensive wider resource.

10.37 To determine significance, effects are considered with reference to the following parameters:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Frequency; and
- Reversibility.

10.38 A degree of confidence, based on professional judgement, is used to assess the likelihood of an effect occurring. The following scale is referred to:

- Certain/near-certain: probability estimated at ≥95%;
- Probable: probability estimated at 50 – 90%;
- Unlikely: probability estimated at 5 – 50%; and
- Extremely unlikely: probability estimated at ≤ 5%.

10.39 Based on the combination of these parameters and likelihood, an effect is then considered to be either significant or not. An effect is considered to be significant if it has the potential to affect the integrity of a habitat or the conservation status of a species. Technical definitions of integrity and conservation status follow CIEEM guidelines[iv].

10.40 Within the context of the EcIA method, the significance of a potential effect is considered within the context of the geographically-based ecological importance of the feature. For example, an effect on a habitat of local ecological importance is considered to be significant, or not significant, at a Local level. In some cases, where only a small part of an ecological feature is affected, the potential effect may be significant at a lower geographical level; for example, where only a small part of a habitat of local ecological importance is affected, the effect may only be significant at a Study Area level.

10.41 The EIA process requires that the significance of an effect is described as either 'major, 'moderate', 'minor' or 'negligible/none'. However, best practice guidance in relation to EcIA does not support this approach, due to the complexities of ecological processes.

10.42 To allow the potential effects identified in this EcIA to be considered alongside those addressed in other topic chapters, a 'translation' from EcIA significance to EIA significance has been undertaken, as set out in Table 10.7 below. The translation relates the geographically based significance of ecological effects (identified through the EcIA process) to the standard terminology for significance presented in other chapters (following the EIA process), allowing direct comparison.

10.43 Effects of Major and Moderate significance are considered 'significant' in the context of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended) ('the 2017 EIA Regulations').

Table 10.7 Ecological Effect 'Significance' translation to EIA terminology

EIA Significance Terminology	Corresponding EcIA Effect Significance Terminology
Major	International/European
	UK/National
Moderate	Regional
	County
Minor	Local
	Study Area
Negligible/None	Not Significant

10.44 The significance of effects on habitats of Conservation Concern is partly informed by a calculation of direct habitat loss. In relation to broadleaved woodland, it should be noted that calculations within this Chapter vary from those presented in Chapters 5 and 8 for the following reasons:

- Calculations do not include areas of new broadleaved woodland planted since surveys were undertaken in 2017.
- Calculations are based on broadleaved woodland boundaries identified during Phase 1 Habitat Surveys and exclude other habitat codes, including scattered trees and dense scrub, identified immediately adjacent to, or within, broadleaved woodland features.

Identifying Additional Mitigation and Assessing Residual Significance

10.45 Where potential significant effects are identified, additional mitigation measures are identified to reduce their significance. The standard mitigation hierarchy applies, whereby the following sequential measures are considered:

- Avoidance: the effect is avoided by removing its pathway, e.g. by changing the route of an access track (this approach is normally achieved through embedded mitigation and an iterative design process);
- Mitigation: measures are taken to reduce the significance of the effect, e.g. vegetation clearance around badger setts is undertaken outside the maternity season to avoid disturbance effects; and
- Compensation: where the effect cannot be reduced, alternative action is taken elsewhere within the site boundary, e.g. landscape proposals that act as wildlife bridges for protected species, etc.

10.46 Using the assessment method described above, significant effects are re-assessed on the basis that additional mitigation measures will be applied, and a residual significance identified. An important part of this step is the identification of the likely success, or confidence in, the proposed mitigation measure.

10.47 Specifically, in relation to windthrow areas, the third-party ownership of these lands mean that the implementation of recommendations to reduce effects are not within SPEN's control. However statutory obligations that require the replanting of these areas by landowner qualify as project mitigation. Further information is provided in Chapter 8.

Assessment Limitations

10.48 Ecological surveys are limited by a variety of factors which affect the presence of flora and fauna; for example, climatic variation, season, and species behaviour may mean that evidence of protected species is not always recorded during a survey. This does not mean that a species is absent; hence the surveys also record and assess the ability of habitats to support species. All ecological surveys provide a snapshot of activity and cannot be used for long-term interpretation.

10.49 While every effort has been made to identify evidence of pine marten and red squirrel, the density of the forest estate means both species are likely to have been under-recorded. To counter this, extensive existing data has been provided by Forestry and Land Scotland (previously known as Forestry Enterprise Scotland until 1st April 2019), allowing the assessment to be better informed. All assessments have applied the precautionary principle in relation to these species and their presence has been assumed in suitable, well-connected habitat.

10.50 No bat roost surveys have been undertaken of individual trees to be removed during the construction phase as this would be an unreasonably high level of survey work to carry out given the amount of forestry to be affected. As detailed in the programme in Chapter 5, there is an expectation of a minimum three years between the completion of the ecology field surveys and the commencement of the construction phase. However, static bat detectors were deployed in suitable habitat within the Study Area and these were supplemented by both walked and driven transects. Therefore, an understanding of the bat species and activity levels has been gained for the KTR Project. This is considered sufficient baseline data to inform the EcIA.

10.51 Bat roost surveys will be undertaken prior to the commencement of construction. If bat roosts are identified, the bat roost licensing process will be engaged. This is considered an appropriate response as bat tree roosts can often be transient and open to considerable change due to the effects of weather on suitable features. Mitigation measures address this information gap.

10.52 Within these constraints, it is considered that the baseline data collected has allowed a robust and thorough assessment of potential effects to be undertaken. A further account of constraints is provided in Appendices 10.2-10.5.

Future Baseline in the Absence of the Development

10.53 Ecological features are rarely static in their extent, distribution and condition. Habitats and species populations are dynamic and so the prediction of future baseline is complex.

10.54 However, in the absence of the KTR Project it is likely that the forests that comprise a large proportion of the Study Area would continue to be subject to their existing Forest Management Plans. This would involve extensive felling and re-stocking which, like the KTR Project, have the potential to affect the protected species assemblages discussed in this chapter.

10.55 In relation to lowland agricultural habitats, it is anticipated that agricultural land use will persist, limiting opportunities for habitat enhancement or protected species range expansion.

Implications of Climate Change

10.56 The predicted effects of climate change are also likely to influence the future ecological status of the Study Area. Drawing on The UK Climate Projections (UKCP18), which generally predicts hotter, drier summers and milder, wetter winters, it is likely that ecological features will be subject to:

- An increase in invasive species diversity and range.
- Changes to vegetation assemblages.
- Range contraction/expansion of faunal species.

Infrastructure Location Allowance

10.57 As detailed in Chapter 4, a 50m infrastructure location allowance (ILA) is included as part of the Section 37 applications. Situations in which micrositing could be applied, in relation to ecological constraints, include bat roosts of rare or uncommon species (e.g. Leisler's bats), breeding shelters of protected species (e.g. badger main setts) or where works could cause severe damage to habitats of conservation concern. In many situations, the use of an ILA will be determined after pre-works surveys have been undertaken, so as to be based on the most relevant and up-to-date information. The potential use of the ILA is factored into the EcIA. Subject to the application of mitigation, the use of the ILA will not exacerbate the significance of effects described in this chapter.

Embedded Mitigation

10.58 In determining the potential significant effects of the KTR Project on ecological features, it should be noted that certain good practice measures are part of the mitigation embedded through the KTR Project design process as detailed more fully within Chapter 3 and Chapter 5. The measures are therefore accounted for in the assessment as embedded mitigation and will be implemented to minimise effects of construction on ecology wherever practicable to do so. The specific and general site wide mitigation measures (additional mitigation) to be implemented for each connection are identified within the sections entitled *Proposed Additional Mitigation.*

10.59 Those embedded/good practice measures of relevance to the construction of the KTR project are described in Appendix 5.2: Embedded and Additional Mitigation and Monitoring Measures and include:

- Adherence to Guidelines on Pollution Prevention (GPPs), which will significantly reduce the likelihood and severity of pollution events;
- The application of appropriate buffers around watercourses, which will protect riparian habitat while reducing disturbance and the likelihood of pollution events;
- The application of biosecurity measures to avoid the accidental spread of North American Crayfish;
- The adoption of the Forest Design Concept (FDC, refer to Appendix 5.1) in determining future landscaping of both the wayleave and, where possible, windthrow areas. The Forest Design Concept includes a decision flow chart that allows the development of species-specific restoration/enhancement planting in areas of highest ecological importance. While it will not be possible to vegetate the entire wayleave, for technical reasons, the FDC introduces the concept of a 'wildlife bridge' which will allow the re-connection of severed habitats in key locations, for example where evidence of red squirrel or pine marten has been recorded;
- The development and application of a Construction and Decommissioning Environment Management Plan (CDEMP), which will set out guidance on compliance with nature conservation legislation and policy;
- The use of temporary roads and bog matting where appropriate, particularly peatland habitats; and
- The appointment of an Advisory Environmental Clerk of Works (ECoW) to advise, monitor and report on compliance with relevant legislation, policy and project specific mitigation during construction.

Polquhanity to Glenlee (via Kendoon) Including Removal of N and R (North) Routes

Existing Conditions

Designated Sites

10.60 Figure 10.2. shows the spatial arrangement of designated sites as they relate to the P-G via K connection.

10.61 There are no statutory designated sites within the proposed development footprint, wayleave or wider windthrow areas. The nearest statutory designated sites (<1km) are:

- Cleugh SSSI – c.800m east – designated for its lowland neutral grassland.
- Hannaston Wood SSSI – c.900m west – designated for its lichen assemblages, upland oak woodland and neutral grassland.
- Water of Ken Woods SSSI – c.700m west and c.500m south-east – designated for lichen assemblages and upland oak woodland.

10.62 With the exception of the Water of Ken Woods SSSI, there is no structural or functional connectivity between the P-G via K connection and the statutory designated sites. The Water of Ken Woods SSSI comprises a series of units across a wider area of woodland. While the P-G via K connection does not bisect any of the units, it does pass through woodland that provides connectivity between units.

10.63 Three distinct Ancient Woodland Inventory (AWI) sites are located within the wayleave. These are located immediately north of Kendoon substation, at Knocknalling wood and at Hag Wood. Note that while Hag Wood is recorded on the inventory, the designation relates to its seed bank; the site has been planted over with a commercial conifer plantation and is therefore considered a PAWS site (further detail provided in Chapter 8).

10.64 Further non-statutory designated sites <1km include:

- Polmaddy Local Wildlife Site (LWS) – c.250m west – qualifying features unknown.

10.65 The Polmaddy LWS is upstream of the development footprint but is technically structurally and functionally connected to the P-G via K connection by a tributary of the Water of Ken, which flows through both the LWS and the wayleave.

Habitats

P-G via K

10.66 The P-G via K connection Study Area accounts for 15.81% of all habitats within the KTR Project Study Area. The north of the Study Area primarily comprises operational coniferous forest plantation, dominated by commercial sitka spruce. Most of these areas are operational with some coups recently felled. Open ground in the north of the Study Area is dominated by improved grassland and species-poor marshy grassland.

10.67 The southern part of the Study Area, from Kendoon to Glenlee comprises a mosaic of typical lowland agricultural habitats. Improved grassland, semi-improved neutral grassland and species-poor marshy grassland were identified. Extensive areas of bracken were recorded.

10.68 Deciduous and mixed woodland were rare; however, the Study Area included a small part of the Knocknalling Wood, between Towers 19 and 20. Riparian woodland associated within the Water of Ken was also recorded in this area. All other wooded habitats are associated with watercourses or visual screening provision around substations.

N Route and R Route (North)

10.69 The existing N route runs adjacent to the A713, between Polquhanity and Kendoon. The R (North) route in this area extends from Kendoon substation to Glenlee substation. It runs in parallel to the P-G via K connection for much of its length and, consequently, its habitat composition is broadly similar to that described for the southern section of P-G via K.

10.70 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitats. Table 10.8 provides a brief summary of the habitat composition of the P-G via K Study Area, including N Route and R (North) Route Study Area.

Table 10.8: P-G via K, N Route and R Route Habitats

Phase 1 Habitat Group	Area within Study Area (Ha)	Proportion of Study Area (%)
Grasslands (predominantly agricultural pasture)	122.61	47.92
Woodland and scrub (predominantly commercial forestry plantation)	66.81	26.11
Tall herb and fern (predominantly bracken)	47.71	18.65
Miscellaneous	10.14	3.69
Mire	3.86	1.51
Open water	3.77	1.47
Heathland	0.79	0.31
Rock exposure	0.11	0.04
Swamp, marginal inundation	0.07	0.03
Total	255.87	100

10.71 The majority of habitats within the Study Area were considered to be common and widespread within the lowland agricultural context and are scoped out of this assessment. However, Table 10.9 provides further details of those habitats of conservation concern identified during field surveys. Where necessary, Phase 1 Habitat types are converted to NVC classifications to aid identification of Annex 1 habitats.

Table 10.9: P-G via K, N Route and R Route – Habitats of Conservation Concern

Phase 1 Habitat Type	NVC code where appropriate	Description	Total Habitat Area (ha)
Broadleaved woodland	N/A	Oak, beech and birch dominated woodlands, primarily of riparian nature.	5.36
Mixed woodland	N/A	As above, but with influences of commercial plantation – sitka spruce and Scot's pine identified in the canopy.	1.75
Mire	M20	Present in small, isolated stands. Normally heavily modified by grazing or drying with a subsequent loss of species diversity. *Molinia caerulea* normally dominant with sphagnum rare or absent. Ericoid layers impoverished by grazing.	3.86
Heath	H12	Present in small isolated stands, normally in forestry rides and fire breaks. Species diversity limited and normally in mosaic with acid grasslands, where ericoid cover is diminished by grazing etc.	0.79

Protected Species

10.72 Detailed accounts of protected species evidence identified during surveys are provided in Appendices 10.3 and 10.4 (Confidential). Figures 10.4, and 10.5 show evidence spatially. Summaries are provided below.

Pine Marten and Red Squirrel

10.73 Due to similarities in the habitat requirements for these species, field surveys for pine marten and red squirrel were conducted simultaneously. Surveys identified suitable habitat for both species in the forested areas in the north of the P-G via K Study Area while the desk study recognised the 'hotspot'

nature of the South of Scotland for red squirrels (i.e. the population here is particularly viable, with extensive optimal habitat).

10.74 The presence of red squirrel was confirmed through camera trapping, evidence of feeding remains and the analysis of existing data, provided by Forest Enterprise Scotland, who have been collecting data in the area for many years. Existing data shows extensive evidence of red squirrel both within and adjacent to the Study Areas and it is expected that the Study Area supports dreys. The largely agricultural nature of the N and R Routes meant these Study Areas were less suitable for the species.

10.75 Pine marten was not recorded within the Study Areas of the P-G via K, N or R (North) Routes. There are, however, historic records of pine marten less than 2km from the Study Area. Given the species' large home range and good connectivity between optimal forest coups, it is highly likely the species is present but at a low density (see Figure 10.4).

Badger

10.76 The Study Area of the P-G via K, N and R (North) routes offered wide-ranging suitable habitat for badger, due to the mosaic of forest, woodland and agricultural habitat. Both forest and broadleaved woodland in the Study Areas offered sett excavation habitat, due to the presence of friable and free-draining soils, while the network of improved grasslands offer suitable foraging. The south of the Study Area offered the greatest potential. A main sett was recorded in an arable field, within a cluster of trees, and activity levels were high, despite widespread disturbance from grazing cattle.

10.77 Two further main setts were recorded near Glenlee substation, with several associated secondary setts. Extensive evidence of foraging and commuting was also recorded in Hag Wood (see Appendix 10.4: Confidential Badger Survey Report)

Otter

10.78 The P-G via K, N and R (North) Route Study Areas supported numerous small watercourses of variable depth and flow rate. Small burns and streams discharge into the larger Waters of Deugh and Ken, feeding into the loch systems that run parallel to the Study Areas. The riparian habitats present within the Study Areas provide suitable habitat for otters to shelter, forage and commute; particularly areas of rocky banks, undercut banks and dense bankside scrub (see Figure 10.5).

10.79 Surveys identified that otters were active within the Study Areas, within the areas to the north (around Kendoon) and to the South (around Glenlee). Holts and hovers were recorded more frequently than couches for this connection, suggesting that the Study Areas represented important parts of the resident otter population's territories.

10.80 A holt near Kendoon substation was recorded as having 'High' potential to support breeding otters.

10.81 A number of shelters were identified on the steep north bank of Coom Burn, near Glenlee. A holt has been created in a disused badger sett and is of a suitable size to meet breeding otter requirements.

Bats

10.82 An assessment of habitat suitability for bats identified a large number of broadleaved trees with potential to support roosting bats (see Figure 10.6).

10.83 Two built structures were identified as having Bat Roost Potential (BRP). A ruined stone cottage, to the south of Knocknalling wood, offered 'High' BRP with good foraging opportunities in the adjacent wood and fields. The other building, a part of the Glenlee electrical substation was recorded as having 'Low' BRP.

10.84 Proposed works at Glenlee substation are the subject of a standalone separate EIA associated with the application and the findings of detailed bat surveys are discussed in that report[vii].

10.85 Static bat detectors were deployed at three locations within the Study Area, where bat activity was most likely to be encountered; i.e. on woodland/forest edges. Static detectors recorded activity of four genera of bat; *Pipistrellus*, *Myotis*, *Plecotus*, and *Nyctalus*. One detector did not record any bats. The most common species recorded was soprano pipistrelle. Activity levels were generally low across the Study Area (see Figure 10.7).

Ecological Importance

10.86 Table 10.10 provides an interpretation of the Study Area's Ecological Importance for those habitats and species scoped into the assessment.

Table 10.10: P-G via K, N Route and R (North) Route - Ecological Importance Assessment

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
Designated Sites		Local	The Water of Ken Woods SSSI is an important component of the local provision of broadleaved woodland. While the resource is not of national value, the role the Study Areas play in maintaining connectivity between units conveys importance at local level. AWI sites within the wayleave were generally designated for their seed bank composition, having been planted over with commercial conifer species. However, each site, particularly Knocknalling Wood, plays a role in the maintenance of the local resource.
Habitats	Broadleaved woodland	Study Area	Almost all broadleaved woodland within the Study Areas is riparian and associated with the Water of Ken or its tributaries. The woodland within the Study Areas forms part of the connectivity of these wider features, but the viability of the resource is not contingent upon them.
	Mire and Heath	Study Area	The Study Areas supports very small, isolated and fragmented examples of these habitat types.
Species	Pine marten	Study Area	It is assumed that pine marten is present within the Study Areas, at very low density. The forests within the Study Areas form a very small component of the much larger available resource within adjacent forestry resources where the species is also confirmed as being present. It is also acknowledged that the forests within the Study Area are largely operational and subject to ongoing felling plans.
	Red squirrel	Study Area	While the species is confirmed as present in the Study Area, the forests within the Study Area form a very small component of the much larger available resource within adjacent forestry resources. It is also acknowledged that the forests within the Study Area are largely operational and subject to ongoing felling plans.
	Badger	Study Area	Surveys identified three main setts (and associated secondary setts) within the Study Areas with two of these clearly associated with a distinct and isolated woodland. Field signs were generally restricted to small, but intensively used, areas. The optimality of the available foraging resource suggests small territories are likely maintained.
	Otter	Local	Otter activity was limited within the Study Area; however, the presence of a potential natal holt was recorded adjacent to Kendoon substation. In considering the extensive territories of otters (20 – 30km) it is likely that the Study Area plays an important role in the maintenance of the local population.
	Bats	Study Area	While trees and built structures within the Study Area were considered to offer potential for roosting bats, the relative likely ubiquity of similar features on the surrounding landscape diminishes the overall importance of the Study Area. Activity surveys identified a standard species assemblage in relatively low numbers.

Identification of Potential Effects

10.87 Potential effects associated with the construction of the KTR Project have been identified through consideration of information provided in Chapters 4 and 5, standard guidance and guidelines and the professional judgment of the assessment team. Table 10.6, presented in the Assessment Methodology section, relates ecological features to potential effects, effect pathways and development activities.

10.88 In addition to the construction activities, including access tracks, directly associated with the construction of the P-G via K connection, the following additional infrastructure is considered in this assessment:

- Barlae Hill Quarry (Q1)
- Two construction compounds, one at Polquhanity (CC1) and one at Carsfad (CC2)

10.89 This assessment also considers the effects of the removal of both the N and R (North) route which, due to their overlapping Study Areas, are considered together with P-G via K. The assessment recognises that there is no habitat loss associated with the route removal projects. It is assumed that potential effects associated with the construction of P-G via K have the potential to be more significant than removal unless specifically stated otherwise in the assessment text.

Assessment of Potential Effects

10.90 In this section, drawing on Table 10.6, an assessment is made of the significance of potential effects on ecological features during construction and route removal, in the absence of mitigation. Assessments are undertaken on the assumption that the embedded mitigation comprising good practice measures, as detailed in Appendix 5.1 will be successfully applied. Unless highlighted as otherwise, all potential effects are considered to be negative.

Statutory Designated Sites

10.91 The Study Areas do not support any statutory designated sites, however the structural and functional connectivity of the Water of Ken Woods SSSI partly relies on existing woodland and forest features within the Study Area. Potential effects on statutory designated sites, therefore, have been identified as severance, as a consequence of wayleave felling of both broadleaved woodland and coniferous forest at the Coom Burn, immediately north of the Glenlee substation and, further north, at Hag Wood.

10.92 Three AWI sites are partly located within the wayleave of the P-G via K connection. One site supports commercial conifer plantation while two support semi-natural broadleaved woodland. Potential effects on non-statutory designated are therefore considered to be direct habitat loss and severance.

10.93 In considering the above, the significance of potential effects on designated sites is detailed in Table 10.11.

Table 10.11: P-G via K, N Route and R (North) Route - Assessment of Potential Effect Significance – Designated sites

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Approximately 50% of the remaining Hag wood will be lost (note that 50% of the total feature was previously felled to accommodate the wayleave of the existing R Route). At Kendoon and Knocknalling the proportion will be less than 5% of the designated area.	In relation to the Water of Ken Woods SSSI, approximately 50% of Hag wood, a coniferous plantation, will be lost while a further small and narrow stretch of broadleaved woodland on the banks of the Coom Burn will be felled. In relation to the AWI features, in addition to the loss at Hag wood, less than 5% of the Kendoon and knocknalling features will be lost.
Magnitude	At Hag wood, which is overplanted with commercial plantation (and therefore constitutes a PAWS site), felling will create an opportunity for regeneration from the seed bank within the wayleave. An opportunity to achieve a similar result exists in the wider windthrow area however this it outwith the SPEN's control. In windthrow areas there is a presumption of replanting. At Kendoon and Knocknalling, a very small proportion of woodland will be lost. This is unlikely to have an effect on the viability of the resource.	The broadleaved woodland features form a part of a wider network of broadleaved, mixed and coniferous woodland features that connect the Water of Ken Woods SSSI. The loss of these features will result in gaps in the network, reducing the overall connectivity of SSSI units, particularly for faunal species. It is noted, however, that watercourses will continue to persist, with associated bankside vegetation, offering significant continued resource for aquatic dispersal. In relation to the AWI features, severance at Hag wood is unlikely to affect the feature's function due to current planting. At Knocknalling loss will occur on the edge of the feature, which is unlikely to affect wider connectivity. At Kendoon, the adjacent watercourse is likely to continue playing an important role in connectivity.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Reversible (SSSI connectivity)/Irreversible (AWI features)
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Significant for SSSI connectivity (Study Area)
Translation (2017 EIA Regulations)	None/Not Significant	Minor

Habitats of Conservation Concern

10.94 The Study Areas supported only small areas of habitat of conservation concern, limited to broadleaved woodland and very small areas of mire and heath. Potential effects on these habitats have been identified as direct habitat loss and severance arising from the P-G via K connection. There are no predicted effects arising from works associated with N and R (North) Route removals.

10.95 Direct habitat loss would be the result of woodland felling to maintain wayleaves and the necessary, however all other habitat loss would be temporary, due to the temporary nature of construction accesses.

10.96 Table 10.12 below provides detail of habitat loss.

Table 10.12: P-G via K, N Route and R (North) Route - Habitat Loss Calculations

NVC Plant Community/Phase 1 Habitat Code		Area		Relative Area to be Lost (%)
Code	Vegetation Type	Absolute (ha)	Loss (ha)	
N/A	Broadleaved woodland	5.36	0.86	16
N/A	Mixed woodland	1.75	0.02	1.14
M20	Mire	3.86	0.06	1.55
H12	Heath	0.79	0.17	21.52
Totals		11.76	1.11	9.44

10.97 In considering the above, the significance of potential effects on habitats of conservation concern is detailed in Table 10.13.

Table 10.13: P-G via K, N Route and R (North) Route - Assessment of Potential Effect Significance – Habitats

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Permanent loss of habitat of conservation concern is limited to broadleaved woodland within the Study Area. All broadleaved woodland within the 80m wayleave will be removed.	Permanent loss of habitat of conservation concern is limited to broadleaved woodland within the Study Area. All broadleaved woodland within the 80m wayleave will be removed.
Magnitude	The permanent loss of woodland within the Study Areas is largely limited to riparian habitat at Dundeugh and along the Water of Ken, and at Knocknalling. Further felling of roadside trees will be required to facilitate the undergrounding of the existing 11kV OHL. Felling in these areas is unlikely to result in the total loss of functionality as the	At two locations, riparian woodland, running perpendicular to the OHL, will be lost to the wayleave. A maintained gap of 80m will exist within these features, however it is recognised that the watercourses will support structural and functional connectivity.

Parameter	Potential Effect	
	watercourses themselves will offer continuity.	
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain
Significance (EcIA)	Significant (Study Area)	Significant (Study Area)
Translation (2017 EIA Regulations)	Minor	Minor

Pine marten

10.98 Potential effects on pine marten have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat), including through windthrow areas; severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.99 No direct evidence of pine marten was recorded within the Study Area, however the presence of historic records within 2km and the prevalence of suitable forest habitat, particularly within the north of the Study Area, suggests the species is likely to be present, albeit in low densities. Felling operations associated with the preparation of the wayleave and the windthrow area north of Dundeugh account for the greatest risk to the species.

10.100 In considering the above, the significance of potential effects on pine marten is detailed in Table 10.14. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.14: P-G via K, N Route and R (North) Route - Assessment of Potential Effects – Pine marten

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Loss limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Limited to a relatively small area (8ha) of Study Area forest resource	Limited to a relatively small area (8ha) of Study Area forest resource	Limited to a relatively small area (8ha) of Study Area forest resource
Magnitude	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Given the likely low density of the population present within the Study Area, the effect has the potential to have longer term detrimental consequences for the future viability of the population within the Study Area	Given the likely low density of the population, the magnitude is likely to be limited
Duration	Permanent	Permanent	11 months of felling	11 months of felling
Frequency	Perpetual	Perpetual	Potentially repeatedly during 11 months of felling	Potentially repeatedly during 11 months of felling
Reversibility	Functionally irreversible	Functionally irreversible	May be irreversible at Study Area population level, given the low density of species presence	Reversible
Likelihood	Certain	Certain	Unlikely	Unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Translation (EIA Regs)	None/Not significant	None/Not significant	Minor	None/Not significant

Red squirrel

10.101 Potential effects on red squirrel have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.102 Evidence of red squirrel activity was recorded during surveys. The suitable forest habitats in the north of the P-G via K Study Area is likely to support viable population of the species.

10.103 In considering the above, the significance of potential effects on red squirrel is detailed in Table 15. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.15: P-G via K, N Route and R (North) Route - Assessment of Potential Effects – Red squirrel

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.	Limited to a relatively small area (8ha) of Study Area forest resource. Species population likely to remain viable.
Magnitude	Limited to a relatively small area (8ha) of Study Area forest resource	Limited to a relatively small area (8ha) of Study Area forest resource	On the basis of the small area (8ha) of available resource to be removed, magnitude is likely to be limited	On the basis of the small area (8ha) of available resource to be removed, magnitude is likely to be limited
Duration	Permanent	Permanent	11 months of felling	11 months of felling
Frequency	Perpetual	Perpetual	Potentially repeatedly during 11 months of felling	Potentially repeatedly during 11 months of felling
Reversibility	Functionally irreversible	Functionally irreversible	Reversible at population level due to breeding rate	Reversible
Likelihood	Certain	Certain	Unlikely	Extremely unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Translation (EIA Regs)	None/Not significant	None/Not significant	Minor	None/Not significant

Badger

10.104 Potential effects on badger have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.105 Badger activity was recorded at a number of locations across the Study Area and two main setts were identified. Of these, the main sett at 'Location 2'[viii] is likely to be most affected. In this area, the clearance of woodland to accommodate construction and maintenance (i.e. both wayleave and windthrow area) will see the potential destruction of the main sett, along with foraging habitat associated with the

territory. As a much more generalist species, badger is less reliant on forested habitat than other species considered in this assessment.

10.106 In considering the above, the significance of potential effects on badger is detailed in Table 10.16. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.16: P-G via K, N Route and R (North) Route - Assessment of Potential Effects – Badger

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	The Study Area forms a small part of a much larger resource of suitable foraging habitat, while clearfelled areas will potentially create new habitat opportunities.	Limited to a relatively small area (8ha) of Study Area forest resource. Wider construction activity in other parts of the Study Area, such as temporary access infrastructure, is unlikely to cause severance for this species.	Likely to be experienced where works directly conflict with setts. This is likely to be limited to 'Location 2'.	Likely to be experienced where works directly conflict with setts. This is likely to be limited to 'Location 2'.
Magnitude	Based on the ubiquity of suitable habitat, magnitude is likely to be limited to those clans directly affected by the works. However the 'Location 2' clans are likely to be affected by vegetation clearance.	Limited to a relatively small area (8ha) of Study Area forest resource during felling activities. Once complete, the species is unlikely to experience severance.	As 'location 2' includes a main sett, the effect is likely to be experienced by that entire clan.	As 'location 2' includes a main sett, the effect is likely to be experienced by that entire clan.
Duration	Permanent	Permanent	Permanent	Limited to the construction period
Frequency	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly during vegetation clearance and construction	Potentially repeatedly during vegetation clearance and construction
Reversibility	Irreversible in relation to the 'location 2' clans	Reversible	Irreversible (at the population level for 'location 2' clans)	Reversible
Likelihood	Certain	Unlikely	Certain	Certain
Significance (EcIA)	Significant (Study Area) – **'location 2'** clans only	Not significant	Significant (Study Area) – **'location 2'** clans only	Significant (Study Area) – **'location 2'** clans only
Translation (EIA Regs)	Minor	None / Not significant	Minor	Minor

Otter

10.107 Potential effects on otter have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of riparian vegetation removal and pollution; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.108 Much of the Study Area offered suitable habitat for otter however activity was broadly limited to areas around Kendoon and Glenlee. Two potential natal holts were identified, suggesting at least two territories are present within the Study Area. It should be recognised that as part of the design process, efforts have been made to avoid construction activity within 10m of watercourses. This approach means that otter, which is largely restricted to within a few metres of watercourses, is less likely to experience direct negative effects during construction, although temporary access infrastructure may still have effects. A greater threat to otter is mortality through a pollution event.

10.109 In considering the above, the significance of potential effects on otter is detailed in Table 10.17. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.17: P-G via K, N Route and R (North) Route - Assessment of Potential Effects – Otter

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to small temporary crossings over small watercourses.	Limited to small temporary crossings over small watercourses.	Due to the crepuscular nature of otters, direct mortality arising from vehicle collision is unlikely. However, mortality may occur through pollution events. Given the extensive network of proposed access infrastructure across the Study, the potential extent is large.	Limited to small temporary crossings over small watercourses.
Magnitude	Limited to non-core foraging and commuting habitat for resident otter populations.	Limited to non-core foraging and commuting habitat for resident otter populations.	Pollution events vary in scale, with effects experienced in the immediately area only, through to catchment-wide repercussions.	Limited to non-core foraging and commuting habitat for resident otter populations.
Duration	Limited to construction period only	Limited to construction period only	Duration depends on severity of pollution events	Limited to construction period only
Frequency	One off during construction	One off during construction	Potentially repeatedly during construction	Potentially repeatedly during construction
Reversibility	Reversible	Reversible	Potentially irreversible	Reversible
Likelihood	Unlikely	Unlikely	Extremely unlikely on the basis of the embedded mitigation measures commitment to CDEMP and GPPs.	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None / Not significant	None / Not significant	None / Not significant	None / Not significant

Bats

10.110 Potential effects on bats have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.111 The Study Area supported a large number of trees, and two buildings, with BRP, ranging from low to high potential. Bat activity surveys across the Study Area suggest a fairly typical assemblage of bats, dominated by soprano pipistrelle. All species identified are capable of roosting in tree cavities and are closely associated with the foraging potential offered by the Study Area.

10.112 In considering the above, the significance of potential effects on bats is detailed in Table 10.18. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Value for these species.

Table 10.18: P-G via K, N Route and R (North) Route - Assessment of Potential Effect Significance – Bats

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	In relation to roosting potential, suitable roosting features are present throughout the Study Area.	Limited to forested areas in the north of the Study Area only. By removing forest, and creating new wayleaves, the potential exists to create a more varied habitat structure, with greater foraging potential for bat	Mortality could occur through the loss of roosts. Potential roost features are present throughout the Study Area.	Disturbance would be achieved through felling and construction adjacent to roosts. Potential roost features are present throughout the Study Area.
Magnitude	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Potential to create new foraging opportunities at the Study Area level.	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Roosts across the Study Area could be affected, consequently affecting breeding success at the Study Area level.
Duration	Permanent	Permanent	Permanent	During vegetation clearance and construction period only
Frequency	One off during vegetation clearance	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly
Reversibility	Irreversible	Reversible	Likely reversible at the population level of the species identified	Reversible at the population level
Likelihood	Likely	Near certain	Likely	Probable
Significance (EcIA)	Significant (Study Area)	Significant (Study Area) (Positive)	Significant (Study Area)	Significant (Study Area)
Translation (EIA Regs)	Minor	Minor (Positive)	Minor	Minor

Proposed Mitigation

10.113 Those embedded/good practice measures which are part of the mitigation embedded through the KTR Project design are addressed above (in the embedded mitigation section) and not repeated again here. Additional mitigation measures in the form of both specific and general site wide mitigation are set out for potential negative significant (EcIA) effects in Table 10.19. Specific mitigation is designed to reduce the significance of effects, while general site-wide mitigation provides a mechanism for measures that will support compliance with wildlife legislation, irrespective of the significance of effects.

10.114 Mitigation measures set out in the table below represent a combination of standard, well-rehearsed and successfully-implemented techniques and measures specifically designed for the KTR project. It is extremely likely that these mitigation measures will be successful.

Table 10.19: P-G via K, N Route and R (North) Route - Proposed Mitigation

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
Designated Sites	Severance	• Vegetation removal will be limited to trees. Shrub and field layers will be retained.	• Preparation of Species Protection Plans for felling and construction phases, as part of the project's wider CDEMP. The Species Protection Plans will set out measures to protect all species covered by legislation in the UK.
Habitats	Direct Habitat Loss	• Application of the FDC in identifying areas in the wayleave where replanting can achieve biodiverse mixed scrub/woodland through the re-planting of connecting wildlife bridges (see Appendix 5.1).	
	Severance	• Application of the FDC in identifying areas in the wayleave where replanting can achieve biodiverse mixed scrub/woodland	• Presence of an ECoW during all operations to provide ongoing support and monitoring. The ECoW role will be developed in accordance with current good practice guidelines[ix].
Pine Marten and Red Squirrel	Mortality	• Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Species licensing route where surveys suggest presence of resting sites. • Sensitive timing of felling works to avoid breeding season (March – July). • Replacement habitat in form of pine marten den boxes (and ongoing maintenance). Total number to be determined by pre-construction surveys. • Toolbox talks for all site contractors.	
Badger	Direct Habitat Loss Mortality Disturbance	• Retention of shrub and field layer structure within 'location 2' where possible. • Pre-construction surveys, no more than 6 months prior to felling, to identify changes in baseline (part of ECoW role). • Species licensing route (and full sett closure ahead of works). This approach may require the construction of new setts. • Sensitive timing of works to avoid breeding season (November – June). • Toolbox talks for all site contractors. • Adoption of FDC principles in 'location 2' through future discussion with landowner (see Appendix 5.1).	
Bats	Direct Habitat Loss Mortality Disturbance	• Retention of trees with BRP where possible. • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline. Surveys may include climb-and-inspect approach or activity surveys of individual trees (part of ECoW role). • Sensitive timing of felling works to avoid breeding season (April – September). • Installation (and ongoing maintenance) of bat roosting boxes. Total number to be determined by detailed pre-construction surveys. • Toolbox talk for all site contractors.	

Potential Enhancement

10.115 Following the removal of vegetation within the windthrow areas, through the application of the FDC, the forestry will be replanted and /or vegetation restored in these areas (see Appendix 5.1). This may comprise like-for-like restoration, the default position, or the introduction of more species-rich, ecologically valuable broadleaved woodland or wildlife bridges at specific locations, following engagement with landowners. These measures would be particularly valuable, in relation to badgers, at 'Location 2' and in relation to pine marten and red squirrel at the large area of windthrow clearance north of Dundeugh.

Residual Construction Effects

10.116 Based on the successful implementation of the additional mitigation, no significant residual effects are predicted, in either EcIA or EIA terminology.

Monitoring

10.117 Monitoring will include pre-construction surveys. These will form part of the ECoW role, which should be appointed and developed at an early stage and in consultation with relevant stakeholders. Additionally, the ECoW will be responsible for ongoing monitoring during construction, to support and report on compliance with mitigation measures and legislative compliance.

Summary of Effects

10.118 Within the context of the 2017 EIA Regulations, no pre-mitigation significant effects (i.e. Moderate or Major) are predicted.

Carsfad to Kendoon

Existing Conditions

Designated Sites

10.119 Figure 10.2 shows the spatial arrangement of designated sites as they relate to the C-K connection.

10.120 There are no statutory designated sites within the proposed development footprint, or wayleave. The nearest statutory designated sites (<1km) are:

- Cleugh SSSI – c.600m east – designated for its lowland neutral grassland.

10.121 There is no structural or functional connection between the designation and the C-K connection, thus statutory designated sites are not discussed further in this assessment.

10.122 One AWI site is located within the wayleave, which is located north of Kendoon substation. The AWI here comprises semi-nature broadleaved woodland as part of a wider riparian woodland corridor.

Habitats

10.123 The proposed C-K wood pole connection is located parallel to a short section of the P-G via K connection, largely within the footprint of the existing R (north) route (proposed for removal). Consequently, the Study Areas for C-K and P-G via K overlap.

10.124 C-K connection accounts for 3.04% of all habitats within the KTR Study Area. The area is primarily within agricultural land, with around two thirds of the Study Area composed of agricultural grassland and tall herb and fern, the latter being predominantly continuous bracken.

10.125 The A713 is a dominant feature in the Study Area of this connection and runs almost entirely along its length. Continuous bracken dominates the area east of the road and semi-improved grasslands to the west.

10.126 The habitats in the north and south of the Study Area, surrounding the two substations, Kendoon and Carsfad, are broadleaved woodland areas with a number of buildings and miscellaneous habitats.

10.127 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitats. Table 10.20 provides a brief summary of the habitat composition of the Study Area.

Table 10.20: C-K Habitats

Phase 1 Habitat Group	Area within Study Area (Ha)	Proportion of Study Area (%)
Grassland (Predominantly agricultural pasture)	16.50	33.54
Tall herb and fern (Predominantly bracken)	16.99	34.53
Woodland and scrub	8.74	17.76
Miscellaneous	5.67	11.53
Open water	1.23	2.50
Swamp, marginal inundation	0.05	0.10
Rock exposure	0.02	0.04
Total	49.2	100

10.128 The majority of the habitats within the Study Area were considered to be common and widespread within the lowland agricultural context and are scoped out of this assessment. However, Table 10.21 provides further details of those habitats of conservation concern identified during field surveys. Where necessary, Phase 1 Habitat types are converted to NVC classifications to aid identification of Annex 1 habitats.

Table 10.21: C-K – Habitats of Conservation Concern

Phase 1 Habitat Type	NVC code where appropriate	Description	Total Habitat Area (ha)
Broadleaved woodland	N/A	Oak, beech and birch dominated woodlands, primarily of riparian nature.	1.22
Mixed woodland	N/A	As above, but with influences of commercial plantation – sitka spruce and Scot's pine identified in the canopy.	0.73

Protected Species

10.129 Detailed accounts of protected species evidence identified during surveys are provided in Appendices 10.3 and 10.4 (Confidential). Figures 10.4, and 10.5 show evidence spatially. Summaries are provided below.

Pine Marten and Red Squirrel

10.130 Due to similarities in the habitat requirements for these species, field surveys for pine marten and red squirrel were conducted simultaneously. Surveys identified suitable habitat for both species in the forested areas in the north of the Study Area, around Kendoon substation, while the desk study recognised the 'hotspot' nature of the South of Scotland for red squirrels.

10.131 The presence of red squirrel was confirmed through camera trapping, evidence of feeding remains and the analysis of existing data, provided by Forest Enterprise Scotland, who have been collecting data in the area for many years. Existing data shows evidence of red squirrel both within and adjacent to the Study Areas and it is expected that the Study Area supports dreys. The remaining areas of this connection were not suitable for the species due to lack of tree cover.

10.132 Pine marten was not recorded within the Study Area. There are, however, historic records of pine marten less than 2km from the Study Area. Given the species' large home range and good connectivity between optimal forest coups, it is highly likely the species is present but at a low density.

Badger

10.133 The northern parts of the Study Area offered suitable habitat for badger. Habitats in the south were less suitable for the species due to a lack of suitable cover vegetation for sheltering. No evidence of badger was recorded and consequently this species is not further considered in this assessment.

Otter

10.134 The Study Area has numerous small watercourses of variable depth and flow rate. Small burns and streams discharge into the larger Waters of Deugh and Ken, feeding into the loch systems that run parallel to the Study Area. The riparian habitats present within the Study Area provide suitable habitat for otters to shelter, forage and commute. In particular areas of riparian woodland and scrub were identified as optimal.

10.135 Surveys identified that otters were active in the Study Area, with almost all activity recorded on the Water of Deugh where a holt with 'High' potential for breeding and two further resting sites were identified adjacent to Kendoon substation (see Figure 10.5).

Bats

10.136 An assessment of habitat suitability for bats identified a number of broadleaved trees with potential to support roosting bats, particular to the north of Carsfad substation (see Figure 10.6).

10.137 A static bat detector was placed in an area of woodland edge habitat near a watercourse and other linear features, at a nearby location on the P-G via K connection. The detector recorded four genera of bats in the area: *Pipistrellus, Myotis, Plecotus,* and *Nyctalus,* in low numbers. The most common species recorded was soprano pipistrelle (see Figure 10.7).

Ecological Importance

10.138 Table 10.22 provides an interpretation of the Study Area's Ecological Importance for those habitats and species scoped into the assessment.

Table 10.22: Ecological Importance Assessment

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
Non-statutory Designated Sites		Study Area	A small part of an AWI feature, part of a riparian woodland, was recorded at Kendoon. The area of AWI within the Study Area was a very small proportion of the designated feature.
Habitats	Broadleaved and Mixed woodland	Study Area	Almost all broadleaved and mixed woodland within the Study Area is riparian and/or located in close proximity to the Carsfad or Kendoon substations where it acts as a visual screen. While woodland within the Study Area is structurally and functionally connected to larger woodland structures, it forms a very small part of the resource.
Species	Pine marten	Study Area	No evidence of the species was identified during surveys. Suitable habitat was largely limited to a very small area of forested habitat adjacent to Kendoon substation.
	Red squirrel	Study Area	While the species is confirmed as present in the Study Area, the forest within the Study Area forms a very small component of the much larger available resource within adjacent forestry resources.
	Otter	Local	Otter activity was limited within the Study Area, however the presence of a potential natal holt was recorded adjacent to Kendoon substation. In considering the extensive territories of otters (20 – 30km) it is likely that the Study Area plays an important role in the maintenance of the local population.
	Bats	Study Area	While trees within the Study Area were considered to offer potential for roosting bats, the relative likely ubiquity of similar features on the surrounding landscape diminishes the overall importance of the Study Area. Activity surveys identified a standard species assemblage in relatively low numbers.

Identification of Potential Effects

10.139 Potential effects associated with the construction of the KTR Project have been identified through consideration of information provided in Chapters 4 and 5, standard guidance and guidelines and the professional judgment of the assessment team. Table 10.6, presented in the Assessment Methodology section, relates ecological features to potential effects, effect pathways and development activities.

Assessment of Potential Effects

10.140 In this section, drawing on Table 10.6, an assessment is made of the significance of potential effects on ecological features during construction, in the absence of mitigation. Unless highlighted as otherwise, all potential effects are considered to be negative.

Designated Sites

10.141 A small part of an AWI feature was located within the wayleave of the C-K connection. The feature, a riparian woodland, supports semi-natural broadleaved riparian woodland associated with the Water of Ken. Potential effects on non-statutory designated are therefore considered to be direct habitat loss and severance.

10.142 In considering the above, the significance of potential effects on designated sites is detailed in Table 10.23.

Table 10.23: C-K - Assessment of Potential Effect Significance – Designated sites

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Less than 5% AWI feature will be lost	Less than 5% of The AWI feature will be lost
Magnitude	A very small proportion of woodland will be lost. This is unlikely to have an effect on the viability of the resource.	Severance of the AWI feature will disrupt the linear riparian woodland. However, the width of loss is limited to 80m, and it is acknowledged that retention of shrub and ground layers, along with the continuity of the adjacent watercourse will support continued connectivity.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Not significant
Conversion (2017 EIA Regulations)	Not significant	Not significant

Habitats of Conservation Concern

10.143 This connection supported only small areas of habitat of conservation concern, limited to broadleaved woodland adjacent to the Kendoon and Carsfad substations. Potential effects on these habitats have been identified as direct habitat loss and severance. Direct habitat loss would be the result of woodland felling within wayleaves, however all other habitat loss would be temporary, due to the temporary nature of construction accesses.

10.144 The table below provides detail of habitat loss.

Table 10.24: C-K - Habitat Loss Calculations

NVC Plant Community/Phase 1 Habitat Code		Area		Relative Area to be Lost (%)
Code	Vegetation Type	Absolute (ha)	Loss (ha)	
N/A	Broadleaved woodland	1.22	0.01	0.82
Totals		1.22	0.01	0.82

10.145 In considering the above, the significance of potential effects on habitats of conservation concern is detailed in Table 10.25.

Table 10.25: C-K - Assessment of Potential Effect Significance – Habitats

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Permanent loss of habitat of conservation concern is limited to broadleaved woodland adjacent to the Carsfad and Kendoon substations.	Severance of habitat of conservation concern is limited to broadleaved woodland adjacent to the Carsfad and Kendoon substations.
Magnitude	The permanent loss of woodland within the Study Area is largely limited to small areas of woodland within a much larger context of similar resource. Felling in these areas is unlikely to result in the loss of viability or functionality.	While wayleaves will result in the physical severance of broadleaved woodland at Carsfad and Kendoon substation, a significant proportion of resource will be retained, meaning that viability and functionality is likely to be maintained.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain

Parameter	Potential Effect	
Significance (EcIA)	Not Significant	Not Significant
Translation (EIA Regs)	None/Not Significant	None/Not Significant

Pine marten

10.146 Potential effects on pine marten have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.147 No direct evidence of pine marten was recorded within the Study Area, and suitable habitat is limited to the edge of plantation forest at Dundeugh Castle. However, the presence of historic records within 2km and the prevalence of suitable woodland habitat, particularly within the north of the Study Area, suggests the species is likely to be present, albeit in low densities. Felling operations associated with the wayleave account for the greatest risk to the species.

10.148 In considering the above, the significance of potential effects on pine marten is detailed in Table 10.26. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.26: C-K - Assessment of Potential Effects – Pine marten

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource
Magnitude	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Given the likely low density of the population present within the Study Area, the effect has the potential to have consequences for the viability of the population within the Study Area	Given the likely low density of the population, the magnitude is likely to be limited
Duration	Permanent	Permanent	Three months of felling	Three months of felling
Frequency	Perpetual	Perpetual	Potentially repeatedly during three months of felling	Potentially repeatedly during three months of felling
Reversibility	Functionally irreversible	Functionally irreversible	May be irreversible at population level, given the low density of species presence	Reversible
Likelihood	Certain	Certain	Unlikely	Unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Translation (EIA Regs)	None/Not Significant	None/Not Significant	Minor	None/Not Significant

Red squirrel

10.149 Potential effects on red squirrel have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.150 Red squirrel evidence was identified during surveys and it is likely that much of the woodland within, and forest adjacent to, the Study Area supports the species.

10.151 In considering the above, the significance of potential effects on red squirrel is detailed in Table 10.27. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.27: Assessment of Potential Effects – Red squirrel

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource
Magnitude	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	Limited to a relatively small area (0.01ha) of Study Area broadleaved woodland resource	On the basis of the small area (0.01ha) of available Study Area resource to be removed, magnitude is likely to be limited	On the basis of the small area (0.01ha) of Study Area resource to be removed, magnitude is likely to be limited
Duration	Permanent	Permanent	Three months of felling	Three months of felling
Frequency	Perpetual	Perpetual	Potentially repeatedly during three months of felling	Potentially repeatedly during three months of felling
Reversibility	Functionally irreversible	Functionally irreversible	Reversible at population level	Reversible
Likelihood	Certain	Certain	Unlikely	Extremely unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Translation (EIA Regs)	None/Not Significant	None/Not Significant	Minor	None/Not Significant

Otter

10.152 Potential effects on otter have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.153 Much of the Study Area offered suitable habitat for otter however activity was broadly limited to areas around Kendoon. One potential natal holt was identified, suggesting at least one territory is maintained within the Study Area. Although the species was well-recorded, it should be recognised that as part of the design process, efforts have been made to avoid construction activity within 10m of watercourses. This approach means that otter, which is largely restricted to within a few metres of watercourses, is less likely to experience direct negative effects during construction, although temporary access infrastructure may still have effects. A greater threat to otter is mortality through pollution events.

10.154 In considering the above, the significance of potential effects on otter is detailed in Table 10.28. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.28: C-K - Assessment of Potential Effects – Otter

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to small temporary crossings over small watercourses.	Limited to small temporary crossings over small watercourses.	Due to the crepuscular nature of otters, direct mortality arising from vehicle collision is unlikely. However, mortality may occur	Limited to installation works associated with woodpole R002R which sites immediately opposite resting sites on the banks of the

Parameter	Potential Effect			
			through pollution events. Given the extensive network of proposed access infrastructure across the Study, the potential extent is large.	Water of Deugh, at Kendoon substation
Magnitude	Limited to non-core foraging and commuting habitat for resident otter populations.	Limited to non-core foraging and commuting habitat for resident otter populations.	Pollution events vary in scale, with effects experienced in the immediately area only, through to catchment-wide repercussions.	Potential disturbance to natal holt, which could have a wider effect on rearing success if holt in use.
Duration	Limited to construction period only	Limited to construction period only	Duration depends on severity of pollution events	Limited to duration of works at woodpole R002R, but potential longer term effect on resident population if rearing of young fails.
Frequency	One off during construction	One off during construction	Potentially repeatedly during construction	One off during construction
Reversibility	Reversible	Reversible	Potentially irreversible	Reversible
Likelihood	Unlikely	Unlikely	Extremely unlikely on the basis of commitment to CDEMP and GPPs.	Extremely unlikely on the basis of distance, existing vegetation screening and limited duration of installation required for a woodpole.
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None/Not Significant	None/Not Significant	None/Not Significant	None/Not Significant

Bats

10.155 Potential effects on bats have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.156 The Study Area supported a number of trees with BRP, ranging from low to high potential. Bat activity surveys across the Study Area suggest a typical assemblage of bats, dominated by soprano pipistrelle. All species identified are capable of roosting in tree cavities and are closely associated with the foraging potential offered by the Study Area.

10.157 In considering the above, the significance of potential effects on bats is detailed in Table 10.29. Significance is assessed within the context of the Site's Site Ecological Value for these species.

Table 10.29: C-K - Assessment of Potential Effect Significance – Bats

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	In relation to roosting potential, suitable roosting features are present throughout the Study Area	Habitats within this Study Area are generally very open, therefore the extent of severance effects would be limited to small areas of woodland removed to facilitate wayleave at Kendoon substation.	Mortality could occur through the loss of roosts. Potential roost features are present throughout the Study Area	Disturbance would be achieved through felling and construction adjacent to roosts. Potential roost features are present throughout the Study Area
Magnitude	Potential to lose a number of roosts simultaneously may affect the conservation status of bat species at the Study Area level	On the basis that only small areas of woodland will be removed, and that the Water of Ken remains as a valuable navigation resource, the magnitude of the effect is very limited	Potential to lose a number of roosts simultaneously may affect the conservation status of bat species at the Study Area level	Roosts across the Study Area could be affected, consequently affecting breeding success at the Study Area level
Duration	Permanent	Permanent	Permanent	During vegetation clearance and construction period only
Frequency	One off during vegetation clearance	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly
Reversibility	Irreversible	Reversible	Likely reversible at the population level of the species identified	Reversible at the population level
Likelihood	Likely	Near certain	Likely	Probable
Significance (EcIA)	Significant (Study Area)	Not significant	Significant (Study Area)	Significant (Study Area)
Translation (EIA Regs)	Minor	None/Not Significant	Minor	Minor

Proposed Mitigation

10.158 The embedded/good practice measures which are part of the mitigation embedded through the KTR Project design are addressed above (in the embedded mitigation measures section) and not repeated again here. Additional mitigation measures in the form of both specific and general site wide mitigation are set out for potential negative significant (EcIA) effects in Table 10.30. Specific mitigation is designed to reduce the significance of effects, while general site-wide mitigation provides a mechanism for measures that will support compliance with wildlife legislation, irrespective of the significance of effects.

10.159 Mitigation measures set out in the table below represent a combination of standard, well-rehearsed and successfully implemented techniques and measures specifically designed for the KTR project. It is extremely likely that these mitigation measures will be successful.

Table 10.30: Proposed Mitigation

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
Pine Marten and Red Squirrel	Mortality	• Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Species licensing route where surveys suggest presence of resting sites. • Sensitive timing of felling works to avoid breeding season (March – July). • Replacement habitat in form of pine marten den boxes (and ongoing maintenance). Total number to be determined by pre-construction surveys. • Toolbox talks for all site contractors.	• Preparation of Species Protection Plans for felling and construction phases, as part of the project's wider CEMP. The Species Protection Plans should set out measures to protect all species covered by legislation in the UK. • Presence of an ECoW during all operations to provide ongoing support and monitoring. The ECoW role should be developed in accordance with current good practice guidelines[ix].
Bats	Direct Habitat Loss Mortality Disturbance	• Retention of trees with BRP where possible. • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline. Surveys may include climb-and-inspect approach or activity surveys of individual trees	

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
		(part of ECoW role). • Sensitive timing of felling works to avoid breeding season (April – September). • Installation (and ongoing maintenance) of bat roosting boxes. Total number to be determined by detailed pre-construction surveys. • Toolbox talk for all site contractors.	

Residual Construction Effects

10.160 Based on the successful implementation of the additional mitigation, no significant residual effects are predicted, in either EcIA or EIA terminology.

Monitoring

10.161 Monitoring will include pre-construction surveys. These will form part of the ECoW role, which will be appointed and developed at an early stage and in consultation with relevant stakeholders. Additionally, the ECoW will be responsible for ongoing monitoring during construction, to support and report on compliance with mitigation measures and legislative compliance.

Summary of Effects

10.162 Within the context of the 2017 EIA Regulations, no pre-mitigation significant effects (i.e. Moderate or Major) are predicted.

Earlstoun to Glenlee

Existing Conditions

Designated Sites

10.163 There are no statutory designated sites within the proposed development footprint, wayleave or wider windthrow areas. The nearest designated sites (<1km) are:

- Hannaston Wood SSSI – c.900 m west – designated for its lichen assemblages, upland oak woodland and neutral grassland.
- Water of Ken Woods SSSI – c.700 m west and 400m south-east – designated for lichen assemblages and upland oak woodland.

10.164 There is no structural or functional connectivity between the E-G connection and Hannaston Wood SSSI. The Water of Ken SSSI comprises series of units across a wider area of woodland. While the E-G connection does not bisect any of the units, it does pass through woodland that provides connectivity between units.

10.165 One AWI site is located within the wayleave, which is located at Hag Wood. The AWI here comprises plantation forestry over, presumably, ancient woodland soils (a PAWS site). Figure 10.2 shows the spatial arrangement of designated sites as they relate to the E-G connection.

Habitats

Habitats

10.166 Habitats within the E-G wood pole connection and short section of underground cable Study Area account for 2.40% of the total KTR Study Area. The habitats comprise of a mosaic of agricultural grasslands, tall herb and fern, dominated by bracken, and smaller areas of semi-natural woodlands and scrub. Much of the E-G connection is improved grassland.

10.167 In the south of the Study Area is Hag wood, a conifer plantation on an ancient woodland site (PAWS). A substantial area of an invasive non-native species, Rhododendron, was recorded within Hag wood.

10.168 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitats. Table 10.31 provides a brief summary of the habitat composition of the Study Area.

Table 10.31: E-G Habitats

Phase 1 Habitat Group	Area within Study Area (Ha)	Proportion of Study Area (%)
Grasslands (largely agricultural pasture)	25.09	64.60
Woodland and scrub (largely associated with Black Bank Wood)	6.52	16.80
Miscellaneous	3.45	8.88
Tall herb and fern	2.46	6.33
Open water	1.32	3.39
Total	38.84	100%

10.169 The majority of the habitats within the Study Area were considered to be common and widespread within the lowland agricultural context and are scoped out of this assessment. However, Table 10.32 provides further details of those habitats of conservation concern identified during field surveys. Where necessary, Phase 1 Habitat types are converted to NVC classifications to aid identification of Annex 1 habitats.

Table 10.32: E-G – Habitats of Conservation Concern

Phase 1 Habitat Type	NVC code where appropriate	Description	Total Habitat Area (ha)
Broadleaved woodland	N/A	Oak, beech and ash dominated woodlands, primarily acting as screens around Earlstoun and Glenlee substation.	1.60
Mixed woodland	N/A	A small are of mixed woodland, comprising oak, beech, ash, sitka and Scot's pine at Craiggubble Wood	0.82

Protected Species

10.170 Detailed accounts of protected species evidence identified during surveys are provided in Appendices 10.3 and 10.4 (Confidential). Figures 10.4, and 10.5 show evidence spatially. Summaries are provided below.

Pine Marten and Red Squirrel

10.171 Due to the similarities of habitat requirements for these species, field surveys for pine marten and red squirrel were conducted simultaneously. Surveys identified little suitable habitat for either species within this Study Area. Areas of dense woodland cover around Hag Wood offer potential to support red squirrel and pine marten, however no field signs were recorded, and this wood is poorly connected to other more suitable habitats (See Figure 10.4).

10.172 No field signs of either species were recorded within the Study Area of this connection. The species are not further considered in this assessment.

Badger

10.173 The Study Area offered wide-ranging suitable habitat for badger, due to the mosaic of forest, woodland and agricultural habitat. Both forest and broadleaved woodland in the Study Area offered sett excavation habitat, due to the presence of friable and free-draining soils, while the network of grasslands offered suitable foraging. The south of the Study Area offered the greatest potential. A main sett was recorded in an arable field, within a cluster of trees, and activity levels were high, despite widespread disturbance from grazing cattle.

10.174 Two further main setts were recorded near Glenlee substation, along with several further secondary setts. Extensive evidence of foraging and commuting was also recorded in Hag Wood (see Appendix 10.4: Confidential Badger Survey Report).

Otter

10.175 The Study Area supported many small watercourses of variable depth and flow rate. Small burns and streams are present across the Study Area and culminate into the larger Water of Ken which runs parallel.

10.176 The riparian habitats present within the Study Area provide suitable habitat for otters to shelter, forage and commute; particularly areas of rocky banks, undercut banks and dense bankside scrub.

10.177 Surveys identified that otters were active within the Study Area, particularly within the areas to the south of the connection, at Glenlee. Holts and hovers were recorded more frequently than couches for this connection.

10.178 A number of shelters were identified on the steep north bank of Garrioch/Coom Burn, near Glenlee. The holt here has been a former badger sett and is therefore of suitable size to meet breeding otter requirements. Further field signs were noted further east of this site (see Figure 10.5).

Bats

10.179 An assessment of habitat suitability for bats identified a number of broadleaved trees throughout the Study Area with potential to support roosting bats (See Figure 10.6).

10.180 A static bat detector was placed in an area of woodland edge habitat near a watercourse and other linear features. The detector recorded four genera of bats in the area: *Pipistrellus, Myotis, Plecotus,* and *Nyctalus*. The most common species recorded was soprano pipistrelle. Activity levels were generally low (see Figure 10.7).

Ecological Importance

10.181 Table 10.33 provides an interpretation of the Study Area's Ecological Importance for those habitats and species scoped into the assessment.

Table 10.33: E-G - Ecological Importance

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
Designated Sites		Local	AWI site, Hag Wood, has value at the local level for its ancient woodland seed bank.
Habitats	Broadleaved woodland	Study Area	The primary woodland resource within the Study Area is Black Bank Wood. As a PAWS site, the value of the Wood is discussed above, in 'designated sites'.
Protected Species	Badger	Study Area	two main setts were identified in 'Location 2[viii]' and so the Study Area is considered to be a key part of the resident clans' territories.
	Otter	Local	The potential presence of a natal holt suggests that the Study Area supports a key part of the resident otter population's territory. On the basis that territories are generally very large, often several kilometres, the Study Area is likely to be of importance to the Local otter population.
	Bats	Study Area	Potential roosting habitat was identified; however the Study Area supports a small proportion of a much larger available roosting resource in surrounding woodland and settlements.

Identification of Potential Effects

10.182 Potential effects associated with the construction of the KTR Project have been identified through consideration of information provided in Chapters 4 and 5, standard guidance and guidelines and the professional judgment of the assessment team. Table 10.6, presented in the Assessment Methodology section, relates ecological features to potential effects, effect pathways and development activities.

Assessment of Potential Effects

10.183 In this section, drawing on Table 10.6, an assessment is made of the significance of potential effects on ecological features during construction, in the absence of mitigation. Unless highlighted as otherwise, all potential effects are considered to be negative.

Designated Sites

10.184 The Study Area does not support any statutory designated sites, however the structural and functional connectivity of the Water of Ken Woods SSSI partly relies on existing woodland and forest features within the Study Area. Potential effects on statutory designated sites, therefore, have been identified as severance, as a consequence of wayleave felling of both broadleaved woodland and coniferous forest at the Coom Burn, immediately north of the Glenlee substation and, further north, at Hag Wood.

10.185 Hag Wood is also an AWI site. It comprises mature commercial conifer plantation over, presumably, ancient woodland soils and associated seed bank and is considered a PAWS site.

10.186 In considering the above, the significance of potential effects on designated sites is detailed in Table 10.34.

Table 10.34: E-G- Assessment of Potential Effect Significance – Designated sites

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Approximately 50% of Hag Wood will be lost.	In relation to the Water of Ken Woods SSSI connectivity, approximately 50% of Hag Wood will be lost while a further small and narrow stretch of broadleaved woodland on the banks of the Coom Burn will be felled.
Magnitude	At Black Bank Wood the vegetation comprises recently planted broad-leaved species over felled forestry plantation. The woodland structure is limited, with no shrub or field layer identified.	The broadleaved woodland features form a part of a wider network of broadleaved, mixed and coniferous woodland features that connect the Water of Ken Woods SSSI. The loss of these features will result in gaps in the network, reducing the overall connectivity of SSSI units, particularly for faunal species. It is noted, however, that watercourses will continue to persist, with associated bankside vegetation, offering significant continued resource for aquatic dispersal. In relation to the AWI features, severance at Hag Wood is unlikely to affect the feature's function due to current planting.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Reversible (SSSI connectivity)/Irreversible (AWI features)
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Significant for SSSI connectivity (Study Area)
Translation (2017 EIA Regulations)	None/Not significant	Minor

Habitats of Conservation Concern

10.187 This connection supported only small areas of habitat of conservation concern, limited to broadleaved woodland adjacent to Earlston and Glenlee substations. Potential effects on these habitats have been identified as direct habitat loss and severance. Direct habitat loss would be the result of woodland felling within wayleaves.

10.188 The table below provides detail of habitat loss.

Table 10.35: E-G - Habitat Loss Calculations

NVC Plant Community/Phase 1 Habitat Code		Area		Relative Area to be Lost (%)
Code	Vegetation Type	Absolute (ha)	Loss (ha)	
N/A	Broadleaved woodland	1.60	0.40	25
N/A	Mixed woodland	0.82	0.29	35.37
Totals		2.42	0.69	28.5

10.189 In considering the above, the significance of potential effects on habitats of conservation concern is detailed in Table 10.36.

Table 10.36: E-G - Assessment of Potential Effect Significance – Habitats

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Permanent loss of habitat of conservation concern is limited to broadleaved woodland adjacent to the Earlston and Glenlee substations.	Severance of habitat of conservation concern is limited to broadleaved woodland adjacent to the Earlston and Glenlee substations.

Parameter	Potential Effect	
	While Table 10.35 suggests a high proportionate loss of mixed woodland, this is a function of the Study Area. Craigubble wood is a larger feature than the Study Area recognises and, in actuality, only a small proportion of the western edge will be removed.	
Magnitude	The permanent loss of woodland within the Study Area is largely limited to small areas of woodland within a much larger context of similar resource. Felling in these areas is unlikely to result in the loss of viability or functionality.	While wayleaves will result in the physical severance of broadleaved woodland at Earlston and Glenlee substations, a significant proportion of resource will be retained, meaning that viability and functionality is likely to be maintained.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain
Significance (EcIA)	Not Significant	Not Significant
Translation (EIA Regs)	None/Not Significant	Not Significant

Badger

10.190 Potential effects on badger have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.191 Badger activity extended to two main setts (and extensive activity) at 'Location 2'. In this area, the clearance of woodland within both the wayleave and the windthrow area will see the potential destruction of the main setts.

10.192 In considering the above, the significance of potential effects on badger is detailed in Table 10.37. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.37: E-G - Assessment of Potential Effects – Badger

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	The Study Area forms a small part of a much larger resource of suitable foraging habitat, while clearfelled areas will potentially create new habitat opportunities.	Limited to a relatively small area of wider forest resource to be removed for the wayleave. Wider construction activity in other parts of the Study Area, such as temporary access infrastructure, is unlikely to cause severance for this species.	Likely to be experienced where works directly conflict with setts. This is likely to be limited to 'Location 2'.	Likely to be experienced where works directly conflict with setts. This is likely to be limited to 'Location 2'.
Magnitude	Based on the ubiquity of suitable habitat, magnitude is likely to be limited to those clans directly affected by the works. However the 'Location 2' clans are likely to be very affected by vegetation clearance.	Limited to a relatively small area of wider forest resource during felling activities. Once complete, the species is unlikely to experience severance.	As 'Location 2' supports two main setts, the effect is likely to be experienced by both clans.	As 'Location 2' supports two main setts, the effect is likely to be experienced by both clans.
Duration	Permanent	Permanent	Permanent	Limited to the construction period
Frequency	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly during vegetation clearance and construction	Potentially repeatedly during vegetation clearance and construction
Reversibility	Irreversible in relation to the clans at 'Location 2'	Reversible	Irreversible	Reversible
Likelihood	Certain	Unlikely	Certain	Certain
Significance (EcIA)	Significant (Study Area) – **'Location 2'** Clans only	Not significant	Significant (Study Area) – **'Location 2'** Clans only	Significant (Study Area) – **'Location 2'** Clans only
Translation (EIA Regs)	Minor	None/Not significant	Minor	Minor

Otter

10.193 Potential effects on otter have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.194 Much of the Study Area offered suitable habitat for otter however activity was broadly limited to an area around Glenlee. A potential natal holt was identified, suggesting at least one territory is present within the Study Area. Although the species was well-recorded, it should be recognised that as part of the design process, efforts have been made to avoid construction activity within 10m of watercourses. This approach means that otter, which is largely restricted to within a few metres of watercourses, is less likely to experience direct negative effects during construction, although temporary access infrastructure may still have effects. A greater threat to otter is mortality through pollution events.

10.195 In considering the above, the significance of potential effects on otter is detailed in Table 10.38. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.38: E-G - Assessment of Potential Effects – Otter

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to small temporary crossings over small watercourses.	Limited to small temporary crossings over small watercourses.	Due to the crepuscular nature of otters, direct mortality arising from vehicle collision is unlikely. However, mortality may occur through pollution events. Given the extensive network of proposed access infrastructure across the Study, the potential extent is large.	Limited to small temporary crossings over small watercourses.
Magnitude	Limited to non-core foraging and commuting habitat for resident otter populations.	Limited to non-core foraging and commuting habitat for resident otter populations.	Pollution events vary in scale, with effects experienced in the immediately area only, through to catchment wide repercussions.	Limited to non-core foraging and commuting habitat for resident otter populations.
Duration	Limited to construction period only	Limited to construction period only	Duration depends on severity of pollution events	Limited to construction period only

Parameter	Potential Effect			
Frequency	One off during construction	One off during construction	Potentially repeatedly during construction	Potentially repeatedly during construction
Reversibility	Reversible	Reversible	Potentially irreversible	Reversible
Likelihood	Unlikely	Unlikely	Extremely unlikely on the basis of commitment to CDEMP and GPPs.	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None / Not significant	None / Not significant	None / Not significant	None / Not significant

Bats

10.196 Potential effects on bats have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.197 The Study Area supported a larger number of trees with BRP, ranging from low to high potential. Bat activity surveys across the Study Area suggest a fairly typical assemblage of bats, dominated by soprano pipistrelle. All species identified are capable of roosting in tree cavities and are closely associated with the foraging potential offered by the Study Area.

10.198 In considering the above, the significance of potential effects on bats is detailed in Table 10.39. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for these species.

Table 10.39: E-G - Assessment of Potential Effect Significance – Bats

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	In relation to roosting potential, suitable roosting features are present throughout the Study Area.	Limited to wooded areas at Earlston substation. By removing forest, and creating new wayleaves, the potential exists to create a more varied habitat structure, with greater foraging potential for bat.	Mortality could occur through the loss of roosts. Potential roost features are present throughout the Study Area.	Disturbance would be achieved through felling and construction adjacent to roosts. Potential roost features are present throughout the Study Area.
Magnitude	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Potential to create new foraging opportunities at the Study Area level.	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Roosts across the Study Area could be affected, consequently affecting breeding success at the Study Area level.
Duration	Permanent	Permanent	Permanent	During vegetation clearance and construction period only
Frequency	One off during vegetation clearance	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly
Reversibility	Irreversible	Reversible	Likely reversible at the population level of the species identified	Reversible at the population level
Likelihood	Likely	Near certain	Likely	Probable
Significance (EcIA)	Significant (Study Area)	Significant (Study Area) (Positive)	Significant (Study Area)	Significant (Study Area)
Translation (EIA Regs)	Minor	Minor (Positive)	Minor	Minor

Proposed Mitigation

10.199 The embedded/good practice measures which are part of the mitigation embedded through the KTR Project design are addressed above (see embedded mitigation section) and not repeated again here. Additional mitigation measures in the form of both specific and general site wide mitigation are set out for potential negative significant (EcIA) effects in Table 10.40. Specific additional mitigation is designed to reduce the significance of effects, while general site-wide mitigation provides a mechanism for measures that will support compliance with wildlife legislation, irrespective of the significance of effects.

10.200 Mitigation measures set out in the table below represent a combination of standard, well-rehearsed and successfully implemented techniques and measures specifically designed for the KTR project. It is extremely likely that these mitigation measures will be successful.

Table 10.40: E-G - Proposed Mitigation

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
Designated Sites	Severance	• Vegetation removal will be limited to trees. Shrub and field layers will be retained.	• Preparation of Species Protection Plans for felling and construction phases, as part of the project's wider CDEMP. The Species Protection Plans will set out measures to protect all species covered by legislation in the UK. • Presence of an ECoW during all operations to provide ongoing support and monitoring. The ECoW role will be developed in accordance with current good practice guidelines[ix].
Badger	Direct Habitat Loss Mortality Disturbance	• Retention of shrub layer and field layer vegetation in 'Location 2' where possible. • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Species licensing route (and full sett closure ahead of works). This approach may require the construction of new setts. • Sensitive timing of works to avoid breeding season (November – June). • Toolbox talks for all site contractors.	
Bats	Direct Habitat Loss Mortality Disturbance	• Retention of trees with BRP where possible. • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline. Surveys may include climb-and-inspect approach or activity surveys of individual trees (part of ECoW role). • Sensitive timing of felling works to avoid breeding season (April – September). • Installation (and ongoing maintenance) of bat roosting	

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
		boxes. Total number to be determined by detailed pre-construction surveys. • Toolbox talk for all site contractors.	

Residual Construction Effects

10.201 Based on the successful implementation of the additional mitigation, no significant residual effects are predicted, in either EcIA or EIA terminology.

Monitoring

10.202 Monitoring will include pre-construction surveys. These will form part of the ECoW role, which will be appointed and developed at an early stage and in consultation with relevant stakeholders. Additionally, the ECoW will be responsible for ongoing monitoring during construction, to support and report on compliance with mitigation measures and legislative compliance.

Summary of Effects

10.203 Within the context of the 2017 EIA Regulations, no pre-mitigation significant effects (i.e. Moderate or Major) are predicted.

BG Route Deviation

Existing Conditions

Designated Sites

10.204 Figure 10.2 shows the spatial arrangement of designated sites as they relate to the BG Deviation.

10.205 There are no statutory designated or non-statutory designated sites within the proposed development footprint or wayleave. The nearest designated sites (<1km) are:

- Water of Ken Woods SSSI – c.700 m north west and 400m south-east – designated for lichen assemblages and upland oak woodland.

10.206 There is no structural or functional connectivity between the SSSI and the BG Deviation.

10.207 One AWI site is located within the wayleave, which is located at Black Bank Wood. At the time of survey, the AWI comprised apparently recently planted broadleaved woodland and its eastern edge sits within the wayleave. Black Bank Wood already accommodates the existing B-G route.

Habitats

10.208 BG Deviation Study Area accounts for the smallest area of land mass and habitat across the KTR Study Area; 1.63%. Woodland and scrub vegetation accounts for nearly 40% of the total habitat in this connection. The land running to the north, north-west is dominated by bracken and semi improved grasslands. The gentle slope of the ground sees water culminating downslope and the habitat becomes increasingly more marshy to the south of the connection.

10.209 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitats. Table 10.41 provides a brief summary of the habitat composition of the Study Area.

Table 10.41: BG Deviation Habitats

Phase 1 Habitat Group	Area within Study Area (Ha)	Proportion of Study Area (%)
Woodland and scrub	10.01	37.83
Grassland	9.42	35.60
Tall herb and fern	6.64	25.10
Miscellaneous	0.32	1.21
Rock exposure	0.07	0.26
Total	26.46	100

10.210 The majority of the habitats within the Study Area were considered to be common and widespread within the lowland agricultural context and are scoped out of this assessment. However, Table 10.42 provides further details of those habitats of conservation concern identified during field surveys. Where necessary, Phase 1 Habitat types are converted to NVC classifications to aid identification of Annex 1 habitats.

Table 10.42: BG Deviation – Habitats of Conservation Concern

Phase 1 Habitat Type	NVC code where appropriate	Description	Total Habitat Area (ha)
Broadleaved woodland	N/A	Largely limited to Black Bank Wood. The Species mix is typical of contemporary woodland schemes; oak, ash, hazel, beech etc.	5.21

Protected Species

10.211 Detailed accounts of protected species evidence identified during surveys are provided in Appendices 10.3 and 10.4 (Confidential). Figures 10.4, and 10.5 show evidence spatially. Summaries are provided below.

Pine Marten, Red Squirrel, Badger

10.212 Despite suitable habitat being available for these species within the Study Area, no evidence was identified along this short deviation. The species are not further considered in the assessment.

Otter

10.213 Suitable habitat for otter was limited to the Craigshinnie Burn, a tributary of the Water of Ken, which lies in the south-east of the Study Area (see Figure 10.5). The north bank of the burn is densely vegetated with broadleaved woodland offers opportunities for shelter and foraging.

10.214 Evidence of otter was limited to spraint, which was recorded at five locations along the burn. Spraint ranged in age from fresh to old, suggesting that the watercourse is regularly used by the species.

Bats

10.215 With the exception of the area where tower R-BG-102 is located, the connection has negligible potential to support roosting bats. There are a number of trees suitable to support roosting bats around Glenlee substation. Two buildings, at the substation, were recorded as having potential to support roosting bats. Bat surveys were undertaken to inform a separate EIA for proposed works at the Glenlee substation and these are reported elsewhere[vii].

10.216 Generally, the route is not well connected to suitable roosting, foraging or navigating habitat. However, it is likely that bats are using the tree line which follows Craigshinnie burn (south-east of the connection) and connects to a larger block of plantation forest.

Ecological Importance

10.217 Table 10.43 provides an interpretation of the Study Area's Ecological Importance for those habitats and species scoped into the assessment.

Table 10.43: BG Deviation - Ecological Importance Assessment

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
Designated Sites		Study Area	A small part of the eastern edge of the Black Bank Wood AWI feature sits within the wayleave. This small part of the feature does not contribute significantly to the function or viability of the woodland.
Habitats	Broadleaved woodland	Study Area	The Study Area includes a small proportion of the Black Bank Wood which, itself, is a functional unit of a much larger broad/mixed woodland resource to the north east. While the proportion of the woodland within the Study Area forms a bridge between the woodland resource to the north and east and further woodland to the east, it is recognised that the resource is already partially fragmented by the existing BG route.
Species	Bats	Study Area	Both bat roost potential and foraging opportunities are limited within the Study Area.

Identification of Potential Effects

10.218 Potential effects associated with the construction of the BG Deviation have been identified through consideration of information provided in Chapters 4 and 5, standard guidance and guidelines and the professional judgment of the assessment team. Table 10.6, presented in the Assessment Methodology section, relates ecological features to potential effects, effect pathways and development activities.

Assessment of Potential Effects

10.219 In this section, drawing on Table 10.6, an assessment is made of the significance of potential effects on ecological features during construction, in the absence of mitigation. Unless highlighted as otherwise, all potential effects are considered to be negative.

Designated Sites

10.220 A small part of an AWI feature was located within the wayleave of BD deviation. The feature is a large, semi-natural broadleaved woodland and its eastern edge sits within the wayleave of the deviation. Potential effects on non-statutory designated are therefore considered to be direct habitat loss and severance.

10.221 In considering the above, the significance of potential effects on designated sites is detailed in Table 10.44.

Table 10.44: BG Deviation - Assessment of Potential Effect Significance – Designated sites

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Less than 5% of Black Bank Wood will be lost.	Less than 5% of Black Bank Wood wood will be lost.
Magnitude	The area proposed for felling sits on the eastern edge of the feature. Its loss will not affect the structural or functional viability of Black Bank Wood.	The area proposed for felling sits on the eastern edge of the feature. Its loss will not affect the structural or functional viability of Black Bank Wood.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Not significant
Translation (2017 EIA Regulations)	None/Not significant	None/Not significant

Habitats of Conservation Concern

10.222 This connection supports only small areas of habitat of conservation concern, limited to broadleaved woodland. Potential effects on these habitats have been identified as direct habitat loss and severance. However, severance of the feature is best considered in the context of designated sites; refer to Table 10.44. Direct habitat loss would be the result of woodland felling for the wayleave.

10.223 Table 10.45 below provides detail of habitat loss.

Table 10.45: BG Deviation - Habitat Loss Calculations

NVC Plant Community/Phase 1 Habitat Code		Area		Relative Area to be Lost (%)
Code	Vegetation Type	Absolute (ha)	Loss (ha)	
N/A	Broadleaved woodland	5.21	2.12	40.70
Totals		5.21	2.12	40.70

10.224 In considering the above, the significance of potential effects on habitats of conservation concern is detailed in Table 10.46.

Table 10.46: BG Deviation - Assessment of Potential Effect Significance – Habitats

Parameter	Potential Effect
	Direct Habitat Loss
Extent	Permanent loss of habitat of conservation concern is limited to a single area of broadleaved woodland, extending to 2.1ha
Magnitude	The permanent loss of woodland within the Study Area is limited to a small, relatively isolated broadleaved woodland which, until recently, appears to have been surrounded by commercial forestry (recently felled). The woodland has been fragmented over time, owing to existing electricity connections (existing BG route) and is not currently functionally connected to the much wider woodland resource in the St John's Town of Dalry area.
Duration	Permanent
Frequency	Perpetual
Reversibility	Irreversible
Likelihood	Certain
Significance (EcIA)	Not Significant
Translation (EIA Regs)	None/Not Significant

Otter

10.225 Potential effects on otter have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.226 The Craigshinnie Burn in the south-east of the Study Area offered suitable habitat for otter and regular sprainting was identified here. However, no evidence of resting sites was recorded. Although the species was well-recorded, it should be recognised that as part of the design process, efforts have been made to avoid construction activity within 10m of watercourses. This approach means that otter, which is largely restricted to within a few metres of watercourses, is less likely to experience direct negative effects during construction, although temporary access infrastructure may still have effects. A greater threat to otter is mortality through pollution events.

10.227 In considering the above, the significance of potential effects on otter is detailed in Table 10.47. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.47: BG Deviation - Assessment of Potential Effects – Otter

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to small temporary crossings over small watercourses.	Limited to small temporary crossings over small watercourses.	Due to the crepuscular nature of otters, direct mortality arising from vehicle collision is unlikely. However, mortality may occur through pollution events. Given the extensive network of proposed access infrastructure across the Study, the potential extent is large.	Limited to small temporary crossings over small watercourses.
Magnitude	Limited to non-core foraging and commuting habitat for resident otter populations.	Limited to non-core foraging and commuting habitat for resident otter populations.	Pollution events vary in scale, with effects experienced in the immediately area only, through to catchment wide repercussions.	Limited to non-core foraging and commuting habitat for resident otter populations.
Duration	Limited to construction period only	Limited to construction period only	Duration depends on severity of pollution events	Limited to construction period only
Frequency	One off during construction	One off during construction	Potentially repeatedly during construction	Potentially repeatedly during construction
Reversibility	Reversible	Reversible	Potentially irreversible	Reversible

Parameter	Potential Effect			
Likelihood	Unlikely	Unlikely	Extremely unlikely on the basis of commitment to CDEMP and GPPs.	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None / Not significant	None / Not significant	None / Not significant	None / Not significant

Bats

10.228 Potential effects on bats have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.229 In considering the above, the significance of potential effects on bats is detailed in Table 10.48. Significance is assessed within the context of the Study Area's 'Study Area' importance for these species.

Table 10.48: BG Deviation - Assessment of Potential Effect Significance – Bats

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	In relation to roosting potential, suitable roosting is limited to the area immediately surrounding Glenlee substation.	The habitat is already very open. Severance would be limited to the very small area of woodland to be lost to the wayleave.	Mortality could occur through the loss of roosts. Potential roost features are present in only a small part of the Study Area.	Disturbance would be achieved through felling and construction adjacent to roosts. Potential roost features are present in only a small part of the Study Area.
Magnitude	Potential to lose a small number of roosts. Given the general sub-optimality of surrounding habitat, this is unlikely to affect the conservation status of bat species at the Study Area level.	Likely limited to a small number of commuting bats.	Potential to lose a small number of roosts. Given the general sub-optimality of surrounding habitat, this is unlikely to affect the conservation status of bat species at the Study Area level.	Potential to lose a small number of roosts. Given the general sub-optimality of surrounding habitat, this is unlikely to affect the conservation status of bat species at the Study Area level.
Duration	Permanent	Permanent	Permanent	During vegetation clearance and construction period only
Frequency	One off during vegetation clearance	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly
Reversibility	Irreversible	Irreversible	Likely reversible at the population level of the species identified	Reversible at the population level
Likelihood	Probable	Probable	Likely	Probable
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None / Not significant	None / Not significant	None / Not significant	None / Not significant

Proposed Additional Mitigation

10.230 There are no predicted significant effects for the BG Deviation. Consequently, no additional mitigation measures are proposed. However, consistent with SPEN's duty under schedule 9 of the Electricity Act 1989 to do what can reasonably be done to mitigate any effect of proposals on the environment[4] the mitigation in the form of the embedded/good practice measures described in other parts of this chapter, continue to be relevant to the construction phase of BG Deviation.

Monitoring

10.231 Monitoring will include pre-construction surveys. These will form part of the ECoW role, which will be appointed and developed at an early stage and in consultation with relevant stakeholders. Additionally, the ECoW will be responsible for ongoing monitoring during construction, to support and report on compliance with mitigation measures and legislative compliance.

Summary of Effects

10.232 Within the context of the 2017 EIA Regulations, no pre-mitigation significant effects (i.e. Moderate or Major) are predicted.

[4] Environment is used as the proxy for the natural beauty of the countryside or any such flora, fauna, features, sites buildings or objects

Glenlee to Tongland Including Removal of R (South) Route

Existing Conditions

Designated Sites

G-T Connection

10.233 There are no statutory designated sites within proposed development footprint, wayleave, or windthrow areas. Excluding sites designated for their ornithological features (refer to Chapter 11), the nearest (< 1km) designated sites are:

- Water of Ken Woods SSSI – c.700 m north west and 400m south-east – designated for lichen assemblages and upland oak woodland.

10.234 The Water of Ken SSSI comprises a series of units across a wider area of woodland. While the G-T connection does not bisect any of the units, it does pass through woodland that provides connectivity between units.

10.235 There are four AWI features within the proposed wayleave:

- Black Bank wood – a large semi-natural broad-leaved woodland near Glenlee (within which the existing BG is located);
- Knocknairling Burn – a narrow strip of mixed riparian woodland on the edge of commercial forestry (adjacent to the Queen's Way);
- Ross Hill Forest- mature commercial forestry, over ancient woodland soils and associated seed bank, near Mossdale (PAWS site);
- Kenick Burn – a narrow strip of mixed riparian woodland, in the Laurieston forest.

R (South) Route

10.236 A Unit of the Water of Ken Woods SSSI crosses the existing R route to the north of New Galloway.

10.237 There are no further designated sites within the route, but the following are within 1km:

- Kenmure Holms SSSI –c.700 west – designated for beetle and dragonfly assemblages and fen habitat.

10.238 There is no structural or functional connectivity between the R route and the Kenmure Holms SSSI.

10.239 Figure 10.2 shows the spatial arrangement of designated sites as they relate to the G-T Connection and R (South) Route.

Habitats

10.240 As the Study Areas for the G-T Connection and R (South) Route are geographically distinct, each is discussed separately below.

G-T Connection

10.241 G-T connection accounts for 47.64% of all habitat recorded within the KTR Study Area.

10.242 The north of the Study Area is dominated by agricultural grasslands, which have been previously improved for grazing livestock. Gently rolling hills to the west of the Study Area direct natural drainage to the Study Area, accounting for marshier and wetter areas within the agricultural landscape.

10.243 However, woodland and scrub are the most dominant habitat feature of this Study Area, the commercial forest blocks of Bennan and Laurieston being the largest areas of habitat recorded. Smaller areas of further woodland and forest are present along the G-T connection.

10.244 Areas of heath and mire are found throughout the connection with a higher percentage of mire habitats found south of Laurieston forest block, from tower 74 to 85 near Bargatton Loch.

10.245 The southern section from tower 92-120, of the connection is predominantly composed of improved grassland used for grazing livestock mosaicked with small areas of grassland and scrub.

10.246 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitat. Table 10.52 provides a brief summary of the habitat composition of the Study Area.

R (South) Route

10.247 The R Route (south) accounts for 31.11% of all habitat recorded within the KTR Study Area.

10.248 Habitats along the R Route (south) are characterised by their agricultural context. Improved grassland, predominantly grazing land, is dominant. Occasionally, species diversity increases, allowing the characterisation of grassland as semi-improved neutral grassland.

10.249 In lower lying areas grassland becomes water-logged, giving rise to marshy grassland habitats. Broadleaved woodland is present, normally in riparian form, while occasional stands of commercial coniferous plantation were also recorded.

10.250 Detailed habitat and vegetation accounts are provided in Appendix 10.2, while Figure 10.3 shows mapped habitat. Table 10.49 provides a brief summary of the habitat composition of the Study Areas[5].

Table 10.49: G-T - including Existing R (South) Route Habitats

Phase 1 Habitat Group	Area within Study Area (Ha)	Proportion of Study Area (%)
Grassland	610.69	48.91
Woodland & scrub	450.17	36.06
Tall herb and fern	70.02	5.61
Miscellaneous	49.40	3.96
Heathland	32.33	2.59
Mire	21.34	1.71
Rock exposure	6.91	0.55
Open water	5.62	0.45
Swamp, marginal inundation	2.03	0.16
	1248.41	100%

10.251 The majority of the habitats within the G-T and R (South) Route Study Areas were considered to be common and widespread within the lowland agricultural context and are scoped out of this assessment. However, Table 10.50 provides further details of those habitats of conservation concern identified during field surveys. Where necessary, Phase 1 Habitat types are converted to NVC classifications to aid identification of Annex 1 habitats.

Table 10.50: G-T including Existing R (South) Route – Habitats of Conservation Concern

Phase 1 Habitat Type	NVC code where appropriate	Description	Total Habitat Area (ha)
Broadleaved woodland	N/A	Broadleaved woodland extended to riparian woodland features, dominated by beech, oak, ash, birch and lyme (generally with understories of similar composition) and plantation broadleaved woodland in an agricultural context, normally dominated by oak, ash beech and birch.	34.3
Mixed woodland	N/A	Generally, as described above for broadleaved woodland, but with influences of sitka and Scot's pine.	4.65
Heath	H12	Heath communities were identified in forest rides and in association with acid grassland stands in more acidic conditions. The communities were impoverished and, in many locations, indistinguishable from a general H12 community (i.e. dominated by *Calluna vulgris* with very limited variation or diversity)	32.3
Mire	M19, M20	Bog communities both routes are highly modified. Generally in isolated stands between forestry coups, the mire communities have suffered extensively from drying and grazing and rarely align well with NVC classifications. Sphagnum layers were generally poor and impoverished and aggressive agricultural grass species were often noted.	23.58

[5] Habitat figures for both the G-T Connection and R (South) Route are combined in this table for consistency with other Connection assessments, and ease of comparison.

Protected Species

10.252 Detailed accounts of protected species evidence identified during surveys are provided in Appendices 10.3 and 10.4 (Confidential). Figures 10.4, and 10.5 show evidence spatially. Summaries are provided below.

Pine Marten and Red Squirrel

10.253 Due to similarities in habitat requirements for these species, field surveys for pine marten and red squirrel were conducted simultaneously.

10.254 Surveys identified suitable habitat for both species within the G-T Study Area, particularly the large mature coniferous plantations in the central areas. Accordingly, extensive evidence of red squirrel, including sightings and foraging remains, was recorded throughout the forests. While dreys were not recorded, likely due to the density of the canopy, it is assumed they are present. Similarly, extensive evidence of pine marten was recorded, including scats and dens. In relation to the latter, it is assumed these were under-recorded due to the density of the plantation stands. The R (South) Route Study Area offered much less suitable species for either species, given the agricultural context, and evidence was very limited.

10.255 Presence of pine marten and red squirrel was identified from field studies conducted by LUC and from (as was) Forestry Commission Scotland (now Scottish Forestry), who had been collecting data and monitoring red squirrel and pine marten within National Forest Estate for an extended period of time. Both species were confirmed in Bennan, Laurieston, and Slogarie forests (see Figure 10.4).

Badger

10.256 Extensive suitable habitat exists for badger within both the G-T Connection and R (South) Route Study Areas. Dense forest habitat within the G-T Study Area provides suitable habitat for sett excavation, foraging and dispersal, particularly in drier areas. Agricultural landscapes, particularly improved grasslands, in the south of the G-T Study Area and R route (south) offer less suitable habitat, although a network of tree lines, hedgerows and other linear features offer opportunities for foraging and commuting.

10.257 Badger field signs were recorded across most of the G-T Study Area, with a particular concentration in the south, below Laurieston Forest. Five main setts and numerous secondary setts were identified, as was extensive evidence of territorial marking (latrines, dungpits etc.). Evidence along the R (South) Route was reduced, but two main setts were identified (see Appendix 10.4: Confidential Badger Survey Report).

Otter

10.258 The Study Areas of the G-T connection and R (South) Route offer extensive suitable habitat for otters due to a large network of major and minor watercourses and waterbodies. From north to south on the G-T connection Study Area, the following watercourse/bodies were all identified as species 'hotspots', i.e. those where concentrations of activity were recorded:

- Garrich/Coom burn;
- Craigshinnie burn;
- Black water of Dee;
- Kennick burn;
- Camelon Lane burn;
- Barstobrick burn/Bargatton Loch.

10.259 Within the R (South) Route, 'hotspots' were identified at:

- Garple Burn;
- Loch Ken;
- Un-named tributary of Loch Ken (at Drumlane).

10.260 Seven resting sites were identified within the Study Area. The majority of the shelters were of low value with the exception of a holt, located within a mammal hole, near tower 76 (see Figure 10.5).

Bats

10.261 An assessment of habitat suitability for bats identified a number of broadleaved trees along the length of the G-T and R (South) Route Study Areas which have potential to support roosting bats. Features were primarily within the R (South) Route Study Area, however a structure at the north of the G-T connection was identified as having BRP (see Figure 10.6). The building, part of the existing Glenlee electrical substation was recorded as having 'Low' BRP. Bat surveys were undertaken to inform a separate EIA for proposed works at the Glenlee substation and these are reported elsewhere[vii].

10.262 Static bat detectors were deployed at seven locations along the G-T Study Area (see Figure 10.7). No detectors were deployed on the R (South) route. These detectors recorded activity from four genera of bats within the Study Area; *Pipistrellus*, *Myotis*, *Plecotus*, and *Nyctalus*. Across all locations, the most common genus recorded was *Pipistrellus*.

Ecological Importance

10.263 Table 10.51 provides an interpretation of the Study Area's Ecological Importance for those habitats and species scoped into the assessment.

Table 10.51: G-T and R (South) Route - Ecological Importance Assessment

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
Designated Sites		Local	The Water of Ken Woods SSSI is an important component of the local provision of broadleaved woodland. The role the Study Area plays in maintaining connectivity between units conveys importance at local level. The R (South) Route crosses the western edge of a Water of Ken Woods SSSI unit, at Garple Bridge. The SSSI at this location is partly fragmented by the existing route, the A713 and private access tracks. AWI sites within the wayleave were generally designated for their seed bank composition, having been planted over with commercial conifer species (PAWS sites). However, each site, particularly those associated with watercourses, plays a role in the maintenance of the local resource.
Habitats	Broadleaved woodland	Study Area	Almost all broadleaved woodland within the Study Area is small, isolated and fragmented, either by extensive areas of commercial forestry, or expanses of agricultural land.
	Mire	Study Area	Almost all bog habitat within the Study Area is heavily modified and exists only in small assemblages in forest rides or other open areas within the forest estate.
	Heath	Study Area	Almost all heath habitat within the Study Area is heavily modified and exists only in small assemblages in forest rides.
Species	Pine marten	Study Area	Pine marten was recorded throughout the forests of the G-T Study Area. The population, having been well studied by F&LS for a number of years, is part of the larger Galloway Forest pine marten resource. Recognised as a highly mobile species, individuals are likely to move around the forest resource, taking advantage of large ranges. As a consequence, the relatively small area of forest within the Study Area is considered to be of limited overall importance to the species.
	Red squirrel	Study Area	Red squirrel was recorded throughout the forests of the G-T Study Area. The population, having been well studied by F&LS for a number of years, is part of the larger Galloway Forest pine

Ecological Feature		Ecological Importance of Study Area for Feature	Rationale
			marten resource. Recognised as a highly mobile species, individuals are likely to move around the forest resource, taking advantage of large ranges. As a consequence, the relatively small area of forest within the Study Area is considered to be of limited overall importance to the species.
	Badger	Local	Extensive evidence of badger along the G-T route, including at least five main setts and numerous territorial markers, suggest that multiple badger clan territories meet within the Study Area. Badger activity was less extensive along the R (South) Route, however two main setts were recorded. Given the sensitivity of badgers to changes in territory, the Study Area is considered to be of Local importance for badger populations.
	Otter	Local	Extensive evidence suggests watercourses within the Study Area are of particular importance to otter. This is reinforced by the presence of resting sites; however, with just one natal holt identified, it is considered that the importance of the Study Area for the species is at a local level.
	Bats	Study Area	Bat roost potential is limited within the Study Area.

Identification of Potential Effects

10.264 Potential effects associated with the construction of the G-T connection and removal of the R (South) Route have been identified through consideration of information provided in Chapters 4 and 5, standard guidance and guidelines and the professional judgment of the assessment team. Table 10.6, presented in the Assessment Methodology section, relates ecological features to potential effects, effect pathways and development activities.

10.265 In addition to the construction activities, including access tracks, directly associated with the construction of the G-T connection, the following additional infrastructure is considered in this assessment:

- Gallows Knowe Quarry (Q2);
- Will's Hill Quarry (Q3);
- Hind Craig Quarry (Q4);
- Lochenbreck Quarry (Q5);
- Craiglewhan Quarry (Q6);
- Craigelwhan West Quarry (Q7);
- Four construction compounds (CC3 – CC6).

10.266 While potential effects arising from the construction of the G-T connection and removal of the R (South) Route are considered together in the tables below, both routes are discussed separately. The assessment recognises that there is no habitat loss associated with the route removal project.

Assessment of Potential Effects

10.267 In this section, drawing on Table 10.6, an assessment is made of the significance of potential effects on ecological features during construction, in the absence of mitigation. Unless highlighted as otherwise, all potential effects are considered to be negative.

Designated Sites

10.268 The G-T Study Area does not support any statutory designated sites, however the structural and functional connectivity of the Water of Ken Woods SSSI relies on existing woodland and forest features within the Study Area. Potential effects on designated sites, therefore, have been identified as severance, as a consequence of wayleave felling of broadleaved woodland at Black Bank Wood, an AWI feature which has recently been re-planted.

10.269 Four AWI sites are partly located within the wayleave of the G-T connection. The AWI sites are a mix of semi-natural broadleaved woodland and commercial forestry plantation on ancient woodland soils (PAWS sites). Sections of each AWI will be removed to accommodate the wayleave of the G-T connection. Effects on non-statutory designated are therefore considered to be direct habitat loss and severance.

10.270 A small part of the Water of Ken Woods SSSI crosses the existing R (South) Route, along the Garple Burn near Garple Bridge. However, the KTR Project includes the removal of the R (South) Route and, beyond the removal of towers and associated conductor wires, no disturbance of the SSSI is anticipated at this location. As the wayleave here will no longer be maintained, an opportunity exists for the regeneration of vegetation, reducing fragmentation.

10.271 In considering the above, the significance of potential effects on designated sites is detailed in Table 10.52.

Table 10.52: G-T and R (South) Route - Assessment of Potential Effect Significance – Designated sites

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	In relation to the AWI features, less than 5% of each of the following features will be lost: • Black Bank wood • Knocknairling Burn • Ross Hill Forest • Kenick Burn	In relation to the AWI features, less than 5% of each of the following features will be lost: • Black Bank wood • Knocknairling Burn • Ross Hill Forest • Kenick Burn
Magnitude	In most of the AWI features, wayleave felling will result in very small proportions of each feature being lost. The loss will not affect the overall structure or function of the features, particularly those that have been over-planted with commercial conifer plantation.	The broadleaved woodland features form a part of a wider network of broadleaved, mixed and coniferous woodland features that connect the Water of Ken Woods SSSI. The loss of these features will result in gaps in the network, reducing the overall connectivity of SSSI units, particularly for faunal species. It is noted, however, that watercourses will continue to persist with associated bankside vegetation, offering significant continued resource for aquatic dispersal. It is also acknowledged that the removal of infrastructure along the R (South) Route will allow partial re-connection. At Black Bank wood AWI, habitat loss will be experienced at the eastern most edge of the feature; as a consequence severance will not be experienced. The other AWI features are largely riparian and while canopy cover may be lost, the riparian nature will ensure connectivity and routes for species dispersal.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Reversible (SSSI connectivity)/Irreversible (AWI features)
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Significant for SSSI connectivity (Study Area)
Translation (2017 EIA Regulations)	None/Not significant	Minor

Habitats of Conservation Concern

10.272 The G-T connection (including R route (south) supports only small and isolated areas of habitat of conservation concern, limited to broadleaved woodland and very small areas of wet and dry modified bog and dry heath. Potential effects on these habitats have been identified as direct habitat loss and severance. Direct habitat loss would be the result of woodland felling for wayleaves. Note that while there will be extensive forestry clearing in additional windthrow areas outside the wayleave, commercial forestry as a habitat in its own right has been scoped out of this assessment.

10.273 The table below provides detail of habitat loss associated with the G-T Connection and R (South) Route removal.

Table 10.53: G-T and R (South) Route - Habitat Loss Calculations

NVC Plant Community/Phase 1 Habitat Code		Area		Relative Area to be Lost (%)
Code	Vegetation Type	Absolute (ha)	Loss (ha)	
N/A	Broadleaved woodland	7.40	2.42	32.70
N/A	Mixed Woodland	4.65	0.03	0.65
H12	Heath	32.30	1.93	5.98
M19/20	Mire	23.58	0.17	0.72
Totals		67.93	4.55	6.70

10.274 In considering the above, the significance of potential effects on habitats of conservation concern is detailed in Table 10.54.

Table 10.54: G-T and R (South) Route - Assessment of Potential Effect Significance – Habitats

Parameter	Potential Effect	
	Direct Habitat Loss	Severance
Extent	Permanent loss of habitat of conservation concern is largely limited to isolated and degraded assemblages across the Study Area, including small areas of heath and mire. The largest loss of habitat of conservation concern relates to Broadleaved woodland, 2.12ha of which is at Black Bank Wood, south west of Glenlee Substation.	Severance of habitat of conservation concern is limited as the examples in the Study Area are already isolated and degraded.
Magnitude	The permanent loss of habitats of conservation concern is largely limited to diminished and degraded examples. The broadleaved woodland at Black Bank Wood is isolated, having, until recently, been encapsulated within a commercial coniferous plantation. The loss of these habitats will have no bearing on the structural or functional viability of habitats of conservation concern within the wider area.	Due to the existing isolation of the habitats in question, their severance will not result in reduced viability of a wider resource.
Duration	Permanent	Permanent
Frequency	Perpetual	Perpetual
Reversibility	Irreversible	Irreversible
Likelihood	Certain	Certain
Significance (EcIA)	Not significant	Not significant
Translation (EIA Regs)	None/Not significant	None/Not significant

Pine marten

10.275 Potential effects on pine marten have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.276 Extensive evidence of the species was recorded within the Study Area, while similarly extensive records from the extensive surrounding forest resource were also collected. In considering the above, the significance of potential effects on pine marten is detailed in Table 10.55. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.55: G-T and R (South) Route - Assessment of Potential Effects – Pine marten

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Limited to a relatively small area (10ha) of suitable habitat with the Study Area
Magnitude	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Given the likely low density of the population present within the Study Area, the effect has the potential to have consequences for the viability of the population within the Study Area	Given the likely low density of the population, the magnitude is likely to be limited
Duration	Permanent	Permanent	28 months of felling (G-T only)	28 months of felling (G-T only)
Frequency	Perpetual	Perpetual	Potentially repeatedly during 28 months of felling	Potentially repeatedly during 28 months of felling
Reversibility	Functionally irreversible	Functionally irreversible	May be irreversible at population level, given the low density of species presence	Reversible
Likelihood	Certain	Certain	Unlikely	Unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Translation (EIA Regs)	None/Not significant	None/Not significant	Minor	None/Not significant

Red squirrel

10.277 Potential effects on red squirrel have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.278 Red squirrel activity was widespread within the Study Area's forest resource. Similarly, widespread records were collected for the surrounding forest estate.

10.279 In considering the above, the significance of potential effects on red squirrel is detailed in Table 10.56. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for the species.

Table 10.56: G-T and R (South) Route - Assessment of Potential Effects – Red squirrel

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to a relatively	L Limited to a relatively	Limited to a relatively	Limited to a relatively

Parameter	Potential Effect			
	small area (10ha) of suitable habitat with the Study Area	small area (10ha) of suitable habitat with the Study Area	small area (10ha) of suitable habitat with the Study Area	small area (10ha) of suitable habitat with the Study Area
Magnitude	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	Limited to a relatively small area (10ha) of suitable habitat with the Study Area	On the basis of the small area (10ha) of available resource to be removed, magnitude is likely to be limited	On the basis of the small area (10ha) of available resource to be removed, magnitude is likely to be limited
Duration	Permanent	Permanent	28 months of felling	28 months of felling
Frequency	Perpetual	Perpetual	Potentially repeatedly during 28 months of felling (G-T only)	Potentially repeatedly during 28 months of felling (G-T only)
Reversibility	Functionally irreversible	Functionally irreversible	May be irreversible at population level, given the low density of the species presence	Reversible
Likelihood	Certain	Certain	unlikely	Extremely unlikely
Significance (EcIA)	Not significant	Not significant	Significant (Study Area)	Not significant
Conversion (EIA Regs)	Not significant	Not significant	Minor	Not significant

Badger

10.280 Potential effects on badger have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.281 Badger activity was widespread across the G-T Study Area. Five main setts, and numerous secondary setts, were identified. Activity was less widespread within the R (South) Route Study Area, but two main setts were recorded. A number of these setts are located within proximity of proposed infrastructure locations, including access tracks, however it is not anticipated that any setts will be destroyed by the proposed works. In considering the above, the significance of potential effects on badger is detailed in Table 10.67. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.57: G-T and R (South) Route - Assessment of Potential Effects – Badger

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	The G-T connection And R (South) Rote Study Areas support extensive suitable habitat, and will continue to do so post-construction. Direct habitat loss on this connection relates directly to the loss of habitat adjacent to setts. 4 main setts and numerous secondary setts are likely to be directly affected.	Limited to a relatively small areas of existing forest habitat.	Could be experienced across both Study Areas, where construction is adjacent to setts, including main setts, where cubs may be present.	Likely to be experienced at locations where main setts are close to proposed works.
Magnitude	As four main setts will be affected, magnitude extends to four neighbouring clans.	Although 4 clans may be affected by the works, the existing and retained network of habitat will support continued connectivity	If mortality is experienced at all four main setts, the magnitude could extend to four adjacent territories.	Disturbance could affect the behaviours of 4 clans within apparently extensive territories
			for each	
Duration	Permanent	Permanent	Permanent	Temporary
Frequency	Multiple events during vegetation clearance and construction	One off during vegetation clearance	Potentially repeatedly during construction and vegetation clearance	Potentially repeatedly during construction and vegetation clearance
Reversibility	Reversible	Reversible	Irreversible if main setts are destroyed	Reversible
Likelihood	Certain	Extremely unlikely	Unlikely on the basis of embedded mitigation, including the presence on an ECoW	Certain
Significance (EcIA)	Significant (Local)	Not significant	Significant (Local)	Significant (Local)
Translation (EIA Regs)	Minor	None/Not significant	Minor	Minor

Otter

10.282 Potential effects on otter have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.283 Much of the Study Area offered suitable habitat for otter and activity was widespread. Holts were recorded, however there were largely considered to be of low value, with the exception of one potential natal holt within the G-T Study Area. Although the species was well-recorded, it should be recognised that as part of the design process, efforts have been made to avoid construction activity within 10m of watercourses. This approach means that otter, which is largely restricted to within a few metres of watercourses, is less likely to experience direct negative effects during construction, although temporary access infrastructure may still have effects. A greater threat to otter is mortality through pollution events.

10.284 In considering the above, the significance of potential effects on otter is detailed in Table 10.58. Significance is assessed within the context of the Study Area's 'Local' Ecological Importance for the species.

Table 10.58: G-T and R (South) Route - Assessment of Potential Effects – Otter

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	Limited to small temporary crossings over small watercourses	Limited to small temporary crossings over small watercourses	Due to the crepuscular nature of otters, direct mortality arising from vehicle collision is unlikely. However, mortality may occur through pollution event. Given the extensive network of proposed access infrastructure across the Study, the potential extent is large	Limited to small temporary crossings over small watercourses
Magnitude	Limited to non-core foraging and commuting habitat for resident otter populations	Limited to non-core foraging and commuting habitat for resident otter populations	Pollution events vary in scale, with effects experienced in the immediately area only, through to catchment wide repercussions	Limited to non-core foraging and commuting habitat for resident otter populations
Duration	Limited to construction period only	Limited to construction period only	Duration depends on severity of pollution	Limited to construction period only

Parameter	Potential Effect			
			events	
Frequency	One off during construction	One off during construction	Potentially repeatedly during construction	Potentially repeatedly during construction
Reversibility	Reversible	Reversible	Potentially irreversible	Reversible
Likelihood	Unlikely	Unlikely	Extremely unlikely on the basis of commitment to CDEMP and GPPs.	Unlikely
Significance (EcIA)	Not significant	Not significant	Not significant	Not significant
Translation (EIA Regs)	None/Not significant	None/Not significant	None/Not significant	None/Not significant

Bats

10.285 Potential effects on bats have been identified as direct habitat loss (in relation to suitable sheltering and foraging habitat); severance of dispersal and foraging corridors; mortality as a consequence of vegetation removal; and disturbance through an increased human and vehicle presence (resulting in increased noise and vibration).

10.286 The Study Area supported a larger number of trees with BRP, ranging from low to high potential. Bat activity surveys across the Study Area suggest a fairly typical assemblage of bats, dominated by soprano pipistrelle. All species identified are capable of roosting in tree cavities and are closely associated with the foraging potential offered by the Study Area.

10.287 In considering the above, the significance of potential effects on bats is detailed in Table 10.59. Significance is assessed within the context of the Study Area's 'Study Area' Ecological Importance for these species.

Table 10.59: G-T and R (South) Route - Assessment of Potential Effect Significance – Bats

Parameter	Potential Effect			
	Direct Habitat Loss	Severance	Mortality	Disturbance
Extent	In relation to roosting potential, suitable roosting features are present throughout the Study Area.	Limited to forested areas in the north and central areas of the Study Area only. By removing forest, and creating new wayleaves, the potential exists to create a more varied habitat structure, with greater foraging potential for bat.	Mortality could occur through the loss of roosts. Potential roost features are present throughout the Study Area.	Disturbance would be achieved through felling and construction adjacent to roosts. Potential roost features are present throughout the Study Area.
Magnitude	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Potential to create new foraging opportunities at the Study Area level.	Potential to lose a number of roosts may affect the conservation status of bat species at the Study Area level.	Roosts across the Study Area could be affected, consequently affecting breeding success at the Study Area level.
Duration	Permanent	Permanent	Permanent	During vegetation clearance and construction period only
Frequency	One off during vegetation clearance	One off during vegetation clearance	One off during vegetation clearance	Potentially repeatedly
Reversibility	Irreversible	Reversible	Likely reversible at the population level of the species identified	Reversible at the population level
Likelihood	Likely	Near certain	Likely	Probable
Significance	Significant (Study	Significant (Study	Significant (Study	Significant (Study

Parameter	Potential Effect			
(EcIA)	Area)	Area) (Positive)	Area)	Area)
Translation (EIA Regs)	Minor	Minor (Positive)	Minor	Minor

Proposed Mitigation

10.288 The embedded/good practice measures which are part of the mitigation embedded through the KTR Project design are addressed above (see section on embedded mitigation) and not repeated again here. Additional mitigation measures in the form of both specific location/species and general site wide mitigation are set out for potential negative significant effects in Table 10.60. Specific additional mitigation is designed to ameliorate the significance of effects, while general site-wide mitigation provides a mechanism for measures that will support compliance with wildlife legislation, irrespective of the significance of effects.

10.289 Mitigation measures set out in the table below represent a combination of standard, well-rehearsed and successfully implemented techniques and measures specifically designed for the KTR project. It is extremely likely that these mitigation measures will be successful.

Table 10.60: G-T and R (South) Route - Proposed Mitigation

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
Designated Sites	Severance	• Vegetation removal will be limited to trees. Shrub and field layers will be retained.	• Preparation of Species Protection Plans for felling and construction phases, as part of the project's wider CDEMP. The Species Protection Plans should set out measures to protect all species covered by legislation in the UK. • Presence of an ECoW during all operations to provide ongoing support and monitoring. The ECoW role should be developed in accordance with current good practice guidelines[ix].
Pine Marten and Red Squirrel	Mortality	• Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Species licensing route where surveys suggest presence of resting sites • Sensitive timing of felling works to avoid breeding season (March – July). • Replacement habitat in form in pine marten den boxes (and ongoing maintenance). Total number to be determined by pre-construction surveys. • Adoption of FDC principles to create 'wildlife bridges' during restoration works (See Appendix 5.1). • Toolbox talks for all site contractors.	
Badger	Direct Habitat Loss Mortality Disturbance	• Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline (part of ECoW role). • Retention of shrub and field layer vegetation around retained setts where possible. • Species licensing route (and full sett closure ahead of works). This approach may require the construction of new setts in appropriate locations. • Sensitive timing of works to avoid breeding season (November – June). • Toolbox talks for all site contractors.	
Bats	Direct Habitat Loss Mortality	• Retention of trees with BRP where possible. • Pre-construction surveys, no more	

Ecological Feature	Effect	Specific Mitigation	General site-wide mitigation
	Disturbance	than 6 months prior to felling, to identify changes in baseline (part of ECoW role). • Pre-construction surveys, no more than six months prior to felling, to identify changes in baseline. Surveys may include climb-and-inspect approach or activity surveys of individual trees (part of ECoW role). • Sensitive timing of felling works to avoid breeding season. • Installation (and ongoing maintenance) of bat roosting boxes. Total number to be determined by detailed pre-construction surveys. • Toolbox talk for all site contractors.	

Residual Construction Effects

10.290 Based on the successful implementation of the additional mitigation, no significant residual effects are predicted, in either EcIA or EIA terminology.

Monitoring

10.291 Monitoring will include pre-construction surveys. These will form part of the ECoW role, which will be appointed and developed at an early stage and in consultation with relevant stakeholders. Additionally, the ECoW will be responsible for ongoing monitoring during construction, to support and report on compliance with mitigation measures and legislative compliance.

Summary of Effects

10.292 Within the context of the 2017 EIA Regulations, no pre-mitigation significant effects (i.e. Moderate or Major) are predicted.

KTR Project as a Whole: Assessment of Effects

Construction Effects

10.293 In assessing the potential effects of the KTR Project as a Whole, it is considered that all ecological features, potential effect pathways and potential effects are consistent with those described for the individual connections.

10.294 However, in accordance with the method applied to the assessment of each connection, this assessment revisits the Ecological Importance of the Study Area for the KTR Project as a Whole for each ecological feature, to enable the subsequent consideration of those parameters necessary to identify effect significance.

10.295 In the following sections, potential effects arising from the KTR Project as a Whole are considered against three broad groupings; designates sites, habitats of conservation concern and protected species.

10.296 The following factors are relevant:

- The long, linear nature of the KTR Project as a Whole means that, while effects may be experienced over a greater area, they will continue to largely affect ecological features immediately within and adjacent to a narrow corridor.
- Related to the above, the length of the KTR Project as a Whole also means that those ecological features subject to effects, particularly protected species, are more likely to be part of geographically distinct populations.

10.297 Definitions of Study Area and Ecological Importance remain as described in Tables 10.4 and 10.5 respectively.

Designated Sites

10.298 The KTR Project as a Whole Study Area supports, or is within proximity to, a small number of SSSIs and AWI sites (largely PAW sites). Most of these are associated with the northern connections (P-G via K, C-K and E-G), which are largely parallel, or contiguous, connecting into Glenlee Substation.

10.299 No individual connection Study Area was considered to have a greater Ecological Importance than 'Local', with most considered as being of 'Study Area' Importance. Despite the larger Study Area, the linear or contiguous nature of the KTR Project as a Whole means the development occupies a narrow footprint, upon which the viability of the various designated sites is not reliant. Consequently, the KTR Project as a Whole Study Area is considered to be of 'Local' importance for designated sites.

10.300 At an individual connection level, effects were identified as being of 'Study Area' significance, in relation to effects on severance of the Water of Ken Woods SSSI. However, the extent and magnitude of the combined effect (of the connections collectively comprising KTR as a Whole) of severance on this site is greater, due to the need to maintain the wayleaves of a number of connections (P-G via K, E-G, BG Deviation and G-T).

10.301 Despite an increased extent and magnitude, the effect at the KTR Project as a Whole level continues to be of 'Study Area' significance, as extensive additional connectivity remains within the wider area and it is not considered that combined effects arising from each connection will affect the overall viability of the Water of Ken Woods SSSI.

10.302 As such, the KTR Project as a Whole is considered to have a significant effect at the 'Study Area' level only. Mitigation measures described throughout this assessment will achieve a 'Not Significant' residual significance in EcIA terminology ('None / Not Significant' in EIA regs terminology).

Habitats

10.303 Habitat assemblages, quality and connectivity were broadly consistent across all connections in the project Study Area (however a large part of the G-T connection is dominated by commercial forestry). When considering potential effects at the KTR Project as a Whole level, it is necessary to recognise the importance of scale. For example, at a KTR Project as a Whole Study Area level, there is a greater area of broadleaved woodland habitat loss than at individual connection level (due to the combined total from each connection), however this corresponds with a greater availability of broadleaved woodland resource at the KTR Project as a Whole Study Area too.

10.304 Accordingly, the Study Area remains to be considered as being of 'Study Area' Ecological Importance for its habitats of conservation concern. Whilst effects of direct habitat loss and severance have a greater extent and magnitude at the KTR Project as a Whole level, they continue to be significant at a 'Study Area level' only, as the narrow, linear nature of the KTR Project as a Whole means that affected habitats remain viable across the Study Area. Proposed mitigation at an individual connection level means that, at a KTR Project as a Whole level, residual effects will be 'not significant' in EcIA terminology ('None / Not Significant' in EIA regs terminology).

Protected Species

10.305 Protected species, primarily bats, red squirrel, pine marten, badger and otter, were present throughout the KTR Project as a Whole Study Area. However, given the project's narrow corridor, and the extent of suitable habitat within the wider area, the KTR Project as a Whole Study Area is considered to be of 'Local' Ecological Importance for these species (at the individual connection level, the Study Area was generally considered to be of 'Study Area' Ecological Importance for most species). The notable exception being the G-T connection Study Area, which was considered to be of 'Local' importance for badgers).

10.306 At a KTR Project as a Whole level, the effects described at an individual connection level are of greater extent. Similarly, magnitude increases, as a number of discrete, viable populations may be affected simultaneously. However, the overall significance of effects on protected species is unlikely to increase at the KTR Project as a Whole level, as locally viable populations will persist along the length of the KTR Project as a Whole Study Area due to extensive suitable habitat availability.

10.307 On this basis, at a KTR Project as a Whole level, effects on bats, red squirrel, pine martin and otter are predicted to be significant at the 'Study Area' level only. Mitigation described in previous sections reduce the residual significance to 'not significant' in EcIA terminology ('None / Not Significant' in EIA regs terminology).

10.308 At a KTR Project as a Whole level, effects on badgers are predicted to be significant at a 'Local' level, due to the number of individual clans affected. Mitigation described in previous sections reduce the residual significance to 'not significant' in EcIA terminology ('None / Not Significant' in EIA regs terminology).

Interrelationship between Effects

10.309 There are interrelationships between potential effects assessed in this chapter and those discussed in Chapter 9: Geology, Hydrology, Hydrogeology, Water Resources, and Peat, and Chapter 11: Ornithology.

10.310 This assessment has provided the necessary information for Chapter 9's assessment of potential effects on GWDTEs (this assessment considers the ecological importance of GWDTEs as habitats in their own right, within the context of habitats of conservation concern (largely heath and mire habitats)). Many of the effects identified in this chapter, relating primarily to habitat loss and disturbance, are of importance to ornithological features, and these are discussed in detail in Chapter 11.

Summary of Significant Effects

10.311 No significant effects on ecology (i.e. effects considered **'major'** or 'moder**ate'** in EIA terminology) were identified prior to, or following, the application of the additional mitigation measures.

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[i] As listed in Annex 1 of the Habitats Directive; the Scottish Biodiversity List and the Dumfries and Galloway Biodiversity Action Plan.
[ii] Scottish Biodiversity List (2013). Available at https://www.gov.scot/Topics/Environment/Wildlife-Habitats/16118/Biodiversitylist/SBL
[iii] The North East Scotland Biodiversity Action Plan (2014 – 2017). Available at http://www.nesbiodiversity.org.uk/publications/north-east-scotland-biodiversity-partnership-plan-2014-2017
[iv] Guidelines for Ecological Impact Assessment in the UK and Ireland – Terrestrial, Freshwater and Coastal. 2nd Edition. CIEEM (2016)
[v] Available at https://www.nature.scot/professional-advice/planning-and-development/advice-planners-and-developers

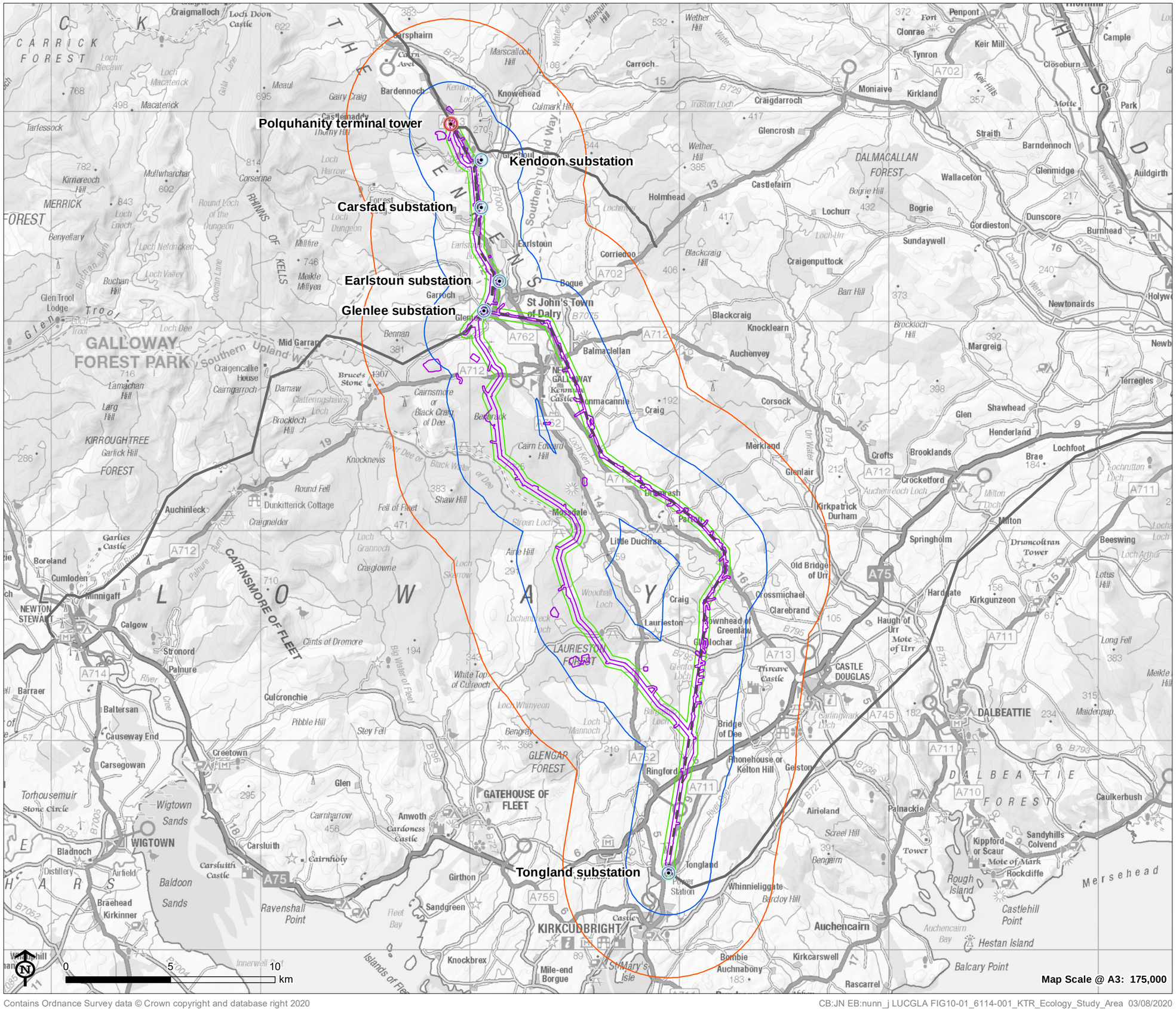
[vi] Land Use Planning System: Guidance Note 31 – Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (GWDTE). SEPA (2014)

[vii] Available at https://eaccess.dumgal.gov.uk/online-applications/applicationDetails.do?activeTab=documents&keyVal=PXMM3LGB00A00

[viii] Detailed locations of setts are not provided in this publicly available EcIA, due to persecution concerns. Refer to Confidential Appendix 10.4 for further detail of sett locations.

[ix] Burns, O. & Jackson-Matthews, S. (2016). Environmental Clerks of Works. Good Practice Guidance

Figure 10.1: Ecology Study Area



- Polquhanity sealing end and terminal tower
- Substation and hydro electricity generating station
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network

Ecology study area

- 5km – statutory and non-statutory designated sites
- 2km – existing protected species data (desk study)
- 250m study area for aquatic protected species *
- 50m study area for terrestrial protected species and habitat survey **

Note:

* Based on 250m from area of wayleave and existing overhead line to be removed.

** Based on 50m from area of wayleave, existing overhead line to be removed, new access track, construction compound, working areas and potential quarry working areas.

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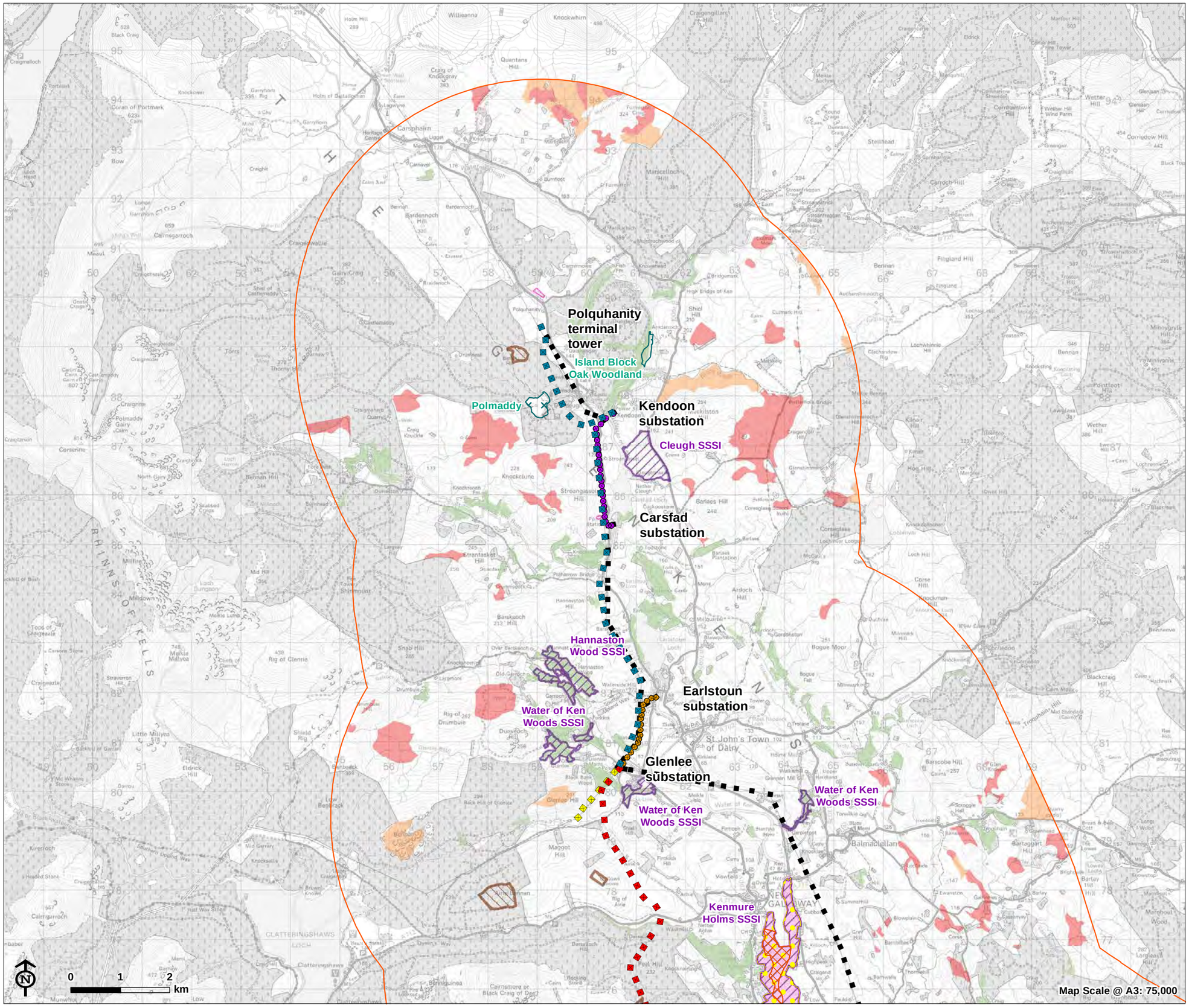
Figure 10.2.1: Biodiversity Sites



Overhead line infrastructure

- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Carsfad to Kendoon (wood pole)
- Earlstoun to Glenlee (wood pole)
- Glenlee to Tongland (steel lattice
- BG route deviation (steel lattice tower)
- Existing tower for removal
- Construction compound
- Potential quarry working area

Designated sites

- 5km – statutory and non-statutory designated sites
- Special Protection Area (SPA) - Loch Ken and River Dee Marshes
- Site of Special Scientific Interest
- Ramsar Site (R) - Loch Ken and River Dee Marshes
- Ancient Woodland Inventory (AWI)

Non-statutory sites

- Local Wildlife Site
- RSPB Reserve - Ken-Dee Marshes

Priority peatland habitats

- Class 1
- Class 2

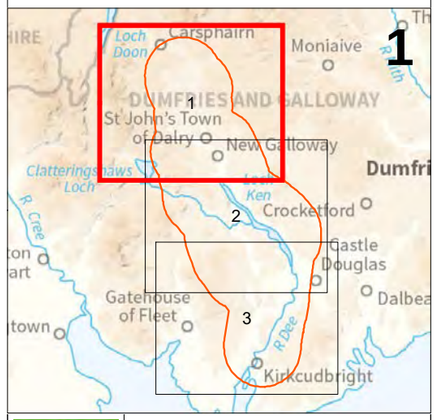


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Figure 10.2.2: Biodiversity Sites

Glenlee substation
Water of Ken Woods SSSI
Water of Ken Woods SSSI
Kenmure Holms SSSI
Airds of Kells Wood SSSI
Woodhall Loch SSSI
Laughenghie and Airie Hills SSSI
River Dee (Parton to Crossmichael) SSSI
Threave and Carlingwark Loch SSSI

Overhead line infrastructure

- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Earlstoun to Glenlee (wood pole)
- Glenlee to Tongland (steel lattice tower)
- BG route deviation (steel lattice tower)
- Existing tower for removal
- Construction compound
- Potential quarry working area

Designated sites

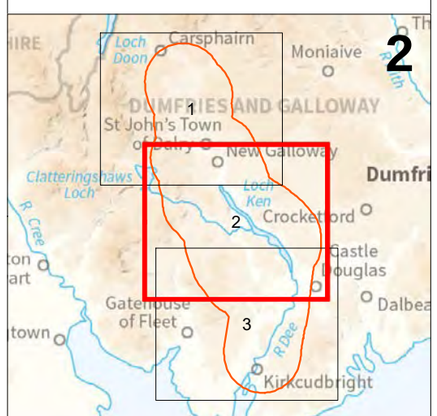
- 5km – statutory and non-statutory designated sites
- Special Protection Area (SPA) - Loch Ken and River Dee Marshes
- Site of Special Scientific Interest (SSSI)
- Ramsar Site (R) - Loch Ken and River Dee Marshes
- Ancient Woodland Inventory (AWI)

Non-statutory sites

- Local Wildlife Site
- RSPB Reserve - Ken-Dee Marshes

Priority peatland habitats

- Class 1
- Class 2



0 1 2 km

Map Scale @ A3: 75,000

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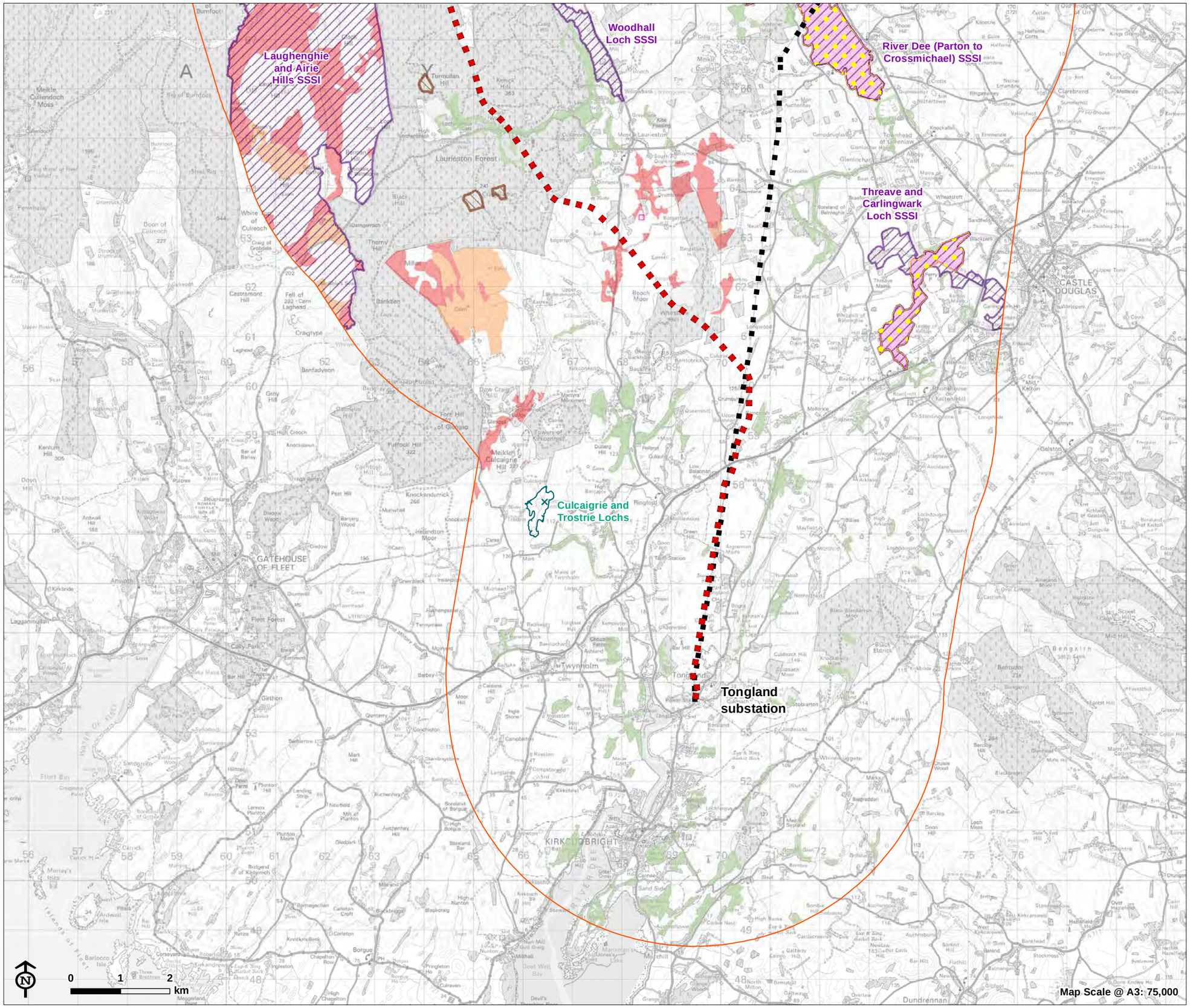
Figure 10.2.3: Biodiversity Sites



Overhead line infrastructure

- Glenlee to Tongland (steel lattice tower)
- Existing tower for removal
- Construction compound
- Potential quarry working area

Designated sites

- 5km – statutory and non-statutory designated sites
- Special Protection Area (SPA) - Loch Ken and River Dee Marshes
- Site of Special Scientific Interest (SSSI)
- Ramsar Site (R) - Loch Ken and River Dee Marshes
- Ancient Woodland Inventory (AWI)

Non-statutory sites

- Local Wildlife Site

Priority peatland habitats

- Class 1
- Class 2

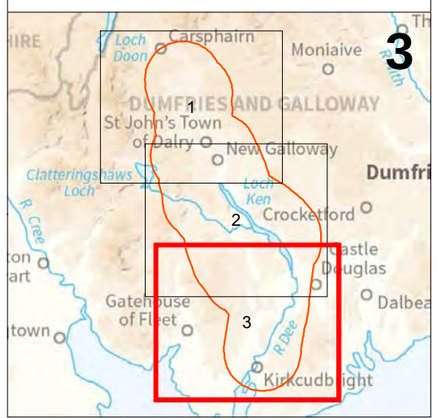


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Figure 10.3.1: Phase 1 Habitats

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

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)/B5 Marshy grassland
- A1.2.1 Coniferous woodland (semi-natural)/E1.7 Wet modified bog
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A1.3.1 Mixed woodland (semi-natural)/A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A1.3.2 Mixed woodland (plantation)
- A2.1 Scrub (dense/continuous)/A3.3 Mixed scattered trees
- A2.2 Scrub (scattered)
- A3.3 Mixed scattered trees
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/B5 Marshy grassland
- A4.2 Coniferous woodland (recently felled)/B5 Marshy grassland/E1.7 Wet modified bog
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B4 Improved grassland/A2.2 Scrub (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/A3.3 Mixed scattered trees
- B5 Marshy grassland/D6 Wet heath/acid grassland
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C3.1 Other tall herb and fern (ruderal)
- C3.1 Other tall herb and fern (ruderal)/A2.2 Scrub (scattered)
- C3.1 Other tall herb and fern (ruderal)/A3.3 Mixed scattered trees
- E1.7 Wet modified bog
- E1.8 Dry modified bog
- G1 Standing water
- G2 Running water
- J1.2 Amenity grassland/A2.2 Scrub
- Survey Not Required

Polquhanity terminal tower
DE102R
Q1
Polquhanity Burn
Water of Deugh
Dalshangan Wood
Dalshangan House
Dalshangan Plantation
Dunbannoch
Devil's Barn Door
Dundeugh Hill
Craigcrocket
Craig Lingal
Craigwhar
Sinking Craig
Knockbuie
Carse of Dundeugh
Dundeugh Castle (remains of)
Carminnows Lodge
Gordon's Knowe

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.2: Phase 1 Habitats

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)

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

Access to towers for removal
- New access
- Working area
- Construction compound

Phase 1 Habitat Survey
- Study area
- Target note
- Invasive species area

Phase 1 Habitat Linear Features
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)/B5 Marshy grassland
- A1.2.1 Coniferous woodland (semi-natural)/E1.7 Wet modified bog
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A1.3.1 Mixed woodland (semi-natural)/A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A1.3.2 Mixed woodland (plantation)
- A1.3.2 Mixed woodland (plantation)/A2.2 Scrub (scattered)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/C3.1 Other tall herb and fern (ruderal)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)/A3.1 Broadleaved scattered trees
- A3.1 Broadleaved scattered trees
- A3.1 Broadleaved scattered trees/C1.2 Bracken (scattered)
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/B5 Marshy grassland
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A3.1 Broadleaved scattered trees/C1.2 Bracken (scattered)
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B4 Improved grassland
- B4 Improved grassland/A2.2 Scrub (scattered)
- B4 Improved grassland/A3.1 Broadleaved scattered trees
- B4 Improved grassland/C1.2 Bracken (scattered)
- B4 Improved grassland/C1.2 Bracken (scattered)/A2.2 Scrub (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B5 Marshy grassland/C1.1 Bracken (continuous)
- B5 Marshy grassland/C1.2 Bracken (scattered)
- B5 Marshy grassland/C1.2 Bracken (scattered)/A2.2 Scrub (scattered)
- B5 Marshy grassland/E1.7 Wet modified bog
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C1.1 Bracken (continuous)/A3.3 Mixed scattered trees
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/C3.2 Other tall herb and fern (non ruderal)
- E1.7 Wet modified bog
- G1 Standing water
- G2 Running water
- G2 Running water/F2.2 Marginal and inundation - inundation vegetation
- I2.1 Quarry
- J1.2 Amenity grassland/A2.2 Scrub
- Survey Not Required

Kendoon substation

Carsfad substation

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.3: Phase 1 Habitats

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)

Access to proposed towers

- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- Existing access
- New access
- Working area
- Construction compound

Phase 1 Habitat Survey

- Study area
- Target note
- Invasive species area

Phase 1 Habitat Linear Features

- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.3.1 Mixed woodland (semi-natural)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- B1.2 Acid grassland (semi-
- B1.2 Acid grassland (semi-improved)/C1.2 Bracken
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A2.2 Scrub (scattered)
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B4 Improved grassland
- B4 Improved grassland/B5 Marshy grassland
- B5 Marshy grassland
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B6 Poor grassland (semi-improved)
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/A3.3 Mixed scattered trees
- C1.1 Bracken (continuous)/B1.2 Acid grassland (semi-
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/A2.2 Scrub (scattered)
- C1.2 Bracken (scattered)/B2.2 Neutral grassland (semi-improved)
- C3.1 Other tall herb and fern (ruderal)
- C3.1 Other tall herb and fern (ruderal)/C1.2 Bracken (scattered)
- E1.7 Wet modified bog
- E1.8 Dry modified bog
- G2 Running water
- I2.1 Quarry
- Survey Not Required

Carsfad substation

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.4: Phase 1 Habitats

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

Access to proposed towers

- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- Existing access
- New access
- Working area

Phase 1 Habitat Survey

- Study area
- Target note
- Invasive species area

Phase 1 Habitat Linear Features

- J2.1.2 Intact hedge (species-poor)
- J2.2.2 Defunct hedge (species-poor)
- J2.4 Fence
- J2.5 Wall
- J2.6 Dry ditch
- TL Tree line

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/A3.1 Broadleaved scattered trees
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A3.1 Broadleaved scattered trees
- A3.1 Broadleaved scattered trees/A2.1 Scrub (dense/continuous)
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A2.2 Scrub (scattered)
- B2.2 Neutral grassland (semi-improved)/A3.1 Broadleaved scattered trees
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C3.1 Other tall herb and fern (ruderal)
- C3.2 Other tall herb and fern (non ruderal)
- F1 Swamp
- G2 Running water
- J1.1
- J4 Bare ground
- Survey Not Required

Earlstoun substation

Glenlee substation

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.5: Phase 1 Habitats

Overhead line infrastructure

- Polquhanity to Glenlee via Kendoon (steel lattice tower)
- Earlstoun to Glenlee (wood pole)
- Glenlee to Tongland (steel lattice tower)
- 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

Access to proposed towers

- Existing access
- New access
- Timber extraction spur

Access to towers for removal

- Existing access
- New access

- Working area
- Potential quarry working area

Phase 1 Habitat Survey

- Study area
- Target note

Phase 1 Habitat Linear Features

- J2.1.2 Intact hedge (species-poor)
- J2.2.2 Defunct hedge (species-poor)
- J2.6 Dry ditch

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)/A1.1.2 Broadleaved woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/A3.1 Broadleaved scattered trees
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/B2.2 Neutral grassland (semi-improved)
- A4.2 Coniferous woodland (recently felled)
- B1.2 Acid grassland (semi-
- B2.1 Neutral grassland (unimproved)
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A3.1 Broadleaved scattered trees
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- B5 Marshy grassland/C1.2 Bracken (scattered)
- B5 Marshy grassland/C1.2 Bracken (scattered)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C1.2 Bracken (scattered)/B5 Marshy grassland/A2.2 Scrub (scattered)
- E1.8 Dry modified bog
- G1 Standing water
- G2 Running water
- I2.1 Quarry
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.6: Phase 1 Habitats

Overhead line infrastructure
- BG route deviation (steel lattice tower)
- Existing 132kV overhead line to be removed (following construction of the KTR Project)
- Existing network

Access to proposed towers
- Existing access
- New access
- Working area
- Potential quarry working area

Phase 1 Habitat Survey
- Study area

Phase 1 Habitat Linear Features
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)/A4.2 Coniferous woodland (recently felled)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- B5 Marshy grassland/C1.2 Bracken (scattered)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.2 Bracken (scattered)/B5 Marshy grassland/A2.2 Scrub (scattered)
- I2.1 Quarry
- Survey Not Required

Q3

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.7: Phase 1 Habitats

Overhead line infrastructure

- Glenlee to Tongland (steel lattice tower)
- 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
- Working area
- Construction compound
- Potential quarry working area

Phase 1 Habitat Survey

- Study area

Phase 1 Habitat Linear Features

- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)/A1.1.2 Broadleaved woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A4.2 Coniferous woodland (recently felled)
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/A3.2 Coniferous scattered trees
- B5 Marshy grassland/A3.2 Coniferous scattered trees/C1.2 Bracken (scattered)
- B5 Marshy grassland/A3.3 Mixed scattered trees
- B5 Marshy grassland/C1.2 Bracken (scattered)
- B5 Marshy grassland/C1.2 Bracken (scattered)/A3.2 Coniferous scattered trees
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.2 Bracken (scattered)/B5 Marshy grassland
- D5 Dry heath/acid grassland/B5 Marshy grassland/C1.2 Bracken (scattered)
- D5 Dry heath/acid grassland/C1.2 Bracken (scattered)
- E1.8 Dry modified bog
- G2 Running water
- I2.1 Quarry
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.8: Phase 1 Habitats

Overhead line infrastructure

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

Access to proposed towers

- Existing access
- New access
- Timber extraction spur
- Working area
- Construction compound
- Potential quarry working area

Phase 1 Habitat Survey

- Study area

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A1.3.2 Mixed woodland (plantation)
- A4.2 Coniferous woodland (recently felled)
- B1.2 Acid grassland (semi-
- B5 Marshy grassland/A3.2 Coniferous scattered trees
- B5 Marshy grassland/A3.2 Coniferous scattered trees/C1.2 Bracken (scattered)
- B5 Marshy grassland/A3.3 Mixed scattered trees
- B5 Marshy grassland/C1.2 Bracken (scattered)/A3.2 Coniferous scattered trees
- B5 Marshy grassland/C1.2 Bracken (scattered)/A3.3 Mixed scattered trees
- B5 Marshy grassland/C3.1 Other tall herb and fern (ruderal)/A3.2 Coniferous scattered trees
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A3.2 Coniferous scattered trees
- C1.1 Bracken (continuous)/A3.3 Mixed scattered trees
- C1.2 Bracken (scattered)/B5 Marshy grassland
- D5 Dry heath/acid grassland
- D5 Dry heath/acid grassland/A3.2 Coniferous scattered trees
- D5 Dry heath/acid grassland/C1.2 Bracken (scattered)
- D5 Dry heath/acid grassland/C1.2 Bracken (scattered)/A3.2 Coniferous scattered trees
- I2.1 Quarry
- Survey Not Required

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Figure 10.3.9: Phase 1 Habitats

Overhead line infrastructure

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

Access to proposed towers

- Existing access
- New access
- Timber extraction spur
- Working area
- Construction compound

Phase 1 Habitat Survey

- Study area
- Target note

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)/B5 Marshy grassland/C1.2 Bracken (scattered)
- A1.2.1 Coniferous woodland (semi-natural)/E1.7 Wet modified bog
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A3.2 Coniferous scattered trees/E1.7 Wet modified bog
- A4.2 Coniferous woodland (recently felled)
- B5 Marshy grassland
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B5 Marshy grassland/A3.2 Coniferous scattered trees
- B5 Marshy grassland/A3.3 Mixed scattered trees
- B5 Marshy grassland/C1.2 Bracken (scattered)/A3.3 Mixed scattered trees
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A3.2 Coniferous scattered trees
- C1.2 Bracken (scattered)
- D1 Dry dwarf shrub heath/A2.2 Scrub (scattered)
- D5 Dry heath/acid grassland/A3.1 Broadleaved scattered trees
- D5 Dry heath/acid grassland/A3.2 Coniferous scattered trees
- D5 Dry heath/acid grassland/C1.2 Bracken (scattered)/A3.2 Coniferous scattered trees
- E1.7 Wet modified bog
- E1.7 Wet modified bog/A3.3 Mixed scattered trees
- E1.7 Wet modified bog/B5 Marshy grassland/A3.3 Mixed scattered trees
- E1.7 Wet modified bog/C1.2 Bracken (scattered)/A3.1 Broadleaved scattered trees
- G1 Standing water
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.10: Phase 1 Habitats

Overhead line infrastructure

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

Access to proposed towers

- Existing access
- New access
- Timber extraction spur
- Working area
- Construction compound

Phase 1 Habitat Survey

- Study area

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)/B5 Marshy grassland/C1.2 Bracken (scattered)
- A1.2.1 Coniferous woodland (semi-natural)/E1.7 Wet modified bog
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A3.1 Broadleaved scattered trees
- A3.2 Coniferous scattered trees/E1.7 Wet modified bog
- A3.3 Mixed scattered trees
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/C3.1 Other tall herb and fern (ruderal)
- B1.2 Acid grassland (semi-improved)/D1 Dry dwarf shrub
- B5 Marshy grassland
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B5 Marshy grassland/A3.3 Mixed scattered trees
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/D1 Dry dwarf shrub heath
- D1 Dry dwarf shrub heath/A2.2 Scrub (scattered)
- D1 Dry dwarf shrub heath/A3.2 Coniferous scattered trees
- D5 Dry heath/acid grassland/A3.1 Broadleaved scattered trees
- E1.7 Wet modified bog
- E1.7 Wet modified bog/A3.3 Mixed scattered trees
- E1.7 Wet modified bog/B5 Marshy grassland/A3.3 Mixed scattered trees
- E1.7 Wet modified bog/C1.2 Bracken (scattered)/A3.1 Broadleaved scattered trees
- G1 Standing water
- I2.1 Quarry
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.11: Phase 1 Habitats

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

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

Phase 1 Habitat Survey
- Study area
- Target note
- Invasive species area

Phase 1 Habitat Linear Features
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)/A4.2 Coniferous woodland (recently felled)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A3.2 Coniferous scattered trees/E1.7 Wet modified bog
- A4.2 Coniferous woodland (recently felled)
- B1.2 Acid grassland (semi-
- B5 Marshy grassland
- B5 Marshy grassland/E1.7 Wet modified bog
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- D5 Dry heath/acid grassland
- E1.7 Wet modified bog
- E1.7 Wet modified bog/A3.2 Coniferous scattered trees
- E1.7 Wet modified bog/C1.2 Bracken (scattered)
- G2 Running water
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.12: Phase 1 Habitats

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

Access to proposed towers
- Existing access
- New access
- Timber extraction spur
- Working area
- Potential quarry working area

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.5 Wall
- J2.6 Dry ditch
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A1.3.2 Mixed woodland (plantation)
- A2.2 Scrub (scattered)
- A3.1 Broadleaved scattered trees
- A3.2 Coniferous scattered trees
- A4.2 Coniferous woodland (recently felled)
- B1.2 Acid grassland (semi-improved)/C1.2 Bracken
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/D1 Dry dwarf shrub heath
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C1.2 Bracken (scattered)/A2.2 Scrub (scattered)
- D1 Dry dwarf shrub heath
- D1 Dry dwarf shrub heath/A3.2 Coniferous scattered trees
- D5 Dry heath/acid grassland
- E1.8 Dry modified bog
- G2 Running water
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 1:10,000

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Figure 10.3.13: Phase 1 Habitats

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

Access to proposed towers
- Existing access
- New access
- Timber extraction spur
- Working area
- Potential quarry working area

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.4 Fence
- J2.5 Wall
- J2.6 Dry ditch
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)/C1.2 Bracken (scattered)
- A1.2.2 Coniferous woodland (plantation)
- A1.3.1 Mixed woodland (semi-natural)
- A2.2 Scrub (scattered)
- A3.2 Coniferous scattered trees
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/A3.2 Coniferous scattered trees
- B1.2 Acid grassland (semi-
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B5 Marshy grassland
- D1 Dry dwarf shrub heath
- D5 Dry heath/acid grassland
- E1.8 Dry modified bog
- G1 Standing water
- G2 Running water
- I2.1 Quarry
- Survey Not Required

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0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.14: Phase 1 Habitats

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

Access to proposed towers
- Existing access
- New access
- Timber extraction spur
- Working area
- Construction compound
- Potential quarry working area

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.4 Fence
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.1 Coniferous woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A2.2 Scrub (scattered)
- A3.2 Coniferous scattered trees
- A4.2 Coniferous woodland (recently felled)
- B1.1 Acid grassland
- B1.2 Acid grassland (semi-
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B5 Marshy grassland
- E1.7 Wet modified bog
- E1.8 Dry modified bog
- F1 Swamp
- G1 Standing water
- Survey Not Required

Map Scale @ A3: 10,000

0 0.25 0.5 km

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Figure 10.3.15: Phase 1 Habitats

Overhead line infrastructure
- Glenlee to Tongland (steel lattice tower)
- 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
- Working area
- Construction compound

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.4 Fence
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/A1.2.2 Coniferous woodland (plantation)
- B1.1 Acid grassland
- B1.2 Acid grassland (semi-improved)/B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/J5 Other habitat
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B2.2 Neutral grassland (semi-improved)
- D1 Dry dwarf shrub heath
- D2 Wet dwarf shrub heath
- E1.7 Wet modified bog
- E1.8 Dry modified bog
- F1 Swamp
- G1 Standing water
- J5 Other habitat
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.16: Phase 1 Habitats

Overhead line infrastructure
- Glenlee to Tongland (steel lattice tower)
- 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

Access to towers for removal
- New access
- Working area

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.1.2 Intact hedge (species-poor)
- J2.2.1 Defunct hedge (native species-rich)
- J2.2.2 Defunct hedge (species-poor)
- J2.3.2 Hedge with trees (species-poor)
- J2.4 Fence
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A3.3 Mixed scattered trees
- B1.2 Acid grassland (semi-improved)/B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B6 Poor grassland (semi-improved)
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B2.2 Neutral grassland (semi-improved)
- C1.2 Bracken (scattered)/B6 Poor semi-improved grassland
- E1.7 Wet modified bog
- G1 Standing water
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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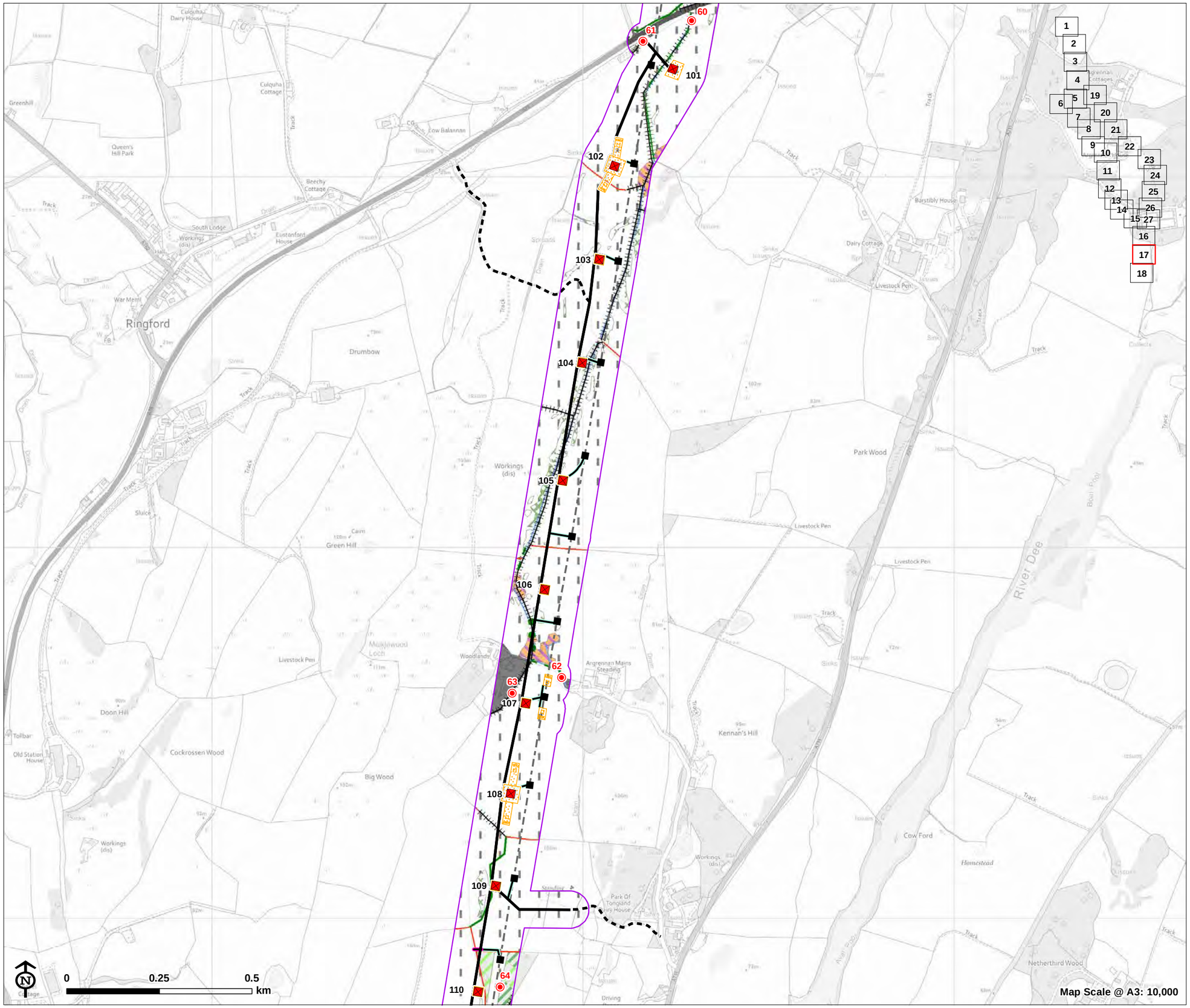
Figure 10.3.17: Phase 1 Habitats



Overhead line infrastructure
- Glenlee to Tongland (steel lattice tower)
- 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

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.1.2 Intact hedge (species-poor)
- J2.2.2 Defunct hedge (species-poor)
- J2.3.2 Hedge with trees (species-poor)
- J2.4 Fence
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- B4 Improved grassland
- B5 Marshy grassland
- Survey Not Required

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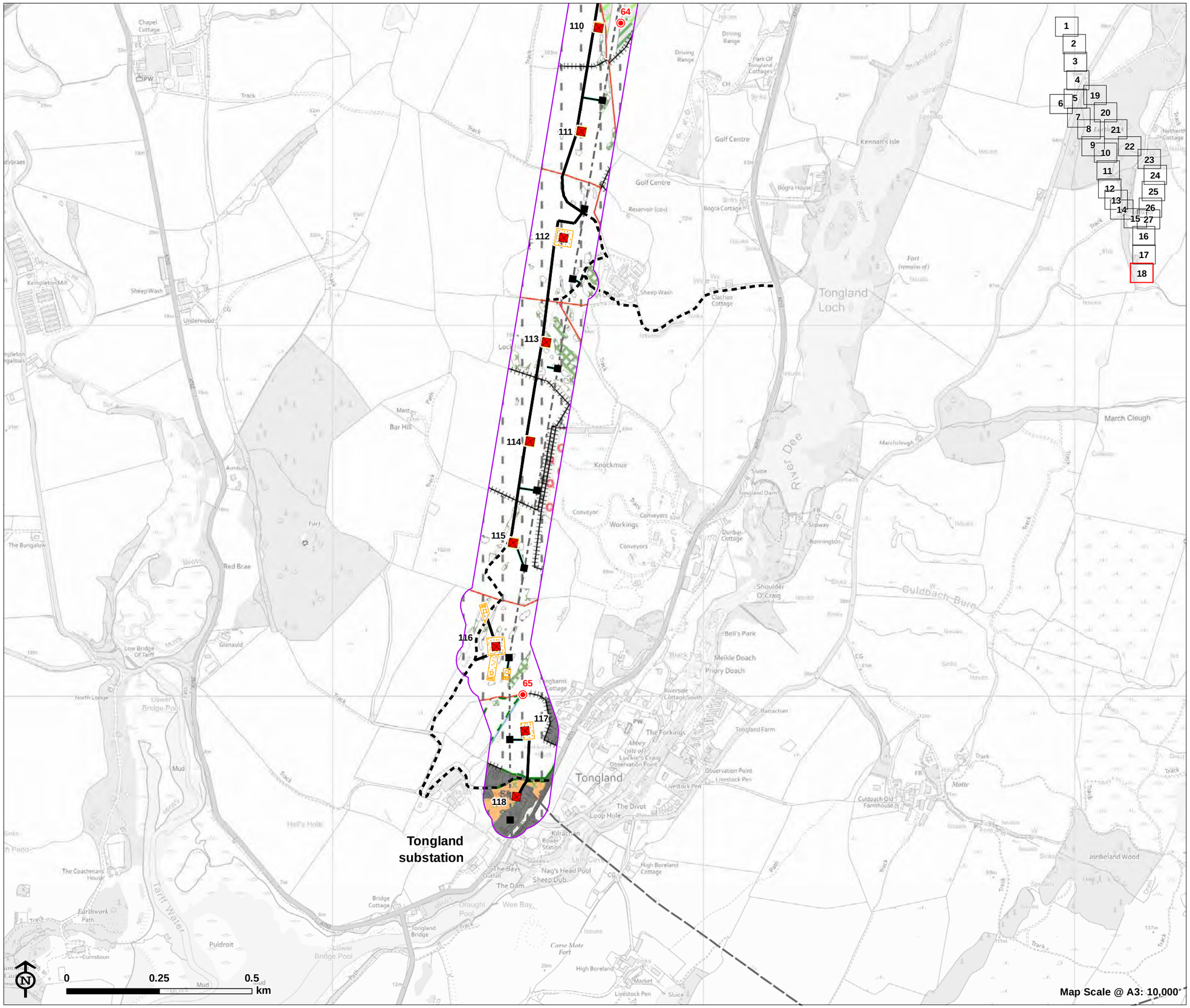

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Figure 10.3.18: Phase 1 Habitats

Overhead line infrastructure

- Glenlee to Tongland (steel lattice tower)
- 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

Access to towers for removal

- New access
- Working area

Phase 1 Habitat Survey

- Study area
- Target note

Phase 1 Habitat Linear Features

- J2.1.2 Intact hedge (species-poor)
- J2.2.2 Defunct hedge (species-poor)
- J2.4 Fence
- J2.5 Wall

Phase 1 Habitat Areas

- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/A3.3 Mixed scattered trees
- A3.1 Broadleaved scattered trees/B4 Improved grassland
- B2.2 Neutral grassland (semi-improved)/A2.2 Scrub (scattered)
- B4 Improved grassland
- B6 Poor grassland (semi-improved)
- I2.1 Quarry
- Survey Not Required

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Figure 10.3.19: Phase 1 Habitats

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

Access to towers for removal
- Existing access
- New access

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.1.2 Intact hedge (species-poor)
- J2.2.2 Defunct hedge (species-poor)
- J2.3.2 Hedge with trees (species-poor)
- J2.4 Fence
- J2.5 Wall
- J2.6 Dry ditch
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.1 Broadleaved woodland (semi-natural)/A2.1 Scrub (dense/continuous)
- A1.1.2 Broadleaved woodland (plantation)
- A1.1.2 Broadleaved woodland (plantation)/A2.2 Scrub (scattered)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/C3.1 Other tall herb and fern (ruderal)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/A3.1 Broadleaved scattered trees
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A3.1 Broadleaved scattered trees
- B2.1 Neutral grassland (unimproved)
- B2.1 Neutral grassland (unimproved)/A1.1.1 Broadleaved woodland (semi-natural)
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B4 Improved grassland/B5 Marshy grassland
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B2.2 Neutral grassland (semi-improved)
- C3.1 Other tall herb and fern (ruderal)
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees
- F1 Swamp
- F2.2 Marginal and inundation - inundation vegetation
- J1.1
- J1.2 Amenity
- J4 Bare ground
- J5 Other habitat
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.20: Phase 1 Habitats

Overhead line infrastructure

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

Access to towers for removal

- Existing access
- New access

Phase 1 Habitat Survey

- Study area
- Target note

Phase 1 Habitat Linear Features

- J2.2.2 Defunct hedge (species-poor)
- J2.4 Fence
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.1 Coniferous woodland (semi-natural)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/C3.1 Other tall herb and fern (ruderal)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/A3.1 Broadleaved scattered trees
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A3.1 Broadleaved scattered trees
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B4 Improved grassland/A2.2 Scrub (scattered)
- B4 Improved grassland/B5 Marshy grassland
- B5 Marshy grassland
- C1.1 Bracken (continuous)
- C3.1 Other tall herb and fern (ruderal)
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees
- J4 Bare ground
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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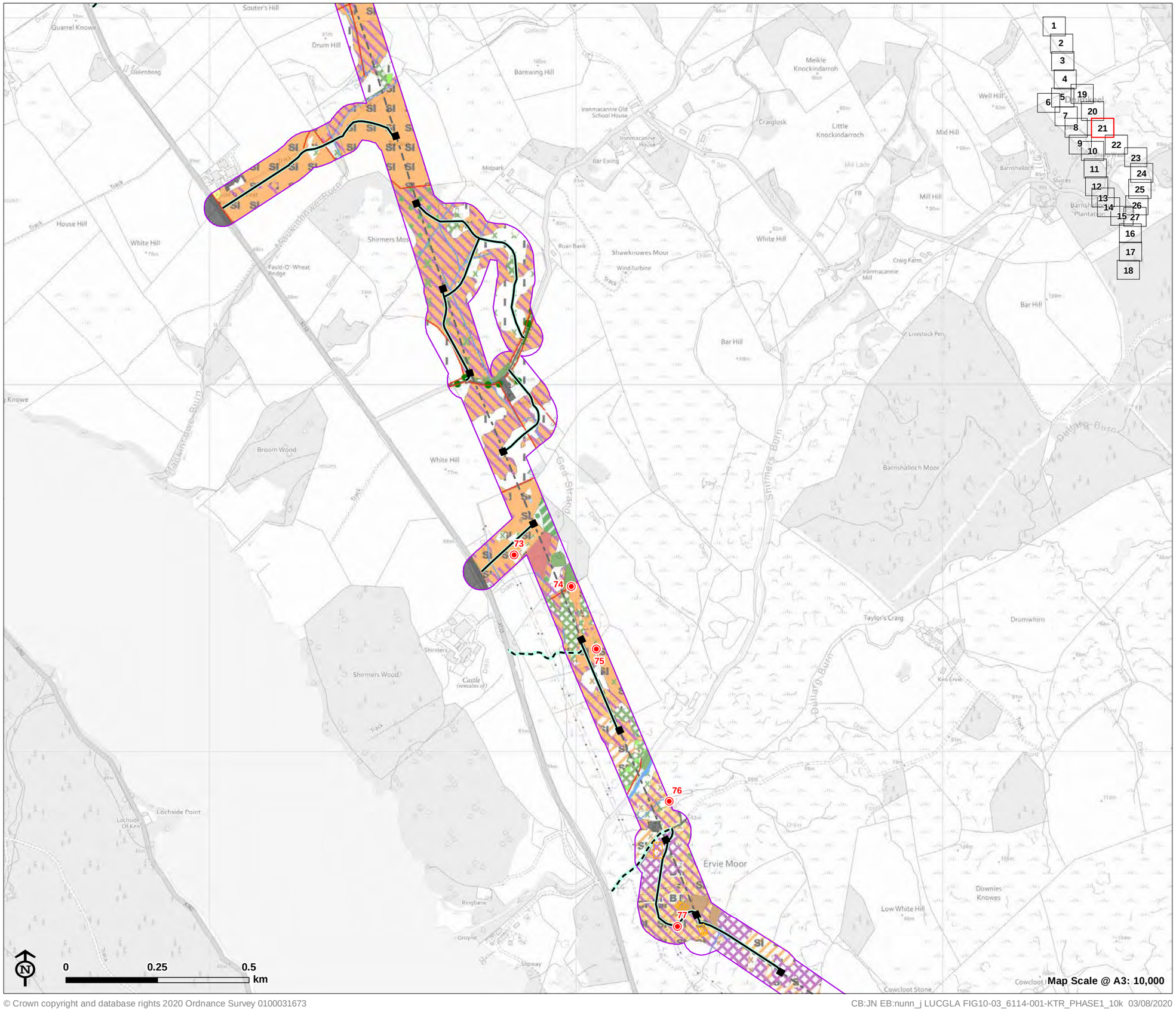
Figure 10.3.21: Phase 1 Habitats



Overhead line infrastructure

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

Access to towers for removal

- Existing access
- New access

Phase 1 Habitat Survey

- Study area
- Target note

Phase 1 Habitat Linear Features

- J2.3.2 Hedge with trees (species-poor)
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas

- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.1 Broadleaved woodland (semi-natural)/A1.1.2 Broadleaved woodland (plantation)
- A1.2.1 Coniferous woodland (semi-natural)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/A3.1 Broadleaved scattered trees
- A2.1 Scrub (dense/continuous)/C1.2 Bracken (scattered)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/A3.1 Broadleaved scattered trees
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A3.1 Broadleaved scattered trees
- A3.1 Broadleaved scattered trees/C1.2 Bracken (scattered)
- B1.2 Acid grassland (semi-
- B1.2 Acid grassland (semi-improved)/A2.2 Scrub
- B1.2 Acid grassland (semi-improved)/C1.2 Bracken
- B1.2 Acid grassland (semi-improved)/D6 Wet heath/acid
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A2.2 Scrub (scattered)
- B4 Improved grassland
- B4 Improved grassland/A2.2 Scrub (scattered)
- B4 Improved grassland/C1.2 Bracken (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/A2.2 Scrub (scattered)
- B5 Marshy grassland/A3.1 Broadleaved scattered trees
- B5 Marshy grassland/D6 Wet heath/acid grassland
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B1.2 Acid grassland (semi-
- C3.1 Other tall herb and fern (ruderal)
- C3.2 Other tall herb and fern (non ruderal)
- D6 Wet heath/acid grassland/A2.2 Scrub (scattered)
- D6 Wet heath/acid grassland/C1.2 Bracken (scattered)
- D6 Wet heath/acid grassland/C1.2 Bracken (scattered)/A3.1 Broadleaved scattered trees
- E1.7 Wet modified bog
- E3.2 Fen - basin mire/D6 Wet heath/acid grassland
- G1 Standing water
- J1.2 Amenity
- J5 Other habitat
- J5 Other habitat/A3.1 Broadleaved scattered trees
- Survey Not Required

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Figure 10.3.22: Phase 1 Habitats

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

Access to towers for removal
- Existing access
- New access

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- B1.2 Acid grassland (semi-
- B2.1 Neutral grassland (unimproved)
- B2.2 Neutral grassland (semi-improved)
- B2.2 Neutral grassland (semi-improved)/A2.2 Scrub (scattered)
- B2.2 Neutral grassland (semi-improved)/C1.2 Bracken (scattered)
- B4 Improved grassland
- B4 Improved grassland/C1.2 Bracken (scattered)
- B5 Marshy grassland
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C1.1 Bracken (continuous)/B4 Improved grassland
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/C3.1 Other tall herb and fern (ruderal)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/D1 Dry dwarf shrub heath/A3.1 Broadleaved scattered trees
- C3.1 Other tall herb and fern (ruderal)
- D5 Dry heath/acid grassland
- E1.7 Wet modified bog
- E2.1 Acid
- I1.4.1 Acid/neutral
- J1.2 Amenity
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.23: Phase 1 Habitats

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

Access to towers for removal
- Existing access
- New access

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.1.1 Intact hedge (native species-rich)
- J2.2.2 Defunct hedge (species-poor)
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)/A3.1 Broadleaved scattered trees
- A4.2 Coniferous woodland (recently felled)
- B2.1 Neutral grassland (unimproved)
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- C1.1 Bracken (continuous)
- C1.1 Bracken (continuous)/A2.2 Scrub (scattered)
- C1.1 Bracken (continuous)/A3.1 Broadleaved scattered trees
- C3.1 Other tall herb and fern (ruderal)
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees/A2.2 Scrub (scattered)
- G1 Standing water
- J1.1
- J1.2 Amenity
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.24: Phase 1 Habitats

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

Access to towers for removal
- Existing access
- New access

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.1.1 Intact hedge (native species-rich)
- J2.2.2 Defunct hedge (species-poor)
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A2.2 Scrub (scattered)
- A4.1 Broadleaved woodland (recently felled)
- B4 Improved grassland
- B4 Improved grassland/A3.1 Broadleaved scattered trees
- B5 Marshy grassland
- B5 Marshy grassland/F1 Swamp
- C1.1 Bracken (continuous)
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees
- C3.1 Other tall herb and fern (ruderal)/A3.1 Broadleaved scattered trees/A2.2 Scrub (scattered)
- G1 Standing water
- I2.1 Quarry
- J1.1
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.25: Phase 1 Habitats

Overhead line infrastructure

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

Access to towers for removal

- Existing access
- New access

Phase 1 Habitat Survey

- Study area

Phase 1 Habitat Linear Features

- J2.2.2 Defunct hedge (species-poor)
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas

- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A1.3.2 Mixed woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A4.2 Coniferous woodland (recently felled)/B5 Marshy grassland
- B4 Improved grassland
- B4 Improved grassland/C3.1 Other tall herb and fern (ruderal)
- B5 Marshy grassland
- E3.3 Fen - flood plain mire
- G1 Standing water
- I2.1 Quarry
- J1.1
- J1.2 Amenity
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.26: Phase 1 Habitats

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

Access to proposed towers
- New access

Access to towers for removal
- Existing access
- New access

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.3.2 Hedge with trees (species-poor)
- J2.4 Fence
- J2.5 Wall

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.1 Scrub (dense/continuous)/B5 Marshy grassland
- A2.2 Scrub (scattered)
- B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B4 Improved grassland/A2.2 Scrub (scattered)
- B5 Marshy grassland
- B5 Marshy grassland/B1.2 Acid grassland (semi-
- G1 Standing water
- J1.1
- J1.2 Amenity
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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Figure 10.3.27: Phase 1 Habitats

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

Access to proposed towers
- New access
- Timber extraction spur

Access to towers for removal
- Existing access
- New access
- Working area

Phase 1 Habitat Survey
- Study area
- Target note

Phase 1 Habitat Linear Features
- J2.2.2 Defunct hedge (species-poor)
- J2.3.2 Hedge with trees (species-poor)
- J2.4 Fence
- J2.5 Wall
- TL Tree line

Phase 1 Habitat Areas
- A1.1.1 Broadleaved woodland (semi-natural)
- A1.1.2 Broadleaved woodland (plantation)
- A1.2.2 Coniferous woodland (plantation)
- A2.1 Scrub (dense/continuous)
- A2.2 Scrub (scattered)
- A2.2 Scrub (scattered)/C1.2 Bracken (scattered)
- A4.2 Coniferous woodland (recently felled)
- A4.2 Coniferous woodland (recently felled)/A1.2.2 Coniferous woodland (plantation)
- B1.2 Acid grassland (semi-improved)/B2.2 Neutral grassland (semi-improved)
- B4 Improved grassland
- B5 Marshy grassland
- B5 Marshy grassland/B1.2 Acid grassland (semi-
- B5 Marshy grassland/G1 Standing water
- B6 Poor grassland (semi-improved)
- C1.1 Bracken (continuous)
- C1.2 Bracken (scattered)
- C1.2 Bracken (scattered)/B2.2 Neutral grassland (semi-improved)
- C1.2 Bracken (scattered)/B6 Poor semi-improved grassland
- D1 Dry dwarf shrub heath
- E1.7 Wet modified bog
- E3.3 Fen - flood plain mire
- G1 Standing water
- I1.4.2 Basic rock
- J1.2 Amenity
- Survey Not Required

0 0.25 0.5 km

Map Scale @ A3: 10,000

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