



Appendix A25.1 – Terrestrial Habitats

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1 Introduction

1.1 General Background

- 1.1.1 This report is one of the appendices supporting Chapter 25 (Ecology and Nature Conservation) of the AWPR Environmental Statement (ES). This report considers the potential impacts on terrestrial habitats and flora associated with the Southern Leg section of the proposed scheme. The results of the surveys carried out for the purposes of this assessment are also presented and are shown on Figures A25.2a-f.
- 1.1.2 The component route sections for the Southern Leg study area of the proposed scheme are as follows:
- Section SL1 ch207200 – 203150 (Charleston to Bishopston);
 - Section SL2 ch203150 – 200600 (Bishopston to Burnhead);
 - Section SL3 ch200600 – 102870 (Burnhead to the A93);
 - Section SL4 ch102870 – 105900 (A93 to Beanshill);
 - Section SL5 ch105900 – 108500 (Beanshill to the South Kingswells Junction); and
 - Section SL6 ch108500 – 111200 (South Kingswells Junction to Derbeth Overhills).
- 1.1.3 All tables and figures are structured in this manner.
- 1.1.4 These studies were included as part of the Ecological Impact Assessment (EclA) and were undertaken in accordance with the 'Design Manual for Roads and Bridges (DMRB) Volumes 10 and 11 and the Environmental Impact Assessment (Scotland) Regulations 1999 (Highways Agency, 2005), along with cognisance of Institute of Ecology and Environmental Management (IEEM) guidelines (2002).
- 1.1.5 These studies included desk-based consultation to collate existing information about terrestrial habitats in the study area for the proposed scheme and field surveys to provide current data about the terrestrial habitats and flora within the study area.
- 1.1.6 Cumulative impacts are assessed in a separate report combining the predicted impacts for all habitats and species over the proposed route (refer to Part E of the ES).

Aims of Assessment

- 1.1.7 The purpose of the extended Phase 1 Habitat survey and the assessment of potentially affected terrestrial habitats and flora was to:
- identify and map all areas of semi-natural habitat within the area to be affected by the proposed scheme;
 - provide a botanical description of the semi-natural habitats surveyed;
 - identify areas or habitats within the study area that are of particular ecological interest for nature conservation and which require more detailed investigation; and
 - provide supplementary information from incidental observations of fauna to assist other surveys.

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1.2 Background to Phase 1 Habitat Survey

- 1.2.1 An extended Phase 1 habitat survey was conducted, using the standard methodology as described in the Handbook for Phase 1 Habitat Survey (JNCC 1993). This has become a widely accepted method for surveying semi-natural habitats and is regarded as an essential part of the EIA process whenever ecological receptors are likely to be affected by a development (IEMA 1995; IEEM 2006).
- 1.2.2 The Phase 1 Habitat survey methodology was developed for the purpose of mapping terrestrial and freshwater habitats within Sites of Special Scientific Interest (SSSIs) and nature reserves and for larger scale strategic surveys. The classification has since been adopted by the Institute of Environmental Management and Assessment (IEMA) and IEEM as one of the standard methods used in EIA and the preparation of Environmental Statements under the Environmental Impact Assessment (Scotland) Regulations 1999.
- 1.2.3 Phase 1 Habitat Survey has been further recognised as a standard ecological assessment tool in the DMRB and is recommended as an essential part of the assessment of ecological impacts associated with road construction (DMRB 2005).

1.3 Legal Status

- 1.3.1 Semi-natural habitats are conferred legal protection through international and national statutes. These recognise the ecological value of the habitats and provide protection or promote policies that guide their conservation.
- 1.3.2 The EU Habitats Directive 1992 aims to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species at a favourable conservation status, introducing robust protection for those habitats and species 'of Community interest' (Article 2) (Jackson and McLeod 2000). In applying these measures, Member States are required to take account of economic, social and cultural requirements and regional and local characteristics.
- 1.3.3 These habitats and species are to be protected by the creation of a series of 'Special Areas of Conservation' (SACs) (Article 4) and by various other safeguard measures for particular species. Annex 1 of the Habitats Directive lists 189 habitats, 76 of which occur in the UK. In addition, a series of Annex 1 habitats are afforded 'priority' status as these are judged to be in particular danger of loss (Article 1). Twenty-three of these priority habitats occur in the UK.
- 1.3.4 Nationally important sites are designated as SSSIs in England, Scotland and Wales and conferred protection under various statutes including the Wildlife and Countryside Act 1981 (as amended) and the Nature Conservation (Scotland) Act 2004.
- 1.3.5 The Nature Conservation (Scotland) Act 2004 requires Scottish Ministers to publish a list of habitats and species considered to be of principal importance for biodiversity. In addition, the Act requires that all public bodies have an obligation to further biodiversity in the course of carrying out all their public duties.

1.4 Biodiversity Action Plans

- 1.4.1 The UK Biodiversity Action Plan (UKBAP) (1994) is the UK government's response to the Convention on Biological Diversity. The UKBAP sets out a programme of action to conserve and enhance biological diversity throughout the UK. Local Biodiversity Action Plans (LBAPs) integrate these measures at the local or regional level (see below).

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- 1.4.2 The UK Biodiversity Steering Group has published individual action plans for 45 priority habitats and 400 of our most threatened and endangered species. These Habitat and Species Action Plans (HAPs and SAPs respectively) have been developed to guide conservation action for the ecological feature concerned. The presence of a HAP or SAP reflects the fact that the habitat or species concerned is in a sub-optimal state and requires conservation action. It does not imply any specific designation or level of importance, but establishes a framework for the conservation of the habitat and identifies current factors causing loss and decline of that feature. The implementation of BAPs, whether at the UK or local level, is perceived as a fundamental requirement for public bodies to meet their obligations under the relevant national legislation.
- 1.4.3 UKBAP Priority Habitats are distinct from Annex I Habitats listed in the EU Habitat Directive. Priority habitats include those identified by the UK Steering Group as being particularly important or that are vulnerable to habitat loss and damage and for which conservation action should be targeted.
- 1.4.4 In order to set priority habitats requiring conservation action in context, a classification of broad habitat types has been developed (UK Steering Group 1995). In the most recent classification (Jackson, 2000), 37 broad habitat types have been identified, 20 of which occur in Scotland.

North East Scotland LBAP

- 1.4.5 The North East Scotland (NES) LBAP is implemented through the North East Scotland Biodiversity Partnership, involving local authorities, environmental, forestry, farming, land and education agencies, businesses and individuals involved in biodiversity across North East Scotland. The NES LBAP includes areas of Aberdeen, Aberdeenshire and Moray and is a locally driven process working towards action to conserve important species and habitats.
- 1.4.6 Most of the North East Action for Biodiversity is addressed through Local Habitat Action Plans (LHAPs), which incorporate action for associated priority species. In addition, a series of Local SAPs have been developed to aid conservation of local priority species. Local SAPs have been implemented to date for red squirrel (*Sciurus vulgaris*), water vole (*Arvicola terrestris*), Aspen hoverfly (*Hammerschmidtia ferruginea*) wych elm (*Ulmus glabra*) and Daubenton's bat (*Myotis daubentonii*). LBAPs and SAPs include targets and objectives that incorporate habitat management actions. Further details of impacts on animal species are included in the relevant appendices accompanying Chapter 25 (Ecology and Nature Conservation). Impacts on local wych elm populations are included in this report.
- 1.4.7 Local Habitat Action Plans are in the process of development and implementation and have been broadly grouped under a series of habitat types that include: Coastal and Marine; Farmland and Grassland; Woodland; Montane, Heath and Bog; Wetland and Freshwater; and Urban Habitats. Local HAPs that have been implemented to date and which are relevant to the current study are listed in Annex 2, which includes a summary of national and local targets and objectives where relevant.

Wet Woodland

- 1.4.8 Willow carr is defined in the Phase 1 Habitat Manual as woodland where the willows are more than 5m tall (although *Salix cinerea* should always be classed as scrub and scrub when all willow carr [are] less than 5m tall [and] all *Salix cinerea* carr. This contrasts with National Vegetation Classification (Rodwell, 1991a et seq.), which describes willow carr as woodland, as does the UK BAP Wet Woodland Priority Habitat. For the purposes of mapping, willow carr has been categorised as woodland to reflect it being assessed as being of higher conservation value. Scrub, therefore, signifies habitats of a lower conservation value such as scattered willow and birch, or dense/scattered gorse/broom.

2 Approach and Methods

2.1 Consultation

- 2.1.1 Existing survey data was sought as it provides evidence of habitats and species present in the study area and provides a basis for updating records of known populations. In addition, consultation with statutory organisations provided information on the presence of designated sites, such as SACs and SSSIs, as well as the existence of HAPs or SAPs relevant to the study area, as specified in the UK BAP or a Local BAP.
- 2.1.2 Consultation was undertaken with several organisations to identify issues relating to habitats and plant species present in the study area:
- Scottish Natural Heritage (SNH);
 - Scottish Environment Protection Agency (SEPA);
 - North East Scotland Biological Records Centre (NESBReC);
 - University of Aberdeen;
 - Royal Society for the Protection for Birds (RSPB);
 - Aberdeenshire and Aberdeen City Councils; and
 - Scottish Wildlife Trust (SWT);
 - North East Scotland LBAP Co-ordinator; and
 - Forestry Commission

2.2 Survey Methods

- 2.2.1 In May to July 2006, all habitats encountered within 500m either side of the centreline of the proposed scheme were assessed and coded according to the survey methods outlined in 'The Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit' (JNCC 1993).
- 2.2.2 Additional target notes were made to record key habitat features too small to be mapped (<100m²) and to provide greater detail on other features of ecological interest. Botanical taxonomic nomenclature follows that of Stace (1997).
- 2.2.3 Hereafter, the area surveyed is referred to as the 'study area'. All areas of countryside or semi-natural vegetation within 500m either side of the route were assessed. It should be noted that urban areas dominated by housing were not subject to detailed survey. However, urban areas with public green space such as industrial estates and parkland were surveyed. Existing curtilages and active railway embankments were not surveyed directly although roadside verges of botanical interest were target noted.
- 2.2.4 In localised areas, the study area extended beyond 500m either side of the proposed scheme, where the proposed route incorporated several potential alignment options at the time of survey, at junctions where the road layout was not known or in areas where ecologically important habitats overlapped the boundary of the study area.
- 2.2.5 To aid description of the semi-natural habitats present in the study area, each section of the route has been sub-divided into Habitat Areas. These were defined *a posteriori*, following analysis of the Phase 1 Habitat Survey data and aerial photographs. This formed the basis for the ecological evaluation of the habitats.

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2.3 Evaluation of Nature Conservation Value

2.3.1 The value of each site with nature conservation interest was determined by reference to any designations and the results of the consultations, literature review and field surveys. Sites and features were classified according to the criteria identified in Table 1.

2.3.2 The criteria used were based on the Ratcliffe Criteria (Ratcliffe 1977) used in the selection of biological Sites of Special Scientific Interest (SSSI). Habitat areas of interest in terms of their ecology and nature conservation value have been evaluated using criteria suggested by the IEEM Guidelines for Ecological Impact Assessment (2002). These criteria assign a level of importance to the habitat area based on whether the ecological value is important at a range of geographical scales, from being important at a local, parish level to being of international importance. The full details of the general evaluation criteria used are included in Table 1.

Table 1 – Evaluation of Ecological Receptor

Value/Importance	Criteria
International (European)	<p>Habitats</p> <p>An internationally designated site or candidate site such as Special Protection Area (SPA), provisional SPA (pSPA), Special Areas of Conservation (SAC), candidate SAC (cSAC, Ramsar site, Biogenetic/Biosphere Reserve, World Heritage Site) or an area that would meet the published selection criteria for designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to maintain the viability of a larger whole. Any river classified as Excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> <p>Species</p> <p>Any regularly occurring population of internationally important species, threatened or rare in the UK, i.e. a UK Red Data Book species categories 1 and 2 of UK Biodiversity Action Plan BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of an internationally important species.</p>
National (Scottish)	<p>Habitats</p> <p>A nationally designated site such as Site of Special Scientific Interest (SSSI), Areas of Special Scientific Interest (ASSI), National Nature Reserve (NNR, Marine Nature Reserve) or a discrete area which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat essential to maintain wider viability. Any river classified as Excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> <p>Species</p> <p>A regularly occurring, regionally or county significant population/number of an internationally/nationally important species. Any regularly occurring population of a nationally important species that is threatened or rare in the region or county (see local BAP). A feature identified as of critical importance in the UK BAP.</p>
Regional (North East Scotland)	<p>Habitats</p> <p>Sites that exceed the County-level designations but fall short of SSSI selection criteria. Viable areas of key habitat identified in the Regional BAP or smaller areas of habitat essential to maintain wider viability. Viable areas of key habitat identified as of Regional value in the appropriate SNH Natural Heritage Future area profile. Any river classified as Excellent A1 or Good A2 and capable of supporting salmonid population. Any river with a Habitat Modification Score indicating that it is Significantly Modified or above.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant SNH Natural Heritage Future area on account of its regional rarity or localisation. A regularly occurring, locally significant population/number of a regionally important species. Sites maintaining populations of internationally/nationally important species that are not threatened or rare in the region or county.</p>
Authority Area (e.g. County or District) (Aberdeenshire/ City of Aberdeen)	<p>Habitats</p> <p>Sites recognised by local authorities, e.g. District Wildlife Sites (DWS) and Sites of Interest for Nature Conservation (SINS). County/District sites that the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNR). A viable area of habitat identified in County/District BAP or in the relevant Scottish Natural Heritage (SNH) Natural Heritage Future area profile. A diverse and/or ecologically valuable hedgerow</p>

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Value/ Importance	Criteria
	<p>network. Semi-natural ancient woodland greater than 0.25ha. Any river classified as Good A2 or Fair B and likely to support coarse fishery. Any river with a Habitat Modification Score indicating that it is Significantly Modified or above.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species listed in a County/District BAP due to regional rarity or localisation. A regularly occurring, locally significant population of a County/District important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county and not integral to maintaining those populations. Sites/features scarce in the County/District or which appreciably enrich the County/ District habitat resource</p>
<p>Local (immediate local area or village importance)</p>	<p>Habitats</p> <p>Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds). Sites that retain other elements of semi-natural vegetation that due to their size, quality or the wide distribution within the local area are not considered for the above classifications. Semi-natural ancient woodland smaller than 0.25ha. Any river classified as Fair B or Poor C and unlikely to support coarse fishery. Rivers with a Habitat Modification Score indicating that it is Severely Modified or above.</p> <p>Species</p> <p>Populations/assemblages of species that appreciable enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county and are not integral to maintaining those populations.</p>
<p>Less than Local (limited ecological importance)</p>	<p>Sites that retain habitats and/or species of limited ecological importance due to their size, species composition or other factors. Any river classified as Impoverished D and/or and with a Habitat Modification Score indicating that it is Severely Modified.</p>

2.3.3 Each Habitat Area has been defined based on the habitats present and its geographical location within the study area. Thus, in any given part of the study area several habitat areas may occur representing, for example, a network of agricultural fields, areas of woodland and other habitats that may be present.

2.4 Impact Assessment

2.4.1 In the assessment of significance of impact, consideration has been given both to the magnitude of impact and to the sensitivity of the receiving environment or species. The sensitivity of a feature was determined with reference to its level of importance although other elements have been taken into account where appropriate. Methods of impact prediction used indirect measurements, correlations, expert opinion, and information from previous developments. Impacts include those that are predicted to be direct, indirect, temporary, permanent, cumulative, reversible or irreversible.

Impact Magnitude

2.4.2 The magnitude of an impact has been assessed for each element of the development. A definition of the magnitude impacts is presented in Table 2 and includes positive impact criteria in accordance with IEEM guidance (2002). The magnitude of each impact was assessed independently of value or statutory status.

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Table 2 – Impact Magnitude

Magnitude	Criteria
High negative	The change is likely to permanently, adversely affect the integrity of an ecological receptor, in terms of the coherence of its ecological structure and function, across its whole area that enables it to sustain the habitat, complex of habitats and/or the population levels of species of interest.
Medium negative	The change is not likely to permanently, adversely affect the integrity of an ecological receptor, but the effect is likely to be substantial in terms of its ecological structure and function and may be significant in terms of its ecological objectives. Likely to result in changes in the localised or temporary distribution of species assemblage or populations but not affect the population status at a regional scale or permanently.
Low negative	The change may adversely affect the ecological receptor, but there will probably be no permanent effect on its integrity and/or key attributes and is unlikely to be significant in terms of its ecological objectives. Impacts are unlikely to result in changes to the species assemblage or populations, but core species more vulnerable to future impacts
Negligible	The change may slightly adversely affect the receptor but will have no permanent effect on the integrity of the receptor or its key attributes. There are no predicted measurable changes to the species assemblage or population and the effect is unlikely to result in an increased vulnerability of the receptor to future impacts.
Positive	The change is likely to benefit the ecological receptor, and/or enhance the biodiversity resource of the receptor.
High positive	The change is likely to restore an ecological receptor to favourable conservation status, contribute to meeting BAP objectives (local and national) and/or create a feature that is of recognisable value for biodiversity.

Impact Significance

2.4.3 The significance of an impact was determined according to the matrix of importance and magnitude as illustrated in Table 3.

Table 3 – Impact Significance

Magnitude \ Importance	High Negative	Medium Negative	Low Negative	Negligible	Positive	High Positive
International	Major	Major	Moderate	Negligible	Moderate	Major
National	Major	Major	Moderate	Negligible	Moderate	Major
Regional	Major	Moderate	Minor	Negligible	Minor	Moderate
County	Moderate	Moderate	Minor	Negligible	Minor	Moderate
Local	Minor	Minor	Minor	Negligible	Minor	Minor
Less than Local	Minor	Negligible	Negligible	Negligible	Negligible	Negligible

2.4.4 The level of significance of impacts predicted on ecological receptors is an important factor in influencing the decision-making process and determining the necessity and/or extent of mitigation measures. Impacts can be beneficial or adverse, either improving or decreasing the ecological status health or viability of a species, population or habitat. In general, an impact significance of greater than or equal to Moderate would require specific mitigation to be undertaken to ameliorate adverse impacts.

2.5 Limitations to Assessment

2.5.1 The survey was undertaken from May to July 2006. This is an optimal time of year to carry out botanical and habitat surveys as flowering plants are in leaf and flower and misidentification is minimised. However, surveys of wildlife cannot guarantee that all biological clues are recorded and early or late flowering species may be under represented.

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3 Baseline

3.1 Consultation Information

- 3.1.1 SNH provided records of ancient and long-established woodlands from their Semi-natural and Ancient Woodland Inventories and peatlands listed in the Lowland Raised Bog Inventory (LRBI) (refer to Figures 25.1a-c).
- 3.1.2 Aberdeen City Council provided details of statutory and non-statutory designated sites of ecological importance including SSSI, District Wildlife Sites (DWS) and a list of NESLBAP priority habitats. The NESLBAP Coordinator confirmed locally important species and priority habitats.
- 3.1.3 The North East Scotland Biological Records Centre (NESBReC) provided Phase 1 Habitat Survey results undertaken by the Scottish Wildlife Trust (1992 to 1997 and 2002), a plan showing DWS and the results of the Grampian Natural Habitat Survey (1988).
- 3.1.4 The Forestry Commission provided data about forest/woodland areas and their management.
- 3.1.5 Additional data concerning rare flora was received from the Botanical Society of the British Isles (BSBI) County Recorder for Aberdeen and Kincardine.

Designated Areas

- 3.1.6 Cleanhill Wood and Kingcausie is a SESA (Study of Environmentally Sensitive Area), while the River Dee is a SAC, SSSI and DWS. Crynoch Burn is part of the River Dee SAC and SSSI. Other DWS sites are the Deeside Old Railway, Culter House Woods, Guttrie Hill, Rotten O'Gairn, Moss of Auchlea and West Hatton Woods. Maps showing sites designated for their conservation value are presented in Figures 25.1a-c.

Habitats

- 3.1.7 Habitat types include boundary and linear features, arable and horticultural land, improved grassland, fen, marsh and swamp, coniferous woodland and broad-leaved, mixed (and yew) woodlands.
- 3.1.8 Several priority UK BAP habitats are present in the study area, including lowland heath, lowland raised bog, cereal field margins, lowland meadows, wood-pasture and parkland and wet woodland. The NES Biodiversity Audit identified that Aberdeenshire (Alexander et. al.) holds 44 listed habitats. The habitats are well represented in North East Scotland in a UK or Scottish context. Those of relevance to the study area are planted coniferous woodlands, acid grassland, lowland raised bogs and fens. In addition, six locally important habitats were identified. Of these, scrub, riparian woodland, birch woodlands and serpentine grassland/heath mosaic are relevant to the study area. Birch woodlands and serpentine grassland/heath mosaic are considered to be of national significance.
- 3.1.9 Although not a BAP species or protected under UK legislation, Herb Paris (*Paris quadrifolia*) has been recorded in Kingcausie since the 18th Century and is a rare species within the region (David Welch, pers.comm.). A July 2006 visit by Mr Welch (a representative of the BSBI), however, noted a substantial decline in the population, stating that only two small stems were present. This is in contrast to a previous survey by Mr Welch (May, 2006), where over 100 stems were recorded.

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3.2 Survey Results

3.2.1 The results of the Phase 1 Habitat survey are presented on Figures 25.2a-h. Target notes are presented on the figures and are detailed in Annex 1. On the basis of these results, further boundaries were drawn around groups of Phase 1 Habitat Areas where they formed an obvious ecological unit and further discussion provided.

3.2.2 The following paragraphs briefly describe the main habitats identified within the study area with Habitat Area numbers.

Section SL1

3.2.3 This is a complex section comprising dominant agricultural fields and extensive plantation woodland with mesotrophic semi-improved rides. Bog is present in Hare Moss and to the west of the A956. Marsh is associated with these bog habitats, as are small areas of swamp (see Table 4).

3.2.4 The following notable habitats are present in this section:

- **Woodland-Plantation:** The more mature plantations are dominated by pine, especially Scots pine (*Pinus sylvestris*) in Habitat Area S7 and parts of S9, whilst the younger plantations are dominated by spruce, particularly Sitka spruce (*Picea sitchensis*) (S9 and S11).
- **Woodland-Semi-natural:** This habitat is limited to mature willow (*Salix* sp.) carr in the west of Hare Moss (S10).
- **Marsh/Marshy grassland:** Marshy grassland is typically linked to the bog habitats of S4 and S10. These tend to be relatively species rich, containing an assortment of grasses and rushes.
- **Bog habitats:** Hare Moss is the largest area of bog. Wet modified bog dominates overall with soft rush (*Juncus effusus*), purple moor-grass (*Molinia caerulea*) and hare's-tail cotton grass (*Eriophorum vaginatum*) all co-dominant, whilst a dry modified bog occurs in the higher areas to the west where heather (*Calluna vulgaris*) and gorse (*Ulex europaeus*) become dominant. Downy birch (*Betula pubescens*) is regenerating. A very degraded modified bog also occurs to the west of the A956 (S4).
- **Semi-improved Grassland:** Semi-improved grassland is generally mesotrophic and associated with conifer plantations. This occurs both as fields adjacent to the plantation and as rides within woodlands. A mesotrophic grassland is present in the southeast (S5).
- **Scrub habitats:** Occasional gorse scrub is present in this section, along with willow as scattered shrubs across the bog habitats.
- **Invasive species:** Japanese knotweed (*Fallopia japonica*) is growing within an earth bund to the west of the A90.
- **Linear habitats:** Dry stone walls separate the series of improved fields in the east of this section.

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Table 4 – Habitat Areas Found in Section SL1

Habitat Area	Feature/Asset	Target Note Number	Description
S1	Hatton Wood	117	Birch wood, which, although derived from plantation, is beginning to develop a semi-natural ground flora. The canopy can be relatively open in places.
S2	Agricultural fields west of the A90	116	A series of largely improved fields, many of which are separated by stone walls.
S3	Blue Hill Wood	110 111 112	This contains an extensive dense gorse scrub in the north, merging into a bracken (<i>Pteridium aquilinum</i>)/conifer plantation assemblage towards the south. A pond is present within a disused quarry where willow carr and marshy grassland have begun to develop.
S4	Bog south of Greenhowe	114	Small area of modified degraded bog habitats. The west is slightly drier than the east due to the presence of a slope. This has resulted in different bog communities, for example, ericoids are more extensive in the west.
S5	Agricultural fields south of Greenhowe	104 105	Dominated by large arable and improved fields. This area also contains a drain-associated marshy grassland with influence of bog species. A woody element is provided by conifers to the south of un-named farm buildings. Japanese knotweed is present.
S6	Greenhowe Wood	102 106 107 108 109 113	Young coniferous plantation with broad-leaved edges and occasional blocks present on the AWI as long-established woodland of plantation origin. A species poor semi-improved ground flora is limited to these broad-leaved sections. A patch of marsh is present to the west, whilst a pond with surrounding wet grassland is located in the northwest.
S7	Duff's Hill	103	Dense pine plantation with broad-leaved edge and a strip of scrub. Virtually no ground flora is associated with this forest.
S8	Agricultural fields west of Duff's Hill		Series of improved, poor semi-improved and arable fields. Dry stone walls are present though limited, whilst shrubs are extremely sparse. Fields contain dark peaty soils.
S9	Wood west of Greenhowe	96 97 98 99 100	The majority of this area is composed of young spruce plantation with little ground flora. Other habitats present include amenity grassland with scattered trees and more mature conifer plantation with poor to good semi-improved field flora. To the south, semi-improved acid grassland with scrub gives way to a small semi-natural broad-leaved woodland.
S10	Hare Moss	91 92 93 94	This area comprises of a number of bog communities, with heather dominant. Extensive areas of marsh grading to swamp are present, these mainly associated with vegetated drains. Scrub can be extensive and dense, particularly towards the south, whilst willow and birch occur across the bog. Part of the moss has been converted to amenity grassland for recreational activity.

Section SL2

3.2.5 This section is dominated by small fields of improved grassland used for grazing cattle and sheep. A number of more diverse grasslands are associated with the grazing of horses. The majority of these fields have dry stone walls as a boundary feature. Scrub, including dense pockets, occurs throughout this section. Woodland is extensive, consisting mainly of conifer plantations. Hill of Blairs is a particularly rich area, consisting of a variety of habitats including conifer and broad-leaved woodland, as well as heath and bog communities.

3.2.6 Habitats within this section of the study area include:

- Woodland-Plantation: Clochandighter Wood (S14) is a lodgepole pine (*Pinus contorta*) / Sitka spruce conifer plantation on the AWI as long-established of plantation origin. At the time of survey the majority of the wood within the route corridor had been felled. A dry heath flora was present within the majority of the rides. Hill of Blairs (S15) is a complex mosaic of communities that includes conifer plantation also on the AWI as above. Most of the plantation is dominated by Scots pine, however, to the north, a rowan (*Sorbus aucuparia*) plantation is present.

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Unusually, this completely encloses a Sitka spruce plantation with a bilberry (*Vaccinium myrtillus*) dominated ground flora. Additional conifer plantation woodlands are present at Whitestone Wood (AWI as above) and Cleanhill Wood Lodge (both S15).

- **Woodland-Semi-natural:** Semi-natural woodland is limited in this section. The only area found was at Greenloaning (AWI as above) (S12), which consists of a birch woodland with willow shrub layer. Fly tipping was observed during field visits to this site.
- **Marsh/Marshy Grassland:** Marshy areas are present in occasional fields with poor drainage. These communities are species poor and overwhelmingly dominated by soft rush.
- **Semi-improved Grassland:** Poor semi-improved grasslands tend to be associated with horse-grazing pastures. The majority of these occur immediately to the north of Clochandighter (S13). Dry stone walls are present as a boundary along fields. Scrub (normally gorse) is also present at the roadside edges of these fields.
- **Bracken and Scrub habitats:** Dense gorse scrub is particularly prominent to the west of Clochandighter (S16). Scattered scrub occurs as a lining to many of the field boundaries with gorse being the dominant species, although elder (*Sambuca nigra*) and hawthorn (*Crataegus monyngna*) can occasionally dominate. Dense bracken occurs to the south of Hill of Blairs (S15), often in connection with dense scrub.
- **Linear habitats:** Dry stone walls are a distinctive feature occurring as barriers between fields and roads. The majority of these are in good condition, though areas such as that delineating Greenloaning Wood (S12) are in poorer condition and were found with fencing. Species rich hedgerows with trees are present to the south of Whitestone Wood (S15), though the majority of wooded boundaries consist of scattered or dense scrub, or a line of individual trees.

Table 5– Habitat Areas Located in Section SL2

Habitat Area	Feature/Asset	Target Note Number	Description
S11	North of Sunnyside	87 88	Two plantation birch/ rowan woodlands (AWI). The western side is becoming more semi-natural, with a variety of ages and less uniform planting. The eastern edge has grassy paths used for recreation.
S12	Greenloaning Wood	89	Two distinct areas of woodland. To the east is a dense birch woodland plantation with other occasional broad-leaved shrubs. The east is dominated by a semi-natural mix of broadleaves, although birch is dominant. Pools, burns and channels are present in both woods.
S13	Agricultural fields around Sunnyside to Causeyport	87 88 89 90 95	A series of improved and horse-grazed semi-improved fields. Small copses of broadleaves surrounded by walls are present though the ground flora is species poor.
S14	Clochandighther Wood	82 83 84 85	Mature conifer plantation woodland (AWI). A sizeable portion of this area has been felled, with the remaining portion being dominated by lodgepole pine and spruce. Dry heath dominates the rides and is also present under much of the plantation. A concrete water storage system is at the centre of this area.
S15	Whitestone Wood and Hill of Blairs	76 77 78 79 80 81	Mature conifer plantation is the dominant habitat within this area both on the AWI. This has a rich ground flora, particularly within Hill of Blairs. Areas of dry heath, wet heath and mire also exist within Hill of Blairs, as do areas of dense bracken and continuous scrub.
S16	Agricultural fields to the east of Burnhead to Greenloaning	86	Improved grassland dominates this area. Soft rush dominated marshy grassland is present within the field. Trees and hedgerows are present within some of the fields and surrounding the area, as are dry stone walls.

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Section SL3

- 3.2.7 Conifer plantation dominates the majority of this section. However, areas such as Cleanhill Wood contain conifer and mixed plantation combined with more semi-natural broad-leaved wood. The division between these communities can be unclear. The northern half of the section contains semi-natural broad-leaved wood, though the majority of this is derived from plantation.
- 3.2.8 Habitats in this section of the study area include:
- **Woodland-Plantation:** Durriss Forest (S18) is a large plantation where, overall, Sitka spruce is dominant. Durriss Forest is included on the AWI as long-established of plantation origin. Other well-defined compartments contain birch, western hemlock (*Tsuga heterophylla*) and Norway spruce (*Picea abies*) plantations. Crynoch Burn (S22) runs through the wood, but this is more associated with grassland communities, particularly in the east. Cleanhill Wood (S20) is dominated by conifer plantation. However to the north, broadleaves become more prevalent, resulting in a mixed plantation or semi-natural broad-leaved woodland derived from plantation. Rhododendron (*Rhododendron ponticum*) is abundant within the shrub layer and was found to be impenetrable in places. An acid grassland/dry heath ground flora is present in many cases. Kingcausie Wood is a conifer plantation on the AWI as long-established of plantation origin with little ground flora, except in clearances such as the marshy grassland containing the reported Herb Paris. Some species-poor plantation also occurs in the west of Storybook Glen (S22).
 - **Woodland-Semi-natural:** Although primarily a conifer plantation, Cleanhill Wood (AWI as above) (S20) develops a more semi-natural community in the north, which continues on into Kingcausie (S24). To the west, sycamore (*Acer pseudoplatanus*) is dominant, while birch is dominant/co-dominant in the east. Rhododendron underlays much of this broad-leaved woodland. The next largest area is riparian woodland associated with Crynoch Burn (S22). Although containing a mix of tree species, overall, sycamore is dominant. The ground flora varies from bare soil to ancient woodland indicators. A smaller area of birch wood is associated with the Blaikiewell Burn (S22). Although mature, the trees are thin, probably due to the high watertable and low nutrient levels, as suggested by the adjacent fen/marsh habitat.
 - **Marsh/Marshy Grassland:** Marshy grassland is present within the floodplain of Crynoch Burn (S22). This is particularly unusual in having reed canary-grass (*Phalaris arundinacea*) as a dominant feature. This species is normally associated with swamp, thus it appears this area is in succession to marsh. Another notable area of marsh occurs alongside Blaikiewell Burn (S22). This habitat grades into floodplain mire when on level ground adjacent to the burn. Other areas of marsh are rare and are associated with poor field drainage, being dominated by soft rush.
 - **Semi-improved Grassland:** Blaikiewell Farm (S19) contains a number of mesotrophic semi-improved grasslands used by horses for grazing. The species richness of habitats varies probably due to grazing intensity. Other areas of poor semi-improved grassland are present in Kingcausie (S24) and by the Old Mill Inn (S26).
 - **Bracken and Scrub habitats:** Dense gorse scrub is associated with many field boundaries. Gorse and elder are present within field systems of Kingcausie (S23). Willow carr with alder occurs along the western riparian zone of the River Dee (S28), with dense gorse to the east. Bracken primarily exists as the field layer to areas of conifer woodland.
 - **Parkland:** The north of Kingcausie (S24) contains an improved field scattered with mature broad-leaved trees.
 - **Linear habitats:** Dry stone walls are particularly a feature of the southern areas of this section (S17 and S20 especially, along with areas of S24). A number of hedgerows are present. Particularly notable is a species rich hedgerow with ancient woodland indicator species within the agricultural habitats of Kingcausie (S23).

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- Invasive Species: Japanese knotweed is present within the agricultural fields of Kingcausie (S23). Rhododendron occurs throughout much of the woodlands of Kingcausie (S24) and Cleanhill Wood (S20).

Table 6 – Habitat Areas Located in Section SL3

Habitat Area	Feature/Asset	Target Note Number	Description
S17	Agricultural fields southwest of Cleanhill Wood	125	Two improved fields separated by an avenue of mixed trees and shrubs, grading into woodland in the north.
S18	Durris Forest	115	Large expanse of plantation woodland, both of broad-leaved and conifer species (AWI). The conifers are mature and have little ground flora associated with them, whilst the broad-leaved birch dominated wood is relatively young and planted upon marshy and acid grassland. Dry heath is often associated with the paths through the wood.
S19	Blaikiewell Farm	119	Sequence of horse-grazed semi-improved fields with occasional buildings. The fields rise sharply from Blaikiewell Burn (i.e. not part of the floodplain) but are gently sloping thereafter towards the south. The rides are lined with young shrubs approaching hedgerows. An arable field is also present.
S20	Cleanhill Wood	138 139 140 141 127 124 123 122 121 128 129 131 134	Mature conifer plantation dominates overall (AWI). However, this area also contains significant amounts of semi-natural broad-leaved woodland. The ground flora is very variable, ranging from heath and acid grassland to bare soil. Rhododendron can be extensive as a shrub layer.
S21	Agricultural fields below Parkhead		Series of arable and improved fields with shrubs and trees provided by the border with the riparian woodland.
S22	Floodplain and immediate surrounds of Crynoch Burn (north) and Blaikiewell Burn	171 153 151 150 149 148 144 143 142 133 132 130	Semi-natural broad-leaved woodland lines much of the area. The river also passes adjacent to the amenity grassland of Storybook Glen. In the north of the area lies a patch of the invasive species, Japanese knotweed. Blaikiewell Burn contains a mosaic of gorse scrub, wet birch woods with grassy undercarpet, marsh in the upper levels grading into floodplain mire in the level ground by the burn.
S23	Agricultural fields within Kingcausie	145 146 147	Series of predominantly improved grassland bordered by woodland and with occasional trees and shrubs located on field boundaries. The area also contains a number of dwelling areas with gardens and amenity grasslands. Ancient hedgerows are present within the vicinity of the dwelling houses. Also present is a small broad-leaved plantation, which is located close to swamp/wet woodland.
S24	Kingcausie	154 155 156 157 158	A number of different habitats dominated by woodland (AWI). This comprises of both plantation and semi-natural, although most of the semi-natural is derived from plantation. The area includes both Kingcausie House and the adjacent walled garden. Two large agricultural fields are also within this area, one with abundant standard trees.

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Habitat Area	Feature/Asset	Target Note Number	Description
		159 160 161 162 163 164 165 166 169 170	
S25	Caravan Park	172	Caravan Park with amenity grassland and scattered trees and shrubs.
S26	Old Mill Inn and agricultural field surrounds		The surrounding agricultural fields are improved or semi-improved. Scattered broadleaves and conifers are also present, as is a well-vegetated field drain. The Inn is a large building with car park.
S27	Agricultural fields south of the River Dee	167 168	This area consists of improved fields with trees and scrub frequent along the margins and two wooded pockets of plantation and scrub in the north of the area.
S28	Floodplain and immediate surrounds of the River Dee	182 176 177 175 174 178	The western section of this area is dominated by wet willow/alder woodland, with tall ruderals also present. The northeastern banks contain a species rich mesotrophic grassland with scattered and dense scrub, plus occasional trees. The southeastern section, however, is primarily composed of woodland. Layers dominated by swamp, bracken and tall ruderals are present towards the rivers edge.
S29	Agricultural fields south of Milltimber	183	A mix of improved and arable fields. Dense gorse and whin scrub lines the roadside and floodplain edges but overall, tree/shrub cover is occasional.
S30	Camphill School	179 180 181	This area comprises of modern buildings with amenity grassland and sculptured gardens. Woodland (AWI), much of it broad-leaved semi-natural derived from plantation, is also present. Trees line most of the area.
S31	Deeside Old Railway		This linear track of a former railway line is a DWS and contains abundant trees and shrubs that can be used as a wildlife corridor.

Section SL4

3.2.9 Improved grassland is overall the most dominant habitat, however, large areas of amenity grassland and built-up areas are present to the south of this section. Dry stone walls line the majority of these fields with plantation and semi-natural woodland occasional.

3.2.10 Habitats found within this section of the study area include:

- Woodland-Plantation: Small pockets of coniferous plantation are located in Milltimber Wood (AWI), much of which has been felled, and Guttrie Hill Wood which, in addition to being on the AWI, is designated as a DWS. Other areas in the southwest of this section contain broad-leaved plantation and semi-natural woodland derived from plantation.
- Woodland-Semi-natural: The semi-natural woodland to the southwest is derived from plantation. Other small pockets of semi-natural broad-leaved woodland are present in Milltimber Wood (S35) and Stone Circle Wood, although much of these are outside the study area.
- Heathland and Acid Grassland habitats: Semi-natural acid grassland occurs to the north of this section. The eastern side is dominated by wavy-hair grass (*Deschampsia flexuosa*) and separated from sheep grazed improved fields by dry stone walls. The west of this area contains a dry heath/acid grassland mix –the acid grassland continuing the wavy-hair grass dominance, with the dry heath being dominated by a heather/bell heather mix. Being less than 300m above sea-level these habitats are classed as lowland.

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- Bracken and Scrub habitats: Scattered gorse scrub with occasional dense pockets is to be found within and surrounding agricultural fields. Scattered gorse is also present within the habitats of Beans Hill (S39).
- Linear habitats: Dry stone walls are extensive throughout the section, providing a boundary for many of the agricultural fields. Hedgerows, however, are largely absent, although the scrub lining around some fields in S36 may be classed as hedgerows.

Table 7– Habitat Areas Located in Section SL4

Habitat Area	Feature/Asset	Target Note Number	Description
S32	Peterculter and western Milltimber	184 185 186 187 188 189 190	Large sports complexes, schools, nursing homes and hotels dominate the built environment. Amenity grassland dominates the habitat, though areas of woodland and ancient hedgerows are also present. Wooded areas are primarily plantation with occasional patches of semi-natural broadleaves and frequent scattered trees.
S33	Milltimber		This area consists of relatively large dwelling houses with gardens, many with mature scattered trees as a border.
S34	Guttrie Hill Wood	193 194	This area is dominated by conifer plantation woodland dominated by Scots pine (AWI, DWS). The western area of the woodland contains abundant broadleaves and a well-developed ground flora.
S35	Milltimber Wood	191	Scots pine plantation with birch surround (AWI). Much of the woodland has been felled, with abundant dead wood now littering the site.
S36	Agricultural fields around Nether Beanshill	192	A mixture of arable and improved fields with shrubs lining many of the fields. Small pockets of woodland are occasional. A large shelter belt (Western Stretch of Stone Circle) containing matures Scots pine, plus a variety of other conifers and broadleaves is present. Walls divide fields across the majority of the area. Species poor marshy grassland is rare.
S37	Woodland from Hill Farm to Westfield Lodge	199	Although all connected and, therefore, providing a wooded wildlife corridor, the structure is varied. The west contains a wood with ancient woodland indicators. However, the wooded area is now so small that the wood is now little more than a large garden. This connects to an area of dense scrub with a new plantation on amenity grassland to the north, before eventually connecting with areas of predominantly conifer plantation to the north and south.
S38	Beans Hill south	198	Series of improved fields with frequent pockets and field borders of gorse scrub. Walls are a boundary feature in many of the fields.
S39	Beans Hill north	200 201	Lowland heath and acid grassland habitats dominate this area. Acid grassland is particularly dominant, though dry heath increases in abundance in the southwest. Gorse is scattered occasionally around the area. Wall enclosed sheep grazed improved grassland is dominant to the east with occasional trees.

Section SL5

- 3.2.11 Improved and arable farmland is the dominant habitat within this section. Many walls line these fields, with occasional gorse scrub. This area is also notable for the large plantations of Kingshill Wood and Gairnhill Wood, plus the smaller plantation of Silverburn Wood. Wet semi-natural wood is present within Moss of Auchlea.
- 3.2.12 Habitats found within this section of the study area include:
- Woodland-Plantation: Kingshill and Gairnhill Woods are both included on the AWI as long-established of plantatn origin (S43). They are largely Scots pine plantations, although Kingshill especially contains a number of other conifer species such as larch (*Larix decidua*), Douglas fir (*Pseudotsuga menziesii*), Norway/Sitka spruce and western hemlock, plus broadleaves, primarily beech. Much of the ground flora can be described as a dry heath/acid grassland

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mosaic with wavy-hair grass and heather being dominant underneath. Under areas with non-native species, such as Douglas fir and Norway/Sitka spruce, the ground flora is largely absent.

- **Woodland-Semi-natural:** Moss of Auchlea (S45) is designated as a DWS and supports the main pocket of semi-natural woodland. The centre of the wood is largely dominated by an eared/grey willow (*Salix aurita/ Salix cinerea*) community with the outer edge being dominated by a birch wood. The watertable is close to the surface of the wood, with many pools of standing water and, in some cases, *Sphagnum* moss emerging. Silverburn Wood (AWI as above) (S41) and Rotten O’Gairn (S42), a DWS, contain pockets of rich wet woodland within plantation and scrub respectively.
- **Marsh/Marshy Grassland:** Marshy grassland occurs across areas of improved grassland which contains a number of burns (S40). In general, these areas tend to be species poor soft rush dominated communities. The exception is at Rotten O’Gairn (S42), which is part of a richer system of wet habitats.
- **Semi-improved Grassland:** Semi-improved grassland in this section tends to be relatively species-poor and generally associated with marsh and running water making small compartments of fields difficult for livestock to graze. Species rich marsh however does exist at Rotten O’Gairn (S42).
- **Bracken and Scrub habitats:** Gorse is occasional around field edges with occasional pockets of more dense gorse scrub. Only towards the border with Beans Hill (S39) are there any significant amounts of other species, in this case, willow.
- **Linear habitats:** Dry stone walls are extensive in the northern half of this section, providing a boundary to many of the fields.
- **Stream habitats:** Silver Burn, Gairn Burn and Upper Beanshill Burn are all concentrated within a relatively small area, giving rise to fields with abundant soft rush, wet woods and small ponds.

Table 8 – Habitat Areas Located in Section SL5

Habitat Area	Feature/Asset	Target Note Number	Description
S40	Agricultural fields around Silverburn		Improved fields with abundant marshy grassland and rocky outcrops dominate. The small channel of the Silverburn runs through the area.
S41	Silverburn Wood		Conifer plantation woodland (AWI) with areas of wetland adjacent to the Silver Burn, which traverses the area.
S42	Rotten O’Gairn		DWS with species rich grasslands and marsh/marshy grassland, plus scrub and wet woodland linkages to Silverburn Wood.
S43	Gairnhill and Kingshill Wood	202 203 204 205 206 207	Plantation conifer woods (AWI) dominate. Beech can be frequent and sometimes dominant in the canopy. Scots pine probably dominates overall but there is a mix of plantings. Under the Scots pine and larch woodlands, a dry heath community is present.
S44	Agricultural fields to the west of Kingshill Wood	212	This area is dominated by improved and arable fields. Dry stone walls act as borders between fields with gorse occasional.
S45	Moss of Auchlea	208 209 210 211	DWS dominated by wet willow woodland on with a ground layer supporting wet grassland and swamp. Areas of birch are also present. Where trees have been removed, marshy grassland dominates, with areas of swamp are also present.

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Section SL6

- 3.2.13 The majority of this section is characterised by improved grassland with dry stone wall boundaries. Semi-natural broad-leaved woodland is present in the largely linear woodland of West Hatton Wood, whilst small pockets of plantation woodland are present upon Cloghill. Although largely comprised of improved grassland, Cloghill also contains a large area of mixed mesotrophic/acid grassland combined with small fragments of dense scrub.
- 3.2.14 This section of the study area contains:
- Woodland-Plantation: Cloghill (S48) contains a number of small pockets of plantation woodland ranging from coniferous in the north-west, mixed in the north-east and broad-leaved in the south of the hill.
 - Woodland-Semi-natural: This habitat is largely confined to the West Hatton Wood (S47), a linear birch/beechn woodland. In addition to its DWS designation, this woodland is on the AWI as long-established woodland of plantation origin.
 - Marsh/Marshy Grassland: Marshy grassland is rare in this section only occurring in the southeast as a result of poor field drainage.
 - Semi-improved Grassland: Poor semi-improved grassland occurs occasionally within this section, being associated with horse-grazed fields. A more diverse semi-improved grassland has developed on Cloghill (S48). This habitat is unusual in being largely composed of mesotrophic grassland but exhibiting acid grassland characteristics in some places, notably around rocky outcrops.
 - Bracken and Scrub habitats: Occasional gorse scrub is associated with some field edges of the agricultural fields in this section. More dense gorse scrub occurs upon Cloghill, often linking woodland to other habitats.
 - Linear habitats: Dry stone walls provide a boundary to most of the fields in this section. As a result, woodland in Cloghill (S48) is linked with other habitats, such as semi-improved grassland and scrub communities.

Table 9– Habitat Areas Located in Section SL6

Habitat Area	Feature/Asset	Target Note Number	Description
S46	Agricultural fields to the north of the A944		This area comprises of many relatively small improved and poor semi-improved fields. Walls surround many of the fields with gorse and whin shrubs frequently lining many of the fields.
S47	West Hatton Wood	213	DWS with relatively open woodland (AWI), of plantation origin but long-established and with semi-natural characteristics. At west end of wood, the canopy is dominated by beech and silver birch (<i>Betula pendula</i>) over a grazed grass-dominated ground flora, with patches of scattered and dense gorse scrub in more open areas. Further east, the woodland canopy becomes dense, dominated by birch and rowan.
S48	Cloghill	214 215 216	This mosaic of communities is dominated by improved grassland bordered by stone walls, the majority of which are tree and shrub lined. Pockets of coniferous woodland, with some dense scrub are frequent in the northern half. The south of the site is dominated by mesotrophic semi-improved grassland with acid characteristics, plus pockets of more typical acid grassland. Scattered trees and scrub are present throughout.

4 Evaluation of Habitat Areas

4.1 Introduction

4.1.1 The evaluation was assessed following the criteria outlined in Table 1. Each Habitat Area was assessed in terms of its overall ecological value. The paragraphs below give a brief summary of the habitats of value within each section. Individual evaluations of Habitat Areas are presented in Table 10.

Section SL1

4.1.2 Blue Hill Wood (S3) is valued at county level due to its small amount of UK BAP wet woodland adjacent to a small pond.

4.1.3 Hare Moss (S10) is a UK BAP lowland raised bog of regional value as it is an important component of a network of sites in the region and integral to the viability of the region's habitat resource.

Section SL2

4.1.4 Two plantation woodlands are of high conservation value. Clochandighter Wood (S14) is a large long-established AWI conifer woodland. Although partly felled, the wood contains dry heath ground flora and, thus, is valued at county level. S15 comprises of the conifer plantation of Whitestone Wood and diverse mosaic of habitats in Hill of Blairs both AWI. It is for the latter's composition, including long-established broad-leaved and conifer plantation, with the wetter habitats of heathland and mire, which makes this a regional resource.

Section SL3

4.1.5 The linked Habitat Areas of Cleanhill Wood, Kingcausie and agricultural estates of Kingcausie (S20, S23 and S24 respectively) are of county value, representing a sizeable area of long-established, AWI, LHAP plantation woodland, with small areas of UK BAP wet woodland and UK BAP ancient hedgerow. The agricultural field in the north of Kingcausie containing frequent mature trees has been present before 1900, (map data 1810 to 1829). This therefore represents the UK BAP Lowland Wood-Pasture and Parkland.

4.1.6 Habitat Areas S22 and S28 represent the running water habitats of Crynoch Burn, Blaikiewell Burn, the River Dee and floodplains. Although the designation primarily relates to fauna, the SAC submission (JNCC, 2006) does also record a number of Annex I habitats within the corridor. These areas contain UK BAP wet woodlands as well as UK BAP Fen in the Blaikiewell Burn. These are therefore of regional value. As the designation of the SAC does not relate to terrestrial riparian habitats specifically, this Habitat Area is assigned as being of regional value.

4.1.7 The LBAP species, wych elm, is found within S23, S24, S27 and S28. None of these are key areas of LBAP species (e.g. none are wych elm rich woodlands), but enhance the local area. Therefore, unless already rated higher, these Habitat Areas are evaluated as being of local value.

Section SL4

4.1.8 Both Guttrie Hill (S34) (AWI) and the site of the Deeside Old Railway Line (S31) are nominated at county value due to their designations as District Wildlife Sites (DWS). Habitat Area S32 is listed as of county value due to the presence of UK BAP Ancient Hedgerow. The lack of connectivity with other valuable habitats limits the value of the hedge.

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- 4.1.9 Rotten O Gairn (S42) is a DWS with species rich marshy grassland that is a rare resource in the county. It forms part of a mosaic of semi-natural habitats and long established plantation woodlands at Silverburn and Kingshill Wood. This site is of county value.
- 4.1.10 Beans Hill contains the UK BAP Lowland Heathland habitat. Only a portion of the area is however composed of this habitat with acid grassland being dominant overall. This grassland is not of the same community as that described in the UK BAP Lowland Dry Acid Grassland. However, the potential to increase the value of this habitat remains, thus the area is valued at county level.
- 4.1.11 The LBAP species, wych elm, is found within Habitat Areas S32 and S37. None of these are key areas of LBAP species (e.g. none are wych elm rich woodlands), but enhance the local area. Therefore, unless already rated higher, these habitat areas are of local value.

Section SL5

- 4.1.12 S40 (Agricultural fields around Silverburn) are considered to be of county level importance as it contains Silver Burn LHAP and a small portion of UK BAP wet willow wood.
- 4.1.13 Moss of Auchlea DWS contains UK BAP wet woodland with areas of swamp, marsh and fen underneath. The biodiversity of the area, combined with the potential to augment and extend leads to an evaluation of this area as being of regional value.

Section SL6

- 4.1.14 West Hatton Wood is a DWS of long-established woodland and is therefore classed as of county value.
- 4.1.15 Cloghill contains LHAP habitats of species-rich grassland, plantation woodland linked with walls and scrub. The mesotrophic grassland contains pockets of UK BAP Lowland Dry Acid Grassland. The diversity of habitats within a small area means this is of regional value.

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Table 10 – Evaluation of Habitat Areas

Habitat Area	Feature / Asset	Description	Evaluation
S1	Hatton Wood	Small broad-leaved woodland plantation of recent origin and of local ecological interest.	Local
S2	Agricultural fields west of the A90	A series of largely improved fields, many of which have boundaries of dry stone walls.	Local
S3	Blue Hill Wood	Extensive dense gorse scrub merging into a bracken/conifer plantation (LHAP) assemblage. A pond is present within a disused quarry where UKBAP wet woodland willow carr and LHAP marshy grassland has begun to develop.	County
S4	Bog south of Greenhowe	Degraded bog habitat of not greater than local value due to small size and damaged condition with little potential for improvement.	Local
S5	Agricultural fields south of Greenhowe	Dominated by large arable and improved fields, this Area also contains a drain-associated marshy grassland with influence of bog species. A woody element is provided by conifers to the south of un-named farm buildings. Japanese knotweed is present.	Local
S6	Greenhowe	AWI-listed young coniferous plantation with broad-leaved edges and occasional blocks. A patch of marsh and a pond with surrounding wet grassland is present. Listed on the AWI.	Local
S7	Duff's Hill	Dense pine plantation.	Local
S8	Agricultural fields west of Duff's Hill	Series of improved, poor semi-improved and arable fields.	Less than local
S9	Wood west of Greenhowe	Young spruce plantation with little ground flora, plus other habitats of low value. Semi-improved acid grassland with scrub and a small semi-natural broad-leaved woodland are also present.	Local
S10	Hare Moss	Extensive area of lowland raised bog, a priority habitat in the UKBAP. Hare Moss is an important component of a network of sites in the region and integral to the viability of the region's habitat resource.	Regional
S11	Sunnyside Wood	Plantation birch/ rowan woodlands listed on the AWI.	Local
S12	Greenloaning Wood	Wet birch woodlands plantation listed on the AWI.	Local
S13	Agricultural fields around Sunnyside to Causeyport	A series of improved and horse-grazed semi-improved fields.	Local
S14	Clochandigther Wood	Mature conifer plantation woodland dominated by lodgepole pine and spruce. Dry heath dominates the rides and under much of the plantation. Listed on the AWI.	County
S15	Whitestone Wood and Hill of Blairs	Series of biodiverse habitats including AWI-listed mature conifer plantation with species-rich ground flora, areas of dry heath, wet heath (both of which are UK BAP Lowland Heathland) and mire (UK BAP Fen).	Regional
S16	Agricultural fields to the east of Burnhead to Greenloaning	Improved grassland with marshy grassland, trees and hedgerows, plus dry stone walls.	Local
S17	Agricultural fields south-west of Cleanhill	Two improved fields separated by an avenue of mixed trees and shrubs.	Local

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Habitat Area	Feature / Asset	Description	Evaluation
	Wood		
S18	Durriss Forest	Large expanse of AWI-listed plantation woodland. Dry heath is often associated with the paths through the wood.	Local
S19	Blaikiewell Farm	Horse-grazed semi-improved fields lined with shrubs approaching hedgerows. An arable field is also present.	Local
S20	Cleanhill Wood	AWI-listed mature conifer plantation (LHAP) with significant amounts of semi-natural broad-leaved woodland. The ground flora can be species rich however rhododendron can also be extensive. The area is a SESA.	County
S21	Agricultural fields below Parkhead	Series of arable and improved fields with shrubs and trees.	Less than local
S22	Floodplain and immediate surrounds of Crynoch Burn (north) and Blaikiewell Burn	Semi-natural broad-leaved woodland lines much of the River Crynoch. Japanese knotweed is present. The Blaikiewell Burn supports the UK BAP Fen community.	Regional
S23	Agricultural fields within Kingcausie	Predominantly improved grassland with occasional trees and shrubs. The area also contains ancient hedgerows (UK BAP habitat) and a small broad-leaved plantation located close to LHAP swamp and UK BAP wet woodland. The area is a SESA. Contains the LBAP species wych elm.	County
S24	Kingcausie	A number of different habitats dominated by AWI-listed woodland. The area is a SESA. Contains the LBAP species wych elm and LBAP habitat of Lowland Wood Pasture and Parkland.	County
S25	Caravan Park	Caravan Park with amenity grassland and scattered trees and shrubs.	Less than local
S26	Old Mill Inn and agricultural field surrounds	Agricultural fields with well-vegetated field drain.	Less than local
S27	Agricultural fields south of the River Dee	Improved fields with UK HAP veteran boundary trees and wooded pockets. Contains the LBAP species wych elm.	Local
S28	Floodplain and immediate surrounds of the River Dee	The River Dee is a SAC, SSSI and DWS. The Area also contains UK BAP wet woodland. Contains the LBAP species wych elm.	Regional
S29	Agricultural fields south of Milltimber	Agricultural fields with little ecological value.	Less than local
S30	Camphill School	Mostly amenity grassland and new buildings the conservation value is increased by the presence of AWI-listed semi-natural woodland.	Local
S31	Deeside Old Railway	DWS comprising of a tree-lined former railway track with various semi-natural habitats.	County
S32	Peterculter and western Milltimber	Amenity grassland with wooded habitats. The conservation value is raised by the presence of a short UK BAP ancient hedgerow.	County
S33	Milltimber	Built up area with occasional trees.	Less than local
S34	Guttrie Hill	Conifer plantation woodland with abundant broadleaves and a well-developed ground flora. This wood is a DWS and listed as an AWI.	County

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Habitat Area	Feature / Asset	Description	Evaluation
S35	Milltimber Wood	AWI-listed Scots pine plantation with birch surround. Much of the woodland has now been felled.	Local
S36	Agricultural fields around Nether Beanshill	Agricultural fields with shrubs, walls, small pockets of woodland and shelterbelt.	Local
S37	Woodland from Hill Farm to Westfield Lodge	Linear wooded structure comprising of conifer plantation, scrub and small amounts of semi-natural woodland.	Local
S38	Beans Hill south	Improved fields with gorse scrub and walls.	Local
S39	Beans Hill north	Heath (UK BAP Priority Habitat) and acid grassland mosaic dominates this area. Acid grassland is particularly dominant, though dry heath increases in abundance in the southwest. Gorse is scattered occasionally around the area. Wall enclosed sheep grazed improved grassland is dominant to the east with occasional trees.	County
S40	Agricultural fields around Silverburn	Improved fields with marshy grassland stemming from the Silver Burn LHAP.	County
S41	Silverburn Wood	AWI-listed plantation woodland with other plantation close by but not connected.	Local
S42	Rotten O' Gairn	District Wildlife Site. Species rich grasslands and marsh/marshy grassland, plus scrub and wet woodland linkages to Silverburn Wood.	County
S43	Gairnhill and Kingshill Wood	AWI-listed plantation conifer woods with dry heath below.	County
S44	Agricultural fields to the west of Kingshill Wood	Agricultural fields with walls.	Local
S45	Moss of Auchlea	District Wildlife Site. UK BAP wet willow/birch woodland with species-rich ground flora in places, including swamp.	Regional
S46	Agricultural fields to the north of the A944	Improved and poor semi-improved fields with wall surround and frequent shrubs.	Local
S47	West Hatton Wood	District Wildlife Site of relatively open AWI-listed woodland, with semi-natural characteristics.	County
S48	Cloghill	Mosaic of communities dominated by low value improved grassland bordered by stone walls linking coniferous woodland and dense scrub. Rich mesotrophic grassland with acid characteristics (Species-Rich Grassland LHAP) with UK BAP lowland dry acid grassland present.	Regional

5 Potential Impacts

5.1 Introduction

- 5.1.1 In general, direct impacts are where the impacts of the proposed scheme would result in a direct change to the status of an ecological receptor, during the construction or operational phase. For example, habitat loss due to land-take or loss of animals due to road mortality are referred to as direct impacts. Indirect effects of the proposed scheme generally relate to secondary effects. Fragmentation of habitat, for example, can affect the long-term viability of local populations of species.
- 5.1.2 It should be noted that the impacts associated with the operational phase of the scheme are considered to be permanent, whereas temporary impacts, which are only apparent while the road is being built, are discussed in association with the construction phase.
- 5.1.3 Potential impacts on terrestrial habitats associated with the proposed scheme include:
- direct habitat loss through land-take;
 - severance or fragmentation of existing areas of habitat;
 - hydrological disruption;
 - pollution via road drainage, runoff and spray from road traffic;
 - physical obstruction caused by road constructions and bridges; and
 - disturbance during construction.

Table 11 – Summary of Potential Impacts During Construction and Operation

Potential Impact	Description	Construction Phase	Operation Phase
Direct Habitat Loss	The proposed works involve construction of a dual carriageway through primarily undeveloped habitat. Direct habitat loss of these habitats is likely along the whole route corridor, with a minimum width of habitat loss being approximately 50m, where the proposed route is at grade with surrounding land. In areas where a cutting or embankment is required, the width of habitat loss may be increased depending on the extent of the required works.	Yes	Yes
Severance or fragmentation of existing habitat areas	The proposed road would result in the severance of habitats adjacent to the alignment. Fragmentation of habitats is likely to occur where the proposed route severs existing habitats, resulting in smaller, more numerous areas of habitat.	Yes	Yes
Physical obstruction caused by road constructions and bridges	The proposed road would act as a physical obstruction to the natural movement of species. The impacts on animal populations resident in the study area are discussed in other specialist reports. However, movement of plant species can also be obstructed by physical barriers such as roads.	Yes	Yes
Hydrological disruption	Wetland habitats, including mires, blanket bog and wet heaths may experience changes in the local hydrological regimes.	Yes	Yes
Pollution via road drainage, runoff and spray	During construction, pollution is likely to be predominantly associated with sediment laden runoff from work sites onto semi-natural habitats. During the operation, pollution resulting from road drainage, runoff and spray is likely to adversely affect habitats adjacent to the road.	Yes	Yes
Visual and light pollution	Visual and light pollution impacts on existing habitat areas will result from the scheme, with the magnitude dependent on the level of road lighting present in specific areas.	Possible	Yes
Air pollution	During construction, particulate deposition of material arising	Yes	Yes

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Potential Impact	Description	Construction Phase	Operation Phase
	from construction materials may result in limited impacts close to work sites and access roads. During operation, localised air pollution impacts may arise from traffic emissions.		
Disturbance during construction	Disturbance to habitats in the proposed road corridor and in adjacent habitat areas is likely during construction and due to the presence of temporary site compounds.	Yes	No

5.2 Specific Impacts

5.2.1 In the following paragraphs for each of the sections, the potential impacts on the habitat areas present within the study area are described assuming no mitigation measures are in place. For each Habitat Area, the magnitude of the combined impacts is assessed using the criteria in Table 2 and the resulting significance of impacts evaluated using the matrix in Table 3.

5.2.2 The paragraphs below present a summary of the main impacts (i.e. of Moderate or above) in each section. Loss of habitat, severance and fragmentation will occur throughout in each of the sections. There is also a potential risk of polluted runoff from construction sites and from the operational scheme along the road corridor, if no mitigation is in place. Full results of impact assessment for each Habitat Area are presented in Tables 12 to 17.

Section SL1

Construction

5.2.3 In addition to severance and fragmentation, polluted runoff from construction sites can result in adverse impacts to adjacent habitat. Potential impacts to the hydrological regime of Hare Moss may result from changes to local drainage from the establishment of work compounds, etc. These impacts have been assessed as being of Moderate significance.

Operation

5.2.4 In this section, the scheme would result in minor habitat loss. The road would run through the southern edge of the hydrological catchment of Hare Moss and the potential impacts on its hydrology are assessed as being of Moderate significance. Loss of the quarry pond and surrounding wet woodland habitat at Blue Hill is assessed as being of Moderate significance.

Section SL2

5.2.5 Construction and operation of the scheme would result in no impacts that have been assessed as being of greater than Minor significance.

Section SL3

Construction

5.2.6 Construction disturbance would lead to the loss and fragmentation of habitats. Potential pollution and hydrological impacts to wetland sites including Blaikiewell Burn and surrounds, River Dee and swamp/wet woodland below the dwelling-houses in S23 have been assessed as being of Moderate to Major significance. Potential changes to hydrological conditions during construction may also affect the Herb Paris site in Kingcausie.

Operation

5.2.7 Habitat loss and fragmentation impacts would occur in this section. Potential pollution from road runoff, as well as change to local hydrological regimes, particularly in wetland sites (including the

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Herb Paris population) are assessed as being of Moderate to Major significance. Fragmentation of the lowland wood-pasture in Kingcausie and the linear habitat of the Deeside Old Railway are assessed as being of Moderate significance.

Section SL4

Construction

- 5.2.8 In addition to severance and fragmentation, polluted runoff from work sites can result in adverse impacts to adjacent habitat ranging from Negligible to Minor. Potential hydrological impacts to heathland habitats have been assessed as being of Moderate significance.

Operation

- 5.2.9 The scheme would result in impacts of habitat loss and fragmentation. Habitat loss, disturbance, hydrological impacts and the potential for pollution from road runoff in Beans Hill north are assessed as being of Moderate significance.

Section SL5

Construction

- 5.2.10 In addition to severance and fragmentation, polluted runoff from work sites would result in adverse impacts to adjacent habitat ranging from Negligible to Minor. Hydrological impacts, notably to Rotten O'Gairn, Moss of Auchlea and the wet woodland in Gairnhill Wood have been assessed as Moderate significance.

Operation

- 5.2.11 Impacts from habitat loss, disturbance, hydrological impacts and potential pollution from road runoff are assessed as being of Moderate significance. Hydrological impacts to Rotten O'Gairn, Moss of Auchlea and the wet woodland in Gairnhill Wood have been assessed as Moderate significance.

Section SL6

Construction

- 5.2.12 In addition to severance and fragmentation, polluted runoff from work sites would result in adverse impacts to adjacent habitat ranging from Negligible to Minor. Disturbance leading to fragmentation and potential pollution of West Hatton Wood is assessed as being of Moderate significance.

Operation

- 5.2.13 Habitat loss and severance of West Hatton Wood DWS is considered to be of Moderate significance. The loss of several different types of habitat, disturbance and potential impacts from pollution on Cloghill (Habitat Area S48) in this section is assessed as being of Major significance.

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Table 12 – Assessment of Construction Impacts for Section SL1

Habitat Area Number	Feature/Asset Evaluation	Potential Impact Descriptor (without mitigation)	Magnitude	Significance of Impact
S1	Hatton Wood Local	No observable impacts are likely to occur.	Negligible	Negligible
S2	Agricultural fields west of the A90 Local	Severance from farmland on other side of route. Fragmentation of three dry stone walls. No observable secondary impacts are likely to occur.	Low negative	Minor
S3	Blue Hill Wood County	Severance and fragmentation of woodland habitats on either side of route. Disturbance and pollution impacts to adjacent habitats.	Medium negative	Moderate
S4	Bog south of Greenhowe Local	No direct impacts as habitat area approx 200 – 300m from route. Potential pollution impacts via drainage ditch along northern edge of Habitat Area.	Low negative	Minor
S5	Agricultural fields south of Greenhowe Local	Possible hydrological damage to peaty soils in fields. No impact to the site of Japanese knotweed.	Low negative	Minor
S6	Greenhowe Local	Severance and fragmentation of blocks adjacent to route. Disturbance and pollution impacts, including impacts on land drains through forest blocks.	Medium negative	Minor
S7	Duff's Hill Local	Minor severance impacts as route severs through northernmost section of plantation. Potential pollution and disturbance to forest habitats.	Low negative	Minor
S8	Agricultural fields west of Duff's Hill Less than local	Severance and fragmentation of fields west of Duff's Hill adjacent to route. Potential pollution and disturbance impacts, including hydrological damage to peaty soils in fields.	Medium negative	Negligible
S9	Wood west of Greenhowe Local	Potential disturbance impacts during construction due to access of construction traffic, but no observable secondary impacts.	Negligible	Negligible
S10	Hare Moss Regional	Potential hydrological damage to bog habitats due to disruption of drainage and site hydrology. Potential damage to sensitive bog habitats from pollution and disturbance during construction.	Medium negative	Moderate

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Table 13 – Assessment of Operational Impacts for Section SL1

Habitat Area Number	Feature/Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S1	Hatton Wood Local	No direct loss of habitat No observable secondary impacts are likely to occur.	Negligible	Negligible
S2	Agricultural fields west of the A90 Local	Direct loss of low value farmland (4.6ha) and plantation woodland (0.02ha). Severance from farmland on other side of route. Fragmentation of three dry stone walls. No observable secondary impacts are likely to occur.	Low negative	Minor
S3	Blue Hill Wood County	Direct habitat loss of woodland and open habitats (0.6ha). Includes loss of quarry pond and associated habitats. Severance and fragmentation of woodland habitats on either side of route. Disturbance and pollution impacts to adjacent habitats.	Medium negative	Moderate
S4	Bog south of Greenhowe Local	No direct impacts as habitat area approx 200 – 300m from route. Potential pollution impacts via drainage ditch along northern edge of Habitat Area.	Low negative	Minor
S5	Agricultural fields south of Greenhowe Local	Small area of habitat loss east of Duffs Hill Plantation (<0.01ha). Possible hydrological damage to peaty soils in fields. No impact to the site of Japanese knotweed.	Low negative	Minor
S6	Greenhowe Local	Direct habitat loss of young coniferous plantation and associated habitats (1.6ha). Severance and fragmentation of blocks adjacent to route. Disturbance and pollution impacts, including impacts on land drains through forest blocks.	Medium negative	Minor
S7	Duff's Hill Local	Direct habitat loss of mature conifer plantation (0.4ha). Minor severance impacts as route severs through northernmost section of plantation. Potential pollution and disturbance impacts to forest habitats.	Low negative	Minor
S8	Agricultural fields west of Duff's Hill Less than local	Habitat loss west of Duffs Hill, (0.08ha marshy grassland and 2ha improved/semi-improved grassland). Severance and fragmentation of fields west of Duffs Hill adjacent to route. Potential pollution and disturbance impacts, including hydrological damage to peaty soils in fields.	Medium negative	Negligible
S9	Wood west of Greenhowe Local	No direct impacts as habitat area approx 200 – 500 m from route. <0.01ha of marshy grassland lost by side road.	Negligible	Negligible
S10	Hare Moss Regional	0.3ha loss of bog on Hare Moss. Potential hydrological damage to bog habitats due to disruption of drainage and site hydrology. Potential damage to sensitive bog habitats from pollution and disturbance during operation.	Medium negative	Moderate

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Table 14 – Assessment of Construction Impacts for Section SL2

Habitat Area Number	Feature/Asset Evaluation	Potential Impact Descripton (without mitigation)	Magnitude	Significance of Impact
S11	Sunnyside Wood Local	Potential disturbance impacts during construction due to access of construction traffic, but no observable secondary impacts.	Low negative	Minor
S12	Greenloaning Wood Local	No direct impacts. Potential disturbance impacts during construction due to access of construction traffic, but no observable secondary impacts.	Negligible	Negligible
S13	Agricultural fields around Sunnyside to Causeyport Local	Severance of agricultural fields on either side of route. Severance of eight dry stone walls. Potential hydrological impacts to areas of marshy grassland. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor
S14	Clochandigther Wood County	No direct impacts Potential disturbance impacts during construction due to access of construction traffic, but no observable secondary impacts.	Negligible	Negligible
S15	Whitestone Wood and Hill of Blairs Regional	No direct impacts Potential disturbance impacts during construction due to access of construction traffic, but no observable secondary impacts.	Negligible	Negligible
S16	Agricultural fields to the east of Burnhead to Greenloaning Local	Severance of species rich hedgerow with trees. Severance of three dry stone walls. Severance from farmland on other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor

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Table 15 – Assessment of Operational Impacts for Section SL2

Habitat Area Number	Feature/Asset Evaluation	Potential Impact Descripton (without mitigation)	Magnitude	Significance of Impact
S11	Sunnyside Wood Local	No direct impacts.	Negligible	Negligible
S12	Greenloaning Wood Local	No direct impacts.	Negligible	Negligible
S13	Agricultural fields around Sunnyside to Causeyport Local	Direct habitat loss of agricultural fields (7.3ha). Direct habitat loss of woodland northwest of Clochandigther (0.01ha) plus surrounding dry stone walls Severance of agricultural fields on either side of route. Severance of eight dry stone walls. Potential hydrological impacts to areas of marshy grassland. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor
S14	Clochandigther Wood County	No direct impacts	Negligible	Negligible
S15	Whitestone Wood and Hill of Blairs Regional	No direct impacts	Negligible	Negligible
S16	Agricultural fields to the east of Burnhead to Greenloaning Local	Direct loss of farmland habitat (5.8ha). Severance of species rich hedgerow with trees. Severance of three dry stone walls. Severance from farmland on other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor

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Table 16 – Assessment of Construction Impacts for Section SL3

Habitat Area Number	Feature/Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S17	Agricultural fields to the east of Cleanhill Wood Local	No direct impacts.	Negligible	Negligible
S18	Durris Forest Local	No observable impacts are likely to occur.	Negligible	Negligible
S19	Blaikiewell Farm Local	Severance from grassland on other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor
S20	Cleanhill Wood County	Severance and fragmentation of blocks adjacent to route. Possible loss of status as DWI. Disturbance and pollution impacts, including impacts on land drains through forest blocks.	High negative	Moderate
S21	Agricultural fields below Parkhead Less than local	No observable impacts are likely to occur.	Negligible	Negligible
S22	Floodplain and immediate surrounds of Crynoch Burn (north) and Blaikiewell Burn Regional	Severance of wet habitats from other side of route. Hydrological impacts to the wider habitat. Potential pollution and disturbance to areas adjacent to route, including Blaikiewell Burn.	High negative	Major
S23	Agricultural fields within Kingcausie County	Severance of grassland from other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Moderate
S24	Kingcausie County	Severance of dry stone wall. Severance and fragmentation of habitats adjacent to route. Disturbance and pollution impacts, including impacts on Kingcausie Burn. Possible hydrological impacts to wetland within Kingcausie Wood.	High negative	Moderate
S25	Caravan Park Less than local	No observable impacts are likely to occur.	Negligible	Negligible
S26	Old Mill Inn and agricultural field surrounds Less than local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible

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Habitat Area Number	Feature/Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S27	Agricultural fields south of the River Dee Local	Severance from farmland on other side of route. Disturbance and pollution impacts, including impacts to River Dee.	Low negative	Minor
S28	Floodplain and immediate surrounds of the River Dee Regional	Severance of grassland from other side of route. Disturbance and pollution impacts, including impacts to River Dee.	Medium negative	Moderate
S29	Agricultural fields south of Milltimber Less than local	Severance from farmland on other side of route. Potential pollution and disturbance impacts.	Low negative	Negligible
S30	Camphill School Local	No observable impacts are likely to occur.	Negligible	Negligible
S31	Deeside Old Railway County	Severance of linear feature. Possible loss of status as DWI. Loss of ability to act as wildlife corridor. Potential pollution and disturbance impacts.	High negative	Moderate

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Table 17 – Assessment of Operational Impacts for Section SL3

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S17	Agricultural fields to the east of Cleanhill Wood Local	No direct impacts from main route. 0.2ha of improved grassland lost by access road.	Negligible	Negligible
S18	Durris Forest Local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible
S19	Blaikiewell Farm Local	Direct loss of semi-improved grassland and other farmland (1.9ha). Severance from grassland on other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Minor
S20	Cleanhill Wood County	Direct habitat loss of woodland habitat (2.5ha) and grassland (0.5ha). Severance and fragmentation of blocks adjacent to route. Possible loss of status as DWI. Disturbance and pollution impacts, including impacts on land drains through forest blocks.	High negative	Moderate
S21	Agricultural fields below Parkhead Less than local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible
S22	Floodplain and immediate surrounds of Crynoch Burn (north) and Blaikiewell Burn Regional	Direct loss of fen (0.8ha) and wet woodland (0.07ha) of Blaikiewell Burn. Severance of wet habitats from other side of route. Hydrological impacts to the wider habitat. Potential pollution and disturbance to areas adjacent to route, including Blaikiewell Burn.	High negative	Major
S23	Agricultural fields within Kingcausie County	Direct loss of species poor semi-improved (0.6ha) and improved grassland (0.3ha). Severance of grassland from other side of route. Potential pollution and disturbance to areas adjacent to route.	Medium negative	Moderate
S24	Kingcausie County	Direct loss of semi-natural woodland habitat (0.8ha). Direct loss of lowland wood-pasture and parkland (1.1ha). Severance of dry stone wall. Severance and fragmentation of habitats adjacent to route. Disturbance and pollution impacts, including impacts on Kingcausie Burn. Possible hydrological impacts to wetland within Kingcausie Wood.	High negative	Moderate
S25	Caravan Park Less than local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible

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Habitat Area Number	Feature / Asset Evaluation	Potential Impact Descripton (without mitigation)	Magnitude	Significance of Impact
S26	Old Mill Inn and agricultural field surrounds Less than local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible
S27	Agricultural fields south of the River Dee Local	Direct loss of farmland (0.2ha). Severance from farmland on other side of route. Disturbance and pollution impacts, including impacts to River Dee.	Low negative	Minor
S28	Floodplain and immediate surrounds of the River Dee Regional	Direct loss of rich semi-improved grassland (0.06ha) and improved/poor semi-improved grassland (0.02ha). Severance of grassland from other side of route. Disturbance and pollution impacts, including impacts to River Dee.	Medium negative	Moderate
S29	Agricultural fields south of Milltimber Less than local	Direct loss of farmland (3.2ha). Severance from farmland on other side of route. Potential pollution and disturbance impacts.	Low negative	Negligible
S30	Camphill School Local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible
S31	Deeside Old Railway County	Direct loss of semi-natural habitats (0.07ha). Severance of linear feature. Possible loss of status as DWI. Loss of ability to act as wildlife corridor. Potential pollution and disturbance impacts.	High negative	Moderate

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Table 18 – Assessment of Construction Impacts for Section SL4

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S32	Peterculter and western Milltimber County	Potential pollution and disturbance impacts.	Low negative	Minor
S33	Milltimber Less than local	No observable impacts are likely to occur.	Negligible	Negligible
S34	Guttrie Hill County	Potential pollution and disturbance impacts.	Low negative	Minor
S35	Milltimber Wood Local	Potential pollution and disturbance impacts.	Low negative	Minor
S36	Agricultural fields around Nether Beanshill Local	Severance of seven dry stone walls. Loss of scrub lining walls. Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	Medium negative	Minor
S37	Woodland from Hill Farm to Westfield Lodge Local	Loss of connectivity for linear habitat. Loss of ability to act as a wildlife corridor. Potential pollution and disturbance impacts.	High negative	Minor
S38	Beans Hill south Local	Severance of five dry stone walls. Potential pollution and disturbance impacts.	Medium negative	Minor
S39	Beans Hill north County	Potential hydrological impacts to acid grassland and hydrological connections to adjacent dry heath. Potential pollution and disturbance impacts.	Medium negative	Moderate

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Table 19 – Assessment of Operational Impacts for Section SL4

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S32	Peterculter and western Milltimber County	Direct loss of built up areas, occasional trees and shrubs, plus other low-value habitats (4.5ha). Potential pollution and disturbance impacts.	Low negative	Minor
S33	Milltimber Less than local	No direct habitat loss. No observable secondary impacts are likely to occur.	Negligible	Negligible
S34	Guttrie Hill County	Direct loss of small portion of woodland edge habitat (0.01ha). Potential pollution and disturbance impacts.	Low negative	Minor
S35	Milltimber Wood Local	Direct loss of small portion of woodland edge habitat (0.1ha). Potential pollution and disturbance impacts.	Low negative	Minor
S36	Agricultural fields around Nether Beanshill Local	Direct loss of farmland habitat (5.8ha). Severance of seven dry stone walls. Loss of scrub lining walls. Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	Medium negative	Minor
S37	Woodland from Hill Farm to Westfield Lodge Local	Direct loss of improved grassland (0.3ha). Direct loss of individual trees and shrubs (0.1ha). Loss of connectivity for linear habitat. Loss of ability to act as a wildlife corridor. Potential pollution and disturbance impacts.	High negative	Minor
S38	Beans Hill south Local	Direct loss of farmland habitat (1.9ha). Severance of five dry stone walls. Potential pollution and disturbance impacts.	Medium negative	Minor
S39	Beans Hill north County	Direct loss of acid grassland habitat (0.8ha). Potential hydrological impacts to acid grassland and hydrological connections to adjacent dry heath. Potential pollution and disturbance impacts.	Medium negative	Moderate

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Table 20 – Assessment of Construction Impacts for Section SL5

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Description (without mitigation)	Magnitude	Significance of Impact
S40	Agricultural fields around Silverburn County	Severance from farmland on other side of route. Potential hydrological to hydrological connections. Potential pollution and disturbance impacts, including along Silver Burn.	Low negative	Minor
S41	Silverburn Wood Local	Potential impacts from pollution disturbance affecting Silver Burn.	Negligible	Negligible
S42	Rotten O'Gairn County	Severance marsh on other side of route. Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	Medium negative	Moderate
S43	Gairnhill and Kingshill Wood County	Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	High negative	Moderate
S44	Agricultural fields to the west of Kingshill Wood Local	Severance from farmland on other side of route. Severance of twelve dry stone walls. Potential pollution and disturbance impacts.	Low negative	Minor
S45	Moss of Auchlea Regional	Potential impacts hydrological impacts from pollution and disturbance in adjacent habitat.	Medium negative	Moderate

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Table 21 – Assessment of Operational Impacts for Section SL5

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Descripton (without mitigation)	Magnitude	Significance of Impact
S40	Agricultural fields around Silverburn County	Direct loss of farmland habitat (0.2ha). Severance from farmland on other side of route. Potential hydrological to hydrological connections. Potential pollution and disturbance impacts, including along Silver Burn.	Low negative	Minor
S41	Silverburn Wood Local	No direct habitat loss. Potential impacts from pollution disturbance affecting Silver Burn.	Negligible	Negligible
S42	Rotten O'Gainr County	Direct loss of marsh habitat (0.01ha) and dense scrub (0.9ha). Severance marsh on other side of route. Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	Medium negative	Moderate
S43	Gairnhill and Kingshill Wood County	Potential hydrological impacts leading to loss of woodland edge habitat, including wet woodland. Potential hydrological impacts to wetland site and hydrological connections. Potential pollution and disturbance impacts.	High negative	Moderate
S44	Agricultural fields to the west of Kingshill Wood Local	Direct loss of farmland habitat (10.5ha). Severance from farmland on other side of route. Severance of twelve dry stone walls. Potential pollution and disturbance impacts.	Low negative	Minor
S45	Moss of Auchlea Regional	No direct habitat loss. Potential impacts hydrological impacts from pollution and disturbance in adjacent habitat.	Medium negative	Moderate

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Table 22 – Assessment of Construction Impacts for Section SL6

Habitat Area Number	Feature / Asset Evaluation	Potential Impact Descripton (without mitigation)	Magnitude	Significance of Impact
S46	Agricultural fields to the north of the A944 Local	Severance from farmland on other side of route. Severance of four dry stone walls. Potential pollution and disturbance impacts.	Low negative	Minor
S47	West Hatton Wood County	Severance and fragmentation of linear habitat. Loss of ability to act as wildlife corridor. Pollution and disturbance impacts likely to be significant during construction phase. Combined impacts could result in loss of designated status of site.	High negative	Moderate
S48	Cloghill Regional	Loss of farmland habitat. Severance from farmland on other side of route. Severance of northern edge of plantation woodland Loss of ability of linear woodland to act as wildlife corridor. Potential hydrological impacts upon acid grassland pockets. Pollution and disturbance impacts. Combined impacts could result in loss of designated status of site.	High negative	Major

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Table 23 – Assessment of Operational Impacts for Section SL6

Habitat Area Number	Feature / Asset Evaluation	Criteria	Magnitude	Significance of Impact
S46	Agricultural fields to the north of the A944 Local	Direct loss of farmland habitat (5.7ha). Severance from farmland on other side of route. Severance of four dry stone walls. Potential pollution and disturbance impacts.	Low negative	Minor
S47	West Hatton Wood County	Direct habitat loss in both east and north sections of woodland (0.13ha). Severance and fragmentation of linear habitat. Loss of ability to act as wildlife corridor. Pollution and disturbance impacts likely to be significant during operation phase. Combined impacts could result in loss of designated status of site.	High negative	Moderate
S48	Cloghill Regional	Direct loss of edge grassland habitat (0.2ha). Loss of farmland habitat (0.5ha). Loss of woodland plantation habitat (0.2ha). Severance from farmland on other side of route. Severance of northern edge of plantation woodland Loss of ability of linear woodland to act as wildlife corridor. Potential hydrological impacts upon acid grassland pockets. Pollution and disturbance impacts. Combined impacts could result in loss of designated status of site.	High negative	Major

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5.3 Estimate of Habitat Loss

5.3.1 The total amount of landtake required in order to construct the Southern Leg of the proposed scheme is estimated at approximately 2.77km² / 277ha. Table 24 shows the estimated total pre-construction and post-construction areas of Phase 1 Habitats present within the proposed land-take. The post-construction figures take account of both anticipated habitat loss to construction and habitat created or changed as a result of mitigation.

Table 24 – Phase 1 Habitat Areas Pre and Post Construction

Phase 1 Habitat Description	Phase 1 Habitat Categories within scheme land-take	
	Pre-construction (ha)	Post-construction (ha)
Woodland mixed plantation	2.43	27.86
Woodland broadleaved plantation (Including standard trees)	2.78	7.43
Woodland broadleaved semi-natural	2.90	1.25
Woodland coniferous plantation	15.41	8.59
Scattered scrub	3.55	6.78
Dense continuous scrub	3.58	7.73
Riparian woodland	0	3.03
Acid grassland semi-improved	4.84	3.40
Acid grassland unimproved	0.09	0.06
Amenity grassland	0.01	0.01
Improved grassland	122.66	66.29
Marshy grassland	4.66	3.63
Neutral grassland semi-improved	3.59	1.85
Neutral grassland unimproved	1.57	0.79
Poor semi-improved grassland	23.45	12.77
Disturbed amenity grassland	0.08	0.06
Arable	43.92	18.70*
Built up areas (buildings)	2.51	3.03
Open water	0.36	0.57
Parkland mixed	3.22	4.35
Fen	0.39	0.60
Heath - acid grassland dry mosaic	0.08	0.13
Recently felled coniferous	0.34	0.58
Wet bog	0.52	0.63
Bare ground	1.58	1.80
Herb and fern tall ruderal	0.18	0.36
Total	244.70	182.29

*Figure assumes all potential return to agriculture is achieved.

6 Mitigation

6.1 Introduction

6.1.1 This section describes the mitigation proposed to address the potential impacts that have been identified in Section 5. Generic mitigation measures will be implemented throughout the area affected by the proposed scheme. Additional site specific mitigation measures are proposed where adverse impacts of Moderate or above are predicted.

6.2 General

6.2.1 The overall objectives for avoiding and minimising the ecological impacts associated with the proposed scheme are:

- to avoid adverse impacts in the first instance, for example by not pursuing a particular option or by devising alternatives where possible;
- where avoidance is not possible, reduce the adverse impacts with the aim of eliminating impacts and reducing each impact to being of minimal significance;
- where adverse residual impacts are anticipated, additional measures to offset the adverse impacts will be sought. For example, habitat creation to offset the local site specific impacts associated with habitat loss and fragmentation; and
- where localised site-specific mitigation may not be possible through habitat creation, or where such measures would be ineffective, it may be possible with the agreement of statutory consultees to offset adverse impacts at a wider, regional level. Such measures may include habitat creation and/or restoration at sites remote from the point of impact or contributions to strategies that contribute to meeting the targets and objectives of Biodiversity Action Plans (BAPs).

6.2.2 Legislative guidance regarding mitigation for habitat loss and fragmentation is provided in Table 25.

6.2.3 In order to guide the development of appropriate mitigation for the proposed scheme, a Mitigation Vision Statement (Jacobs, 2007) has been developed in consultation with the statutory consultees for this project. The purpose of this working document is to provide strategic guidance on the development of site specific, as well as wider scale (i.e. outwith the route corridor) mitigation measures. The aim of this approach is to ensure an integrated approach to mitigation incorporating best practice guidance.

6.2.4 A key factor in the successful implementation of ecological mitigation strategies would be the development of an action plan to take forward the strategies sought by the Mitigation Vision Statement. The action plan will draw together all mitigation, enhancement, offset, management and monitoring proposals into a schedule of commitments.

6.2.5 An assessment of the cumulative impacts of the proposed scheme and further discussion of wider scale mitigation strategies to address habitat loss and fragmentation is presented in Chapter 54 (Cumulative Impact Assessment).

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Table 25 – Legislative Guidance for Mitigation

Mitigation References in Legislation
<p>Nature Conservation (Scotland) Act 2004, Part 1, Section 1.1: "It is the duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions."</p>
<p>Environmental Impact Regulations (Scotland) 1999: Mitigation measures are intended "to prevent, reduce or where possible, offset any significant adverse impacts on the existing ecology and nature and conservation value of the surrounding area."</p>
<p>Design Manual for Roads and Bridges 2001, Volume 10 Section 4: 'Avoiding the negative effects of the project should be the first intention of any project. Mitigation should be provided where this is not possible. Mitigation design should be provided on a site-by-site basis, taking account of appropriate survey information. Land taken or disturbed by project works should be minimised, except where there is a need to acquire more extensive areas of land for environmental mitigation. Where practicable and within the powers and resources of the Overseeing Organisation, opportunities for habitat creation or enhancement and species protection should be taken in addition to providing mitigation. Timing of activities should avoid impacts on protected and rare species and habitats, wherever possible. Mitigation design should retain, or wherever possible create, natural habitat links which may assist wildlife movements. Special engineering features (e.g. tunnels, ledges and bridges) combined with fencing, where appropriate, can be used to assist in maintaining links across roads.'</p>
<p>NPPG14 Natural Heritage, Paragraph 74: http://www.scotland.gov.uk/Publications/1999/01/nppg14 "74. Planning authorities should have full regard to natural heritage considerations in determining individual applications and contributing to the implementation of specific projects. While in some circumstances it will be necessary to refuse planning permission on natural heritage grounds, authorities should always consider whether environmental concerns could be adequately addressed by modifying the development proposal or attaching appropriate planning conditions. In negotiating over development proposals, authorities should first seek to avoid any adverse effects on the natural heritage. Where this is not possible and other material considerations clearly outweigh any potential damage to the natural heritage, they should endeavour to minimise and mitigate the adverse effects and consider the scope for compensating measures. They should always encourage the retention and enhancement of features of natural heritage interest and seek to avoid the fragmentation or isolation of habitats. Where appropriate, they should also consider the scope for concluding an access agreement."</p>
<p>Scottish Transport Appraisal Guidance (STAG): http://www.scotland.gov.uk/library5/transport/stag-07.asp</p> <p>Environment Section – Paragraph 6.15: "6.15.2 The overall objective should be to maintain biodiversity in the study area, including wildlife habitats and species and to improve the status of rare and vulnerable species wherever possible. Transport proposals should therefore be designed:</p> <ul style="list-style-type: none"> • To avoid harmful development affecting protected habitats. All EU member countries have such areas and networks, for example, those established under the Birds Directive (79/409/EEC) and the Habitats Directive (92/43/EEC) — the Natura 2000 sites, National Nature Reserves, Sites of Special Scientific Interest and regionally and locally designated sites; • To avoid development in, or close to, unprotected but valuable and sensitive habitats (e.g. important bird areas); • To avoid fragmentation of wildlife migration routes, e.g. by avoiding migration zones, or by mitigating the barrier effect by providing a tunnel or 'ecoduct' for wildlife; • To adopt the "no net effect" principle, providing full compensation for lost biodiversity values where loss is unavoidable.

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Mitigation References in Legislation
<p>WebTAG – Biodiversity Sub-Objective: http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.10.htm</p> <p>“1.2.18 Mitigation - Where scheme options include proposals for mitigation, this should generally be taken account of in the appraisal of impacts. However, an exception to this general rule is described below. There are three categories to consider:</p> <ul style="list-style-type: none">• design proposals to minimise the impact of the proposal on the site (reducing runoff, for example);• on-site, or near-site, mitigation to help conserve existing biodiversity interest where the impacts can not be minimised (e.g. dedicated animal crossings, land management regimes); and• off-site proposals (such as habitat replacement) to compensate for biodiversity and earth heritage losses. <p>These categories should be developed sequentially in scheme design:</p> <p>1.2.19 The first two categories are essentially about minimising the effects on or near the site. It is appropriate for these to be considered in appraising impact, provided they have been documented properly in the Environmental Statement. The key is to make an appropriate judgement about net impact. Where there is some risk in the mitigation proposals, it is appropriate to complete separate appraisals, for the 'with' and 'without' mitigation cases.</p> <p>1.2.20 The third category above is about compensation for expected loss, though in Environmental Statements it is often described as 'mitigation'. A precautionary approach needs to be taken here: often it is not appropriate to lower the impact category on the basis of off-site compensation proposals, as these are unlikely to fully recompense for the lost features. This is especially so for the more valuable sites.</p>

6.3 Generic Mitigation

- 6.3.1 The proposed scheme would result in the loss, fragmentation and severance of habitat. The implementation of the mitigation measures summarised in Table 26 will avoid or reduce the potential impacts of the proposed scheme on terrestrial habitats. Impacts will be minimised using measures such as best practice during construction, translocation of vegetation (where practical), restricting work to the route corridor, minimising the size of site work compounds and minimising the removal of vegetation.
- 6.3.2 Ecological mitigation measures are often complementary to those needed to reduce or offset impacts on other aspects of the environment. For example, mitigation of landscape and visual impacts can often be combined with ecological measures. Designing for synergistic mitigation measures can result in cost-effective use of resources and net benefits to the local environment.

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Table 26 – Mitigation Measures for Construction

Approach	Mitigation
Avoid	Comply with the requirements of the Ecological Clerk of Works who will be employed on behalf of the Scottish Executive. Ensure that work compounds and access tracks, etc. are not located in, or adjacent to, areas that maintain habitat value. Establish site fencing to prevent access to areas outside of working areas, particularly in areas adjacent to features of interest/value. Cover site safety issues including storage of potentially dangerous materials. Follow SEPA pollution prevention guidelines (PPG1, PPG2, PPG3, PPG5 and PPG6) to prevent pollution of watercourses through siltation or chemicals.
Reduce	Maintenance of connectivity through the use of 'green' bridges, use of crossing structures that avoid removing riparian habitat, etc. Effective management of habitats to increase biodiversity. Restrict workforce to working areas through the erection of fencing, to prevent additional damage. Implementation of best practice methods throughout construction and operation.
Offset	New landscape planting will comprise native species. Direct habitat loss is also mitigated for by some roadside planting and will be integrated with habitat replacement, where possible.

Direct Habitat Loss

- 6.3.3 Offsetting the loss of ecologically important habitats will occur through habitat creation schemes, where appropriate. Direct habitat loss is also mitigated for by some roadside planting and will be integrated with habitat replacement, where possible.
- 6.3.4 During the operation of the proposed road, management and maintenance of roadside verges will be undertaken or less to maintain and enhance floral diversity. Habitats that are not managed may become dominated by undesirable species that reduce the nature conservation value of the area.
- 6.3.5 Where areas of habitat creation are agreed, the strategy will be aimed at contributing directly to biodiversity targets identified in local (LBAP) and national (UKBAP) strategies. For example, wych elm (LBAP species) will be widely incorporated into roadside planting schemes; wet and riparian woodland (UK and LBAP habitats respectively) will be created along watercourses and localised woodland planting will be designed to improve landscape connectivity for red squirrels (UK and LBAP species).

Severance or Fragmentation of Existing Areas of Habitat

- 6.3.6 The proposed scheme would result in increased fragmentation of existing habitats. These impacts will be mitigated through measures that aim to increase the ecological connectivity of habitats following construction.
- 6.3.7 Habitat connectivity will be enhanced through the reinstatement of appropriate linear habitats such as dry stone walls along the boundary of the proposed road. Where stream habitats are severed, measures will include enhancement of the riparian habitats, where possible. Fencing and planting of riparian areas will create important habitat, enhance the connectivity of habitats within the wider landscape and will protect stream banks from erosion and poaching from livestock. The creation of underpasses for mammals at Greenhowe (ch206000), Burnhead (ch201300), Gairnhill Wood (ch106225) and Cloghill (ch110150) and ensuring that bridges with mammal passes (i.e. at Blaikiewell Burn ch100150, Cleanhill Wood ch100600, River Dee ch102000, Milltikber Brae 102990 and Fairly Cloghill ch109540) are installed, where possible, rather than culverts, further mitigates such impacts.

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- 6.3.8 During the operational phase, roadside verges and areas of habitat restoration will be managed to maintain and enhance the ecological value of the habitats and to improve the links between similar habitats along the route corridor.

Pollution: Air, Runoff and Spray

- 6.3.9 During construction, particulates from machinery, increased traffic movements, sediments and exposed topsoils may result in direct pollution. During operation of the scheme, an increase in traffic volume may result in increased runoff pollution and spray from traffic adversely affecting adjacent vegetation. Details regarding the measures that will be implemented to mitigate for adverse water quality and hydrological impacts are provided in Chapter 24 (Water Environment). SEPA pollution prevention guidelines will be strictly adhered to.

Disturbance During Construction

- 6.3.10 Habitat clearance will be undertaken outside the bird breeding season. Conflicts with other protected species such as bats, badgers and reptiles will be avoided. A method statement will be prepared in advance for all areas where tree and scrub removal is required. An Ecological Clerk of Works will be present on site to monitor vegetation removal and associated activities.

6.4 Specific Mitigation

- 6.4.1 Mitigation has been specified for areas where impacts of Moderate or above have been identified. Offset mitigation to address the overall cumulative impacts of the scheme is described in Chapter 56 (Mitigation). For each section of the Fastlink, mitigation for specific impacts is provided below, while Tables 27-32 shows individual assessments by Habitat Area.

Section SL1

- 6.4.2 Severance, fragmentation and habitat loss of wooded habitats in S3 will be offset by roadside plantings along approximately ch206100 to ch206320. A pond to replace the lost quarry pond will be constructed. The surrounding wet woodland on the northern section of the wood would be maintained. Riparian planting will the vegetation that would be lost on the south side. The residual impact is thus reduced to Minor significance. Pollution and hydrological impacts to Hare Moss (S10) will be reduced through the measures identified in the Water Environment chapter (see Chapter 24). The residual impact is therefore reduced from Moderate to Negligible significance. The implementation of a management plan for this site could further increase its nature conservation value.
- 6.4.3 The residual impacts for Section SL1 range from Negligible to Minor.

Section SL2

- 6.4.4 Residual impacts for this section range from Negligible to Minor with a Minor Positive at Habitat Area S11. The generic mitigation described in Section 6.3 will be implemented. There are no impacts of Moderate significance or above for this section and no additional mitigation has been specified.

Section SL3

- 6.4.5 Fragmentation impacts in S20 will be reduced through the provision of a wildlife bridge (approximately ch100600). Landscape planting at ch100200-100800 will replace lost habitat, reducing potential residual impacts to Minor. Bridging of the wet habitats of Blaikiewell Burn (S22), combined with replacing and extending wet woodland (ch204350-204480) will reduce fragmentation and habitat loss. The significance is therefore reduced from Major to a predicted residual impact of Minor. The

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application of mitigation measures reduce the impact significance in S23 from Moderate to Minor. Although sympathetic planting will reduce the impact of the scheme for S24, the severance and habitat loss of the UK BAP Priority Habitat of lowland wood pasture cannot be mitigated for due to the historical component of the habitat being considered to be irreplaceable. Therefore, the impact significance for S24 remains at Moderate. As with S22, the bridge crossing design reduces impact to grasslands of the floodplain of the River Dee (S28), while mitigation measures to protect the water environment (refer to Chapter 24) will minimise the potential for pollution of the River Dee. The impact significance is thus reduced to Negligible from Moderate.

Section SL4

- 6.4.6 Potential hydrological connections to the heathland adjacent to S39 and associated potential pollution impacts will be mitigated by the implementation of generic mitigation, reducing impact significance from Moderate to Minor.

Section SL5

- 6.4.7 Potential pollution, disturbance and hydrological impacts in Habitat Areas S42, S43 and S45 will be reduced through the implementation of generic mitigation. Sympathetic planting will reduce fragmentation and habitat loss in S42 and S43. The increase in habitat through roadside landscape planting and plantings leading to Gairn Hill Farm Accommodation Underpass will augment the nature conservation value in Habitat Area S44. The impact significance is therefore reduced to Negligible to Minor.

Section SL6

- 6.4.8 The fragmentation and habitat loss within the West Hatton Woods DWS is reduced by plantings connecting with Fairly Cloghill Wildlife Bridge in the north and detention ponds in the south. However, this beneficial mitigation is reduced by the loss of a linear feature. The the impact significance reduces from Moderate to Minor as impacts associated with fragmentation and habitat loss in S48 will be reduced by roadside planting, including connections with S47. The loss of semi-improved grassland would be offset by the creation of species-rich grassland (ch109500-109900). However, beneficial mitigation is reduced by the loss of semi-improved grassland. Thus, the impact significance is reduced from Major to Minor.

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Table 27 – Mitigation Measures and Residual Impacts for Section SL1

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S1	Hatton Wood Local	No specific mitigation required.	Negligible	Negligible
S2	Agricultural fields west of the A90 Local	No specific mitigation required. Creation of species-rich grasslands (2.91ha) and roadside plantings (1.1ha) increases the nature conservation value.	Minor	Minor positive
S3	Blue Hill Wood County	Generic mitigation reduces potential pollution and disturbance. Fragmentation is reduced by roadside plantings (1.6ha between ch206100-206320). This planting also offsets habitat loss. A replacement pond with replacement low wet woodland (0.1ha) will be created at ch206030-206100 to offset habitat loss.	Moderate	Minor
S4	Bog south of Greenhowe Local	No specific mitigation required. Generic mitigation reduces potential pollution.	Minor	Negligible
S5	Agricultural fields south of Greenhowe Local	No specific mitigation required.	Minor	Minor
S6	Greenhowe Local	No specific mitigation required. Habitat loss is reduced by landscape (1.7ha) plantings (ch205200-206000). Creation of a pond with wet woodland (see S3) offsets habitat loss. Beneficial mitigation is reduced by continued fragmentation.	Minor	Minor
S7	Duff's Hill Local	No specific mitigation required. Re-stocking of felled woodland to mitigate impacts to red squirrel mitigates for habitat loss and increases the nature conservation value of felled woodland. Generic mitigation reduces potential pollution.	Minor	Minor positive
S8	Agricultural fields west of Duff's Hill Less than local	No specific mitigation required. Generic mitigation reduces potential pollution impacts. Hydrological impacts are mitigated for by road design.	Negligible	Negligible
S9	Wood west of Greenhowe Local	No specific mitigation required.	Negligible	Negligible
S10	Hare Moss Regional	Generic mitigation reduces potential pollution impacts and hydrological impacts. Habitat loss through siting of detention basins will be mitigated by offset creation of wetlands. Plantings at ch2046500 add to conservation value (1.53ha).	Moderate	Negligible

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Table 28 – Mitigation Measures and Residual Impacts for Section SL2

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S11	Sunnyside Wood Local	No specific mitigation required. Landscape planting (0.33ha at ch202670-202700) extends the woodland to the roadside.	Minor	Minor positive
S12	Greenloaning Wood Local	No specific mitigation required.	Negligible	Negligible
S13	Agricultural fields around Sunnyside to Causeyport Local	No specific mitigation required. Additional roadside (2.6ha) and protected species (0.9ha at ch203150-203275) plantings increases nature conservation value.	Minor	Minor
S14	Clochandigther Wood County	No specific mitigation required. Mitigation standard tree planting for bats (ch202000-202100) connects S14 with woodland to the north of Greenloaning.	Negligible	Negligible
S15	Whitestone Wood and Hill of Blairs Regional	No specific mitigation required. Woodland extended to roadside by landscape (0.11ha) planting at ch201110.	Negligible	Negligible
S16	Agricultural fields to the east of Burnhead to Greenloaning Local	No specific mitigation required. Landscape (1.7ha) planting (ch201300-201750) offsets scrub habitat loss.	Minor	Minor

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Table 29 – Mitigation Measures and Residual Impacts for Section SL3

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S17	Agricultural fields to the east of Cleanhill Wood Local	No specific mitigation required.	Negligible	Negligible
S18	Durris Forest Local	No specific mitigation required.	Negligible	Negligible
S19	Blaikiewell Farm Local	No specific mitigation required. Landscape (0.19ha) planting (ch100000-100100) offsets habitat loss.	Minor	Minor
S20	Cleanhill Wood County	Generic mitigation reduces potential pollution problems. Wildlife bridge (ch100600) reduces fragmentation. Landscape (1.35ha at ch100200-100800 and 0.26ha at ch100990) and wildlife bridge planting offsets habitat loss.	Moderate	Minor
S21	Agricultural fields below Parkhead Less than local	No specific mitigation required.	Negligible	Negligible
S22	Floodplain and immediate surrounds of Crynoch Burn (north) and Blaikiewell Burn Regional	Generic mitigation reduces potential pollution impacts. Hydrological impacts are mitigated for by road design. Wet woodland habitat loss is mitigated by sympathetic planting (0.2ha at ch1001500-1002000). Bridging of the burn and immediate environs reduces fragmentation and habitat loss.	Major	Minor
S23	Agricultural fields within Kingcausie County	Generic mitigation reduces potential pollution impacts. Hydrological impacts are mitigated for by road design.	Moderate	Minor
S24	Kingcausie County	Generic mitigation reduces potential pollution impacts. Sympathetic landscape planting (0.97ha at Ch101500-101900) offsets loss of woodland. Hydrological impacts are mitigated for by road design. Fragmentation of wood pasture and ancient parkland habitats cannot be offset.	Moderate	Moderate
S25	Caravan Park Less than local	No specific mitigation required.	Negligible	Negligible
S26	Old Mill Inn and agricultural field surrounds Less than local	No specific mitigation required.	Negligible	Negligible
S27	Agricultural fields south of the River Dee Local	No specific mitigation required.	Minor	Minor

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Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S28	Floodplain and immediate surrounds of the River Dee Regional	Generic mitigation reduces potential pollution impacts. Bridge design reduces fragmentation of grassland by the abutment being located in S29.	Moderate	Negligible
S29	Agricultural fields south of Milltimber Less than local	No specific mitigation required. Landscape, detention ponds and protected species planting (0.55ha at ch102150-102850) provides wooded habitat in an area dominated by arable and improved fields.	Negligible	Minor positive
S30	Camphill School Local	No specific mitigation required. Landscape planting (ch102200-103250 – see S29) extends the woodland, thus providing a wildlife corridor.	Negligible	Minor positive
S31	Deeside Old Railway County	Wildlife bridge plus planting around reduces fragmentation. Habitat loss is offset by wildlife bridge and adjacent planting (see S29). Disturbance and potential pollution impacts will be reduced by generic mitigation. Planting either side of the route alignment increases the ability of the area to act as a wildlife corridor.	Moderate	Minor

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Table 30 – Mitigation Measures and Residual Impacts for Section SL4

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S32	Peterculter and western Milltimber County	No specific mitigation required. Planting of extra-heavy standard trees, plus usual roadside mixed woodland whips (see S29) will provide additional wooded habitat.	Minor	Minor
S33	Milltimber Less than local	No specific mitigation required.	Negligible	Negligible
S34	Guttrie Hill County	No specific mitigation required. Roadside planting (0.9ha at ch103800-104100) connects Guttrie Hill to S32.	Minor	Minor positive
S35	Milltimber Wood Local	No specific mitigation required.	Minor	Minor
S36	Agricultural fields around Nether Beanshill Local	No specific mitigation required. Roadside plantings (3.9ha at 103980-104550) provides wooded habitat in an area dominated by arable and improved fields. Additional woodland to the north (0.3ha at ch104680-104800) connects to the wooded habitats of S37.	Minor	Minor positive
S37	Woodland from Hill Farm to Westfield Lodge Local	No specific mitigation required. Additional plantings (0.2ha at ch104800-104900) offset habitat loss with connections to woodland plantings to the north reducing fragmentation. Beneficial mitigation is reduced by continued loss of linear habitat.	Minor	Minor
S38	Beans Hill south Local	No specific mitigation required. Roadside (1.2ha) plantings (ch104900-105600) provide wooded habitat in an area dominated by arable and improved fields, whilst connecting to existing coniferous woodland.	Minor	Minor positive
S39	Beans Hill north County	Generic mitigation reduces potential pollution impacts and hydrological impacts.	Moderate	Minor

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Table 31 – Mitigation Measures and Residual Impacts for Section SL5

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S40	Agricultural fields around Silverburn County	No specific mitigation required. Generic mitigation reduces potential pollution impacts. Hydrological impacts are mitigated for by road design. Roadside planting (0.6ha at ch106000-106500) reduces fragmentation and increases nature conservation value by connecting protected species plantings (0.5ha at ch 106000 and 0.34ha at ch106500) to riparian woodland (0.2 ha at ch106050) and connecting habitat areas of S39 and S42.	Minor	Minor positive
S41	Silverburn Wood Local	No specific mitigation required.	Negligible	Negligible
S42	Rotten O'Gairn County	Generic mitigation reduces potential pollution impacts and hydrological impacts. Habitat loss is mitigated by sympathetic planting (0.1ha at ch106500-106580). Fragmentation is reduced by roadside planting connecting S42 with S40 and S44. Loss of high value semi-improved grassland will be mitigated by offset creation.	Moderate	Minor
S43	Gairnhill and Kingshill Wood County	Generic mitigation reduces potential pollution impacts and hydrological impacts. Habitat loss is mitigated by sympathetic planting (1.1ha at ch106500-106800).	Moderate	Minor
S44	Agricultural fields to the west of Kingshill Wood Local	No specific mitigation required. Conservation value is increased by the addition of wooded habitats (1.5ha) in an area dominated by arable and improved fields. Roadside plantings connect to the high value habitat of S45.	Minor	Minor positive
S45	Moss of Auchlea Regional	Generic mitigation reduces potential pollution impacts and hydrological impacts. Habitat area is increased by sympathetic planting (0.9ha at ch107350-107700).	Moderate	Negligible

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Table 32 – Mitigation Measures and Residual Impacts for Section SL6

Habitat Area Number	Feature / Asset Evaluation	Impact Description	Pre-Mitigation Impact Significance	Residual Impact
S46	Agricultural fields to the north of the A944 Local	No specific mitigation required. Fragmentation is reduced by roadside plantings (1.6ha at ch108550-109150) connecting to the DWS of S47. Roadside plantings increase the nature conservation value by providing wooded habitats in an area dominated by arable and improved fields.	Minor	Minor positive
S47	West Hatton Wood County	Generic mitigation reduces potential pollution impacts. Fragmentation is reduced by roadside plantings connecting to Fairly Cloghill Wildlife Bridge in the north (0.46ha at ch109500) and detention ponds in the south (0.94ha at ch108600-108800). Loss of linearity reduces beneficial mitigation.	Moderate	Minor
S48	Cloghill Regional	Generic mitigation reduces potential pollution and disturbance impacts. Roadside plantings directly north and south of the Habitat Area reduce fragmentation of the woodland habitat by connecting with value increased by connections to the DWS of S47. This planting also offsets woodland habitat loss. Planting of species-rich grassland (1.6ha at ch109500-109900) offsets grassland habitat loss. Loss and fragmentation of existing high value grassland reduces beneficial impacts.	Major	Minor

7 Conclusions

- 7.1.1 In Section SL1, the implementation of mitigation would reduce potential pollution and disturbance impacts in Blue Hill Wood (S3). Fragmentation would be reduced by the provision of roadside planting (ch206100-206320). Impacts from the loss of habitat associated with the quarry pond will be reduced through the provision of a replacement pond with riparian woodland, augmenting retained existing wet woodland. Mitigation reduces potential pollution, hydrological and disturbance impacts to S10, whilst replacement habitat reduces lost wetlands, thus residual impacts to Hare Moss are reduced.
- 7.1.2 Minor impacts would occur as a result of habitat loss, fragmentation and severance in Section SL2.
- 7.1.3 The implementation of mitigation will reduce the potential for pollution, disturbance and fragmentation impacts in SL3. Fragmentation of the UK BAP Priority Habitat of wood-pasture and parkland (S23) cannot be mitigated for as this is largely an historical habitat and unable to be recreated.
- 7.1.4 Minor impacts would occur as a result of habitat loss, fragmentation and severance in Section SL4.
- 7.1.5 Residual impacts to wetland habitats within S42 (Rotten O'Gairn) and S45 (Moss of Auchlea) are reduced by mitigation which would decrease the potential for pollution, disturbance and hydrological impacts.
- 7.1.6 Fragmentation of West Hatton Wood DWS (S47) would be reduced by roadside planting creating a wooded corridor to Cloghill Wildlife Bridge and detention ponds at ch108600-108800.

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Annex 1 – Target Notes and Species List for the Phase 1 Habitat Survey

Target Note Number	Grid Reference	Description
76	NO88005 98581	Large (c.30m) stand of Japanese knotweed (<i>Fallopia japonica</i>). The stand is adjacent to the track at Whitestone plantation and extends into a nearby garden.
77	NO8415 98949	Wet heath approx. 10m wide which occupies a small ride between the Scots pine (<i>Pinus sylvestris</i>) plantation and dense gorse, this graduates into wet modified bog in the south. Heather (<i>Calluna vulgaris</i>) is dominant with frequent purple moor-grass (<i>Molinia caerulea</i>), Cross-leaved heath (<i>Erica tetralix</i>), hairy woodrush (<i>Luzula pilosa</i>), bilberry (<i>Vaccinium myrtillus</i>), crowberry (<i>Empetrum nigrum</i>) is occasional to locally frequent, occasional species are tormentil (<i>Potentilla erecta</i>), bog asphodel (<i>Narthecium ossifragum</i>), wavy hair-grass (<i>Deschampsia flexuosa</i>), carnation sedge (<i>Carex panicea</i>), matgrass (<i>Nardus stricta</i>), common cotton-grass (<i>Eriophorum angustifolium</i>) and hare's-tail cotton-grass (<i>Eriophorum vaginatum</i>). There is frequent silver birch (<i>Betula pendula</i>) and rowan (<i>Sorbus aucuparia</i>) regeneration in the area. The moss layer is well developed with abundant <i>Polytrichum commune</i> , frequent <i>Hypnum jutlandicum</i> , occasional to locally frequent <i>Sphagnum capillifolium</i> , occasional <i>Hylocomium splendens</i> , <i>Rhytidiadelphus squarrosus</i> and <i>Pleurozium schreberi</i> .
78	NO88495 98935	Small pond surrounded by bare earth and goat willow (<i>Salix caprea</i>).
79	NO88275 98855	The plantation woodland at Hill of Blairs is a complicated patchwork of planting with stands of Sitka spruce (<i>Picea stichensis</i>) and Scots pine surrounded by deciduous trees at the margins that include beech (<i>Fagus sylvatica</i>) and sycamore (<i>Acer pseudoplatanus</i>).
80	NJ88077	Broad-leaved plantation woodland. Rowan is dominant with conifers frequent, plus holly (<i>Ilex aquifolium</i>), rhododendron (<i>Rhododendron ponticum</i>) and birch occasional. Rowan and holly are regenerating in the field layer, where blaeberry is dominant, with wavy hair-grass frequent. Hard fern (<i>Blechnum spicant</i>) is occasional whilst heather (<i>Calluna vulgaris</i>) is rare. The centre of the plantation contains a conifer plantation dominated by Sitka spruce with occasional Scots pine. Ground flora is absent.
81	NO88223 99279	Semi-improved neutral grassland. The sward is comprised of abundant Yorkshire fog (<i>Holcus lanatus</i>) with frequent sweet vernal-grass (<i>Anthoxanthum odoratum</i>) and creeping bent-grass (<i>Agrostis stolonifera</i>). Meadow vetchling (<i>Lathyrus pratensis</i>) and germander speedwell (<i>Veronica chamaedrys</i>) are frequent with occasional wavy bitter-cress (<i>Cardamine flexuosa</i>), creeping buttercup (<i>Ranunculus repens</i>), common lady's-mantle (<i>Alchemilla vulgaris</i>) and heath dog-violet (<i>Viola canina</i>).
82	NO891984	Dry heath. Former fire break separating felled and plantation woodland. Heather is dominant with blaeberry, heath bedstraw (<i>Galium saxatile</i>) and sedges (<i>Carex</i> sp.) abundant. Creeping bent-grass, purple moor-grass, wavy hair-grass and wood sorrel (<i>Oxalis acetosella</i>) are all frequent, whilst foxglove (<i>Digitalis purpurea</i>) is rare. Shrubs (gorse (<i>Ulex europeaus</i>) and willow (<i>Salix</i> sp.)) are occasional with eared willow (<i>Salix aurita</i>) regenerating in the ground layer.
83	NO897985	Dry heath/acid grassland mosaic. Vegetation within the paths of the mature conifer plantation woodland is broadly similar to that in TN82 but with an increased presence of acid grassland species. Heather is co-dominant with wavy hair-grass. Both wood sorrel and <i>Rhytidiadelphus squarrosus</i> are abundant, with blaeberry, Yorkshire fog, heath bedstraw and broad buckler-fern (<i>Dryopteris dilatata</i>) occasional. Purple moor-grass is rare.
84	NO896983	Wet heath. Sunken ground – possible kettle hole – where blaeberry is abundant and cross-leaved heath frequent. Purple moor-grass, <i>Sphagnum</i> sp. and hare's-tail cotton-grass are all occasional.
85	NO898983	Dry heath/acid grassland mosaic is present within the paths through the woodland. The composition is similar to TN83.
86	NO894992	System of sheep-grazed improved grassland fields alternating with gorse scrub that can be extensive in places. Burns are common on this undulating landscape.
87	NO894989	Mixed plantation woodland. Birch dominant (c.8m) and Scots pine abundant (c.10m) in the canopy. Rowan is dominant in the shrub layer with rare holly. Bracken (<i>Pteridium aquilinum</i>) is dominant with occasional bramble (<i>Rubus fruticosus</i>) in the field layer, whereas leaf litter is dominant in the ground layer. Both Yorkshire fog and wood sorrel are frequent. Dead wood is abundant, whilst rowan is regenerating in the ground layer. The edge of the woodland contains a mix of rowan and broom (<i>Cytisus scoparius</i>) with

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		blaeberry, grasses and bramble in the field layer.
88	NO896989	Broad-leaved plantation woodland. Birch dominates with occasional rowan. Bracken dominates in the field layer with frequent grasses. Dead wood is occasional, however there is no regeneration.
89	NO894994	Semi-natural broad-leaved woodland. Mature birch is dominant and regenerating, whilst goat willow is occasional in the shrub layer. Grasses (especially Yorkshire fog) are dominant overall however bracken can be locally dominant. Rubbish dumping is present along the roadside edge.
90	NO898994	This fenced off area is described as a pond on the overlay map however a visit suggests the pond has given way to wet mud. This may suggest the pond is seasonal, however further visits would be required to confirm. Given the heavily grazed improved field surround, it is unlikely that any seasonal pond is ecologically important.
91	NO906993	<p>South west corner of Hare Moss. West of the drainage ditch, Hare Moss is vegetated with dense Gorse scrub with frequent scattered semi-mature trees including silver birch and Scots pine. Along the western perimeter of the moss, a further drain is choked with vegetation including soft rush (<i>Juncus effusus</i>), floating sweet-grass (<i>Glyceria fluitans</i>), broad-leaved dock (<i>Rumex obtusifolius</i>), Yorkshire fog, cocksfoot (<i>Dactylis glomerata</i>) with comon water-starwort (<i>Callitriche stagnali</i> <i>sense. lat.</i>) and algae in areas of open water.</p> <p>Toward the south of Hare Moss, habitats are comprised of a mosaic of marshy grassland, dense scrub and mature willow carr. Marshy areas are abundant close to the drainage ditches within the moss, with soft rush, Yorkshire fog, spear thistle (<i>Cirsium vulgare</i>), marsh thistle (<i>Cirsium palustre</i>), common sorrel (<i>Rumex acetosa</i>), broad-leaved dock, common nettle (<i>Urtica dioica</i>), bog stitchwort (<i>Stellaria alsine</i>), common valerian (<i>Valeriana officinalis</i>), cleavers (<i>Galium aparine</i>), creeping buttercup and cuckoo-flower (<i>Cardamine pratensis</i>) all common. In other areas carr woodland is dominated by birch and willow sp. with dense gorse also forming dominant stands.</p> <p>South of the 'airfield', an open area of marshy grassland is present dominated by soft rush with areas of hare's-tail cotton grass, sheeps sorrel (<i>Rumex acetosella</i>), common sorrel, broad buckler fern, common valerian and Yorkshire fog all abundant. Bottle sedge (<i>Carex rostrata</i>) forms relatively extensive swards in local areas.</p>
92	NO906995	<p>Hare Moss – west end. Approximately 2ha of the northern section of Hare Moss has been infilled with rubble and is mown amenity grassland to construct a model airplane airfield. West of this area, vegetation is relatively open with wet modified bog vegetation, comprising a mosaic of Heather-dominated areas and Purple moor-grass becoming dominant in wetter areas with locally abundant patches of Hare's-tail cotton-grass and occasional common sedge (<i>Carex nigra</i>), silver birch saplings, heath bedstraw, sheep fescue, sheep sorrel and Sphagnum spp. . The ground shows little topographical variation, being more or less even with little hummock-hollow development. In local areas, remnants of former bog pools appear to be present, which are almost dry and vegetated, often with local patches of white sedge (<i>Carex curta</i>) with cushions of <i>Polytrichum</i> sp. and Sphagnum spp. .</p> <p>Near the western edge of the moss, a drainage ditch extends in an approximately NW-SE direction. This varies from 1-2m in width with tall herb spp along the banks including common nettle, broad buckler fern, broad-leaved dock, cleavers and Yorkshire fog. Common water-starwort was present within the ditch.</p>
93	NO910994	Hare Moss – east end Wet modified raised bog with drain along north border. Vegetation comprises a mosaic of Heather-dominated communities with tussocks of Purple moor-grass and Hare's-tail cotton-grass; heather covers approx. 60% of area. Sphagnum spp. are abundant along with other moss spp. Heather ranges in height from 60 – 100cm and is in an advanced successional state. Other species present include broad buckler fern, narrow buckler fern (<i>Dryopteris carthusiana</i>), cross-leaved heath, bilberry, common sorrel, sheep sorrel and occasional crowsberry. Throughout the bog vegetation, scattered downy birch saplings have become established with grey willow also present. East of the airfield, a large wet area is present with less Heather present and a large sward of Bottle sedge , with locally abundant hare's-tail cotton grass and purple moor grass.
94	NO912994	Field adjacent to east end of Hare Moss. Most of field comprises degraded wet modified bog vegetation with approximately 25% cover of heather, with most heather present adjacent to Hare Moss. Other dominant species include locally abundant soft rush, purple moor grass, moss cushions of Sphagnum spp. and <i>Polytrichum</i> sp., hare's-tail cotton grass, tormentil and occasional bilberry.

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Target Note Number	Grid Reference	Description
95	NO913994	Field west of road and east of Hare Moss. Mosaic of marshy grassland and species-poor Semi-improved grassland. Marshy grassland is dominated by Soft rush with Yorkshire fog and creeping buttercup with occasional cuckoo-flower, marshj foxtail (<i>Alopercus geniculatus</i>) and common ragwort (<i>Senecio jacobaea</i>). In drier areas Yorkshire fog replaces soft rush as the dominant species, with additional common daisy (<i>Bellis perennis</i>), cocksfoot, common sorrel, heath milkwort (<i>Polygala serpyllifolia</i>), changing forget-me-not (<i>Myosotis discolor</i>) and meadow vetchling. Along the west border of this field close to Hare Moss, the marshy grassland has a more diverse sward with dominant species including soft rush, marsh foxtail, hare's-tail cotton grass, tormentil, common sedge, meadow foxtail (<i>Alopercus pratensis</i>), sweet vernal grass, heath wood-rush (<i>Luzula multiflora</i>) and abundant bryophytes including Sphagnum spp.
96	NO914997	Habitats adjacent to track leading to Greengate steading. North of track there is a small area of Semi-improved acid grassland with patches of gorse, rowan and broom scrub around the field margins. Grassland is dominated by cocksfoot, Yorkshire fog and red fescue (<i>Festuca rubra</i>) with abundant herbaceous species including cow parsley (<i>Anthriscus sylvestris</i>), climbing cordyalis (<i>Corydalis claviculata</i>), cleavers, common sorrel, creeping thistle (<i>Cirsium arvense</i>) and common nettle. East of this small field, semi-mature Norway spruce (<i>Picea abies</i>), common whitebeam (<i>Sorbus aria</i>), rowan and birch form a dense thicket with abundant bramble and rosebay willowherb (<i>Epilobium angustifolium</i>). South of the track, semi-natural Broad-leaved woodland has developed with semi-mature silver birch, rowan, common whitebeam and occasional Scots pine, over a ground flora including ground elder, Yorkshire fog and broad buckler fern with scattered bilberry, heath bedstraw, bramble and abundant bryophytes.
97	NO913997	Dense scrub west of road. Small area of dense gorse, with scattered brookm, grey willow (<i>Salix cinerea</i>), rowan, bramble and rosebay willowherb. Birds abundant with whitethroat, yellowhammer and abundant starling. South of this area, Semi-improved acid grassland is present in a narrow field adjacent to the road. Cocksfoot and Yorkshire fog are dominant with locally abundant patches of lady fern (<i>Athyrium filix-femina</i>), cow parsley, raspberry (<i>Rubus idaeus</i>), bramble, gorse and rosebay willowherb. Scattered gorse scrub and rowan and common whitebeam trees occur along the margins. A similar area of dense gorse scrub lies on a rocky outcrop to the NW.
98	NO911998	Mature, even-aged coniferous plantation adjacent to Jameston Cottage. Canopy dominated by Scots pine, over grass-dominated ground layer similar in composition to that recorded in TN100 above. A substantial rookery was noted in the pine trees.
99	NO915998	Mature coniferous plantation. Canopy of even-aged Scots pine with occasional European larch (<i>Larix decidua</i>), Norway spruce, common white beam and rowan. Ground flora dominated by Yorkshire fog with occasional broad buckler fern, creeping bent, climbing cordyalis, chickweed wintergreen (<i>Trientalis europaea</i>), common sorrel, wood sorrel, red fescue and soft rush. To the south of this area there is a small area of mixed woodland, of plantation origin but with secondary characteristics developing. Mature coniferous canopy of Scots pine with semi-mature Norway spruce,downy birch,silver birch, rowan and grey willow. These species form a naturally regenerating understorey with additional gorse, bramble and broom over a ground flora including broad buckler fern, Yorkshire fog, chickweed wintergreen, common sorrel, rede fescue and occasional heath milkwort and climbing cordyalis. In wetter, poorly drained areas soft rush is locally abundant with occasional patches of Sphagnum spp. .
100	NO915999	Grazed coniferous plantation. Mature Scots pine plantation of similar age to Blue Hill Wood at TN112 above over improved grassland ground layer. Dry stone walls are present around most Habitat Areas in this section of the study area – many of these are covered in extensive bryophyte carpets and provide valuable habitats to small mammals.
101	NJ916001	Young coniferous plantation. Canopy dominated by young Sitka spruce and similar to that recorded in TN108 above.
102	NO919999	Young broad-leaved plantation in relatively large, roughly circular open area within young conifer plantation. Several mature coniferous trees are present around the edge including Scots pine, European larch and scattered gorse scrub. Broad-leaved trees planted include birch and rowan saplings over rough grassland dominated by Yorkshire fog, cocksfoot and soft rush.
103	NO921996	Duff's Hill Plantation managed by Forestry Commission. Dense semi-mature coniferous plantation, dominated by pine sp. (<i>Pinus</i> sp.) around the borders with occasional common whitebeam and rowan. Virtually no ground flora present, with the exception of occasional bryophytes and Broad buckler-fern. At the northern end of the plantation, a narrow strip of

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		dense gorse scrub is present between it and the younger plantation to the north.
104	NO923997	Marshy grassland in field south of drainage channel and north of Turnamiddle Farm. Dominated by grass species including soft rush, purple moor grass and hare's-tail cotton grass with Yorkshire fog and cocksfoot dominant in drier areas with improved drainage.
105	NO924998	Drainage ditch extending in an approximately east-west direction along the southern boundary of the young conifer plantation. In the eastern end, the drain is vegetated with floating sweet grass, dominant within the channel and soft rush, Yorkshire fog and cocksfoot dominant along the banks. At the west end of the channel, where the drain is to the north of agricultural fields recent clearance of the vegetation has occurred.
106	NO922999	Young broad-leaved plantation, planted along banks of wet ditch between two forest blocks as described in TN108 above. Planted species include wild cherry (<i>Prunus avium</i>), bird cherry (<i>P. padus</i>), sycamore, ash (<i>Fraxinus excelsior</i>) and occasional pendunculate oak (<i>Quercus robur</i>), hawthorn (<i>Crataegus monogyna</i>) and broom over a ground flora of species-poor semi-improved grassland including Yorkshire fog, cocksfoot, broad-leaved dock, common nettle and lady fern on the ditch banks.
107	NJ921000	Deep, wet drainage ditch located between plantation blocks with mature Hawthorn and scattered Gorse scrub along the tops of the banks, along with coarse grass species such as Yorkshire fog and cocksfoot. Young broad-leaved plantation, similar to TN106 is present to the south of the ditch.
108	NJ923001	Young conifer plantation. Numerous plantation blocks extend in roughly westerly direction towards the more mature Forestry Commission plantation at Duff's Hill (see below). In all of the woodland blocks the majority of the canopy is comprised of young, even-aged Sitka spruce and Norway spruce, approximately 5-10m high and 10-15 years old. In small areas around the forest area, broad-leaved woodland species have been planted around the woodland edges and in corners of individual woodland blocks. Here, a range of deciduous species is present including sycamore, wild cherry, ash, bird cherry and pendunculate oak. Within the coniferous areas, ground flora is virtually non-existent. In the areas of broad-leaved woodland and in rides between woodland blocks, a species-poor semi-improved grassland persists, dominated by Yorkshire fog and cocksfoot, with occasional herbaceous species including creeping thistle, cow parsley and wild pansy (<i>Viola tricolor</i>).
109	NJ922003	Cairnfield Pond is a large, linear pond approximately 7m x 70m predominantly consisting of open water. Approximately 90% of the bank and marginal zone is dominated by soft rush. Emergent vegetation was dominated by water forget-me-not (<i>Myosotis scorpioides</i>). The pond is surrounded by rush-dominated marshy and semi-improved grassland habitats within an open area between conifer plantation blocks. A small area of willow scrub has been planted on the south side of the pond.
110	NJ923004	Southwest slopes of Blue Hill above Greenhowe farmhouse, vegetated with a mosaic of dense Gorse scrub and semi-improved acid grassland including sheep fescue (<i>Festuca ovina</i>), Yorkshire fog, wavy hair-grass, tufted hair-grass (<i>Deschampsia cespitosa</i>), sweet vernal grass, tormentil and heath bedstraw.
111	NJ926004	Open area dominated by bracken with occasional mature and semi-mature rowan, Sitka spruce and silver birch. Badger and roe deer tracks and dung were abundant. To the east there is a semi-mature coniferous plantation – dominated by Scots pine, over a ground flora dominated by broad buckler fern with foxglove, chickweed wintergreen, bramble, Yorkshire fog, sheep sorrel, raspberry and common nettle all abundant.
112	NJ926002	Mature conifer plantation on steeply sloping ground south of Blue Hill. Canopy dominated by mature Scots pine over a well-developed understorey comprising rowan and common whitebeam and a ground flora dominated by broad buckler fern with red fescue, wavy hair-grass, Yorkshire fog, bramble and chickweed wintergreen all common. An open area is present to the south of the area of Scots pine with a few scattered rowan and spruce sp. trees over a ground flora dominated by broad buckler fern. Between this area and the field to the east, a disused quarry is present containing a pond approximately 30m in diameter. On three sides of the pond, exposed rock faces are present with overhanging Gorse, Goat willow and Rowan. Marginal vegetation is present in places, with soft rush, cuckoo flower and lady fern on the banks. Within the pond, large numbers of tadpoles were noted.
113	NO927999	Marshy grassland south of conifer plantation block and north of drainage channel. Sward

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		dominated by soft rush and Yorkshire fog, with occasional broad-leaved dock and marsh thistle.
114	NO926998	Remnant of raised peat bog south of drainage channel and north of agricultural/industrial works site. Relatively small site of approximately 3ha comprising modified degraded bog habitats including both wet and dry modified bog habitats. In the eastern section of this Habitat Area, the vegetation is characteristic of wet modified bog with soft rush, purple moor grass and hare's-tail cotton grass all co-dominant with relatively extensive areas of bare ground. To the west, on slightly higher ground, the peat deposits are drier and dominated by ericoid shrubs, with heather and gorse occupying approximately 50-60% of the sward. Other dry heath vegetation is also present including hare's-tail cotton grass, sheep fescue, Yorkshire fog, foxglove, wavy-hair grass, heath bedstraw, tormentil, common sorrel, soft rush and lady fern.
115	NO929997	Unmanaged meadow adjacent to northbound carriageway of existing A90. Vegetation comprises semi-improved grassland, with scattered gorse and goat willow scrub. Grass sward is dominated by coarse grass species including tufted hair-grass, cocksfoot, Yorkshire fog and Soft rush with abundant herbaceous species that form a major component of the sward. These include creeping buttercup, broad-leaved dock, cow parsley, coltsfoot, creeping thistle, spear thistle, field horsetail (<i>Equisetum arvense</i>), hogweed (<i>Heracleum sphondylium</i>), white clover (<i>Trifolium repens</i>), common nettle and germander speedwell. Along the west border of the field a 2-3m high raised earth bund separates the field from a large open area of bare ground and sparse phemeral vegetation. The earth bund is dominated by tall herb vegetation with scattered scrub and tree species. Dominant species include sycamore, goat willow, gorse, redcurrant (<i>Ribes rubrum</i>), Japanese Knotweed, common comfrey (<i>Symphytum officinale</i>), reed canary-grass (<i>Phalaris arundinacea</i>), ground elder, cocksfoot, Yorkshire fog, soft rush and occasional clumps of lady fern.
116	NJ932005	Young mixed plantation woodland associated with embankments and areas of land isolated by slip roads at Charleston Junction. The plantations are relatively young (15-20 years old and include broad-leaved and conifer species.
117	NJ928008	Hatton Wood. Semi-mature broad-leaved woodland, probably of plantation origin but developing a ground flora characteristic of secondary woodland. Canopy dominated by downy birch, rowan and occasional beech around the margins. The ground flora is species-poor with broad buckler-fern dominant with occasional smooth meadow-grass (<i>Poa pratensis</i>), chickweed wintergreen, wood sorrel and hard fern. The canopy is relatively open in places and towards the west end of the wood there are some stands of locally dominant great wood-rush (<i>Luzula sylvatica</i>) and bramble.
118	NO863983	Durris Forest. Mixed plantation woodland. Canopy consists of mature Sitka spruce and birch with gorse along the edge. Yorkshire fog is dominant and tufted hair-grass frequent. Heather is frequent with occasional broom, foxglove, wood sorrel and rare rosebay willowherb.
119	NO872986	Semi-improved mesotrophic/marshy grassland. Tufted hair-grass is dominant with soft rush locally dominant. Both Yorkshire fog and bent grass are abundant with sheep's sorrel and ribwort plantain frequent. Occasional species include marsh thistle, cocksfoot, dock and cuckoo-flower. Blaeberry is rare and only by rock outcrops.
120	NO869987	Broad-leaved plantings (c. 4m tall). Varied species mix, including common lime, beech, elder, hawthorn and holly. The ground layer is of poor neutral semi-improved grassland.
121	NO869988	Conifer plantation woodland. Scots pine dominates with Douglas fir and larch also present. The field layer is of an acid grassland mix, where wavy hair-grass dominates with wood sorrel frequent and chickweed wintergreen and climbing corydalis occasional. Rhododendron is invading. The south is bordered by a fence which has fallen into disrepair and a wall immediately to the south of that.
122	NO869989	Mixed plantation woodland succeeding to semi-natural broad-leaved woodland. Beech is dominant with larch, silver birch, goat willow and rowan also present. The ground layer is bare with occasional bracken.
123	NO873988	Young Sitka spruce conifer plantation woodland with Scots pine to the north. Rhododendron is frequent throughout. Below is acid grassland dominated by wavy hair-grass with frequent hedge bedstraw (<i>Galium mollugo</i>), Yorkshire fog and tormentil. Chickweed wintergreen and crowberry are occasional.
124	NO874990	Mature conifer plantation woodland. Conifer species are varied but include Douglas fir, Sitka and Norway spruce and Larch. Broadleaves are frequent along the edges of the burn, with beech and bird cherry being the most frequent. The field layer is dominated by bare ground with

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		frequent wood sorrel and foxglove. Bracken can be locally dominant.
125	NO875991	Avenue of planted broadleaves with walls. Mix of trees and shrubs include holly, beech, sessile oak (<i>Quercus petraea</i>), sycamore, rowan, ash, field maple (<i>Acer campestre</i>) and horse chestnut (<i>Aesculus hippocastanum</i>). The path is overgrown with common nettle, cocksfoot, Yorkshire fog, cleavers, broad-leaved dock and germander speedwell. Towards the north, ancient woodland indicator species exist, including herb robert (<i>Geranium robertianum</i>), wood sorrel, moschatel (<i>Adoxa moschatellina</i>), wood aven (<i>Geum urbanum</i>) and great woodrush.
126	NO878989	Conifer plantation woodland. Scots pine dominates whilst rowan is occasional in the shrub layer. Broadleaves and other conifers are occasional. Sitka spruce is regenerating in the ground layer. The ground layer is species poor, being dominated by Yorkshire fog with abundant bracken. Towards the south, blaeberry and wavy hair-grass begin to appear.
127	NO871993	Conifer plantation woodland. Canopy includes Sitka spruce and Scots pine. Where Scots pine dominates, silver birch dominates in the shrub layer. The ground flora is mostly acid dominated by wavy hair-grass, Yorkshire fog and wood sorrel though areas of dry heath dominated by heather, blaeberry and bell heather exist. Rhododendron is occasional.
128	NO868987	Willow carr/marshy grassland (approx. 6x6m) produced by thinning of western hemlock (<i>Tsuga heterophylla</i>). Goat willow dominates in the canopy with larch frequent. The ground layer has no dominant species but a mix of water horsetail (<i>Equisetum fluviatile</i>), tufted hair-grass, Yorkshire fog, common valerian, meadowsweet (<i>Filipendula ulmaria</i>), marsh violet (<i>Viola palustris</i>) and marsh thistle, with goat willow regenerating.
129	NO868988	Bluebell (<i>Hyacinthoides non-scripta</i>) under Sitka spruce and larch.
130	NO867989	Floodplain mire. An undercarpet of <i>Sphagnum</i> spp. dominates with marsh pennywort (<i>Hydrocotyle vulgaris</i>), jointed rush (<i>Juncus articulatus</i>) and bog myrtle (<i>Myrica gale</i>) all abundant. Occasional species include meadowsweet, marsh thistle, bugle (<i>Ajuga reptans</i>) and tormentil. This community alternates with a mix of Yorkshire fog and soft rush along the northern bank of the burn associated with the target notes, with the wood described in TN132 present to the north where indicated on the Phase 1 map.
131	NO867989	Conifer plantation woodland. Western hemlock dominates with occasional birch and rare rowan. The ground layer is predominantly bare with bracken invading at the edge and <i>Sphagnum</i> occasionally present in the drainage channel. Further to the east, the ground layer becomes more verdant with species such as Yorkshire fog, tufted hair-grass, horsetail, hard fern with Sitka spruce, Scots pine, larch and goat willow appearing where the conifer plantation thins (predominantly on bends in the road).
132	NO866989	Semi-natural woodland. Birch (c.8m height) dominates the open canopy, though gorse is invading. There is no tree regeneration. The ground flora is dominated by Yorkshire fog with frequent broad-leaved dock and common nettle. Bracken is invading in some areas. There is limited poaching by cattle.
133	NO865989	Marshy grassland. Yorkshire fog is dominant with soft rush abundant. Gorse is invading.
134	NO865991	Small patch of acid grassland dominated by Wavy hair-grass with frequent <i>Sphagnum</i> humps. Broad buckler-fern and foxglove are occasional. Sitka spruce is regenerating the field layer.
135	NO863988	Steep sided (around 60°) slope with gorse dominant and scattered frequent regeneration of conifers from the plantation to the west. The field layer is comprised of mesotrophic grassland species (Yorkshire fog, cocksfoot).
136	NO863991	Marshy grassland/mesotrophic semi-improved grassland. Conifers (spruce) and eared willow are regenerating from the neighbouring plantation. Grasses are dominated by reed canary-grass, whilst common comfrey is abundant in the field layer. Climbing corydalis, marsh thistle and wild angelica (<i>Angelica sylvestris</i>) are frequent, as is bracken towards the river in the west. Occasional species include meadowsweet, cleavers, wild primrose (<i>Primula vulgaris</i>) and jointed rush. Towards the spruce-lined road to the east, the flora becomes more characteristic of wet neutral semi-improved grassland. Yorkshire fog dominates with foxglove and soft rush frequent, as are eared willow shrubs. Tufted hair-grass is occasional in clumps. Underneath the trees, both common dog-violet (<i>Viola riviniana</i>) and wood sorrel were noted, whilst opposite-leaved golden saxifrage (<i>Chrysosplenium oppositifolium</i>) was recorded towards the river.
137	NO863992	Conifer plantation woodland. Spruce is dominant throughout with a largely bare ground layer.

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		Scots pine lines the spruce to the south and has a grassy ground layer.
138	NO864994	Mixed plantation woodland bordering on semi-natural. Varied conifers in compartments give way to mature birch wood. Dense rhododendron is common to all compartments. Lack of woodland management has meant that compartments now merge into each other. In the conifer plantation woodland, besides rhododendron, wavy hair-grass dominates. Bracken is invading.
139	NO868994	Semi-natural broad-leaved woodland. Burns and pools are present. Common alder (<i>Alnus glutinosa</i>) is dominant with occasional birch and other broadleaves, including pendunculate oak and beech. Rhododendron is dominant in the shrub layer with occasional goat willow. <i>Sphagnum</i> is occasional to rare.
140	NO869994	Semi-natural broad-leaved woodland. Birch is dominant but dense rhododendron is the main feature. Merges with conifer plantation.
141	NO870995	Semi-natural broad-leaved woodland. Varied mature canopy of common alder, sycamore, pendunculate oak, horse chestnut, common whitebeam, silver birch, willow and conifers. Dense rhododendron is present in the shrub layer.
142	NO863993	Mixed semi-natural woodland derived from plantation on steeply sloping ground. Canopy of around 20m is dominated by conifers (dominated by larch with Sitka spruce, Norway spruce and Douglas fir). The dense shrub layer is dominated by cherry with abundant rowan and birch. The ground layer is dominated by bare ground with abundant grasses, frequent wood sorrel and occasional foxglove.
143	NO863994	Car park of disused vehicles with a surround of tall ruderals (common nettle and common comfrey). Japanese knotweed is present.
144	NO863994	Mature semi-natural broad-leaved riparian woodland (approx. 15m in height) on very steep-sided ground. The canopy is composed of beech, common alder, pendunculate oak and ash, with hazel and rowan in the shrub layer. The field layer tends to be dominated by grass and leaf litter, whilst the more open areas are dominated by bracken.
145	NO863995	Dense scrub dominated by hazel (<i>Corylus avellana</i>) and common lime of around 6m height. Other species include horse chestnut, rowan and sycamore. The ground layer is grassy with occasional foxglove.
146	NO864995	White willow (<i>Salix alba</i>) carr with also hazel, common whitebeam, common alder, bird cherry and wych elm. The ground layer is a mix of Yorkshire fog, compact rush (<i>Juncus conglomeratus</i>), Meadow grass and tufted hair-grass. The wet ground below contains abundant dead wood but no pools. The centre contains an open area of marshy grassland. Soft rush dominates with marsh thistle frequent. Yellow flag (<i>Iris pseudacorus</i>) and jointed rush are occasional, as are water forget-me-not, common sorrel, cuckoo-flower and wavy bitter-cress. The channel feeding the wetland is choked with variegated reed canary-grass with occasional water horsetail and common comfrey. Common nettle and cleavers are occasional to frequent throughout.
147	NO863995	Species-rich hedgerow. Beech dominates with dogwood (<i>Cornus sanguinea</i>) and sweet chestnut (<i>Castanea sativa</i>) also present. The ground layer is dominated by ground elder with frequent herb robert, common nettle and cow parsley.
148	NO862996	Storybook Glen Theme Park. Amenity grassland dominates the area with many ornamental trees and shrubs, including by managed ponds and streams. Areas of semi-natural habitat do exist, including broad-leaved woodland (see TN151).
149	NO861997	Semi-natural broad-leaved riverine woodland. Beech dominates the canopy, with occasional hazel in the shrub layer, however, the ground flora is absent, with bare soil dominating.
150	NO861996	Semi-natural mixed woodland. Beech is dominant in the mature canopy, with occasional mature larch, Sitka spruce and Scots pine. Other trees include common alder, pendunculate oak and silver birch with hazel dominant in the shrub layer. The ground layer is predominantly leaf litter with bracken invading, though great woodrush is locally dominant.
151	NO860997	Semi-natural broad-leaved woodland. The wood is heavily managed. Birch dominates though a wide variety of broadleaves (sycamore, ash, eared willow, beech, hawthorn and willow) and western hemlock are present. The understory has species characteristic of ancient woodland (dog's mercury, moschatel, wood aven, wild primrose, wood sorrel, great woodrush and <i>Lonicera periclymenum</i>). Other plants present include foxglove, bramble, dog-rose, common comfrey, wood forget-me-not (<i>Myosotis sylvatica</i>) with eared willow regenerating. Sweet cicely (<i>Myrrhis odorata</i>), common comfrey and cow parsley become dominant towards

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		the stream.
152	NO861998	Conifer plantation woodland. The woodland is mature and well-spaced. Norway spruce dominates with silver birch and beech frequent. The ground flora is dominated by leaf litter and dead wood, with great woodrush occasional.
153	NO861998	Semi-natural broad-leaved woodland. Beech is dominant in the canopy with birch and rowan frequent in the shrub layer. Rhododendron is dominant below that, thus restricting the ground layer.
154	NO866996	Narrow shelter belt of mixed broadleaves and conifers. Ground layer is dominated by leaf litter but also includes occasional northern marsh-orchid (<i>Dactylorhiza purpurella</i>).
155	NO868998	Conifer plantation woodland. Scots pine is dominant, with Douglas fir frequent and Sitka spruce occasional. Broadleaves (beech, silver birch and sycamore) are occasional. The ground layer is of acid grassland dominated by wavy hair-grass and a broad-leaved woodland edge of dominant beech with pendunculate oak and sycamore. Bracken is frequent within the woodland.
156	NO866996	Path lined with trees. Broadleaves (pendunculate oak, ash, sycamore and beech) dominate with conifers (larch, cypress and Douglas fir) occasional. The ground layer is predominantly bare with abundant grasses. Common nettle, herb robert and moschatel are frequent. There is limited poaching by cattle.
157	NO866998	Semi-natural broad-leaved woodland. The canopy is varied but includes birch, beech, common alder and sycamore. Rhododendron is dominant throughout with cherry laurel (<i>Prunus laurocerasus</i>) occasional. The ground layer is largely absent. The wood merges with conifer plantation to the north and the tree-lined path to the south.
158	NO866997	Mixed predominantly broad-leaved semi-natural woodland, with frequent conifers.
159	NO863998	Semi-natural broad-leaved woodland derived from plantation. Sycamore is dominant with conifers occasional. Hazel is abundant in the shrub layer, with birch and rowan occasional. Common alder becomes frequent by the burn. The ground layer is predominantly bare, though mosses and ferns are frequent, as are grasses overall, though these are localised. Remnants of bluebell were observed, though the frequency of this species was unable to be assessed. Common dog-violet and great woodrush occurred in the western section of the site, whilst monk's-hood (<i>Aconitum napellus</i>) was rare in the east. Rhododendron is invading in the east.
160	NO864999	Small (4x4m) area of swamp. Bottle sedge is abundant with soft rush frequent and water forget-me-not occasional. Common nettle, creeping buttercup and meadow grass are invading, thus suggesting drying-out of the swamp.
161	NO864999	Traditional walled garden now overgrown and tending towards semi-natural broad-leaved woodland. Many of the traditional boundaries are gone or only remnants remain. New fencing and new planted trees are present however. Ash and sycamore are dominant in the canopy though conifers (Norway spruce, Sitka spruce, cherry laurel, western hemlock and monkey-puzzle tree (<i>Araucaria araucana</i>) are frequent. Other broadleaves include holly, snowberry (<i>Symphoricarpos albus</i>) and bird cherry. The ground layer is predominantly bare though bluebell (<i>Hyacinthoides non-scripta</i>) is abundant.
162	NJ864001	Semi-natural broad-leaved woodland. Sycamore is dominant but a variety of species are present. Rhododendron is dominant in the shrub layer. Frequent species in the field layer include bluebell and leopard's-bane (<i>Doronicum pardalianches</i>), whilst monks-hood and common solomon's-seal (<i>Polygonatum multiflorum</i>) are occasional. An unvegetated small pond is present, as is some rubbish dumping.
163	NJ866002	Mixed plantation woodland. Broadleaves (sycamore, common alder, birch and rowan) are frequent, whilst conifers (larch, spruce and Scots pine) are occasional. The ground is dominated by dead wood with wood sorrel.
164	NJ868001	Although a fence separates the two woodlands, this is a continuation of the wood described in TN155.
165	NJ864002	Tree/shrub-lined path. Varied mix of native and alien species shrubs with mature conifers and broadleaves.
166	NJ866004	Broad-leaved plantation woodland. Birch is dominant with rhododendron dominant in the shrub layer. The edge is of a mixed broad-leaved surround, including pendunculate oak, wych elm, sycamore and ash. A woodpecker was heard.
167	NJ863003	Road lined with mature overhanging trees. Species mix includes laburnum (<i>Laburnum sp.</i>),

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		holly, beech and sycamore with shrubs including dominant elder and bird cherry. The ground flora includes the ancient woodland indicator species of ground elder and dog's mercury, plus common nettle and grasses.
168	NJ864004	Mature broadleaves and conifers surrounding depression in the ground. Beech dominates. The ground layer is predominantly neutral grassland with abundant ferns. The depression has a moat surround.
169	NJ860003	Mixed plantation woodland succeeding to semi-natural. Mature beech dominates with wych elm, wild cherry, Common whitebeam and silver birch also present. The ground flora is mostly absent, with rhododendron invading from the south.
170	NJ861001	Small area of swamp. Pendulous sedge (<i>Carex pendula</i>) is dominant with willow occasional. The area is drying out and being invaded by scaly male fern (<i>Dryopteris affinis</i>). Other species present include frequent meadowsweet and occasional red campion (<i>Silene dioica</i>), soft rush, Common valerian and marsh pennywort. Rare species include wavy bitter-cress and herb robert.
171	NJ858002	Semi-natural broad-leaved riparian woodland/ invasive species. <i>Salix</i> sp. is dominant with frequent ash within an open canopy. In the field layer, ground elder is dominant with frequent bramble. Occasional species include bluebell, creeping thistle, common nettle and dog-rose. Other species include common comfrey, water parsnip (<i>Berula erecta</i>) and a stand of Japanese knotweed.
172	NJ857003	Heavily vegetated burn. Common alder and elder are dominant in an open canopy. The ground flora is dominated by rosebay willowherb with frequent ground elder. Red campion and coltsfoot are occasional. The water line is low and the flow, sluggish.
173	NJ862004	Southern bank of River Dee. Steeply-sloped semi-natural broad-leaved woodland. Mix of species in the canopy, including wych elm (<i>Ulmus glabra</i>), sycamore, common alder, bird cherry, goat willow, ash, silver birch and rowan. To the south, the ground flora is dominated by ferns and tufted hair-grass. To the north, the dominant species are great woodrush, dog's mercury and ground elder, although to the west, great woodrush dominates with wood aven, water aven and herb robert. Reed canary-grass is dominant by the water's edge, whilst common nettle and rosebay willowherb are occasional throughout.
174	NJ862004	Southern bank of River Dee. Possible dead giant hogweed (<i>Heracleum mantegazzianum</i>). One specimen only.
175	NJ864005	Southern bank of River Dee. Semi-natural broad-leaved riparian woodland. Steeply sloped with upper level containing a mix of broadleaves, including sycamore, wych elm, hawthorn, hazel and common alder. In the upper levels, the ground flora is largely dominated by bracken, with the lower slopes containing a varied mix of tufted hair-grass, great woodrush, wood horsetail (<i>Equisetum sylvaticum</i>), common valerian, red campion, herb robert, garlic mustard (<i>Alliaria petiolata</i>), moschatel, marsh thistle, common comfrey, touch-me-not balsam (<i>Impatiens noli-tangere</i>). The water's edge is lined with common alder with reed canary-grass.
176	NJ862005	Northern floodplain of the River Dee. Mesotrophic semi-improved grassland. Yorkshire fog and red fescue co-dominate with abundant cocksfoot and sweet vernal-grass. Frequent species include perennial rye grass (<i>Lolium perenne</i>), rough meadow-grass (<i>Poa trivialis</i>), pignut (<i>Conopodium majus</i>), common ragwort and meadow buttercup (<i>Ranunculus acris</i>). White clover, creeping thistle, cow parsley, ribwort plantain, sheep's sorrel, daisy, meadow foxtail, timothy (<i>Phleum pratense</i>), crested dog's-tail (<i>Cynosurus cristatus</i>), germander speedwell and lesser stitchwort (<i>Stellaria graminea</i>) are frequent, with hogweed rare.
177	NJ857004	Northern bank of River Dee. Willow/common alder carr, with other broadleaves occasional. The ground flora contains false oat-grass (<i>Arrhenatherum elatius</i>), cocksfoot, reed canary-grass, Yorkshire fog, tufted hair-grass, meadowsweet, hogweed and wild angelica.
178	NJ855008	Camphill. Although derived from plantation, the wood contains a structure to suggest it has succeeded to semi-natural. Sign says the woodland was planted in 1999 but many trees far more mature and ground flora contains ancient woodland indicators. New plantings still in tubes are present however. Canopy contains pendunculate oak, silver birch, sycamore, beech and ash. Conifers include Scots pine, larch and Douglas fir. Shrub layer is composed of rowan, holly, silver birch, elder and hawthorn. Shade-loving ground flora includes ground elder, great woodrush, wood aven and herb robert.
179	NJ855008	Camphill. Mixed scattered trees, including sycamore, ash, Norway spruce, beech and larch. The ground flora around the edges contains bramble, common nettle, ground elder and

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		cleavers, whilst, interspersed with wooden buildings and car parks, is a series of amenity grasslands.
180	NJ862007	Camphill. Semi-natural broad-leaved woodland. Mix of trees including beech dominant in the upper canopy, birch in the lower canopy, rowan in the shrub layer and ground elder, grasses (especially bent) and great woodrush in the ground layer.
181	NJ853008	Camphill. Ornamental garden with bridges, burns and exotic trees.
182	NJ864008	Northern floodplain of the River Dee. Former pond, now with no standing water nor is the ground moist. Dominance is very mixed but does contain some marsh/swamp/wet grassland species. The community comprises of reed canary-grass, curled dock (<i>Rumex crispus</i>), timothy, Yorkshire fog, creeping buttercup, rough meadow-grass, red fescue, soft rush, sweet vernal-grass, perennial rye grass, cow parsley, red campion, water forget-me-not and tufted hair-grass. The former pond has an occasional tree/shrub surround, including oak and hawthorn.
183	NJ851009	Camphill. Mixed scattered trees with a broad canopy under which are gardens interspersed with amenity grounds.
184	NJ848011	Ancient hedgerow with trees. Path lined with mature trees and walls on either side. A burn is present from the mid-point to the southern end on the eastern side. The canopy mix includes sycamore, beech, rhododendron, elder, holly, hazel, rowan, wych elm, common lime, plus ash, which is also regenerating. The ground flora includes herb robert, ivy (<i>Hedera helix</i>), common nettle, ground elder, wood aven, water aven, coltsfoot, polypody (<i>Polypodium vulgare</i>), red campion and common comfrey.
185	NJ847012	Broad-leaved plantation woodland derived from coppice but now very overgrown (around 20m) with shrub layer developing. The ground flora is mostly absent, with bare soil/leaf litter dominant.
186	NJ848014	Semi-natural broad-leaved woodland derived from plantation. Sycamore is dominant with conifers around the edge. Some young (still in tubes) planted trees are present in the north. The shrub layer is dominated by elder. The ground layer is dominated by common nettle and cleavers, though grasses can be locally dominant. Occasional species include red campion, germander speedwell, wood speedwell and foxglove.
187	NJ849115	Sporting complex with a number of planted native and ornamental gardens and scattered trees between buildings and lining car parks.
188	NJ852011	Semi-natural broad-leaved woodland. Beech is dominant in the canopy with birch dominant in the shrub layer. The field layer is dominated by grasses with abundant <i>Veronica montana</i> , frequent ground elder. Great woodrush is rare with holly regenerating in the field layer.
189	NJ851015	Shelter belt of broad-leaved semi-natural woodland. Beech is dominant but the species mix is varied and includes wych elm, Douglas fir, sycamore, holly, common whitebeam, <i>Quercus sp.</i> and horse chestnut. The ground layer contains lesser periwinkle (<i>Vinca minor</i>), cleavers, wood speedwell and honeysuckle. A grey squirrel (<i>Sciurus carolinensis</i>) was spotted. The wood develops into dense birch woodland to the east.
190	NJ847015	Broad-leaved plantation woodland succeeding to semi-natural. Beech is dominant but a wide variety of species are present (horse chestnut, pendunculate oak, sycamore, wych elm, holly and various conifers). The ground layer is predominantly bare but both bluebell and common comfrey can be abundant. Foxglove is occasional. A wall surrounds the area.
191	NJ853018	Conifer plantation woodland. Scots pine is dominant with a surround of broad-leaved trees (dominant birch and abundant sycamore). Much of the birch is regenerating.
192	NJ848021	Scattered broad-leaved trees. A dry stone wall surrounds this open canopy of relatively mature trees. The presence of a ruined building (unclear whether this is a dwelling house though) may suggest a former garden. Species include ash, common whitebeam, birch, eared willow, wild cherry and hawthorn. In the shrub layer, gorse is abundant, whilst broom is occasional. There is no evidence of tree regeneration. The ground layer is of mesotrophic grassland, dominated by typical rank grasses (e.g. cocksfoot, Yorkshire fog).
193	NJ846019	Conifer plantation woodland. Sitka spruce is dominant with rare broadleaves (holly, eared willow, willow and pendunculate oak). Sycamore is dominant along the wood boundary.
194	NJ844018	Conifer plantation. Scots pine is dominant with frequent broadleaves in both the shrub and canopy layers. The ground layer contains bracken co-dominant with grass spp.. The wood is bordered by a dry stone dyke in the south with various broad-leaved mature trees. The woodland edge contains snowdrop (<i>Galanthus nivalis</i>), bluebell, bramble, ground elder and

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		common comfrey.
195	NJ840,017	Mixed plantation woodland. Canopy comprises of Scots pine, eared willow, beech and birch. Ancient woodland indicator species include wood sorrel, wood anemone (<i>Anemone nemorosa</i>) and pignut. The edge also contains common whitebeam and white dead-nettle (<i>Lamium album</i>). A badger (<i>Meles meles</i>) latrine was discovered within the wood.
196	NJ855024	Semi-natural broad-leaved woodland. Probably derived from plantation due to the reasonably uniform tree age, however, ancient woodland indicators (bluebell, wood anemone, pignut, moschatel, wood sorrel and dogs mercury) are present, as is common nettle, daffodil (<i>Narcissus pseudonarcissus</i>), foxglove and common dog-violet, although leaf litter is dominant. Ferns include broad buckler-fern and scaly male-fern. The canopy is dominated by beech with sycamore (seen to be regenerating) and occasional conifers. Birch dominant in the shrub layer. In the north, birch becomes the dominant tree with bracken invading. Possible disused badger setts were discovered.
197	NJ847027	Semi-natural broad-leaved woodland. Sycamore is dominant with bird cherry and elder in the shrub layer. Holly is regenerating in the field layer. The understorey is dominated by bramble and dog-rose. Other species present include wood sorrel, ground elder, daffodil and fern species.
198	NJ853031	Constructed dirt circle built for use by quad bikes.
199	NJ854032	Shelter belt. Scots pine is dominant with frequent broadleaves, including rowan, pendunculate oak and wych elm. The ground flora is dominated by bracken, with frequent Yorkshire fog.
200	NJ848038	Dry heath (25%)/ acid grassland mosaic (75%). Wavy hair-grass is dominant with heather and sheep's sorrel frequent but can be dominant in areas. Occasional species include blaeberry, bell heather, purple moor-grass, red fescue, heath speedwell (<i>Veronica officinalis</i>), tormentil and great woodrush. Scattered scrub (frequent gorse and occasional rowan) is present. Rabbits (<i>Oryctolagus cuniculus</i>) are abundant.
201	NJ849099	Marsh. The area of around 2m x 2m is dominated by soft rush and jointed rush, with tufted hair-grass. Occasional species include wood anemone, spear thistle and common sorrel. The area is surrounded by gorse.
202	NJ850039	Gairnhill Wood. Conifer plantation. The plantation is dominated by a mix of Scots pine and Sitka spruce. Rare to occasional broad-leaved trees include rowan, birch and willow. Wood sorrel was present in localised patches. New and disused badger setts are present.
203	NJ850042	Gairnhill Wood. Semi-natural broad-leaved woodland. Dominated by mature birch with occasional conifers and frequent goat willow. Grasses are abundant in the field layer, whilst soft rush is frequent, as is bracken, particularly around the many ditches criss-crossing the area. <i>Sphagnum</i> sp. is abundant in the wetter areas. Lying dead wood is frequent.
204	NJ854044	Gairnhill Wood. Mixed plantation woodland. Scots pine is dominant with beech abundant – possibly regenerating from the neighbouring woodland compartment. Occasional shrubs of rowan and birch are present. Bracken dominates the understorey with abundant wood sorrel. Foxglove and blaeberry are occasional, whilst hard fern is rare.
205	NJ852046	Gairnhill Wood. Semi-natural broad-leaved woodland. Beech is dominant and probably derived from plantation due to the relative uniformity in height of most of the trees. Leaf litter is overwhelmingly dominant in the ground layer.
206	NJ854045	Gairnhill Wood. Conifer plantation woodland. The areas where Sitka spruce is dominant are largely devoid of any field layer however the understorey of the larch and Scots pine plantations is better developed. Birch is dominant in the shrub layer, with occasional rowan however, there is little regeneration. Wavy hair-grass is dominant in the field layer with frequent wood sorrel and occasional blaeberry. Bracken can be abundant in patches.
207	NJ854052	Broad-leaved plantation woodland. Coppiced rowan is dominant with birch occasional. The understorey is dominated by a dry heath (30%)/acid grassland (60%) mix. Overall, wavy hair-grass is dominant, with heather and blaeberry dominant. Purple moor-grass is occasional. This then gives way to Sitka spruce dominated conifer plantation woodland.
208	NJ84955 05340	In general the moss is dominated by goat willow and eared willow, but there are areas where silver birch is dominant. These areas also have open areas beneath the canopy that are characteristic of mossland habitats that are remnants of the old moss. These areas are locally dominated by wavy hair-grass and creeping soft-grass (<i>Holcus mollis</i>), creeping bent-grass, sweet vernal-grass and Yorkshire fog are locally frequent and sheep's fescue, tufted hair-grass

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		and common sedge is occasional. Wood sorrel and bog stitchwort is abundant, sheep's sorrel, wavy bitter-cress, common nettle, creeping buttercup, water horsetail are frequent. Bracken is locally frequent. Meadowsweet, common cat's-ear (<i>Hypochaeris radicata</i>) and wild strawberry (<i>Fragaria vesca</i>) also present as are the mosses <i>Eurynchium praelongum</i> and <i>Climacium dendroides</i> .
209	NJ85000 05350	This is an area of species rich marshy grassland that was once wooded. There is abundant soft rush and tufted hair-grass with frequent cleavers, marsh horsetail (<i>Equisetum palustre</i>), wild angelica, marsh thistle, water horsetail, marsh valerian (<i>Valeriana dioica</i>) and common sorrel. yarrow (<i>Achillea millefolium</i>), meadow vetchling, bramble, creeping buttercup, common nettle, broad-leaved dock, wild strawberry, wavy bitter-cress, common lady's-mantle, creeping thistle, broad-leaved dock and water mint (<i>Mentha aquatica</i>) are occasional. The moss layer is well developed with frequent <i>Bracythecium rutabulum</i> and <i>Eurynchium praelongum</i> .
210	NJ05850 05350	Towards the end of the main ditch the ground layer becomes more acidic and characteristic of moss, with frequent tormentil, heather and sheep's fescue with occasional heath woodrush and devil's bit-scabious (<i>Succisa pratensis</i>). Rowan is occasional in this area.
211	NJ05850 054950	Young mixed plantation woodland. This woodland is comprised of beech, Scots pine, silver birch and larch.
212	NJ852063	Small clump of common solomon's-seal within small area of improved grassland. Possibly garden escapee as this plant is more naturally associated with woodland and calcareous soils.
213	NJ855070	West Hatton Woods – west end of wood, north of West Hatton steading. Relatively open woodland, probably of plantation origin but long-established and with semi-natural characteristics. At west end of wood, canopy dominated by beech and silver birch over a grazed grass-dominated ground flora with wood meadow grass, smooth meadow-grass, Yorkshire fog, creeping soft grass and common sorrel with patches of scattered and dense gorse scrub in more open areas. Further east, the woodland canopy becomes dense, dominated by birch and rowan with occasional beech and sycamore over a ground flora with Yorkshire fog, creeping soft grass, germander speedwell, creeping buttercup, common nettle, foxglove and common sorrel. West Hatton Wood is designated as a DWS.
214	NJ857073	Mixed Plantation woodland around southern edge of Clog Hill and along field margins between horse pastures. Canopy of semi-mature Scots pine, wild cherry, ash, beech, wych elm, sycamore and rowan over ground flora with Yorkshire fog, creeping soft grass, rough meadow grass, bramble and common nettle. In localised areas, the canopy is relatively open with small patches of gorse scrub.
215	NJ855073	Clog Hill – south slopes. Extensive area around most of southern half of Clog Hill, comprising predominantly semi-improved acid grassland with scattered trees and scrub throughout and numerous rocky outcrops. Area has numerous horse paths and farm tracks and appears to be used for exercising horses. Grassland sward is the main habitat present, dominated by Yorkshire fog, cocksfoot and creeping bent in most areas, but with more acidic characteristics in areas on thinner soils and around rocky outcrops. In these areas, Wavy hair-grass and sheep sorrel are locally dominant with heath bedstraw, tormentil, cat's-ear, heath wood-rush, foxglove, bramble and occasional common ramping-fumitory (<i>Fumaria muralis</i>). Tree and scrub species include beech, silver birch, rowan, gorse and broom, the latter two being particularly abundant as seedlings in the SE corner of the site.
216	NJ852076	Northwest slopes around Clog Hill. Small area around a derelict cottage comprising improved grassland (dominated by Yorkshire fog, cocksfoot and cleavers), scattered scrub (hawthorn, gorse, broom and bramble) and mature beech trees along dry stone walls. East of this area, there is a small block of young Sitka spruce. Around the base of the hill, a double line of dry stone walls approx. 5m wide supports a mosaic of semi-natural habitats. These include small patches of semi-natural broad-leaved woodland with a canopy of sycamore, bird cherry, rowan and European larch over a ground flora of cocksfoot, bluebell, broad buckler fern and occasional Yorkshire fog and cleavers. In addition there are extensive areas of dense gorse scrub along the walls and more open areas that maintain grassland that includes Yorkshire fog, cocksfoot, foxglove and cleavers.

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<i>Acer pseudoplatanus</i>	Sycamore
<i>Achillea millefolium</i>	Yarrow
<i>Aconitum napellus</i>	Monk's-hood
<i>Adoxa moschatellina</i>	Moschatel
<i>Aesculus hippocastanum</i>	Horse chestnut
<i>Agrostis stolonifera</i>	Creeping bent
<i>Ajuga reptans</i>	Bugle
<i>Alchemilla vulgaris</i> agg.	Lady's-mantle
<i>Alliaria petiolata</i>	Garlic mustard
<i>Alnus glutinosa</i>	Alder
<i>Alopecurus geniculatus</i>	Marsh foxtail
<i>Anemone nemorosa</i>	Wood anemone
<i>Angelica sylvestris</i>	Wild angelica
<i>Anthoxanthum odoratum</i>	Sweet vernal-grass
<i>Anthriscus sylvestris</i>	Cow parsley
<i>Araucaria araucana</i>	Monkey-puzzle
<i>Arrhenatherum elatius</i>	False oat-grass
<i>Athyrium filix-femina</i>	Lady-fern
<i>Bellis perennis</i>	Common daisy
<i>Berula erecta</i>	Water parsnip
<i>Betula pendula</i>	Silver birch
<i>Blechnum spicant</i>	Hard-fern
<i>Callitriche stagnalis</i> sens. lat.	Common water-starwort
<i>Calluna vulgaris</i>	Heather
<i>Cardamine flexuosa</i>	Wavy bitter-cress
<i>Cardamine pratensis</i>	Cuckoo-flower
<i>Carex curta</i>	White sedge
<i>Carex nigra</i>	Common sedge
<i>Carex panicea</i>	Carnation sedge
<i>Carex rostrata</i>	Bottle sedge
<i>Carex</i> sp.	Sedge sp
<i>Castanea sativa</i>	Sweet chestnut
<i>Chrysosplenium oppositifolium</i>	Opposite-leaved golden-saxifrage
<i>Cirsium arvense</i>	Creeping thistle
<i>Cirsium palustre</i>	Marsh thistle
<i>Cirsium vulgare</i>	Spear thistle
<i>Conopodium majus</i>	Pignut
<i>Cornus sanguinea</i>	Dogwood sp.
<i>Corydalis claviculata</i>	Climbing corydalis
<i>Corylus avellana</i>	Hazel
<i>Crataegus monogyna</i>	Hawthorn
<i>Crepis capillaris</i>	Smooth hawk's-beard

Latin Name	Common Name
<i>Crococsmia x crocosmiflora</i>	Monbretia
<i>Cynosurus cristatus</i>	Crested dog's-tail
<i>Cytisus scoparius</i>	Broom
<i>Dactylis glomerata</i>	Cocksfoot
<i>Deschampsia cespitosa</i>	Tufted hair-grass
<i>Deschampsia flexuosa</i>	Wavy hair-grass
<i>Digitalis purpurea</i>	Foxglove
<i>Doronicum pardalianches</i>	Leopard's-bane
<i>Dryopteris affinis</i>	Scaly male-fern
<i>Dryopteris carthusiana</i>	Narrow buckler-fern
<i>Dryopteris dilatata</i>	Broad buckler-fern
<i>Empetrum nigrum</i>	Crowberry
<i>Epilobium angustifolium</i>	Rosebay willowherb
<i>Equisetum arvense</i>	Field horsetail
<i>Equisetum fluviatile</i>	Water horsetail
<i>Equisetum palustre</i>	Marsh horsetail
<i>Equisetum sylvaticum</i>	Wood horsetail
<i>Erica tetralix</i>	Cross-leaved heath
<i>Eriophorum angustifolium</i>	Common cotton-grass
<i>Eriophorum vaginatum</i>	Hare's-tail cotton-grass
<i>Fagus sylvatica</i>	Beech
<i>Fallopia japonica</i>	Japanese Knotweed
<i>Festuca ovina</i> agg.	Sheep fescue
<i>Festuca rubra</i> agg.	Red fescue
<i>Filipendula ulmaria</i>	Meadowsweet
<i>Fragaria vesca</i>	Wild strawberry
<i>Fraxinus excelsior</i>	Ash
<i>Fumaria muralis</i>	Common ramping-fumitory
<i>Galanthus nivalis</i>	Snowdrop
<i>Galium aparine</i>	Cleavers
<i>Galium mollugo</i>	Hedge bedstraw
<i>Galium palustre</i>	Common marsh-bedstraw
<i>Galium saxatile</i>	Heath bedstraw
<i>Geranium robertianum</i>	Herb-robert
<i>Geum urbanum</i>	Wood aven
<i>Glyceria fluitans</i>	Floating sweet-grass
<i>Hedera helix</i>	Ivy
<i>Heracleum mantegazzianum</i>	Giant hogweed
<i>Heracleum sphondylium</i>	Hogweed
<i>Holcus lanatus</i>	Yorkshire-fog
<i>Holcus mollis</i>	Creeping soft-grass
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hylocomium splendens</i>	A moss

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Latin Name	Common Name
<i>Hypochaeris radicata</i>	Cat's-ear
<i>Hynum jutlandicum</i>	A moss
<i>Ilex aquifolium</i>	Holly
<i>Impatiens noli-tangere</i>	Touch-me-not balsam
<i>Iris pseudocarus</i>	Yellow iris
<i>Juncus articulatus</i>	Jointed rush
<i>Juncus conglomeratus</i>	Compact rush
<i>Juncus effusus</i>	Soft rush
<i>Laburnum sp.</i>	Laburnum
<i>Lamium album</i>	White dead-nettle
<i>Larix decidua</i>	European larch
<i>Lathyrus pratensis</i>	Meadow vetchling
<i>Lolium perenne</i>	Perennial rye-grass
<i>Lonicera periclymenum</i>	Honeysuckle
<i>Luzula multiflora</i>	Heath wood-rush
<i>Luzula pilosa</i>	Hairy wood-rush
<i>Luzula sylvatica</i>	Great wood-rush
<i>Mentha aquatica</i>	Water mint
<i>Molinia caerulea</i>	Purple moor-grass
<i>Myosotis discolor</i>	Changing forget-me-not
<i>Myosotis scorpioides</i>	Water forget-me-not
<i>Myosotis sylvatica</i>	Wood forget-me-not
<i>Myrica gale</i>	Bog myrtle
<i>Narcissus pseudonarcissus</i>	Daffodil
<i>Nardus stricta</i>	Mat-grass
<i>Narthecium ossifragum</i>	Bog asphodel
<i>Oxalis acetosella</i>	Wood-sorrel
<i>Phalaris arundinacea</i>	Reed canary-grass
<i>Phleum pratense</i>	Timothy
<i>Picea abies</i>	Norway spruce
<i>Picea sitchensis</i>	Sitka spruce
<i>Poa pratensis</i>	Smooth meadow-grass
<i>Poa trivialis</i>	Rough meadow-grass
<i>Polygala serpyllifolia</i>	Heath milkwort
<i>Polygonatum multiflorum</i>	Common soloman's seal
<i>Pinus sylvestris</i>	Scots pine
<i>Pleurozium schreberi</i>	A moss
<i>Polypodium vulgare</i>	Polypody
<i>Polytrichum commune.</i>	<i>Polytrichum sp.</i>
<i>Potentilla erecta</i>	Tormentil
<i>Primula vulgaris</i>	Wild primrose
<i>Prunella vulgaris</i>	Selfheal
<i>Prunus avium</i>	Wild cherry
<i>Prunus padus</i>	Bird cherry

Latin Name	Common Name
<i>Pseudotsuga menziesii</i>	Douglas Fir
<i>Pteridium aquilinum</i>	Bracken
<i>Quercus petraea</i>	Sessile Oak
<i>Quercus robur</i>	Pedunculate oak
<i>Ranunculus acris</i>	Meadow buttercup
<i>Ranunculus repens</i>	Creeping buttercup
<i>Rhododendron ponticum</i>	Rhododendron
<i>Rhytidiadelphus squarrosus</i>	A moss
<i>Ribes rubrum</i>	Redcurrant
<i>Rubus fruticosus agg.</i>	Bramble
<i>Rubus idaeus</i>	Raspberry
<i>Rumex acetosa</i>	Common sorrel
<i>Rumex acetosella</i>	Sheep sorrel
<i>Rumex crispus</i>	Curled dock
<i>Rumex obtusifolius</i>	Broad-leaved dock
<i>Salix alba</i>	White willow
<i>Salix aurita</i>	Eared willow
<i>Salix caprea</i>	Goat willow
<i>Salix cinerea</i>	Grey willow
<i>Salix fragilis</i>	Crack willow
<i>Salix sp.</i>	Willow sp.
<i>Sambuca nigra</i>	Elder
<i>Schoenoplectus lacustris</i>	Common club-rush
<i>Scrophularia nodosa</i>	Common figwort
<i>Senecio jacobaea</i>	Common ragwort
<i>Silene dioica</i>	Red campion
<i>Sorbus aria agg.</i>	Common whitebeam
<i>Sorbus aucuparia</i>	Rowan
<i>Sphagnum capillifolium</i>	A moss
<i>Sphagnum spp.</i>	A moss
<i>Stellaria alsine</i>	Bog stitchwort
<i>Stellaria graminea</i>	Lesser stitchwort
<i>Succisa pratensis</i>	Devil's-bit scabious
<i>Symphoricarpos albus</i>	Snowberry
<i>Symphytum officinale</i>	Common comfrey
<i>Trientalis europaea</i>	Chickweed-wintergreen
<i>Trifolium repens</i>	White clover
<i>Tsuga heterophylla</i>	Western hemlock
<i>Ulex europaeus</i>	Gorse
<i>Ulmus glabra</i>	Wych elm
<i>Urtica dioica</i>	Common nettle
<i>Vaccinium myrtillus</i>	Blaeberry
<i>Valeriana dioica</i>	Marsh valerian

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Latin Name	Common Name
<i>Veronica chamaedrys</i>	Germander speedwell
<i>Veronica officinalis</i>	Heath speedwell
<i>Vinca minor</i>	Lesser periwinkle
<i>Viola canina</i>	Heath dog-violet
<i>Viola palustris</i>	Marsh violet
<i>Viola riviniana</i>	Common dog-violet
<i>Viola tricolor</i>	Wild pansy

Annex 2: North East Scotland Local Biodiversity Action Plan – Local Priority Species and Habitats

Species Action Plans

Wych Elm (*Ulmus glabra*) LBAP

- 8.1.1 Wych elm is suffering from Dutch elm disease and an associated lack of planting across the UK. It remains common however in North East Scotland, due to less favourable conditions for the disease than farther south. It is an important tree to the landscape, culture and wildlife of North East Scotland. The species is not listed in the UKBAP, but this LBAP reflects the importance of the species in the region.
- 8.1.2 Objectives:
- Principal objective is to ensure the survival of the Wych elm population in North East Scotland.
 - Minimise the impact of Dutch elm disease to achieve a target of at least as many elms being alive in 2050 as in 1998.
 - Increase knowledge and understanding of Dutch elm disease
 - Create a more balanced population structure, by planting at least 50,000 trees.
 - Improve knowledge of the Wych elm population and their habitat value.
 - Raise public awareness of the importance of elms and their conservation

Habitat Action Plans

- 8.1.3 Local HAPs are in the process of being developed across 6 broad types of habitat. Of these, 2 relate to habitats that are not relevant to the current study: Coastal and Marine Habitats and Urban Habitats. The key targets and objectives of the Local HAPs that have been implemented to date are summarised below.

Habitat Type: Farmland and Grassland

Field Margins and Boundary Habitats LHAP

- 8.1.4 This LHAP relates to the UK/NES Priority Habitat, Cereal Field Margins, as well as the UK Broad/ Locally Important Habitat, Boundary and Linear Features. Field margins and boundary habitats include a range of linear features which are important to biodiversity and landscape, including dry stone walls (drystone dykes), hedges, ditches and burns.

National/Local Objectives

- 8.1.5 Maintain, improve or restore the biodiversity of 15,000 hectares of margins on appropriate soil types in the UK by 2010. *Pro rata*, this translates to a target for North East Scotland of 765 hectares of cereal margins created or managed for biodiversity by 2010.
- 8.1.6 Halt the net loss of hedgerows in the UK by 2000. Halt all loss of ancient and species-rich hedgerow by 2005. Favourable management of 25% of species-rich and ancient hedges by 2000 and of 50% by 2005. These UK targets are also used directly as goals for North East Scotland.

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- 8.1.7 Protection of all drystone dykes of wildlife or historic importance. Construction of new dykes and renovation of old ones where they connect isolated habitat fragments, or significantly add to the landscape. Similar targets to hedgerows used, i.e. 25% by 2000 and 50% by 2005.

Farmland LHAP (UK Broad and Locally Important)

- 8.1.8 This LHAP relates to the UK Broad/Locally Important Habitat of Arable and Cultivated Land. As the last stronghold of mixed farming landscape in Scotland, the northeast provides a diversity of habitats produced by cropping and livestock production resulting in wildlife still being plentiful. Agricultural activities can also have considerable influence on the biodiversity of other habitats, especially watercourses.

Objectives

- 8.1.9 At present, there are no overall UK farmland biodiversity objectives and targets. However, the Northeast Farmland HAP should reflect the objectives and targets of the UK Cereal Field Margins and Improved Grassland HAPs. The main objectives from these HAPs are:
- 8.1.10 Maintain, improve and restore by management, the biodiversity of 15,000 hectares of cereal field margins on appropriate soil types in the UK by 2010.
- 8.1.11 Enhance areas of improved grassland which are of importance for wildlife and restore semi-natural vegetation on sites where this would enhance their wildlife value.
- 8.1.12 The principal local objective of the LHAP is to conserve and enhance the biodiversity of farmland in North East Scotland through appropriate farming practices, habitat management and habitat creation. Local targets include:
- No net loss of existing wildlife habitat on farmland.
 - Existing valuable areas of wildlife habitat on farmland identified and management for biodiversity recommended by 2005.
 - Need for higher political and financial support for the Rural Stewardship Scheme and other mechanisms to benefit farm biodiversity highlighted and maintained at the national level.

Species Rich Grassland LHAP (UK and North East Priority)

- 8.1.13 This LHAP covers UK HAP for the priority habitats of Lowland calcareous grassland, Lowland dry acid grassland and Lowland meadow (neutral grassland). It also covers the UK Broad/Locally important habitat of Improved Grassland.
- 8.1.14 Species-rich grasslands include a range of semi-natural communities that have developed under various combinations of soil types, agricultural practices and climatic conditions. Species-rich grasslands are important wildlife habitats not just for the diversity of plants they comprise, but also for the abundance and variety of invertebrates they support. Agriculturally, species-rich grasslands provide a sustainable method of producing forage, which although low yielding is rich in trace elements and low in gut parasites.
- 8.1.15 They are also more aesthetically pleasing than improved grasslands, contributing colour and character to the landscape.

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Objectives

- 8.1.16 At a national level this broad habitat is broken down into narrower habitat definitions which each contain fewer plant communities. Specific objectives from the UK action plans include:
- Arresting the depletion of species-rich grassland.
 - Encouraging environmentally sensitive management at all surviving sites of more than 0.5 ha.
 - Promoting involvement in agri-environment schemes within the farming community, thereby ensuring 30% of all unimproved grassland sites are in favourable condition by 2005.
 - Review of current management within all grassland SSSIs to ensure the protection and enhancement of all significant stands.
 - Promoting greater understanding of restoration techniques with the aim of expanding this habitat type.
- 8.1.17 At local level objectives include:
- Maintain and enhance extent and status of the habitat through appropriate management, data collection, promotion, education, liaison and legislation.
 - Establish current status of the habitat within the region.
 - Protect and enhance existing sites.
 - Increase the number of habitat creation projects and improve their success rate.
 - Increase understanding and appreciation of the habitat.
 - Encourage appropriate policy to support protection and enhancement of this habitat.

Habitat Type: Woodland

Wet and Riparian Woodland LHAP

- 8.1.18 This LHAP covers the UK Priority habitat of Wet woodland and the Locally Important habitat of riparian woodland. Wet woodland occurs on floodplains, flushed slopes and peaty hollows and includes wet birch woodland, alder woodland and willow carr. Riparian woodland is composed predominantly of native species along burns, rivers and lochs and encompasses a wide range of woodland types depending on local site conditions. Both types of woodlands provide important habitat for a number of plant, invertebrate, bird and mammal species. In addition, riparian woodlands contribute to the health and productivity of the adjacent waters.

Objectives

- The UK BAP for Wet Woodlands has the following objectives:
- Maintain current area of ancient semi-natural wet woodlands.
- Initiate restoration of 3200ha to native wet woodland.
- Create, by colonisation or planting, 6750ha on unwooded or ex-plantation sites.

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- 8.1.19 At local level objectives include:
- Establish/maintain effective conservation management at existing sites.
 - Enhance and restore degraded and fragmented wet and riparian woodland sites.
 - Expand the area of wet/riparian woodland through habitat creation and management.
 - Ensure no loss in the key biodiversity associated with riparian and wet woodland.
- 8.1.20 Set up a mechanism to protect the genetic integrity of populations of wet woodland during management and restoration work.
- Evaluate status of habitat through survey, monitoring and research.
 - Promote good management practice for wet and riparian woods.
 - Encourage the adoption of appropriate policy to support the protection and enhancement of wet and riparian woodland.

Wood Pasture, Parkland and Boundary Trees LHAP

- 8.1.21 This LHAP covers the UK Priority Habitat of Lowland Wood Pastures and Parkland.
- 8.1.22 Wood pastures and parklands are historic, man-made landscapes typically consisting of patches of wooded areas separated by grazed or mown grassland. Veteran boundary trees are remnants of this landscape and provide valuable habitat to other wildlife. In northeast Scotland parkland covers around 2,200 ha, while wood pasture covers around 100 ha.
- 8.1.23 Primary native species include Wych elm, Ash, Alder, Oak, Birch, Scot's pine and Yew, but non-native species such as beech and sycamore also provide valuable habitats.

Objectives

- 8.1.24 UK BAP for Lowland Wood Pastures and Parkland has the following objectives:
- Maintain current extent and distribution of the total resource of wood-pasture and parkland.
 - Maintain current extent, distribution and condition of wood-pasture and parkland that is in favourable ecological condition.
 - Initiate in areas of derelict wood-pasture and parkland a programme to restore 2500ha to favourable ecological condition by 2010.
 - By 2002 initiate the expansion of 500ha of wood-pasture or parkland, in appropriate areas, to help reverse fragmentation and reduce the generation between veteran trees.
- 8.1.25 At local level objectives include:
- Maintain and enhance the ancient wood-pasture and parkland habitats and identified important boundary trees of North East Scotland to achieve a target of at least as many veteran open grown trees in 2050 as at present.
 - Collate all current information on this habitat.
 - Identify gaps in knowledge and extent of this habitat through surveys and liaison with relevant partners.

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- Protect and enhance existing habitat.
- Raise awareness of these habitats.

Habitat Type: Montane, Heath and Bog

Lowland Raised Bog LHAP

8.1.26 Intact Lowland raised bogs are a UK priority habitat and one of Europe's rarest and most threatened habitats. Raised bogs are peatlands fed exclusively by rainfall rather than groundwater or streams. Growth of *Sphagnum* moss creates a dome shape, thus excluding water from flowing in or collecting. Intact bogs are typically surrounded by a lagg fen or wetland fed by surface water.

Objectives

- 8.1.27 UK BAP objectives for this habitat include:
- Safeguard and manage for conservation the bogs in the UK that contain the remaining 6000ha of raised bog in a reasonably natural condition.
 - Safeguard and begin to rehabilitate at least 4000ha of degraded bog.
 - Rehabilitate a further 7000ha of severely damaged sites, either cut-over or afforested, with the aim of encouraging raised bog vegetation.
- 8.1.28 Local level objectives include:
- Maintain and enhance the extent and status, of current resource through appropriate habitat management, data collection, promotion, education, liaison and legislation.
 - Implement effective conservation management with a target of reducing impact of listed threats and maintaining an appropriate hydrological regime.
 - Continuous monitoring of habitats
 - Increased understanding of raised bogs to aim to promote good management practice.
 - Protection through designation of sites.

Wetland and Freshwater

Rivers and Burns LHAP (UK)

8.1.29 This LHAP covers the UK Broad/Locally Important habitat of Rivers and Streams. Running waters of North East Scotland range from large rivers to tiny upland and coastal burns, all draining to the North Sea. Rivers and burns are of great value for wildlife and for human recreation. This HAP covers not only the waters themselves, but also the banks and associated riparian zone.

Objectives

- 8.1.30 UK BAP objectives include:
- Maintain and improve the quality, state and structure of all UK rivers, streams and their associated floodplains.
 - Restore degraded rivers and streams taking account of water quality and quantity, structure and hydraulic connection with the floodplain.

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8.1.31 At the local level, objectives include:

- Maintain and improve all North East rivers and burns in terms of both water quality and semi-natural assemblages of animals and plants in both the channel and riparian zone. The target is for all North East watercourses to be classified as 'high' or 'good' ecological status and no net loss or reduction of river habitat in the LBAP area by 2015.
- Collate existing data on river and burn habitats, identify gaps and initiate surveys as necessary.
- Manage the rivers and burns resource to maintain and enhance ecological status.
- Sustain/restore habitats and semi-natural assemblages in both the channel and riparian zone in all major North East river systems.
- Increase understanding of local people and public participation in lessening impact on water quality and habitats.

Other LHAPs in development

8.1.32 Other LHAPs relevant to the proposed scheme that are currently in development include the following:

- Broad-leaved Woodland – to cover Upland oakwood, Birch woodland and Scrub
- Planted coniferous woodland
- Heathland – to cover Lowland heathland, Upland heathland and Coastal heath and scrub.
- Wetland – to cover Reedbeds, Fens, Coastal and Floodplain grazing marsh and Fen, Carr, Marsh, Swamp and Reedbed.
- Lochs and Ponds – to cover Mesotrophic lochs, standing open water and ponds.