Appendix A10.1 – Terrestrial Habitats

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Contents

1 Introduction

1.1 General Background

1.1.1 This Appendix reports the assessment of potential impacts on terrestrial habitats in the vicinity of the Northern Leg of the proposed scheme, supporting Chapter 10 (Ecology and Nature Conservation).

1.1.2 To aid the interpretation of the assessment, the AWPR Northern Leg study area has been divided into five route sections Habitat sections share similar broad habitat characteristics, and allow comparison of the 'ecological value' of similar habitat areas in each Appendix. The sections are as follows:

- Section NL1 ch314800 – 316000 (Derbeth to Tulloch Road);
- Section NL2 ch316000 – 317400 (SAC Craibstone);
- Section NL3 ch317400 – 322600 (A96 to Nether Kirkton);
- Section NL4 ch322600 – 325370 (Nether Kirkton to Corsehill); and
- Section NL5 ch325370 – 331000 (Corsehill to Blackdog).

1.1.3 Studies on terrestrial habitats were included as part of the Ecological Impact Assessment (EcIA), and were undertaken in accordance with the Design Manual for Roads and Bridges (DMRB) Volumes 10 and 11 and the Environment Impact Assessment (Scotland) Regulations 1999. The three stages of EcIA have been modified to be directly applicable to the proposed scheme, and are based on matrices from an early draft version of IEEM guidance on EcIA (IEEM, 2002) and Transport Advisory Guidance (STAG and WEBTAG). The bulk of the assessment for the AWPR Northern Leg was undertaken before the 2006 issue of the IEEM guidelines. This assessment therefore follows the general approach described in the IEEM 2002 guidelines, with cognisance of the later 2006 guidelines.

Aims

1.1.4 The purpose of the extended Phase 1 Habitat survey is 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;
- provide supplementary information from incidental observations of fauna to assist other surveys;
- provide an assessment of the potential impacts associated with construction and operation of the proposed scheme;
- make recommendations for measures to mitigate these impacts; and
- provide an assessment of any residual impacts remaining after the implementation of any mitigation.

1.2 Phase 1 Habitat Survey

1.2.1 The standard methodology as described in the Handbook for Phase 1 Habitat Survey – a technique for environmental audit (JNCC, 1993) 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 in the 1980s for the purpose of mapping terrestrial and freshwater habitats within Special Sites of Scientific Interest (SSSIs) and nature reserves, and for larger scale strategic surveys. The classification has since been adopted by Institute of Environmental Management and Assessment (IEMA) and IEEM as one of the standard methods for preparation of Environmental Statements under the Environmental Impact Assessment (Scotland) Regulations 1999 (as amended).

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 (Highways Agency, 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); 23 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 (UK BAP) (1994) is the UK government's response to the Convention on Biological Diversity. The UK BAP sets out a programme of action to conserve and enhance biological diversity throughout the UK. Local Biodiversity Action Plans (L BAPs) integrate these measures at the local or regional level (see below).

1.4.2 The UK Biodiversity Steering Group has published individual action plans for 45 priority habitats and some 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. Furthermore,

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 UK BAP Priority Habitats are distinct from Annex I Habitats listed in the EU Habitat Directive and include those habitats 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. Priority habitat types with HAPs are present along the proposed route, including those that often form complex mosaics providing a range of ecological transitions, and include wet woodland and Lowland Raised Bog and the conservation of these is a key role of the North East Scotland Local Biodiversity Action Plan (NES LBAP).

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. Those occurring along the route include improved grassland, broadleaved, mixed (and yew) woodland, conifer woodland, fen, marsh and swamp, bog, rivers and streams.

North East Scotland LBAP

1.4.5 The 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 has 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*) and include targets and objectives that incorporate habitat management actions. Further details of impacts on animal species are included in the relevant appendix; impacts on local wych elm populations are included in this report.

1.4.7 LHAPs are in the process of development and implementation and have been broadly grouped under a series of habitat types that include: Coastal & Marine; Farmland & Grassland; Woodland; Montane, Heath & Bog; Wetland & Freshwater; and Urban habitats. Within these groupings, LHAPs have been developed and incorporate UK and NES priority habitats, UK broad habitats that are locally important in the NE Scotland region and other locally important habitats. LHAPs 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.

2 Methods

2.1 Existing Data

2.1.1 Previous survey data form the basis of any site assessment for an EcIA, providing evidence of habitats and species present in the study area and a basis for updating records of known populations. In addition, consultation with statutory organisations provide 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 L BAP.

2.1.2 A desk-based consultation was undertaken with several organisations to identify key issues relating to habitats and plant species present in the study area. Organisations consulted include:

- 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.

2.2 Survey Methods

2.2.1 From May to July 2004, all habitats encountered within 500m 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 (<100m^2), and to provide greater detail on other features of ecological interest. Botanical taxonomic nomenclature follows that of Stace (1997).

2.2.3 All areas of countryside or semi-natural vegetation within 500m 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 At the time of survey (summer 2004), there had been no decision made as to the preferred route or the details of the final route alignment. Therefore, the survey area included all areas within 500m of the consultation route alignment for the Murtle Route, the preferred route of one of several options then under consideration (refer to Chapter 3: Alternatives Considered). Hereafter, the area surveyed is referred to as the 'study area'.

2.2.5 In localised areas, the study area extended beyond 500m from the preferred route alignment, where the consultation route incorporated several potential alignment options, at junctions where the road layout was not known or in areas where ecologically important habitats overlapped the boundary of the study area.

2.2.6 In most areas, the areas surveyed coincided with areas located within 500m from the final preferred route alignment. Where changes to the final alignment were made post-survey, further surveys were made to include these additional areas.

2.2.7 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, and form the basis for the ecological evaluation of the habitats.

2.2.8 The survey areas were reviewed against the current design, and no further surveys were considered necessary to undertake this assessment.

2.3 Assessment 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 SSSI. Habitat areas of interest in terms of their ecology and nature conservation value have been evaluated using criteria suggested by the IEEM Draft Guidelines for Ecological Impact Assessment. 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)	Habitats An internationally designated site or candidate site (SPA, pSPA, SAC, cSAC, Ramsar site, Biogenetic/Biosphere Reserve, World Heritage Site) or an area which 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 which 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. Species Any regularly occurring population of internationally important species, threatened or rare in the UK. i.e. a UK Red Data Book species categories 1& 2 of UK 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.
National (Scottish)	Habitats A nationally designated site (SSSI, ASSI, 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. Species A regularly occurring, regionally or county significant population/number of an internationally/nationally important species. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A feature identified as of critical importance in the UK BAP.
Regional (North East Scotland)	Habitats Sites which 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. Species Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10 km 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.
Authority Area (e.g. County or District) Aberdeenshire/ City of Aberdeen	Habitats 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 SNH Natural Heritage Future area profile. A diverse and/or ecologically valuable hedgerow network. Semi-natural ancient woodland greater than 0.25 ha. 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. Species 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

Value/ Importance	Criteria
Local (immediate area or local village importance)	Habitats Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds etc). 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 0.25 ha. 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. Species 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.
Less than Local (Limited ecological importance)	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.

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 value and/or sensitivity of the ecological receptor. The sensitivity of a feature was determined with reference to its level of importance although other elements have been taken into account where appropriate.

Impact Magnitude

2.4.2 Methods of impact prediction used included direct 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. The magnitude of each impact was assessed independently of its value or statutory status. Magnitude criteria are presented in Table 2, and include positive impact criteria in accordance with IEEM guidance.

Table 2 – Impact Magnitude

Impact 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 (at a regional or higher level).
Medium negative	The change is not likely to permanently adversely affect the ecological receptor's integrity but the effect on the receptor is likely to be substantial in terms of its ecological structure and function and may change its evaluation. Likely to result in changes in the localised distribution of a species but not affect its population status at a regional level.
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 change its evaluation.
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, but may not improve its evaluation
High positive	The change is likely to restore an ecological receptor to favourable conservation status, or to create a feature of recognisable value (at a regional or higher level).

Impact Significance

2.4.3 The significance of the predicted impacts upon each ecological receptor has been determined as a function of its value and the impact magnitude. The significance of impacts is assessed according to the matrix system 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
Authority Area	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, impact significance greater than or equal to Moderate would require specific mitigation to be undertaken to ameliorate the impact significance to acceptable levels.

2.5 Survey Limitations

2.5.1 The survey was undertaken from May to July 2004. This is an optimal time of year to carry out botanical and habitat surveys as flowering plants are in leaf and flower and thus misidentification is minimised. However, no survey of wildlife can guarantee that all biological cues are recorded, and early or late flowering species may be under-represented.

3 Baseline

3.1 Data Search

Consultation Exercise 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). The locations of these sites are indicated on Figures 10.1a-d.

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 NES LBAP priority habitats. The NES LBAP Coordinator confirmed locally important species and priority habitats.

3.1.3 The 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.

Designated Areas

3.1.5 Corby, Lily and Bishop Lochs form a composite SSSI that is designated for the habitats it supports, which include wet heath, marshy grassland, open water and basin mire habitats. The SSSI citation also refers to the importance of the water bodies as a wintering site for wintering wild fowl.

3.1.6 Locally designated sites include Brimmond Hill DWS and SINS, Gough Burn DWS, Farburn Wood DWS, the River Don DWS, and Newton of Shielhill DWS. Maps presenting sites designated for their conservation value are presented in Figures 10.1a-d.

3.1.7 There are a number of woodlands in the study area that are on the Ancient Woodland Inventory (AWI). Although none are of semi-natural origin, instead they are long-establihed of plantation origin, they are in the following locations: West Woods, Parkhead, Gough Burn, Newhills, Kirkhill, Lower Overton, Monument Pitmedden house, Goval Littlejohns, Corsehill, Skate and Den.

Habitats

3.1.8 Habitat types include boundary and linear features, arable and horticultural land, improved grassland, fen, marsh and swamp, coniferous woodland and broadleaved, mixed (and yew) woodlands.

3.1.9 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 holds 44 listed habitats. The habitats are well represented in NE 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, four are relevant to the study area: scrub, riparian woodland, birch woodlands and serpentine grassland/heath mosaic. Birch woodlands and serpentine grassland/heath mosaic are considered to be of national significance.

3.2 General Survey Results

3.2.1 The results of the Phase 1 Habitat survey are presented in Figures 10.2 a-g. Target note numbers are presented on 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. Results have been described on this basis.

3.2.2 The following paragraphs briefly describe the main habitats found along the route corridor, with Habitat Area numbers given in parentheses. The description is from south to north following the route corridor and divided into five shorter sections referenced by chainage for clarity.

Section NL1: ch314800 – 316000 (Derbeth to Tulloch Road)

3.2.3 This Section includes the buffer zone area 500m around the start of the Northern Leg at Derbeth. The majority of the land use in this Section of the study area is associated with agriculture, with most farmland being managed intensively as improved grassland, with both hay/silage and grazing pasture, or cultivated with arable crops. In localised areas there are also areas of less intensively farmed land supporting semi-improved grassland in hay meadows and low intensity grazing land. The paragraphs below summarise the habitat types found within the study area and a full list of Habitat Areas is presented in Table 4.

3.2.4 Within this Section of the route, there are fragments of plantation woodlands and shelterbelts and areas of semi-natural habitat that include:

- **Woodland – Plantation**. Areas of conifer plantation are located south of Brimmond Hill, near Hillhead of Derbeth Farm. There are also small scattered blocks of plantation woodland, including broad-leaved woodland and conifer plantation, and shelterbelts.

- **Woodland – Semi natural**. This section contains a few areas of semi-natural woodland, mainly small fragments of woodland. These include wet woodland comprising willow and alder carr at Gough Burn DWS (AWI-listed), northeast of Brimmond Hill; a separate area of naturally regenerating birch and rowan woodland south of Brimmond Hill and mature woodland along Bucks Burn as it flows through Kingswells. In addition to these areas, several of the small areas of mixed and broad-leaved woodland plantation have characteristic semi-natural woodland ground flora assemblages.
- **Marshy grassland** – Gough Burn DWS is a mosaic of habitats that include wet woodland and marshy grassland, with localised areas of mire habitats. The vegetation in this habitat area comprises species-rich communities that are free of improvement or modification.
- **Semi-improved grassland** – Most of the farmland comprises arable and improved grassland, with few areas with unimproved or semi-improved grassland habitats. However, around the lower slopes of Brimmond Hill there are a few fields and areas of acid grassland that are being grazed by sheep.
- **Bracken and scrub habitats** – The lower slopes of Brimmond Hill are dominated by stands of dense gorse with localised areas of bracken amongst the scrub vegetation. Further areas of gorse scrub are located at Gough Burn DWS, along Gough Burn itself and in small areas west of Hillhead of Derbeth Farm. Scattered scrub is often distributed along dry stone walls located along field boundaries.
- **Dry Heath habitat** – The upper slopes of Brimmond Hill support dry heath vegetation dominated by heather (*Calluna vulgaris*) with occasional, small patches of acid grassland.
- **Stream habitat** – Kepplehill Burn is a small modified burn that flows through agricultural fields. Gough burn flows out of the Gough Burn DWS, and flows into the following route section, and discussed in more detail below.

Table 4 – Habitat Areas found within Section NL1

HA	Feature / Asset	Target Notes	General description
N1	Kingswells	n/a	Built-up recent settlement comprising housing developments. A burn flows through the centre of the area, with a valley that includes a range of semi-natural habitats that include marshy grassland, semi-natural broad-leaved woodland and plantation woodland.
N2	Agricultural fields north of Clog Hill	4	Area of large, predominantly arable fields on south-facing slopes to south of Brimmond Hill. Field boundaries are often comprised of shelterbelt, mostly young to semi-mature coniferous plantations. A small waterbody has been created in the corner of one field, surrounded by willow carr and scrub.
N3	Woodland at Fairley Home Farm and Derbeth Farm	5, 6	Series of shelterbelts and small woodland plantations in between farmland west of Kingswells. Plantations include coniferous, mixed and broad-leaved woodland, ranging from young to mature in age. North of Fairley Home Farm, the broad-leaved woodland is semi-natural, with species-rich woodland flora.
N4	Agricultural land around Fairley Home Farm and Derbeth Farm	n/a	Series of large fields comprising arable and improved grassland west of Kingswells.
N5	Kingswells (cont. from Sheet 6)	n/a	Built-up recent settlement comprising housing developments. A burn flows through the centre of the area, with a valley that includes a range of semi-natural habitats that include marshy grassland, semi-natural broad-leaved woodland and plantation woodland.
N6	Woodland west of Hillhead of Derbeth Farm	7	Mosaic of young to semi-mature coniferous plantation and semi-natural broad-leaved woodland, west of farm and around south edge of Brimmond Hill. Broad-leaved woodland includes localised areas of wet alder and willow woodland around a waterbody and drainage channel.
N7	Woodland and shelterbelt east of Hillhead of Derbeth Farm	8, 9	Mosaic of conifer and broad-leaved woodland plantation east of farm and including a wide (approx. 30m) mixed shelterbelt forming wildlife corridor from southeast of Brimmond Hill.

HA	Feature / Asset	Target Notes	General description
N8	Scrub and bracken on lower slopes of Brimmond Hill – SINS	10	Extensive are of dense gorse scrub with open areas of bracken around unmanaged lower to mid slopes of Brimmond Hill. Occasional scattered trees including birch, rowan and ash are present amongst the gorse scrub.
N9	Dry Heath on upper slopes of Brimmond Hill SINS	10	Extensive area of dry heath on thin acidic soils on upper slopes and summit of Brimmond Hill. Vegetation dominated by heather, with occasional areas of acid grassland, particularly around buildings and satellite aerials on summit.
N10	Agricultural fields south of C89c and Overhills Farm	n/a	Small area of arable and improved grassland fields with dry stone walls along field boundaries.
N11	Agricultural fields north of C89c and east of Brimmond Hill	n/a	Large area comprising small, irregularly shaped fields of improved and semi-improved grassland, including pasture and hay/silage. Field boundaries comprise a network of well-maintained dry stone walls and include abundant stands of dense and scattered gorse scrub and frequent scattered trees.
N12	Agricultural fields surrounding Kepplestone Farm	n/a	Farmland comprising fields of improved grassland, predominantly grazing pasture, with dry stone walls along most field boundaries, and occasional scattered gorse scrub.
N13	Agricultural fields between Brimmond Hill and Kepplestone	11, 12	Farmland between Brimmond Hill and Kepplestone. Fields comprised of improved grassland dominated by cattle grazing pasture. This area includes dense gorse scrub to the east of Brimmond Hill and a small pond surrounded by scrub vegetation.
N14	Gough Burn DWS	13, 14	Mosaic of semi-natural habitats that include marshy grassland habitats that includes localised areas of wet heath/mire and swamp vegetation, semi-natural willow carr along the burn itself and stand of dense and scattered scrub (gorse and willow). This habitat area has burns and ditches supporting aquatic and marginal plant species and the whole area maintains species-rich vegetation throughout.
N15	Agricultural fields between Gough Burn DWS and Newhills Wood	n/a	Series of large, regular-shaped fields, managed as improved grassland supporting cattle and sheep grazing pasture.
N16	Newhills Wood	15	Two blocks of AWI listed coniferous plantation comprising mature and semi-mature coniferous woodland either side of unclassified road at Newhills.
N17	Agricultural fields and cemetery at Newhills	n/a	Farmland comprising predominantly arable fields (and some improved grassland). Newhills Cemetery supports amenity grassland, shrubs and trees.

Section NL2: ch316000 – 317400 (SAC Craibstone)

3.2.5 This Section forms part of the landholdings or campus of the Scottish Agricultural College at Craibstone. The campus comprises a mosaic of plantation woodland and farmland habitats interspersed with college buildings. Running through this Section are three burns, Gough Burn to the south, Craibstone Burn and Green Burn to the north. The paragraphs below summarise the habitat types found within the study area and a full list of Habitat Areas is presented in Table 5.

- **Woodland – SAC campus.** South of the A96, much of the SAC campus is composed of plantation blocks, with areas of conifer, mixed and broad-leaved woodland plantation. These include an arboretum containing many mature exotic species of trees (TN19), areas of mature beech woodland and mature mixed plantation along Green Burn, adjacent to the A96. Newhills Wood to the east of the C88c Newhills Road comprises mature conifer plantation.
- West of the C88c road, there is an experimental area with a series of fenced trial plots of young broad-leaved woodland. In addition to the plantation woodland, there are several areas of mature semi-natural broad-leaved woodland that support species-rich ground flora, particularly along Craibstone Burn and Gough Burn.

- Further areas of scrub and bracken include localised patches within the SAC campus that contribute to the general habitat diversity of the area, such as bracken and gorse located to the northwest of the main college buildings (TN22).
- **Stream habitat** – Four small streams or burns flow through the SAC campus in a west – east direction, which from south to north are: Gough Burn, an unnamed burn, Craibstone Burn and Green Burn. All of these burns flow through woodland habitat through much of the study area, as discussed above.

Table 5 – Habitat Areas Found Within Section NL2

HA	Feature / Asset	Target Notes	General description
N18	Agricultural fields between Gough Burn and Golf course	16	Farmland comprising a series of improved grassland supporting cattle and sheep grazing pasture. Gough burn flows through these fields in a northerly direction through a gully lined with dense gorse scrub.
N19	Craibstone Golf Course	n/a	Extensive area of mown grassland on recently established golf course. Scattered saplings have been planted along fairways.
N20	Agricultural fields between Newhills Wood and Craibstone Estate	n/a	Farmland comprising arable and improved grassland fields with boundaries that include dry stone walls and mature planted trees.
N21	Parkhead Wood	n/a	Block of mature conifer plantation AWI listed, north of Craibstone Golf Course and west of C88c road. Woodland dominated by dense Sitka spruce.
N22	West Woods	n/a	Commercial conifer plantation AWI listed, most of which located to the west of the study area. Only a small area of plantation is located in the study area, west of West Lodge.
N23	Woodland/ Farmland west of C88c, north of Parkhead Wood	25	Mosaic of farmland and small blocks of plantation woodland, to west of C88c road and south of A96. The woodland includes a series of trial plots of broad-leaved woodland plantation, an avenue of semi-mature trees south of the A96 and several areas of young, mixed shelterbelt plantation.
N24	Woodland along Gough Burn	17, 18	Woodland area in south of SAC campus, including semi-mature mixed plantation and semi-natural woodland that support species-rich ground flora. It also includes an area of mature beech woodland, which is of long-established plantation origin, with semi-natural characteristics and a woodland ground flora.
N25	Woodland in west of SAC campus	19, 20	Woodland along an unnamed burn, west of the main college buildings. This area includes an area managed as an arboretum, with a mixture of exotic and native species and a species-rich shrub and ground layer. It also includes blocks of mixed and conifer plantation adjacent to the C88c road, that vary in age structure.
N26	Woodland along Craibstone Burn	21-23	A mosaic of coniferous mixed and broad-leaved woodland blocks along the course of Craibstone Burn and in adjacent areas, and connected to the previous habitat area (N25). These woodland blocks include several areas with mature and semi-mature woodland habitat with semi-natural characteristics and diverse ground floras. In the northwest of the SAC campus, this area includes an ecologically important water body, Craibstone Pond (TN23) that has abundant aquatic and marginal plant species and has areas of willow scrub and wet woodland in its immediate vicinity.
N27	Woodland along Green Burn	24	Semi-mature mixed plantation woodland along the course of Green Burn, to the south of the A96.
N28	Agricultural land in SAC campus east of C88c road	n/a	A series of improved grassland (pasture) and arable fields within the SAC campus. Most fields are surrounded by woodland areas or scrub.

Section NL3: ch317400 – 322600 (A96 to Nether Kirkton)

3.2.6 This section of the route extends from the junction with the A96, in a northwesterly direction to skirt around Aberdeen Airport. The end of this route section is at ch322600 at Nether Kirkton.

3.2.7 North of the A96, land use is predominantly in agriculture and forestry. Large arable fields are present between the A96 and the industrial estates surrounding the airport. West of the airport, the

route passes through an area with mixed farming that rises away from the airport towards conifer plantations at Kirkhill Forest. Kirkhill Forest is a large area of forest that extends to the west and north of the study area. Two smaller areas of commercial woodland, East Woodlands and Lower Overton Wood, are also present. The paragraphs below summarise the habitat types found within the study area and a full list of Habitat Areas is presented in Table 6.

3.2.8 Within this section of the route, there are numerous areas of semi-natural habitat that include:

- **Woodland – Kirkhill Forest**. Kirkhill Forest is an AWI listed area of Forestry Commission woodland that includes blocks of conifer plantation of varying ages from newly planted nursery and recently planted blocks of saplings to mature areas of pine, larch and spruce. Standingstones Wood on the east side of Kirkhill Forest occupies the lower slopes and comprises a mosaic with recently planted plantation blocks, and areas of dense gorse, dry heath, tall herb and broad-leaved woodland plantation. South of Standingstones Wood, Kirkhill Forest is being converted to a Continuous Cover management regime. Most of the forest areas located within the study area in the northern part of Kirkhill, East Woodlands and Lower Overton Wood comprise areas of young planting with no felling planned (Forestry Commission, 2005).
- In addition to being a commercial forest, Kirkhill is an important amenity resource, with numerous tracks and cycle paths. These are often wide and support acid grassland and heathland vegetation. The northern part of Kirkhill Forest includes localised areas of open habitat that include acid grassland and scrub along forest roads, marshy grassland and Christmas tree nurseries at Bogenjoss.
- **Woodland – Other plantations.** East Woodlands is a mainly conifer plantation, located to the north of Kirkhill and connected to it via a small area of mature beech woodland. Lower Overton Forest is an AWI listed semi-mature spruce woodland that extends to the east of the study area. North of the A96, there is a small broad-leaved woodland plantation at Chapelbrae Wood dominated by rowan. Monument Wood is an AWI listed plantation that comprises semi-mature larch, with one small area of the wood supporting open, mature pine forest that has semi-natural characteristics. In addition, there are several smaller areas of plantation woodland. These include small areas of mature pine and mixed plantation wood adjacent to Pitmedden House and two areas of recently planted plantation to the east of Monument Wood.
- **Woodland – Broad-leaved woodland**. Mature broad-leaved trees and lines of trees form landscape features in several locations, including around Standingstones Farm and Stone Circle respectively, at Bogenjoss in Kirkhill Forest and in East Woodlands. East of Standingstones Wood there is a small, semi-natural woodland, known as Farburn Wood, which is designated as a DWS. In the north of the study area. Semi-natural broad-leaved woodland is present along the course of Bogenjoss Burn. Bogenjoss Burn supports semi-natural broad-leaved woodland along its valley, it is AWI listed as it passes through the grounds of Pitmedden House. Other semi-natural woodland is infrequent, limited to naturally regenerating woodland habitat in a small area of Overton Wood in the south of the study area.
- **Un-improved and Semi-improved grassland.** Although most of the farmland in this Section of the study area is intensively managed and supports improved grassland as pasture or hay/silage, there are localised areas of less intensively managed farmland that maintain semi-improved or unimproved grassland. Within Kirkhill Forest, there are small areas of such habitat along the edges of rides, and in open amenity areas. East of Kirkhill Forest, at Balgosie, there are a series of small meadows south of Standingstones Woods that support semi-improved grassland communities. These meadows have been managed at a low intensity and include several species-rich meadows, with species-rich verges present along farm access tracks and along field margins. In the north of the area, unimproved acid grassland is located along the east bank of Bogenjoss Burn and localised areas associated with roadside verges north of the airport and with the quarry to the north of the railway line.

- **Bracken and scrub habitats.** Dense and scattered scrub habitats (most commonly gorse) are frequent in Kirkhill Forest, particularly along forest rides, along tracks and in recently planted areas, such as Standingstones Wood. The farmland east of Kirkhill Forest has field boundaries with dry stone walls that often have gorse scrub along their lengths. Other areas of scrub and bracken are associated with the Bogenjoss Burn valley in the north of the study area. There are localised areas that support dense and scattered scrub habitats throughout this section of the study area, including stands of bracken around the edges of woodland, and gorse scrub in and around the sand and gravel quarry.
- **Stream habitat.** Bogenjoss Burn flows through much of this section of the study area. It flows in an easterly direction through Kirkhill Forest, before flowing northwards towards Pitmedden House. The valley of this burn supports a mosaic of habitats and forms an important ecological corridor linking all three forest areas and further woodland surrounding Pitmedden House to the north. The valley of the burn supports broad-leaved woodland habitats that are semi-natural in character.

Table 6 – Habitat Areas Found in Section NL3

HA	Feature / Asset	Target Notes	General description
N29	Agricultural land northeast of Dyce Drive	n/a	Small area of farmland south of Aberdeen Airport and north of Dyce Drive. Series of small fields of improved grassland with dry stone walls on field boundaries.
N30	Agricultural between A96 and Dyce Drive	n/a	Farmland bounded by A96, Dyce Drive and Newton Road, comprising a series of large fields (mainly arable crops). In the southeast of the habitat area, the fields are part of the SAC and contain crop trials. Fields to the north of the A96 support improved grassland, with silage and grazing pasture.
N31	Chapelbrae Wood	26	Relatively small area of semi-mature broad-leaved woodland plantation, comprising rowan woodland.
N32	Agricultural land between Newton and Upper Corsehill	27	Large area comprising predominantly arable fields with some grazing pasture. Field boundaries consist of well-maintained dry stone walls, often with scattered gorse scrub. A farm track extending from Newton Road has species-rich verges in many areas.
N33	Agricultural land south of StandingStones Wood and east of Kirkhill Forest	27	Farmland around Howemoss Farm and including land around derelict farm at Balgosie. Land slopes down from Kirkhill Forest in the west towards the airport in the east, where large arable fields are present. Around Balgosie, there are a series of hay meadows that are unimproved and support species-poor grassland with more species-rich vegetation in localised areas and along verges of tracks and dry stone walls.
N34	Kirkhill Forest South	n/a	AWI listed, extensive area with blocks of young to mature coniferous plantation. Dense scrub is present along rides and under electricity transmission lines and in localised areas around the forest edge.
N35	Standingstones Wood	29-33	Area of Kirkhill Forest that extends downhill almost as far as Farburn Wood. Woodland comprises blocks of young spruce and larch. A dry valley extends along the south edge of this Habitat Area, which supports a mosaic of habitats that include dry heath, bracken, scrub and tall herb vegetation. Dense gorse is abundant along forest tracks and paths.
N36	Farburn Wood DWS	28	Relatively small area of mature broad-leaved woodland, probably of long-established plantation origin, but with semi-natural characteristics. The site includes stands of wet and riparian woodland and is designated as a District Wildlife Site (DWS).
N37	Kirkhill Forest North	35, 36, 38	AWI listed, extensive area of commercial forest plantation predominantly comprised of blocks of spruce, pine and larch plantations. Forest roads and tracks support localised areas of semi-natural habitats such as marshy grassland, acid grassland and scrub habitats. Tree nursery areas at Bogenjoss represent open areas within the forest.
N38	Open Habitats along Bogenjoss Burn within Kirkhill Forest.	35, 37	Mosaic of habitats along the course of Bogenjoss Burn as it flows through Kirkhill Forest. These habitats include acid grassland, scrub and marshy grassland that have developed naturally in areas left unplanted.
N39	Agricultural fields at Standingstones Farm	34	Farmland comprising arable and improved grassland fields with boundaries that include well-maintained dry stone walls. This area includes scrub and a mature beech copse located at Standingstones Stone Circle.

HA	Feature / Asset	Target Notes	General description
N40	Lower Overton Wood	37, 49	AWI listed area of commercial conifer plantation, most of which is comprised of young to semi-mature spruce plantation, although a small area adjacent to Bogenjoss Burn supports mixed woodland plantation and naturally developing young broad-leaved woodland.
N41	Agricultural fields between Lower Overton Wood and East Woodlands	41, 42, 46	Farmland located between forest areas supporting small, irregularly shaped fields with improved grassland pasture, on either side of Bogenjoss Burn. On the right bank of the burn, there are two fields that support unimproved acid grassland, where scrub and bracken encroachment is occurring on the steep valley sides.
N42	Bogenjoss Burn downstream of Kirkhill Forest.	41, 43	Linear series of habitats along the course of the burn including marshy grassland, scrub and semi-natural broad-leaved woodland that is naturally regenerating along the valley bottom.
N43	East Woodlands	39, 40	Area of conifer plantation, north of Kirkhill Forest, comprised of blocks of mature Douglas fir, spruce and pine. Within the woodland there are localised areas with open habitats, broad-leaved woodland plantation and a line of mature beech trees along a former land boundary.
N44	Agricultural fields west of Bogenjoss Burn	44	Farmland to west and north of East Woodlands, comprising large arable and improved grassland fields. This area includes a stand of mature conifer plantation.
N45	Bogenjoss Burn and grounds of Pitmedden House.	43, 45, 47	Woodland along Bogenjoss Burn and in grounds of Pitmedden House (AWI listed). Includes semi-natural broad-leaved woodland (riparian woodland) and areas of mixed and conifer plantation. Includes small areas of parkland with ornamental gardens.
N46	Agricultural fields southeast of Bogenjoss Burn.	50	Series of improved grassland fields along the south bank of Bogenjoss Burn and extending along the south of the C55c Pitmedden Road. Fields include grazing and hay/silage fields with occasional areas of scrub and mature trees. West of Monument Wood, there is a large field of semi-improved acid grassland, a small section of which has been recently planted with conifer saplings.
N47	Monument Wood	48	AWI listed conifer plantation comprising predominantly mature larch plantation, with a small area of mature pinewood of long-established plantation origin, with semi-natural characteristics in the southwest corner. Approximately 50% of this woodland was felled in 2004-2005.
N48	Agricultural fields between Monument Wood and Lower Overton Wood	n/a	Improved grassland fields supporting grazing pasture, with well-maintained dry stone walls along field boundaries. At West Overton there are areas of dense and scattered scrub within the field and small areas of less intensive grassland.

Section NL4: ch322600 – 325370 (Nether Kirkton to Corsehill)

3.2.9 This section of the route includes the route from the River Don crossing at ch323050 to the B977 at Littlejohn's Wood. The route follows a more or less easterly direction and after crossing the River Don, also crosses several roads, including the B977 and A947 at Goval, and the B997 and B977 (again) at Littlejohn's Wood. In addition, the route crosses the Formartine and Buchan Way, a disused railway that is now used as a long distance cycle and footpath. The route includes a junction with the A947 and a new section of this road that rejoins the existing A947 near Goval Belt. The proposed new section of the A947 diverges from the current road at Goval Belt, crosses the Mill Lade Canal, AWPR and Goval Burn before heading south to meet the junction with the B977. The habitat areas of ecological interest in this section of the study area are summarised in Table 7 and discussed in more detail below.

3.2.10 Intensive agriculture is the predominant land use in this section of the study area with arable fields and improved grassland as pasture and hay/silage. However, there are also areas of semi-natural habitats present that include semi-natural and commercial woodland and areas of unimproved and marshy grassland. The paragraphs below summarise the habitat types found within the study area and a full list of Habitat Areas is presented in Table 7.

- **Woodland – Plantation**. There are numerous areas of plantation woodland in this section of the study area. Mature commercial Sitka spruce plantation blocks are present to the north of

Goval Wood, at Littlejohn's Wood and in Den Wood (all three AWI listed). Smaller blocks of conifer plantation are scattered throughout this Section of the study area. At Derbeth, the broad-leaved woodland plantation is present in the form of small plantations and as shelterbelts. These include Goval Belt (AWI listed) east of Goval Wood, and areas of AWI listed mature broad-leaved woodland at Corsehill, west of Littlejohn's Wood. In the south of the route corridor, there is also a belt of semi-mature even-aged beech woodland that is part of the Park Hill estate that extends to the south of the study area. Other small areas of mixed and broad-leaved woodland plantation are scattered throughout this section.

- **Woodland – Semi-natural**. Semi-natural broad-leaved woodland is present in numerous locations in this section of the study area. These include semi-natural birch woodland at Goval Wood and naturally regenerating birch and rowan woodland in the northwest corner of Littlejohn's Wood. Other areas include several areas of woodland that are likely to be of long-established plantation origin that have semi-natural characteristics including a diverse age structure and ground flora. These include woodland on the east bank of the River Don around Goval House, roadside woodland in the Park Hill estate, Skate Wood (AWI listed) and at Corsehill, west of Littlejohn's Wood.
- **Un-improved and Semi-improved grassland.** Species-rich grassland habitats are present along both banks of the River Don, often forming mosaics with tall herbaceous vegetation and scattered scrub. Further linear grassland habitats are associated with the Formartine and Buchan Way, where the embankments and cuttings support species-rich swards. At Goval Wood, there are open areas comprising a mosaic of unimproved acid grassland and birch woodland. Other areas of semi-improved grassland are located in fields with less intensive agricultural management, such as those adjacent to Goval Burn.
- **Bracken and scrub habitats.** There are localised areas that support dense and scattered bracken and scrub habitats, including field boundaries with gorse scrub growing over dry stone walls.
- **Stream habitat.** Goval Burn flows through this Section of the study area in a southward direction, entering the River Don upstream of the existing A947 Park Hill Bridge. This burn is a small river that has been modified and canalised in most sections, but has a more natural course where it flows alongside the Formartine and Buchan Way. Along the length within the study area, it supports marginal vegetation, and has numerous trees and scrub along its banks. A small reservoir, known as Goval Reservoir, acts as the source of a diverted channel (Goval Mill Lade) that flows for approximately 1km before rejoining the Goval Burn downstream. Two smaller burns, Meadowhead Burn and Corsehill Burn, flow into Goval Burn near Little Goval Farm.

Table 7 – Habitat Areas Found in Section NL4

HA	Feature / Asset	Target Notes	General description
N49	Agricultural fields and quarry north of railway line	53	West of the quarry, there are two arable fields north of the Inverness to Aberdeen railway line. The quarry is comprised of bare ground with occasional water bodies, and patches of scrub and tall herb vegetation.
N50	Agricultural fields on either side of Dyce Drive, south of railway line	51, 52	Farmland comprising improved grassland and arable fields around West Overton, Upper Kirkton and Nether Kirkton Farms. Around the farms there are localised areas with small blocks of broad-leaved woodland plantation and occasional standard trees and gorse scrub.
N51	Agricultural fields on southwest bank of River Don valley	n/a	Farmland with improved grassland comprising sheep and horse grazing pasture. East of the quarry, there is an area of marshy grassland (Moss Fetach) at the edge of the flood plain. Scattered gorse scrub is located along the field margins.
N52	River Don	54	Riverine habitats along both banks of River Don. The river itself supports important freshwater habitats as discussed in detail in a separate report. Both banks support species-rich grassland habitats with scattered scrub and tall herbaceous vegetation. The River Don is a DWS.
N53	Woodland around Goval House	n/a	Relatively small block of mature broad-leaved woodland of long-established plantation origin, but with semi-natural ground flora.

HA	Feature / Asset	Target Notes	General description
N54	Farmland between River Don and the B977	55, 56	Farmland on east bank of River Don, supporting large arable fields in the south of the habitat area and improved grassland pasture farther north. These pastures support scattered scrub and a narrow belt of mature mixed plantation.
N55	Agricultural fields surrounding Goval Farm	56, 61	Farmland comprising arable and improved grassland fields around Goval Farm; between B977, A947 and south of Goval Wood. Field boundaries have well-maintained dry stone walls and occasional scattered scrub.
N56	Goval Wood	57, 59, 60	Mosaic of semi-natural habitats, dominated by birch woodland with areas of mature birch and rowan, and unimproved acid grassland. In the north of this habitat area, the mosaic includes wet heath habitats and AWI listed mixed woodland where localised planting of conifers has taken place.
N57	Plantation north of Goval Wood	58	Semi-mature coniferous plantation, dominated by Sitka spruce forest.
N58	Goval Belt	62	Relatively wide shelterbelt (approximately 50m wide) AWI listed extends either side of the A947, and comprising mature birch and rowan with other broad-leaved woodland tree species.
N59	Agricultural fields north of Goval Belt	n/a	Farmland, with improved grassland (horse pasture and silage) and arable fields, on either side of the A947 and west of Goval Burn.
N60	Agricultural fields south of Goval Belt, between A947 and Formartine & Buchan Way	56,	Relatively small area of farmland comprising a series of arable and improved grassland fields. The habitat diversity is enhanced by the Mill Lade Aqueduct and Goval Burn, which both flow along field margins.
N61	Goval Burn and The Goval Mill Lade	56, 64, 66-68	Linear feature extending across route corridor. Marginal habitats and wayside trees are present along canalised stretches of Goval Burn. Between the lade / Goval Burn and the Formartine & Buchan Way, there is a diverse range of habitats that include tall herbaceous vegetation, grassland, scrub, woodland and semi-improved pasture.
N62	Formartine & Buchan Way	63, 65	The Formartine and Buchan Way support species-rich grassland along its embankments and cuttings with scattered areas of scrub and occasional mature trees.
N63	Park Hill Estate	69	Relatively small area of the grounds of Park Hill House, located in the south of the study area. Habitats present include semi-natural broad-leaved woodland and mature beech plantation of long-established plantation origin, which surround cattle-grazed improved grassland.
N64	Agricultural fields southeast of Formartine & Buchan Way	n/a	Farmland, southeast of disused railway, with arable and improved grassland fields on either side of the B977 and Corsehill Burn.
N65	Skate Wood	71	AWI listed Mature birch and rowan woodland, of long-established plantation origin, but supporting semi-natural characteristics such as widespread natural regeneration and woodland ground flora.
N66	Roadside plantation and mature pine avenue at Little Goval	70	Small semi-mature mixed plantation between farm access road and the B977. North of this plantation, an avenue of mature pine trees acts as a shelterbelt either side of the farm access road.
N67	Den Wood and roadside plantations	n/a	Block of mature conifer plantation southwest of junction of the B977 and B997. West of this block, there are young roadside conifer plantations on the south of the B977.
N68	Agricultural fields between the B977 and Meadowhead Burn	n/a	Farmland comprising small fields of predominantly improved grassland, mainly cattle pasture, with well-maintained dry stone walls along field boundaries, and occasional trees and scrub.
N69	Agricultural fields north of Meadowhead Burn and east of Formartine & Buchan Way	n/a	Farmland comprising arable and improved grassland fields with well-maintained dry stone walls along boundaries. The fields are connected by farm access tracks that support species rich verges in localised areas and have numerous wayside trees and scrub. West of Longhills Farm there is an area of young plantation woodland with both conifer and mixed woodland planting.
N70	Agricultural fields east of the B997 at Newpark Steading	75	Farmland with improved grassland, with large fields north of Newpark steading supporting sheep pasture. South and east of this farm, the fields are small and support horse pasture. Meadowhead Burn flows in a westward direction with two fields with impeded drainage supporting areas of marshy grassland.
N73	Meadowhead Burn	n/a	Farmland with improved and marshy grassland and occasional arable fields and occasional small blocks of conifer and mixed plantation.

Section NL5: ch325370 – 331000 (Corsehill to Blackdog)

3.2.11 This section of the route includes the route from the B977 at Littlejohn's Wood (ch326000) to the junction of the AWPR with the A90 north of Aberdeen near Blackdog. It also includes a corridor on either side of a short section (1km) of the A90 north of Blackdog, which is to be affected by works to the junction. The proposed scheme also includes the construction of a minor road east of the existing A90 at Blackdog to accommodate local traffic.

3.2.12 The route follows a more or less easterly direction and after crossing the B977 crosses a single unclassified road, at Newtonhill, before reaching the B999. It continues northeast, crossing Blackdog Burn to meet the A90 at Fifehill, north of Blackdog.

3.2.13 The land use is dominated by intensive agriculture, with a high proportion of arable farmland, as well as fields of improved grassland. In addition, there are also areas of semi-natural habitat and areas associated with sand and gravel extraction in quarries along the southern boundary of the study area. This section of the study area also includes part of Corby, Lily and Bishops Loch SSSI.

3.2.14 East of the B999, the land use is predominantly agricultural, although at Blackdog there are built-up areas that include industrial and residential areas. Southeast of Blackdog, there is a large landfill site, much of which has been capped with improved grassland. The paragraphs below summarise the habitat types found within the study area and a full list of Habitat Areas is presented in Table 8.

3.2.15 Semi-natural habitats in this section of the route include:

- **Woodland – Plantation**. There are few areas of plantation woodland in this section of the study area comprising commercial conifer plantation. Mature spruce plantations are present to the north of the study area, north of Red Moss and there is a small block of mature pine northeast of Corby Loch. Other areas comprise mixed or broad-leaved woodland plantation that often form shelterbelts such as at Moss Belt, south of the B977. West of the B977 there is an area that has been recently planted with predominantly coniferous tree saplings, but currently resembles unmanaged grassland. Between the B999 and the A90 there are numerous small blocks of woodland, most of which are young to semi-mature in age. These included two areas east of Blackdog that support recently planted coniferous plantation and areas of conifer and mixed plantation surrounding Harehill Farm. To the east of the B999, there is a small area of mature even-aged beech woodland, at Butterywells.
- **Woodland – Semi-natural.** Areas of semi-natural broad-leaved woodland include a large area of mature birch woodland at Red Moss, north of the B977, and naturally developing birch woodland and semi-natural areas of long-established plantation origin to the south of Red Moss, between the B977 and Lochgreens Road. Further woodland habitat is present around the north of Corby and Lily Lochs, comprising wet woodland dominated by willow carr with alder and birch species. Characteristic features of this area of the route are lines of mature trees of broad-leaved woodland species, in particular beech and sycamore. These linear features include many mature standard trees that may be relics of historic land boundaries, and/or shelterbelt plantations.
- **Lowland Raised Bog.** There are two areas of Lowland Raised Bog in the northwest of this section of the study area. These areas are both part of a large raised bog system that is known in the SNH LRBI as Red Moss (Park Hill) to differentiate it from other similarly named mosses in Aberdeenshire. The two areas of raised bog are located either side of the B977 and comprise modified bog habitats that show clear evidence of peat cutting up to approximately 20-30 years ago. In addition to drains, both areas exhibit terraced peat profiles and encroachment by woodland species, in particular birch. The majority of the bog habitats are characteristic of wet modified bog, with localised wetter areas on lower surfaces with evidence of block or domestic cutting. Dry modified bog habitats are associated with a small proportion of each raised bog.
- **Wet Heath Habitats**. These habitats are associated with areas adjacent to the raised bogs at Red Moss and on peat deposits surrounding Lily Loch. These areas are similar to wet

modified bog habitats, but exist on shallower peat deposits and often form a mosaic with acid grassland species, as in the areas of wet heath at Red Moss. The wet heath surrounding Lily Loch is characteristic of upland blanket peat bogs and unusual in lowland Aberdeenshire.

- **Fen Habitats – Basin Mire**. The Corby and Lily Lochs SSSI includes an area of mire habitat, dominated by Bottle sedge and Sphagnum species, located to the southwest of Lily Loch. The topography of the site characterises this as basin mire, with scattered scrub and tree saplings. The mire community present here is also characteristic of upland areas.
- **Open Water**. Corby and Lily Lochs represent significant areas of open water, that form part of the Corby, Lily and Bishops Loch SSSI. Corby Loch is the larger of the two lochs and is used for fishing, with its west side being free of vegetation and with a large quarry close to the shore. On its north and west shores, it is bounded by wet woodland, swamp vegetation and wet heath habitats. Lily Loch is much smaller and totally surrounded by wetland habitats, including wet heath, mire and swamp habitats. A second small area of open water at Newton of Shielhill, which is designated as a DWS.
- **Marshy Grassland.** Marshy areas are present in many fields with poor drainage that support wet, rush-dominated grassland. These include moderately extensive areas north of Red Moss, west of the B999 at Gourdieburn and west of Leuchland's Croft. Areas of marshy grassland are also located in fields to the north of Corby and Lily Lochs, which support particularly species-rich vegetation.
- **Un-improved and Semi-improved grassland.** In many of the farmland areas, pasture fields support semi-improved grassland, with species-poor vegetation. These fields, often managed to produce hay, appear to have been seeded in past seasons, and retain a grass-dominated sward. In many areas, particularly around Blackdog, fields appear to have been left unmanaged allowing tall herbaceous plants and rank grasses to dominate.
- **Bracken and scrub habitats.** Dense and scattered scrub is found throughout this section, often comprising gorse, located along field margins and encroaching scrub that is invading the bog habitats. There are stands of dense gorse and bracken along the valley of Blackdog Burn, and surrounding a gravel quarry south of Harehill Farm.
- **Stream Habitats.** Blackdog Burn flows in an east-south-east direction from Potterton to the north of the route, crossing the A90 at Blackdog. The burn is fast flowing, and has been modified along many stretches. However, in the northwest of this area it flows through a valley with increased habitat diversity and topographical interest.

Table 8 – Habitat Areas Located in Section NL5

HA	Feature / Asset	Target Notes	General description
N71	Corsehill Wood	n/a	Plantation and semi-natural broad-leaved woodland to northwest of the junction of the B977 and B997 at Corsehill. The woodland is connected to woodland habitats at Den Wood to the south and Littlejohn's Wood to the northeast.
N74	Woodland at Red Moss, north of the B977	76, 78	Mature semi-natural broad-leaved woodland comprising predominantly birch and rowan woodland with occasional area of willow dominated wet woodland. The woodland occupies an area southwest of Red Moss bog, with species rich ground flora. It also includes more open areas to the east of the woodland, which support a mosaic of wet heath and acid grassland.
N75	Raised bog at Red Moss, north of the B977	79	Raised bog to the north of woodland and Moss-side landfill site. Habitats are predominantly wet modified bog with drier peat bog vegetation on higher areas in the centre of the peat dome. Cut surfaces are evident around the edges of the bog, and there is evidence of drainage, but no recent workings are present and the site maintains bog habitats that have potential for restoration.
N76	Farmland and bare ground at Moss-side, north of the B977	80	Series of small fields between moss-side landfill site (now disused) and comprised of horse and sheep pasture, with occasional stands of tall herb vegetation.
N77	Plantation northeast of Red Moss,north of B977	n/a	Small part of a large block of semi-mature spruce forest that extends to the northeast of Red Moss, and is assumed to have been planted over former areas of bog habitat.

HA	Feature / Asset	Target Notes	General description
N78	Mosaic of scrub and grassland west of Moss Belt	77	Mosaic of semi-natural habitats, in belt of land south of the B977. Along the south of the road, there is a line of mature beech trees along the roadside and a strip of wet heath habitat, approximately 10 m wide. Away from the road, the habitats comprise a mosaic of acid grassland and scattered and dense gorse scrub.
N79	Moss Belt Plantation	81	Shelterbelt comprising mature mixed plantation in belt of woodland to the south of the B977.
N80	Agricultural fields between the B977 and Loch Hills Quarry	89, 90	Area of farmland comprising a series of large arable fields with dry stone walls along the field boundaries. In the southeast a series of fields with species-poor semi-improved grassland maintain scattered and dense patches of scrub. Two small water bodies are present, comprising small ponds surrounded by marshy grassland and scrub habitat respectively.
N81	Loch Hills Quarry	88	A sand and gravel quarry with areas of bare ground, and localised scrub and sparse vegetation in unworked areas.
N82	Red Moss, south of the B977	84, 85, 87	Extensive area of lowland raised bog, comprising mainly wet modified bog habitats with a small area of drier habitat to the north of the site. Scrub and woodland is encroaching around the edge of the bog, with stands of bracken present in the southeast of the area. There is evidence of drainage and cutting, particularly along the south of the bog, but the bog retains a raised dome structure. An area to the west to a line of electricity transmission lines supports a mosaic of wet heath and acid grassland.
N83	Woodland between Red Moss and Lochgreens Farm	82, 83, 86	Semi-natural broad-leaved woodland on either side of west-east drainage channel. North of this drain, the woodland is mature birch woodland that is encroaching northwards into the area of raised bog. South of the drain, the woodland is probably of long-established plantation origin, with a more diverse canopy, but resembling semi-natural woodland.
N84	Agricultural fields south of Lochgreens Farm	91	Series of large fields, most of which are improved grassland, with both silage and grazing pasture. In the southeast of this habitat area, there is a small copse of mature beech around a walled area of acid grassland.
N85	Corby and Lily Lochs and associated habitats	92-100	Approximately 50% of the Corby and Lily Lochs area of the SSSI is located in this section of the study area. It includes a diverse range of habitats that include open water, swamp, basin mire (poor-fen vegetation), wet heath, wet woodland, scrub and drainage channels.
N86	Agricultural fields between Red Moss and Newtonhill Farm		Farmland with few field boundaries comprising species-poor semi-improved grassland as hay meadows and grazing pasture.
N87	Agricultural fields between Lochgreens Road and Gravel Pit.	101	Farmland with improved cattle grazing pasture, less intensively farmed sheep pasture with species-poor sward, and two arable fields adjacent to the unclassified road in the east. Within this area of farmland, there are small blocks of semi-natural habitat that include rush-dominated marshy grassland, dense scrub along field margins, dry stone walls, and a small area of semi-mature spruce plantation northeast of Corby Loch.
N88	Newton of Shielhill DWS	103	A small water body used for fishing, and supporting swamp and marginal vegetation, with localised areas of gorse scrub. A recent broad-leaved woodland plantation is located along the roadside at Newtonhill Farm.
N89	Agricultural fields between unclassified road and the B999 (north)	102	Farmland comprising predominantly arable fields with dry stone walls along field boundaries including an area of recently planted conifer plantation woodland, with blocks of broad-leaved woodland plantation planted around the periphery. It also includes a series of small ponds and marshy grassland adjacent to the B999 at Gourdieburn.
N90	Agricultural fields between unclassified road and the B999 (south)		Farmland comprising arable fields in the north of the area and improved grassland sheep grazing pasture adjacent to the unclassified road in the south of the area. In the east, the field boundaries support lines of mature sycamore trees that form wind breaks and increase the habitat diversity of the area.
N91	Agricultural fields adjacent to Blackdog Burn, east of the B999	104-105	Farmland on either side of Blackdog Burn, south of Potterton. Fields comprise predominantly improved grassland of grazing pasture for cattle and horses. Along the valley sides and bottom there are stands of dense gorse scrub with localised patches of broad-leaved woodland plantation.
N92	Agricultural fields between the B999 and Harehill Farm		Farmland comprising a series of arable fields, with occasional mature trees and dry stone walls along field boundaries. In the southeast, is the northernmost tip of a sand quarry that extends to the south, and which is surrounded by gorse scrub.

HA	Feature / Asset	Target Notes	General description
N93	Agricultural fields between Harehill Farm and the A90, south of Blackdog Burn	106	Farmland with predominantly improved grassland (grazing pasture), with well-maintained network of dry stone walls. Around Harehill Farm, a series of woodland plantations mostly comprised of semi-mature and young conifer plantation and young mixed plantations are found. Scrub and bracken are present along the Blackdog Burn valley.
N94	Agricultural fields west of the A90, north of Blackdog Burn	107	Farmland comprising arable fields, with scattered gorse scrub and bracken along the valley of Blackdog Burn.
N95	Grassland east of the A90, south of Blackdog		Area of open improved grassland , some grazed by sheep. Land to the southeast comprises a revegetated area of landfill. Young recently planted conifer plantations are present south of residential areas in Blackdog.
N96	Agricultural fields, west of the A90, either side of Potterton Road	108-109	Farmland comprising arable and improved grassland fields with localised areas of dense gorse scrub. North of Potterton Road, there are areas of semi-improved grassland, and broad-leaved woodland plantation around the south edge of an old sand and gravel quarry that extends to the north.
N97	Agricultural fields east of the A90, north of Blackdog	110	Farmland, north of Blackdog, comprising arable and improved grassland fields, with localised areas of unmanaged land with scattered ruderal and tall herb vegetation. In the northeast, there is semi-improved grassland associated with a firing range. North of Blackdog, there is a young conifer plantation with recently planted saplings.

3.3 Summary of Survey Results

Section NL1: ch314800 - 316000 (Derbeth to Tulloch Road)

3.3.1 Land use is predominantly agricultural and the corridor crosses a matrix of fields, often with characteristic dry stone dykes, and occasional shelterbelts, woodland blocks and scattered trees, but few areas of semi-natural vegetation.

3.3.2 To the south of the start of the Northern Leg, large predominantly arable fields occur at Fairley Home Farm and Derbeth Farm on south-facing lower slopes of Brimmond Hill. Field boundaries include shelterbelts of mostly young to semi-mature coniferous plantations (N4). A small waterbody has been created in the corner of one field, surrounded by willow carr and scrub (N2). Locations of farms referred to are shown in Chapter 7 (Land Use) and on Figures 7.1 and 7.2a-g.

3.3.3 Woodlands at Fairley Home Farm and Derbeth Farm include young to mature coniferous, mixed and broad-leaved woodland (N7). North of Fairley Home Farm, the broad-leaved woodland is semi-natural, with a species-rich ground flora (N3). At Derbeth, the broad-leaved woodland includes local areas of wet alder and willow woodland around a waterbody and drainage channel (N6).

3.3.4 Sheep-grazed fields with patches of acid grassland characterise the lower slopes of Brimmond Hill (DWS, SINS). The unmanaged lower to mid slopes have areas of dense gorse scrub with bracken. Occasional scattered trees, including naturally regenerating birch, rowan and ash, are present in the scrub (N8) The upper slopes support dry heath vegetation dominated by heather (*Calluna vulgaris*) with occasional, small patches of acid grassland on the thin acidic soils (N9).

3.3.5 Agricultural land on higher ground between Brimmond Hill and the farms at Newton and Kepplestone comprises small irregularly shaped fields of grazed improved and semi-improved grassland. Field boundaries form a network of dry stone walls with abundant stands of dense and scattered gorse scrub and frequent scattered trees. The area includes patches of dense gorse scrub and a small pond to the east (N11, N12, and N13).

3.3.6 The few small fragments of semi-natural woodland are present, including wet woodland with willow and alder carr and stands of dense and scattered scrub (gorse and willow). South of the SAC campus, these areas of wet woodland form a mosaic with marshy grassland and patches of wet heath, mire and swamp vegetation along the Gough Burn DWS (N14). There are subsidiary burns

and ditches supporting aquatic and marginal plant species and species-rich vegetation. To the west, the Gough Burn flows through fields in a gully lined with dense gorse scrub (N18).

Section NL2: ch316000 - 317400 (SAC Craibstone)

3.3.7 The SAC campus has a mosaic of woodland blocks and improved grassland fields (N25, N26, and N28). There are areas of conifer, mixed and broad-leaved woodland plantation, including an arboretum containing mature, exotic tree species, and areas of mature beech woodland. Four small streams flow through these woodland habitats: Gough Burn, an unnamed burn, Craibstone Burn and Green Burn. The mature woodland supports a species-rich ground flora, particularly along the Craibstone and Gough Burns (N24). Scrub and bracken patches, and the Craibstone pond, which has abundant aquatic and marginal plant species with willow scrub and wet woodland, contribute to the rich diversity of the area (N28). To the west of the C88c road, there is an experimental area with a series of fenced trial plots of young broad-leaved woodland.

Section NL3: Ch317400 - 322600 (A96 to Nether Kirkton)

3.3.8 North of the A96, the land use is predominantly agriculture and forestry. Most of the farmland is intensively managed, but there are local areas with semi-improved or unimproved grassland, such as at the derelict farm at Balgosie. Here species-rich field margins and verges occur along farm tracks, and small meadows support semi-improved grassland communities (N33). Farmland east of Kirkhill Forest has field boundaries with gorse scrub along dry stone walls.

3.3.9 Large arable fields (mainly in arable crop) lie between the A96 and Dyce Industrial Estate (N30). The route then passes through an area of mixed farming that rises westwards to the conifer plantations at Kirkhill Forest. Kirkhill Forest extends to the west and north of the study area and is owned and managed by the Forestry Commission. It includes blocks of conifer plantation ranging from nursery stock and saplings, Christmas tree nurseries at Bogenjoss, to mature pine, larch and spruce (N34 and N37). The area is used for recreation with numerous tracks and cycle paths, often with acid grassland and heathland vegetation. The northern part of Kirkhill Forest includes open habitats such as acid grassland and scrub, and marshy grassland.

3.3.10 Standingstones Wood (N35) occupies the lower slopes on the east side of Kirkhill Forest and comprises recently planted blocks, and areas of dense gorse, dry heath, tall herb and broad-leaved woodland plantation. Other commercial conifer woodlands include East Woodlands to the north of Kirkhill, connected to Kirkhill by a small area of mature beech woodland (N43), and Lower Overton Forest, which comprises semi-mature spruce and extends to the east of the study area (N40). Most of the forests here have young trees and no felling is currently planned (Forestry Commission, 2005).

3.3.11 Landscape features include mature broad-leaved trees and lines of trees, for example around Standingstones Farm, and at the Stone Circle in East Woodlands (N39). Farburn Wood DWS is east of Standingstones Wood and is a small semi-natural wood with wet and riparian habitat (N36).

3.3.12 Bogenjoss Burn flows in an easterly direction through Kirkhill Forest and then northwards towards Pitmedden House (N42 and N45). The valley of the burn supports a mosaic of various semi-natural habitats, including marshy grassland, scrub, bracken and naturally regenerating broad-leaved woodland, forming an important ecological corridor linking the large commercial forest areas with woodland surrounding Pitmedden House. Other semi-natural woodland is infrequent, and limited to naturally regenerating woodland habitat in a small area of Overton Wood in the south of the study area.

3.3.13 Monument Wood is also a commercial plantation (N47) with semi-mature larch and a small open area, of mature pine forest with semi-natural characteristics. Approximately 50% of this woodland was felled in 2004-2005. Other small areas of mature pine and mixed plantation wood occur adjacent to Pitmedden House and there are two areas of recent plantation to the east of Monument Wood.

3.3.14 Some local areas have semi-improved or unimproved grassland, including acid grassland to the southeast of Bogenjoss Burn, roadside verges north of the airport and near a large sand and gravel quarry, north of Upper Kirkton to the north of the railway line (N49). The quarry has bare ground with occasional water bodies, and patches of scrub and tall herb vegetation. East of the quarry, there is an area of marshy grassland (Moss Fetach) on the edge of the flood plain of the River Don (N51). Patches of dense and scattered scrub occur, including gorse scrub in and around the sand and gravel quarry and stands of bracken around the edges of woodlands.

Section NL4: ch322600 - 325370 (Nether Kirkton to Corsehill)

3.3.15 This is the most complex part of the northern section of the AWPR. There are crossings proposed over the river, several roads and other existing features of interest (such as Goval Lade). After crossing the River Don, the route crosses the B977 and A947at Goval, and the B997 and B977 (again) at Littlejohn's Wood. It also crosses the Formartine and Buchan Way, a disused railway that is now used as a long distance cycle and footpath. The route includes a junction with the A947 and a new section that rejoins the existing A947 near Goval Belt.

3.3.16 Land use is predominantly agricultural (e.g. N54 and N55). Most of the farmland is intensively managed, with fields of improved grassland for cattle grazing or silage, and some arable land. Agricultural fields on southwest bank of the River Don are used for sheep and horse grazing (N51).

3.3.17 The River Don is a DWS and supports species-rich grassland habitats along both banks often forming mosaics with tall herbaceous vegetation and scattered scrub (N52). The Formartine and Buchan Way has species-rich grassland on its embankments and cuttings with scattered areas of scrub and occasional mature trees (N62). Other areas of semi-improved grassland are located in fields with less intensive agricultural management, such as those adjacent to Goval Burn. North of Meadow-head Burn and east of the Formartine and Buchan Way. Arable and improved grassland fields have well-maintained dry stone walls along boundaries. The fields are connected by farm access tracks with species rich verges in some areas and wayside trees and scrub.

3.3.18 Goval Burn flows in a southerly direction, entering the River Don upstream of the existing A947 Park Hill Bridge. This small river has been modified and canalised in most sections, but has a more natural course where it flows alongside the Formartine and Buchan Way. The river has marginal vegetation, with trees and scrub on the banks. A small reservoir (the Lade) is the water source for a canal (approximately 1km long) that rejoins the burn downstream. The diversity of habitats is enhanced by the Mill Lade Aqueduct and Goval Burn, which both flow along field margins (N60 and N61).

3.3.19 At Derbeth, broad-leaved woodland plantations and shelterbelts include Goval Belt, east of Goval Wood, and areas of mature broad-leaved woodland at Corsehill, west of Littlejohn's Wood. Goval Belt is a shelterbelt (approximately 50m wide) of mature birch and rowan with other broad-leaved woodland tree species extending either side of the A947 (N58). Goval Wood has a mosaic of semi-natural habitats, dominated by birch woodland with areas of mature birch and rowan, and unimproved acid grassland (N56). In the south of the corridor, a belt of semi-mature even-aged beech woodland that is part of the Parkhill Estate extends to the south. Other small areas of mixed and broad-leaved woodland plantation are scattered throughout the section.

3.3.20 Semi-natural broad-leaved woodland includes woodlands that are likely to be of long established plantation origin with semi-natural characteristics including a diverse age structure and ground flora, such as on the east bank of the River Don around Goval House, in roadside woodland in the Park Hill estate, at Skate Wood and at Corsehill (N71), west of Littlejohn's Wood.

3.3.21 Mature commercial Sitka spruce plantation blocks are present to the north of Goval Wood, at Littlejohn's Wood and in Den Wood, and smaller blocks are scattered elsewhere in the section. Littlejohn's Wood is mixed woodland (N72). The eastern half was mature coniferous plantation that was felled in winter 2004-2005. In the northwest, previously felled woodland has regenerated naturally and now has a mosaic of young birch woodland and wet heath. North of the conifer block,

mature broad-leaved woodland of long-established plantation origin forms a strip to the south of a large area of marshy grassland and connects to woodland at Red Moss.

Section NL5: ch325370 - 331000 (Corsehill to Blackdog)

3.3.22 After crossing the B977, the proposed scheme crosses an unclassified road at Newtonhill Farm to the B999, and crosses the Blackdog Burn to join the A90 at Fifehill, north of Blackdog. Land use is dominated by intensive, mainly arable agriculture, with fields of improved grassland (e.g. N84, N86 and N87).

3.3.23 The Lowland Raised Bog at Red Moss (Park Hill) is located on either side of the B977 (SNH LRBI). Both areas show evidence of past peat cutting, including terraced peat profiles, and are being encroached by birch (N83). The main habitats are wet modified bog with drier bog vegetation in the centre of the peat dome (N74, N75 and N82). Wet heath forms a mosaic with acid grassland on shallower peat. The bog habitats are considered to have restoration potential.

3.3.24 Corby and Lily Lochs are significant areas of open water, that form part of the Corby, Lily and Bishops Loch SSSI. Approximately 50% of the Corby and Lily Lochs area of the SSSI is located in the section (N85). Corby Loch is the larger of the two lochs and is used for fishing. Its west side is free of vegetation and has a large sand and gravel quarry close to the shore (N81). The north and west shores are bounded by wet woodland, swamp vegetation and wet heath.

3.3.25 Lily Loch is smaller and surrounded by wet heath, mire and swamp. Mire habitat to the southwest of Lily Loch is dominated by Bottle Sedge and Sphagnum species. The topography of the site characterises this as basin mire, with scattered scrub and tree saplings, but both the wet heath and mire communities have characteristics of upland blanket peat bog that are unusual in lowland Aberdeenshire. To the north of Corby and Lily Loch, wet woodland is dominated by willow carr with alder and birch and marshy grassland fields that are particularly species-rich.

3.3.26 Newton of Shielhill DWS is a small water body used for fishing, with swamp and marginal vegetation and gorse scrub (N88).

3.3.27 There are few areas of commercial conifer plantation. Mature spruce plantations are present to the north of Red Moss (assumed to have been planted over former bog habitat) (N77) and there is a small block of mature pine northeast of Corby Loch. Other areas of mixed or broad-leaved woodland plantation form shelterbelts such as at Moss Belt, south of the B977 (N78).

3.3.28 Semi-natural broad-leaved woodland includes a large area of mature birch woodland at Red Moss, north of the B977, and naturally developing birch woodland and semi-natural areas of broad-leaved woodland to the south of Red Moss, between the B977 and Lochgreens Road.

3.3.29 A characteristic landscape feature is lines of mature trees of broad-leaved woodland species, in particular beech and sycamore. These linear features include many mature standard trees that may be relics of historic land boundaries, and/or shelterbelt plantations (N90)

3.3.30 Blackdog Burn flows in an east-south-east direction from Potterton to the north of the route, crossing under the A90 at Blackdog. The burn is fast flowing, and has been modified in many parts. Either side of Blackdog Burn, are stands of dense gorse scrub with local patches of broad-leaved woodland plantation (N91, N94). Dense and scattered scrub is found throughout this Section along field margins and invading bog habitats.

3.3.31 East of the B999, land use is predominantly agricultural, although at Blackdog there are industrial and residential areas. Southeast of Blackdog, there is a large landfill site, much of which has been capped with improved grassland. Many farmland fields have species-poor, semi-improved grassland around Blackdog. The fields have been left unmanaged allowing tall herbaceous plants and rank grasses to dominate (N97).

4 Ecological Evaluation of Habitat Areas

4.1 Introduction

4.1.1 The evaluation was carried out following the criteria outlined in Tables 1-3, and each Habitat Area has been 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 9.

Section NL1: ch314800 – 316000 (Derbeth to Tulloch Road)

4.1.2 Most semi-natural habitats within the Kingswells area are of local ecological value and include shelterbelt plantation and localised areas of marshy grassland.

4.1.3 There are two DWSs and Sites of Interest to Natural Science (SINS) in this area: Brimmond Hill and Gough Burn. Brimmond Hill has a mosaic of coniferous plantation and semi-natural broad-leaved woodland, including localised areas of wet woodland and dense gorse scrub with occasional scattered trees. Gough Burn has a mosaic of semi-natural riparian habitats including marshy grassland, wet heath/mire, swamp, wet woodland and scrub. These are assessed as being of regional ecological value.

Section NL2: ch316000 – 317400 (SAC Craibstone)

4.1.4 In this section there are four Habitat Areas evaluated as being of county ecological value. At Craibstone and at Gough Burn there are areas of semi-mature mixed plantation and semi-natural woodland. These collectively represent a viable area of a priority habitat identified in the NES LBAP.

4.1.5 West Woods is an extensive area of AWI listed commercial conifer plantation, most of which is located to the west of the study area. The extent and diversity of associated habitats confers a county level of ecological value.

Section NL3: ch317400 – 322600 (A96 to Nether Kirkton)

4.1.6 In this section there are ten areas of county ecological value including a large area of farmland with arable, improved and semi-improved grassland, dry stone walls, scattered scrub and species-rich grass verges and hay meadows.

4.1.7 Woodlands in this area of county level of ecological value are Kirkhill Forest South and Farburn Wood DWS. Kirkhill Forest South is an AWI listed mature coniferous plantation with a diverse range of semi-natural habitats, including localised areas of broad-leaved woodland, scrub, wet heath and grassland. Farburn Wood is a relatively small area of mature broad-leaved woodland of possibly long established plantation origin.

4.1.8 Areas along Bogenjoss Burn form a mosaic of semi-natural habitats including acid grassland, scrub and marshy grassland. The woodland along Bogenjoss Burn and in the grounds of Pitmedden House comprises semi-natural riparian broad-leaved woodland and areas of AWI listed mixed and conifer plantation. This includes viable areas of riparian woodland (L BAP priority), and small areas of parkland with woodland and ornamental species.

4.1.9 Most of Kirkhill Forest lies to the west of the study corridor, with relatively small areas of it evaluated here. The size and diversity of the habitats associated with the combined area of the AWI listed Kirkhill Forest would be evaluated as being of Regional ecological value.

Section NL4: ch322600 – 325370 (Nether Kirkton to Corsehill)

4.1.10 The River Don has valuable riparian habitats on both banks with additional important freshwater habitats in the river channel. Both banks support species-rich grassland, scattered scrub and tall herb habitats. The semi-natural riparian habitats associated with the River Don represent a viable area of priority habitats identified in the NES LBAP and are considered to be of regional ecological value to the habitat resource.

4.1.11 There are also six Habitat Areas of county ecological value in this route Section. Goval Belt is a relatively wide AWI listed shelterbelt of broad-leaved woodland, dominated by mature birch and rowan with records of wych elm. This forms an important ecological link between Goval Burn and Goval Wood (also AWI listed). Goval Burn, the Mill Lade and Goval reservoir have marginal habitats and wayside trees, and a diverse mosaic of habitats: tall herb, grassland, scrub, woodland and semi-improved pasture.

4.1.12 The Formartine and Buchan Way DWS is also evaluated as being of county ecological value as it supports species-rich grassland along its embankments and cuttings with scattered areas of scrub and occasional mature trees. Finally, Skate Wood is an AWI listed mature birch and rowan woodland with semi-natural characteristics such as widespread natural regeneration and woodland ground flora. This woodland is listed as an Important Local Wildlife Site under the Scottish Wildlife Action Project, and considered to be of county ecological value.

Section NL5: ch325370 – 331000 (Corsehill to Blackdog)

4.1.13 This section has the habitat with the highest ecological evaluation; Lily and Corby Lochs SSSI are of national ecological value. The SSSI includes a diverse range of habitats such as open water, swamp, basin mire (poor-fen vegetation), wet heath, wet woodland, scrub and drainage channels.

4.1.14 The habitats at Red Moss are comprised of mainly wet modified bog habitats with a small area of drier habitat to the north of the site. Scrub and woodland encroachment is occurring around the edge of the bog, with evidence of drainage and cutting, particularly along the south of the bog. However, the bog retains a raised dome structure and forms part of an important network of similar sites throughout North East Scotland. Lowland Raised Bog is a UK BAP and NES BAP priority habitat and therefore is considered to be of regional ecological value.

4.1.15 Newton of Shielhill DWS is a small wetland area comprising a small waterbody supporting swamp and marginal vegetation, with localised areas of gorse scrub. This area is evaluated as being of county ecological value. There are four other Habitats Areas of county ecological value in this Section, generally semi-natural woodland dominated by birch and rowan.

Table 9 – Evaluation of Habitat Areas

Feature / Asset	HA	Phase 1 Description of HA	HA value
Section NL1			
Kingswells	N1	Most semi-natural habitats within Kingswells are of local ecological value and include shelterbelt plantation and localised areas of marshy grassland. Den of Moss-side District Wildlife Site (DWS) is located just outside the study area.	County
Agricultural fields north of Clog Hill	N2	Extensive area of arable farmland, with shelterbelt woodlands that are features of local ecological value.	Local
Woodland at Fairley Home Farm and Derbeth Farm	N3	Series of shelterbelts and small woodland plantations in between farmland west of Kingswells with semi-natural woodland habitat present north of Fairley Home Farm. These woodland areas are small and thus considered to be features that enhance the local habitat resource.	Local
Agricultural land around Fairley Home Farm and Derbeth Farm	N4	Large arable fields of limited ecological value.	Less than local
Kingswells	N5	Most semi-natural habitats within Kingswells are of local ecological value and include shelterbelt plantation and localised areas of marshy grassland.	Local
Woodland west of Hillhead of Derbeth Farm	N6	DWS and Site of Interest to Natural Sciences (SINS).Part of Brimmond Hill DWS and SINS, with a mosaic of coniferous plantation and semi-natural broad-leaved woodland, including localised areas of wet woodland.	County
Woodland and shelterbelt east of Hillhead of Derbeth Farm	N7	Mosaic of conifer and broad-leaved woodland plantation and a wide shelterbelt that enhances the local ecological resource.	Local
Scrub and bracken on lower slopes of Brimmond Hill – SINS	N8	DWS and SINS. Part of Brimmond Hill DWS and SINS. Area of gorse scrub with occasional scattered trees.	County
Dry Heath on upper slopes of Brimmond Hill – SINS	N9	DWS and SINS. Part of Brimmond Hill DWS and SINS. Area of dry heath on thin acidic soils on upper slopes and summit of Brimmond Hill. This area constitutes an important area of lowland heath (<300 m altitude) in the region of NE Scotland. Lowland heath is a UK BAP priority habitat. The area is identified in the NE Coastal Plain Natural Heritage Futures as being a remnant of formerly extensive cover of lowland heath across much of the area.	Regional
Agricultural fields south of C89c and Overhills Farm	N10	Arable and improved grassland fields with dry stone walls of limited ecological value.	Local
Agricultural fields north of C89c and east of Brimmond Hill	N11	Large area of small fields of improved grassland with a network of intact dry stone walls and abundant scrub and scattered trees that enhance the local habitat resource.	Local
Agricultural fields surrounding Kepplestone Farm	N12	Farmland with predominantly improved grassland and dry stone walls and occasional scattered gorse scrub, which are of local ecological value.	Local
Agricultural fields between Brimmond Hill and Kepplestone	N13	Farmland with improved grassland and an area of dense gorse scrub to the east of Brimmond Hill and a small pond that enhance the local habitat resource.	Local
Gough Burn DWS	N14	DWS and SINS. Mosaic of semi-natural habitats including marshy grassland, wet heath/mire, swamp, wet woodland and scrub. Wet woodland is a UK BAP priority habitat. This habitat area also comprises several viable areas of habitats prioritised in the NES LBAP.	Regional

Feature / Asset	HA	Phase 1 Description of HA	HA value
Agricultural fields between Gough Burn DWS and Newhills Wood	N15	Series of large fields, of limited ecological value.	Less than local
Newhills Wood	N16	AWI listed Commercial coniferous plantation that enhances the local habitat resource.	Local
Agricultural fields and cemetery at Newhills	N17	Farmland with predominantly arable fields and amenity planting associated with Newhills Cemetery that are of limited ecological value.	Less than local
Section NL2			
Agricultural fields between Gough Burn and Golf Course	N18	Farmland with improved grassland and riparian habitats adjacent to Gough Burn that enhance the local habitat resource.	Local
Craibstone Golf Course	N19	Extensive area of mown grassland with scattered tree saplings of limited ecological value.	Less than local
Agricultural fields between Newhills Wood and Craibstone Estate	N20	Relatively small habitat area with farmland of limited ecological value.	Less than local
Parkhead Wood	N21	Small block of mature AWI listed conifer plantation that enhances the local habitat resource.	Local
West Woods	N22	AWI listed extensive area of commercial conifer plantation, most of which is located to the west of the study area. The extent and diversity of associated habitats is considered to enhance the habitat resource at the county level.	County
Woodland/Farmland west of C88c, north of Parkhead Wood	N23	Mosaic of farmland and small blocks of plantation woodland, which enhance the habitat resource at the local level.	Local
Woodland along Gough Burn	N24	AWI listed woodland area with semi-mature mixed plantation and semi-natural broad-leaved woodland. This habitat area forms part of an area of semi-natural woodland within the SAC campus that represents a viable area of a priority habitat in the NE LBAP and is considered to enhance the habitat resource at the county level.	County
Woodland in west of SAC campus	N25	An area of woodland that includes two woodland areas with semi-mature mixed plantation and semi-natural broad-leaved woodland. This habitat area forms part of an area of semi-natural woodland within the SAC campus that represents a viable area of a priority habitat in the NE LBAP and is considered to enhance the habitat resource at the county level.	County
Woodland along Craibstone Burn	N26	Woodland area with semi-mature mixed plantation and semi-natural broad-leaved woodland. This habitat area forms part of an area of semi-natural woodland within the SAC campus that represents a viable area of a priority habitat in the NE LBAP and is considered to enhance the habitat resource at the county level.	County
Woodland along Green Burn	N27	Relatively small area of semi-mature mixed plantation woodland that is of less ecological value that other woodland areas, but enhances the habitat resource at the local level.	Local
Agricultural land in SAC campus east of C88c Road	N28	Farmland within the SAC campus enhances the habitat resource at the local level.	Local

Feature / Asset	HA	Phase 1 Description of HA	HA value
Section NL3			
Agricultural land northeast of Dyce Drive	N29	Relatively small area of farmland of limited ecological value.	Less than local
Agricultural land between the A96 and Dyce Drive	N30	Extensive area of farmland with large fields that are of limited ecological value.	Less than local
Chapelbrae Wood	N31	Small area of semi-mature broad-leaved woodland plantation that enhances the ecological value at the local level.	Local
Agricultural land between Newton and Upper Corsehill	N32	Large area of farmland with arable, improved and semi-improved grassland, dry stone walls, scattered scrub and species-rich grass verges. The habitats towards Upper Corsehill are a particularly important network of dry stone walls and species-rich grassland that are of a county level of ecological value.	County
Agricultural land south of Standingstones Wood and east of Kirkhill Forest	N33	Farmland that includes large arable fields on lower ground to the east and less intensively managed fields on higher ground to the west of the study area. In these areas, there are species-rich hay meadows with species-rich verges along tracks and dry stone walls that enhance the habitat resource at the county level.	County
Kirkhill Forest South	N34	AWI listed extensive area of young to mature coniferous plantation forming part of Kirkhill Forest that extends farther west and north. Kirkhill Forest includes a diverse range of semi-natural habitats, including localised areas of broad-leaved woodland, scrub, wet heath and grassland and enhances the habitat resource at the county level.	County
Standingstones Wood	N35	Area of Kirkhill Forest that extends downhill almost as far as Farburn Wood. Woodland comprises blocks of young spruce and larch. A dry valley extends along the south edge of this habitat area, which supports a mosaic of habitats that include dry heath, bracken, scrub and tall herb vegetation. This mosaic of habitats and the connectivity of the area with Kirkhill forest to the west confer a county level of ecological importance.	County
Farburn Wood DWS	N36	DWS. Relatively small area of mature broad-leaved woodland, probably of long-established plantation origin, but with semi-natural characteristics. The site is designated as a DWS.	County
Kirkhill Forest North	N37	Awi listed extensive area of commercial forest plantation with localised areas of semi-natural habitats such as marshy grassland, acid grassland and scrub habitats that enhance the habitat resource at the county level.	County
Open Habitats along Bogenjoss Burn within Kirkhill Forest	N38	Mosaic of semi-natural habitats along the course of Bogenjoss Burn including acid grassland, scrub and marshy grassland that enhance the habitat resource at the county level.	County
Agricultural fields around Standingstones Farm	N39	Farmland comprising arable and improved grassland with well-maintained dry stone walls, and localised areas of scrub and woodland that enhance the local habitat resource.	Local
Lower Overton Wood	N40	AWI listed commercial conifer plantation with localised areas of mixed woodland plantation and naturally developing young broad-leaved woodland that enhance the local habitat resource.	Local
Agricultural fields between Lower Overton Wood and East Woodlands	N41	Farmland between forest areas with small fields with improved grassland with localised areas of unimproved acid grassland on steep valley sides. These habitats are considered to enhance the habitat resource at the local level.	Local

Feature / Asset	HA	Phase 1 Description of HA	HA value
Bogenjoss Burn downstream of Kirkhill Forest	N42	Linear series of habitats along the course of the burn including marshy grassland, scrub and semi-natural, riparian broad-leaved woodland along the valley bottom that forms a viable area of priority L BAP habitat.	County
East Woodlands	N43	Area of conifer plantation, with open habitats, broad-leaved woodland plantation and a line of mature beech trees along a former land boundary. These habitats are considered to enhance the habitat resource at the county level and include areas of priority L BAP habitat.	County
Agricultural fields west of Bogenjoss Burn	N44	Farmland comprising large arable and improved grassland fields of limited ecological value.	Less than local
Bogenjoss Burn and grounds of Pitmedden House	N45	Woodland along Bogenjoss Burn and in grounds of Pitmedden House comprising semi-natural riparian broad-leaved woodland and areas of AWI listed mixed and conifer plantation. Includes viable areas of riparian woodland (L BAP priority), and small areas of parkland with woodland and ornamental gardens that enhance the habitat resource at the county level.	County
Agricultural fields southeast of Bogenjoss Burn	N46	Farmland with predominantly grazing and silage fields with occasional areas of scrub and mature trees. This area includes a large field of semi-improved acid grassland, which enhances the habitat resource at the local level.	Local
Monument Wood	N47	AWI listed commercial conifer woodland with a small area of mature semi-natural pinewood that enhances the habitat resource at the local level.	Local
Agricultural fields between Monument Wood and Lower Overton Wood	N48	Farmland with improved grassland fields, well-maintained walls and localised areas of less intensive grassland and scrub at West Overton that enhance the habitat resource at the local.	Local
Section NL4			
Agricultural fields and Quarry north of railway line	N49	Farmland north of the Inverness to Aberdeen railway line of limited ecological value.	Less than local
Agricultural fields on either side of Dyce Drive, south of railway line	N50	Extensive area of farmland with improved grassland and arable fields and localised areas with small blocks of broad-leaved woodland plantation, occasional standard trees and gorse scrub that enhance the habitat resource at the local level.	Local
Agricultural fields on southwest bank of River Don valley	N51	Farmland with improved grassland and an area of marshy grassland (Moss Fetach) at the edge of the flood plain. These habitats enhance the habitat resource at the local level.	Local
Banks of the River Don	N52	DWS. Riparian habitats on both banks of the River Don with additional important freshwater habitats in the river channel. This chapter does not address freshwater habitats and they are not one of the criteria for assessing conservation value. Both banks support species-rich grassland, scattered scrub and tall herb habitats. The semi-natural habitats associated with the River Don represent viable areas of priority habitats identified in the NES LBAP and enhance the habitat resource at the regional level. BUT no UKBAP priority habitats	Regional
Woodland around Goval House	N53	Mature broad-leaved woodland of long-established plantation origin that enhances the habitat resource at the local level.	Local
Farmland between River Don and the B977	N54	Farmland large arable fields and improved grassland pasture with scattered scrub and shelterbelts of mature mixed plantation that enhance the local habitat resource.	Local

Feature / Asset	HA	Phase 1 Description of HA	HA value
Agricultural fields surrounding Goval Farm	N55	Farmland comprising arable and improved grassland fields with well-maintained dry stone walls and scattered scrub that enhance the local habitat resource.	Local
Goval Wood	N56	Mosaic of semi-natural habitats, dominated by birch woodland with areas of priority L BAP habitats including wet woodland, unimproved acid grassland, and wet heath habitats.	County
Plantation north of Goval Wood	N57	Semi-mature commercial coniferous plantation of local ecological value.	Local
Goval Belt	N58	Relatively wide AWI listed shelterbelt of broad-leaved woodland, dominated by mature birch and rowan with records of wych elm. This habitat area forms an important ecological link between Goval Burn and Goval Wood and supports woodland that enhances the habitat resource at the county level.	County
Agricultural fields north of Goval Belt	N59	Farmland, with improved grassland of limited ecological value.	Less than local
Agricultural fields south of Goval Belt, between the A947 and Formartine & Buchan Way	N60	Small area of farmland with arable and silage fields and increased habitat diversity due to the Mill Lade Aqueduct and Goval Burn, which both flow along field margins. These habitats are considered to enhance the habitat resource at the local level.	Local
Goval Burn and The Lade	N61	River and reservoir with marginal habitats and wayside trees, and diverse mosaic of habitats: tall herb, grassland, scrub, woodland and semi-improved pasture, which enhance the habitat resource at the county level.	County
Formartine & Buchan Way	N62	The Formartine & Buchan Way supports species-rich grassland along its embankments and cuttings with scattered areas of scrub and occasional mature trees.	County
Park Hill Estate	N63	Semi-natural broad-leaved woodland and mature beech plantation of long-established plantation origin, amongst cattle-grazed improved grassland. This area is a small proportion of a much larger area that includes the NES LBAP priority habitat, parkland and wood pasture, with records of wych elm.	County
Agricultural fields southeast of Formartine & Buchan Way	N64	Relatively small area of farmland with arable and improved grassland fields of limited ecological value.	Less than local
Skate Wood	N65	AWI listed Mature birch and rowan woodland of plantation origin but with semi-natural characteristics such as widespread natural regeneration and woodland ground flora. This woodland is listed as an Important Local wildlife Site under the Scottish Wildlife Action Project.	County
Roadside plantation and mature pine avenue at Little Goval	N66	Mixed plantation between farm access road and the B977 and an adjacent avenue of mature pine trees forming a shelterbelt either side of the farm access road. These features are considered to enhance the habitat resource at the local level.	Local
Den Wood and roadside plantations	N67	AWI listed commercial conifer plantation with mature and young blocks that enhance the habitat resource at the local level.	Local
Agricultural fields between the B977 and Meadowhead Burn	N68	Extensive area of farmland with predominantly improved grassland, well-maintained dry stone walls and occasional trees and scrub that enhance the habitat resource at the local level.	Local
Agricultural fields north of Meadowhead Burn and east of Formartine & Buchan Way	N69	Extensive area of farmland with arable and improved grassland and well-maintained dry stone walls. Farm access tracks support localised species-rich verges and have numerous wayside trees and scrub. These features are considered to enhance the habitat resource at the local level.	Local

Feature / Asset	HA	Phase 1 Description of HA	HA value
Agricultural fields east of the B997 at Newpark Steading	N70	Extensive area of farmland with improved grassland, marshy grassland and modified burn channels that are considered important at the local level.	Local
Meadowhead Burn	N73	Farmland with improved and marshy grassland and occasional arable fields, and occasional small blocks of conifer and mixed plantation. These habitats enhance the habitat resource at the local level.	Local
Section NL5			
Corsehill Wood	N71	Relatively small area of AWI listed plantation and semi-natural broad-leaved woodland that is connected to woodland habitats at Den Wood to the south and Littlejohn's Wood to the northeast. The woodland habitat is considered to enhance the habitat resource at the county level.	County
Littlejohn's Wood	N72	Relatively small area of woodland, mostly AWI listed conifer plantation with naturally regenerated birch woodland in the northwest and boundary features of mature beech trees. Forms important ecological links to Red Moss and Corsehill Wood.	County
Woodland at Red Moss, north of the B977	N74	Mature semi-natural broad-leaved woodland dominated by birch and rowan with localised areas of wet woodland, wet heath and acid grassland. The habitat diversity, size and connectivity with Littlejohn's Wood and Red Moss confer county ecological importance.	County
Raised bog at Red Moss, north of the B977	N75	Lowland raised bog habitats comprised of wet modified bog with a central dome supporting drier peat bog vegetation. Although modified, these habitats retain features of intact bogs that are priority habitats in the UK BAP. Red Moss forms part of an important network of similar sites throughout NE Scotland and therefore is considered to be regionally important.	Regional
Farmland and bare ground at Moss-side, north of the B977	N76	Series of small fields of improved grassland that are of limited ecological value.	Less than local
Plantation northeast of Red Moss, north of the B977	N77	Semi-mature commercial spruce forest that extends to the northeast of Red Moss, and enhances the habitat resource at the local level.	Local
Mosaic of scrub and grassland west of Moss Belt	N78	Mosaic of semi-natural habitats, with mature boundary-feature beech trees along the roadside, wet heath, acid grassland and scattered and dense gorse scrub habitat. The limited size of this habitat area prevents a county level of importance and thus the area is considered to be of local ecological importance.	Local
Moss Belt Plantation	N79	Shelterbelt comprising mature mixed plantation that enhances the habitat resource at the local level.	Local
Agricultural fields between the B977 and Loch Hills Quarry	N80	Farmland comprising large arable fields with dry stone walls, several with species-poor semi-improved grassland, with areas of scattered scrub. Two small ponds are surrounded by marshy grassland and scrub habitat. These enhance the habitat resource at the local level.	Local
Loch Hills Quarry	N81	Gravel and sand quarry, with areas of bare ground, and localised areas of scrub and sparse vegetation of limited ecological value.	Less than local
Red Moss, south of the B977	N82	DWS. Extensive area of Lowland Raised Bog, functionally connected to Red Moss, north of B977 (N75). Habitats comprised of mainly wet modified bog habitats with a small area of drier habitat to the north of the site. Scrub and woodland encroachment is occurring around the edge of the bog, with evidence of drainage and cutting, particularly along the south of the bog. However, bog retains a raised dome structure and forms part of an important network of similar sites throughout NE Scotland and therefore is considered to be regionally important.	Regional
Woodland between Red Moss and Lochgreens Farm	N83	Semi-natural broad-leaved woodland on south side of Red Moss (N82) and encroaching into bog habitats. The woodland supports a semi-natural ground flora and enhances the habitat resource at the county level.	County
Agricultural fields south of Lochgreens Farm	N84	Farmland with large arable and IMG fields, and including a small copse of mature beech around a walled area of acid grassland. These habitats are considered to be of local ecological importance.	Local

Feature / Asset	HA	Phase 1 Description of HA	HA value
Corby and Lily Lochs and associated habitats	N85	SSSI, DWS and SINS. Approximately 50% of the Corby and Lily Lochs area of the SSSI is located within this section of the study area. It includes a diverse range of habitats that include open water, swamp, basin mire (poor-fen vegetation), wet heath, wet woodland, scrub and drainage channels.	National
Agricultural fields between Red Moss and Newtonhill Farm	N86	Extensive area of farmland with large fields of species-poor hay meadows and grazing pasture, which are of local ecological importance.	Local
Agricultural fields between Lochgreens Road and Gravel Pit	N87	Extensive area of farmland with predominantly improved grassland and two arable fields, with localised semi-natural habitats that enhance the local habitat resource.	Local
Newton of Shielhill DWS	N88	DWS. A small habitat area comprising a small waterbody supporting swamp and marginal vegetation, with localised areas of gorse scrub. A recent broad-leaved woodland plantation is located along the roadside at Newtonhill.	County
Agricultural fields between unclassified road and the B999 (north)	N89	Farmland with predominantly arable fields with dry stone walls and an extensive, recently planted conifer plantation woodland. It also includes a series of small ponds and marshy grassland and is considered to enhance the habitat resource at the local level.	Local
Agricultural fields between unclassified road and the B999 (south)	N90	Farmland comprising arable fields and improved grassland, and mature sycamore trees that form boundary features and enhance the habitat resource at the local level.	Local
Agricultural fields adjacent to Blackdog Burn, east of the B999.	N91	Farmland that comprise predominantly improved grassland with stands of dense gorse scrub and localised patches of broad-leaved woodland plantation, which enhance the habitat resource at the local level.	Local
Agricultural fields between B999 and Harehill Farm	N92	Farmland comprising arable fields, with occasional mature trees and dry stone walls and gorse scrub of limited ecological value.	Less than local
Agricultural fields between Harehill Farm and the A90, south of Blackdog Burn	N93	Farmland with improved grassland well-maintained network of dry stone walls, and a series of semi-mature and young conifer and mixed plantation woodland blocks. These habitats are assessed as being of local ecological value.	Local
Agricultural fields west of the A90, north of Blackdog Burn	N94	Farmland comprised of arable fields, with scattered gorse scrub and bracken of local ecological value.	Local
Grassland east of the A90, south of Blackdog	N95	Open improved grassland, comprising a revegetated area of landfill. Young recently planted conifer plantations are present south of residential areas in Blackdog.	Local
Agricultural fields, west of the A90, either side of Potterton Road	N96	Farmland comprising arable and improved grassland fields with localised areas of dense gorse scrub, semi-improved grassland, and young broad-leaved woodland plantation that enhance the local habitat resource.	Local
Agricultural fields east of the A90, north of Blackdog	N97	Farmland, comprising arable and improved grassland fields, with localised areas of unmanaged grassland with scattered ruderal and tall herb vegetation and a young conifer plantation. These habitats enhance the local habitat resource.	Local

5 Potential Impacts

5.1 Introduction

5.1.1 The range of ecological impacts on the receptors associated with a development scheme is dependent on the individual characteristics of each development. In general, impacts can be referred to as direct impacts, where the proposal, either during a construction or operational phase, results in a direct change to the status of an ecological receptor. For example, habitat loss due to land-take, or loss of animals due to road mortality can be referred to as direct impacts. In addition, indirect effects of developments relate to secondary effects of the proposal. For example, fragmentation of habitat units can affect the long-term viability of local populations of species.

5.1.2 In this section of the report, the potential ecological impacts of the proposed route are described and assessed in terms of their magnitude using the criteria outlined in Table 2. These impacts include generic impacts that are likely to arise along the whole route and site-specific impacts that are predicted to occur on individual habitat areas. The significance of these impacts is then determined using the criteria in Table 3. This method of assessing impacts is derived from draft and final guidance from IEEM (IEEM 2002; 2006) and from guidance related to impacts associated with the construction of road schemes (Highways Agency 2000; 2001; 2005).

5.2 Potential Generic Impacts

5.2.1 Generic impacts associated with road developments have been identified in the DMRB (Highways Agency 2000; 2001; 2005) and include:

- direct habitat loss through land-take;
- severance or fragmentation of existing habitat areas;
- hydrological disruption;
- pollution via road drainage, runoff and spray from road traffic;
- physical obstruction caused by road constructions and bridges;
- visual and light pollution caused by road lighting;
- air pollution; and
- disturbance during construction.

5.2.2 The proposed route of the AWPR involves the construction of approximately 46km of dual carriageway, along an offline alignment through a landscape dominated by agriculture and forestry. Generic impacts are predicted to occur along the whole of this route and a summary description of these impacts is presented in Table 10. In addition, the presence of these impacts in the construction and/or the operational phase of the proposed road is indicated. 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.

Table 10 – Summary of Generic Impacts of the Proposed Scheme During Construction and Operational Phases

Generic Impact	Effects in Study Area	Construction Phase	Operation Phase
Direct Habitat Loss	The proposed works involve construction of a dual carriageway through a variety of habitats, which are predominantly utilised for farming and agricultural purposes. 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 is increased depending on the extent of the required works.	No	Yes
Severance or fragmentation of existing habitat areas	The proposed road will result in the severance of habitats adjacent to the proposed alignment. Fragmentation of habitat areas is likely to occur where the proposed route severs existing habitat areas, resulting in smaller, more numerous areas of habitat.	Yes	Yes
Physical obstruction caused by road constructions and bridges	The proposed road will act as a physical obstruction to the natural movement of certain species. These impacts are more obvious on animal populations resident in the study area and these are discussed in other specialist reports. However, movement of plant species (e.g. via seed dispersal) can also be obstructed by physical barriers such as roads.	Yes	Yes
Hydrological disruption	Wetland habitats, including mires, blanket bog and wet heaths are susceptible to impacts from developments that affect the hydrological regimes of those habitats. Wetland habitat areas close to the proposed route may be subject to such impacts.	Yes	Yes
Pollution via road drainage, run-off and spray	During construction of the proposed road, pollution is likely to be predominantly associated with run-off of construction materials onto semi-natural habitats and may result in adverse impacts to these habitats. During the operation of the road, pollution resulting from road drainage, run-off and spray is likely to adversely impact habitats adjacent to the road.	Yes	Yes
Visual and light pollution	Visual and light pollution impacts on existing habitat areas are predicted, with the magnitude dependent on the level of road lighting present in specific areas.	Possible	Yes
Air pollution	During the construction phase, particulate deposition of material arising from construction materials may result in limited impacts close to the construction site. During operation of the road, air pollution may arise from traffic emissions.	Yes	Yes
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

Estimate of Habitat Loss

5.2.3 The total amount of land-take required in order to construct the Northern Leg of the proposed scheme is estimated at approximately 3.16km^2 / 316ha. Table 11 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 11 – Summary of Areas of Land-take by Phase I Habitat Category

Phase 1 Habitat Description	Phase 1 Habitat Categories within proposed scheme land-take	
	Pre-construction (Ha)	Post-construction (Ha)
Woodland mixed plantation	6.57	25.53
Woodland broadleaved plantation (including standard trees)	3.57	4.22
Woodland broadleaved semi-natural	7.06	2.16
Woodland coniferous plantation	19.19	14.28
Scattered scrub	4.30	11.30
Dense continuous scrub	4.94	13.56
Acid grassland semi-improved	2.32	1.86
Acid grassland unimproved	0.47	0.43
Amenity grassland	0.83	0.63
Improved grassland	153.04	112.41
Marshy grassland	1.91	1.44
Neutral grassland semi-improved	0.41	0.36
Neutral grassland unimproved	0.16	0.16
Poor Semi-improved grassland	18.06	13.13
Arable	88.42	39.61*
Built up areas (buildings)	1.42	0.72
Herb & Fern bracken continuous	1.71	0.24
Open water	0.29	0.13
Parkland broadleaved	0.59	0.26
Parkland coniferous	0.22	0.07
Heathland wet heath acid	0.15	0
Total	**315.63**	**242.50**

**Figure assumes all potential return to agriculture is achieved*

5.3 Potential Impacts on Habitat Areas

5.3.1 In the following paragraphs for each of the sections, the potential impacts on the habitat areas present within the study area are described. For each Habitat Area, the magnitude of the combined impacts is assessed using the criteria in Table 2 and the resulting significance of these impacts presented using the matrix in Table 3. The paragraphs below present a brief summary of the most important impacts in each section, full results of impact assessment for each Habitat Area are presented in Table 12 to Table 21.

Section NL1: Ch314800 – 316000 (Derbeth to Tulloch Road)

5.3.2 There are no impacts of greater than Minor significance for terrestrial habitats in this section.

Section NL2: Ch316000 – 317400 SAC Craibstone

Construction

5.3.3 Disturbance, fragmentation and potential pollution in and around Craibstone Burn and the habitat surrounding Gough Burn is assessed as being of Moderate significance.

Operation

5.3.4 Permanent habitat loss in and surrounding Craibstone Burn involves high-value pond and stream habitats. This, together with further operational impacts caused by disturbance, fragmentation and potential pollution due to particulate or chemical runoff is assessed as being of Moderate significance.

Section NL3: Ch317400 – 322600 (Kirkhill to Monument Wood)

Construction

5.3.5 Disturbance, fragmentation and potential pollution of the valuable riparian habitat surrounding Bogenjoss Burn including Kirkhill Forest North is of Moderate significance.

Operation

5.3.6 Habitat loss of farmland between Newton and Upper Corsehill including the loss of 13-14 dry stone walls results in impacts of Moderate significance. Habitat loss would also constitute a Moderate significant impact in the area surrounding Bogenjoss Burn (including Kirkhill Forest North). Although occurring during the construction phase, this habitat loss would be permanent and is thus considered an operational impact. Further operational impacts caused by disturbance, fragmentation and potential pollution due to particulate or chemical runoff are assessed as being of Moderate significance.

Section NL4: Ch322600 – 325370 (Nether Kirkton to Corsehill)

Construction

5.3.7 Disturbance, fragmentation and potential pollution of the valuable riparian habitat surrounding Bogenjoss Burn including Kirkhill Forest North during construction of the proposed scheme is of Moderate significance.

Operation

5.3.8 There is permenant habitat loss of high value riparian habitat along the River Don, Goval Burn and the Mill Lade. The species-rich grasslands bordering the Formartine and Buchan Way are also subject to habitat loss, which is predicted to constitute an impact of Moderate significance. Additional operational impacts caused by disturbance, fragmentation and potential pollution due to particulate or chemical runoff are assessed as being of Moderate significance.

Section NL5: Ch325370 – 331000 (Corsehill to Blackdog)

Construction

5.3.9 The AWI listed plantation woodlands of Littlejohns and Corsehill would be severed resulting in disturbance of Moderate significance. There would be no direct impacts upon Corby and Lily Lochs; however, the indirect impacts of fragmentation and disturbance, which may result in hydrological disruption, risking the integrity of the wetland habitat, and potential pollution, are considered to be of Major significance upon this section of the Corby, Lily and Bishops Loch SSSI.

Operation

5.3.10 Permanent habitat loss of Littlejohns wood and fragmentation from Corsehill and impacts of Moderate significance. Operational impacts caused by disturbance, fragmentation and potential pollution due to particulate or chemical runoff are assessed as being of Major significance.

Table 12 – Assessment of Construction Impacts on Individual Habitat Areas – Section NL1

HA in NL1	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N1	Kingswells County	No direct impacts as all habitats of ecological value are > 500m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N2	Agricultural fields north of Clog Hill Local	No direct impacts as habitat area is > 250m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N3	Woodland at Fairley Home Farm and Derbeth Farm Local	Severance and disturbance leading to fragmentation of woodland habitats remaining on either side of the route. Potential pollution and disturbance to remaining woodland fragments.	High negative	Minor Adverse
N4	Agricultural land around Fairley Home Farm and Derbeth Farm Less than local	Severance and disturbance leading to fragmentation of farmland habitats remaining on either side of the route. Potential pollution and disturbance to remaining farmland habitats.	High negative	Minor Adverse
N5	Kingswells Local	No direct impacts as all habitats of ecological value are > 500m from the proposed route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N6	Woodland west of Hillhead of Derbeth Farm County	No impacts as all habitats of ecological value are > 500m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N7	Woodland and shelterbelt east of Hillhead of Derbeth Farm Local	Severance and disturbance leading to fragmentation of shelterbelt on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N8	Scrub and bracken on lower slopes of Brimmond Hill – DWS/SINS County	No direct impacts as all habitats of ecological value are > 250m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N9	Dry Heath on upper slopes of Brimmond Hill – DWS/SINS Regional	No direct impacts as all habitats of ecological value are > 1000m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N10	Agricultural fields south of C89c and Overhills Farm Local	No direct impacts as all habitats of ecological value are > 250m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible

HA in NL1	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N11	Agricultural fields north of C89c and east of Brimmond Hill Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	High negative	Minor Adverse
N12	Agricultural fields surrounding Kepplestone Farm Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Minor Adverse
N13	Agricultural fields between Brimmond Hill and Kepplestone Local	Severance from farmland on other side of route. Potential pollution and disturbance impacts.	Low negative	Minor Adverse
N14	Gough Burn DWS Regional	No direct impacts as habitats between 50 and 600m from route. Potential secondary impacts including hydrological damage to wetland habitats, pollution and disturbance, particularly to habitats closest to route.	Low negative	Minor Adverse
N15	Agricultural fields between Gough Burn DWS and Newhills Wood Less than local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Negligible
N16	Newhills Wood Local	No direct impacts as habitats between 150m and 500m from route. Potential secondary impacts including pollution and disturbance.	Low negative	Minor Adverse
N17	Agricultural fields and cemetery at Newhills Less than local	No direct impacts as habitats between 150m and 500m from route. Potential secondary impacts including pollution and disturbance.	Low negative	Negligible

Table 13 – Assessment of Operational Impacts on Individual Habitat Areas – Section NL1

HA in NL1	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N1	Kingswells Local - County	Direct habitat loss of 0.104 ha agricultural land (arable) between ch314800 – ch314900 (Small blocks of improved grassland 0.097 and 0.007ha arable). No observable secondary impacts are likely to occur.	Low Negative	Minor
N2	Agricultural fields north of Clog Hill Local	No direct habitat loss as habitat area is > 250m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N3	Woodland at Fairley Home Farm and Derbeth Farm Local	Direct loss of woodland habitat at ch313650, ch314100, ch314200 and ch314350 (small blocks of planation woodland 0.013ha plus 2.904ha arable and 0.045ha scrub). Severance and fragmentation of woodland habitats remaining on either side of the route. Potential pollution and disturbance to remaining woodland fragments.	High negative	Minor Adverse
N4	Agricultural land around Fairley Home Farm and Derbeth Farm Less than local	Direct loss of 0.199ha farmland between ch313450 and 314800 (0.095ha arable and 0.104ha improved grassland plus 0.44ha of woodland). Severance and fragmentation of farmland habitats remaining on either side of the route. Potential pollution and disturbance to remaining farmland habitats.	High negative	Minor Adverse
N5	Kingswells (cont. from Sheet 6) Local - County	No direct habitat losses as all habitats of ecological value are > 500m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N6	Woodland west of Hillhead of Derbeth Farm County	No direct habitat losses as all habitats of ecological value are > 500m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N7	Woodland and shelterbelt east of Hillhead of Derbeth Farm Local	Direct loss of habitat where route crosses shelterbelt between ch314875 and 314900 (0.027ha arable, 0.052ha improved grassland, 0.021ha dense continuous scrub and 0.087ha mixed woodland plantation). Severance and fragmentation of shelterbelt on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N8	Scrub and bracken on lower slopes of Brimmond Hill – DWS/SINS County	Direct habitat loss of 0.025 ha dense continuous scrub between ch314800 – ch315000 (bracken scattered 0.002 ha plus 0.023 ha scrub dense continuous). No observable secondary impacts are likely to occur.	Low Negative	Minor
N9	Dry Heath on upper slopes of Brimmond Hill – DWS/SINS Regional	No direct habitat losses as all habitats of ecological value are > 1000m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N10	Agricultural fields south of C89c and Overhills Farm Less than local	Direct habitat loss of 0.021 ha improved grassland between ch314900 – ch 315000. No observable secondary impacts are likely to occur.	Negligible	Negligible

HA in NL1	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N11	Agricultural fields north of C89c and east of Brimmond Hill Local	Direct loss farmland between ch314900 and ch315300 and associated with Kingswells North junction (2.073ha improved grassland plus 0.119ha dense continuous scrub and 0.016ha scattered scrub). Loss of 8-10 dry stone walls. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	High negative	Minor Adverse
N12	Agricultural fields surrounding Kepplestone Farm Local	Direct loss farmland between ch315300 and ch315650 (1.4ha improved grassland plus 0.022ha dense continuous scrub) Loss of four dry stone walls. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Minor Adverse
N13	Agricultural fields between Brimmond Hill and Kepplestone Local	Habitat loss of 0.395ha farmland in southeast corner of habitat area (0.039ha acid grassland semi-improved, 0.356ha improved grassland plus 0.083ha dense continuous scrub). Severance from farmland on other side of route. Potential pollution and disturbance impacts.	Low negative	Minor Adverse
N14	Gough Burn DWS Regional	Direct habitat loss of 0.006 ha improved grassland between ch315300 – ch315400. Potential secondary impacts including hydrological damage to wetland habitats, pollution and disturbance, particularly to habitats closest to route.	Low negative	Minor Adverse
N15	Agricultural fields between Gough Burn DWS and Newhills Wood Less than local	Direct loss of farmland between ch315650 and ch316050 (1.593ha improved grassland plus 0.088ha scattered scrub). Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Negligible
N16	Newhills Wood Local	No direct habitat loss as habitats between 150 and 500m from route. Potential secondary impacts including pollution and disturbance.	Low negative	Minor Adverse
N17	Agricultural fields and cemetery at Newhills Less than local	No direct habitat loss as habitats between 150 and 500m from route. Potential secondary impacts including pollution and disturbance.	Low negative	Negligible

Table 14 Assessment of Construction Impacts on Individual Habitat Areas – Section NL2

HA in NL2	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N18	Agricultural fields between Gough Burn and Golf Course Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Minor Adverse
N19	Craibstone Golf Course Less than local	No direct impact as route passes 50m to east of course. Potential pollution and disturbance impacts.	Negligible	Negligible
N20	Agricultural fields east of C88c between Newhills Wood and Craibstone Estate Less than local	Severance and disturbance leading to fragmentation of farmland habitats. Potential secondary impacts including pollution and disturbance.	Low negative	Negligible
N21	Parkhead Wood Local	No direct impacts as habitats between 150 and 500m from route. Potential secondary impacts including pollution and disturbance during construction.	Negligible	Negligible
N22	West Woods County	No direct impacts as all habitats of ecological value are > 250m from the route. No observable secondary impacts are likely to occur.	Negligible	Negligible
N23	Woodland/ Farmland west of C88c, north of Parkhead Wood Local	No direct impacts as habitats between 150 and 500m from route. Potential secondary impacts including pollution and disturbance during construction.	Low negative	Minor Adverse
N24	Woodland along Gough Burn County	Severance from woodland fragments remaining on west of AWPR. Potential secondary impacts, including run-off and road drainage downstream along Gough Burn, spray and atmospheric pollution and disturbance to remaining woodland habitat.	Medium negative	Moderate adverse
N25	Woodland in west of SAC campus County	Severance and disturbance leading to fragmentation of woodland within SAC campus. Potential pollution, disturbance and impacts on downstream habitats along burn.	Medium negative	Moderate adverse
N26	Woodland along Craibstone Burn County	Severance and disturbance leading to fragmentation of woodland within SAC campus. Potential pollution, disturbance and impacts on downstream habitats along burns.	High negative	Moderate adverse
N27	Woodland along Green Burn Local	Potential pollution, disturbance and impacts on downstream habitats along burn.	Medium negative	Minor Adverse
N28	Agricultural land in SAC campus east of C88c Road. Local	Severance and disturbance leading to fragmentation of farmland habitats. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse

Table 15 – Assessment of Operational Impacts on Individual Habitat Areas – Section NL2

HA in NL2	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N18	Agricultural fields between Gough Burn and Golf Course Local	Direct loss of farmland between ch316050 and 316300 (1.093ha improved grassland 1.093ha plus 0.11ha scattered scrub). Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance impacts.	Medium negative	Minor Adverse
N19	Craibstone Golf Course Less than local	Direct habitat loss of 0.087 ha improved grassland and 0.086 ha woodland broadleaved plantation between ch 316200 – ch316400. Potential pollution and disturbance impacts.	Negligible	Negligible
N20	Agricultural fields east of C88c between Newhills Wood and Craibstone Estate Less than local	Direct habitat loss of agricultural fields (0.006ha improved grassland) due to construction of new access road to SAC campus. Severance and fragmentation of farmland habitats. Potential secondary impacts including pollution and disturbance.	Low negative	Negligible
N21	Parkhead Wood Local	No direct habitat loss as habitats between 150 and 500m from route.	Negligible	Negligible
N22	West Woods County	No direct habitat losses as all habitats of ecological value are > 250m from the proposed route. No observable secondary impacts are likely to occur	Negligible	Negligible
N23	Woodland/Farmland west of C88c, north of Parkhead Wood Local	No direct habitat loss as habitats between 150 and 500m from the proposed route.	Low negative	Minor Adverse
N24	Woodland along Gough Burn County	Direct habitat loss between south entrance to SAC campus and arboretum (ch316300 and 316700) including improved grassland (0.153ha) and loss of mature broad-leaved woodland (0.414ha). Further mixed woodland habitat lost (0.097ha) due to construction of detention basins south of SAC campus. Severance from woodland fragments remaining on west of AWPR. Potential secondary impacts, including run-off and road drainage downstream along Gough Burn, spray and atmospheric pollution and disturbance to remaining woodland habitat.	Medium negative	Moderate adverse
N25	Woodland in west of SAC campus County	Direct habitat loss of 0.533ha of mixed plantation between ch316700 and ch316800 at west end of Arboretum (0.061ha semi-natural broadleaved, 0.011ha coniferous plantation and 0.461ha mixed plantation). Severance and fragmentation of woodland within SAC campus. Potential pollution, disturbance and impacts on downstream habitats along burn.	Medium negative	Moderate adverse

HA in NL2	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N26	Woodland along Craibstone Burn County	Direct habitat loss between ch316900 and ch317200 of semi-natural and plantation woodland (0.55ha broadleaved plantation, 0.067ha semi-natural broadleaved, 0.013ha coniferous plantation and 0.011ha mixed plantation plus 0.215ha continuous herb fern bracken, 0.004ha unimproved neutral grassland and 0.342ha improved grassland). Loss of pond and stream habitats along Craibstone Burn. Severance and fragmentation of woodland within SAC campus. Potential pollution, disturbance and impacts on downstream habitats along burns.	High negative	Moderate adverse
N27	Woodland along Green Burn Local	Direct habitat loss of west end of plantation, between ch317250 and ch317300 (0.205ha mixed plantation plus 0.006 ha improved grassland) due to realignment of burn. Potential pollution, disturbance and impacts on downstream habitats along burn.	Medium negative	Minor Adverse
N28	Agricultural land in SAC campus east of C88c Road. Local	Loss of 3.104ha of farmland habitats in SAC campus in numerous locations, between ch316450 and 317300 (0.654ha arable, 2.45ha improved grassland plus 0.004ha continuous herb fern bracken and 0.04ha woodland plantation), due to the construction of detention basins. Severance and fragmentation of farmland habitats. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse

Table 16 – Assessment of Construction Impacts on Individual Habitat Areas – Section NL3

HA in NL3	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N29	Agricultural land northeast of Dyce Drive Less than local	No direct impacts as habitats > 500m from route. Potential secondary impacts including pollution and disturbance during construction.	Low negative	Negligible
N30	Agricultural between A96 and Dyce Drive Less than local	Severance and disturbance leading to fragmentation of farmland habitats in remaining areas. Potential pollution and disturbance to habitats.	Medium negative	Minor Adverse
N31	Chapelbrae Wood Local	No direct impacts as woodland is approximately 150 – 250m from route. Potential secondary impacts including pollution and disturbance during construction.	Low negative	Minor Adverse
N32	Agricultural land between Newton and Upper Corsehill County	Severance and disturbance leading to fragmentation of farmland on either side of the main route alignment. Potential pollution and disturbance to habitats, including road drainage and run-off to areas downhill of alignment.	Medium negative	Moderate adverse
N33	Agricultural land south of StandingStones Wood and east of Kirkhill Forest County	Severance and disturbance leading to fragmentation of farmland on either side of the main route alignment. Potential pollution and disturbance to habitats, including road drainage and runoff to areas downhill of alignment.	Medium negative	Moderate adverse
N34	Kirkhill Forest South County	No direct impacts as woodland is > 150m from route. No observable secondary impacts predicted.	Negligible	Negligible
N35	Standingstones Wood County	Severance and disturbance leading to fragmentation of habitats, with isolation of habitats to east of route. Potential secondary impacts including pollution, runoff and disturbance.	Medium negative	Moderate adverse
N36	Farburn Wood DWS County	No direct impacts as woodland is 250 - 500m from route. Severance impacts as AWPR will isolate site from woodland habitats in Kirkhill Forest. No observable secondary impacts predicted.	Low negative	Minor Adverse
N37	Kirkhill Forest North County	Severance and disturbance leading to fragmentation of remaining forest areas, with isolation of woodland east of the route and severance of links between Kirkhill Forest and Lower Overton Wood. Potential pollution and disturbance, including hydrological impacts to marshy grassland, road drainage into Bogenjoss Burn and disturbance to woodland habitats.	Medium negative	Moderate adverse
N38	Open Habitats along Bogenjoss Burn within Kirkhill Forest. County	Severance and disturbance leading to fragmentation of burn habitats up and downstream of the realigned section. Potential road drainage pollution and disturbance.	High negative	Moderate adverse
N39	Agricultural fields around Standingstones Farm Local	Severance and disturbance leading to fragmentation of farmland habitats on either side of route. Potential secondary impacts including pollution, run-off and disturbance.	Medium negative	Minor Adverse

HA in NL3	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N40	Lower Overton Wood Local	No direct impacts as woodland is approximately 150 – 500m from route. Severance of wood from Kirkhill Forest to the west. Potential secondary impacts including pollution and disturbance during construction.	Medium negative	Minor Adverse
N41	Agricultural fields between Lower Overton Wood and East Woodlands Local	Severance and disturbance leading to fragmentation of habitats remaining on either side of route. Potential secondary impacts including pollution, disturbance and hydrological impacts.	High negative	Minor Adverse
N42	Bogenjoss Burn downstream of Kirkhill Forest. County	Severance of habitats on either side of embankment. Potential impacts of road drainage, pollution and disturbance to remaining habitats.	Medium negative	Moderate adverse
N43	East Woodlands County	Severance of wood from Overton Wood to the east. Potential secondary impacts including pollution and disturbance during construction.	Low negative	Minor Adverse
N44	Agricultural fields west of Bogenjoss Burn Less than local	No direct impacts. No observable secondary impacts.	Negligible	Negligible
N45	Bogenjoss Burn and grounds of Pitmedden House. County	No direct impacts as woodland is approximately 200 – 500m from route. Severance of habitat area from Monument and Overton Woods to the south. Potential secondary impacts including run-off, pollution and disturbance during construction.	Low negative	Minor Adverse
N46	Agricultural fields southeast of Bogenjoss Burn. Local	Severance of habitats from habitats to the south. Potential secondary impacts including pollution and disturbance.	Low negative	Minor Adverse
N47	Monument Wood Local	Severance of remaining woodland form habitats to north of route. Potential secondary impacts including pollution and disturbance.	Medium negative	Minor Adverse
N48	Agricultural fields between Monument Wood and Lower Overton Wood Local	Potential secondary impacts including pollution and disturbance, although of reduced significance as buffered by Monument Wood to the north.	negligible	Negligible

Table 17 – Assessment of Operational Impacts on Individual Habitat Areas – Section NL3

HA in NL3	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N29	Agricultural land northeast of Dyce Drive Less than local	No direct habitat loss as habitats > 500m from route.	Negligible	Negligible
N30	Agricultural between the A96 and Dyce Drive Less than local	Direct habitat loss between ch317400 and ch317900 and associated with new alignment of Chapel of Stoneywood Road, construction of detention basins and underbridge (0.166ha arable, 1.406ha improved grassland and 0.778ha poor semi-improved grassland). Loss of approx. five to six dry stone walls. Severance and fragmentation of farmland habitats in remaining areas. Potential pollution and disturbance to habitats	Medium negative	Minor Adverse
N31	Chapelbrae Wood Local	No direct habitat loss as woodland is approximately 150 – 250m from route.	Negligible	Negligible
N32	Agricultural land between Newton and Upper Corsehill County	Direct habitat loss of improved grassland and arable fields between ch317900 and ch318500, (1.622ha arable, 0.327ha improved grassland, 0.05ha poor semi-improved grassland plus 0.055ha scattered scrub). Loss of four dry stone walls. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to habitats, including road drainage and run-off to areas down hill of alignment.	Medium negative	Moderate adverse
N33	Agricultural land south of Standingstones Wood and east of Kirkhill Forest County	Direct habitat loss of arable and improved grassland between ch318500 and ch319100 associated with proposed route and South Kirkhill junction, (0.678ha arable, 0.794ha improved grassland and 0.302ha poor semi-improved grassland plus 0.017ha continuous herb fern bracken, scattered scrub 0.133ha and coniferous woodland plantation 0.005ha). Most of species-rich hay meadows and verges not subject to habitat loss. Loss of five to six dry stone walls. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to habitats, including road drainage and run-off to areas down hill of alignment.	Medium negative	Moderate adverse
N34	Kirkhill Forest South County	No direct habitat loss as woodland is > 150m from route. No observable secondary impacts predicted	Negligible	Negligible
N35	Standingstones Wood County	Direct habitat loss of habitats between ch319100 and ch319350 (0.208ha continuous dense scrub, 0.073ha tall ruderal herd fern, 0.059ha dry dwarf acid heath and 0.271ha coniferous woodland plantation) Severance and fragmentation of habitats, with isolation of habitats to east of route. Potential secondary impacts including pollution, runoff and disturbance.	Medium negative	Moderate adverse
N36	Farburn Wood DWS County	No direct habitat loss as woodland is 250 - 500m from route. Severance impacts as AWPR will isolate site from woodland habitats in Kirkhill Forest. No observable secondary impacts predicted	Low negative	Minor Adverse

HA in NL3	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N37	Kirkhill Forest North County	Direct habitat loss of young coniferous plantations between ch319700 and ch320400 (0.032ha continuous dense scrub, 0.0449ha coniferous woodland plantation and 0.443ha mixed woodland plantation). Severance and fragmentation of remaining forest areas, with isolation of woodland east of the route and severance of links between Kirkhill Forest and Lower Overton Wood. Potential pollution and disturbance, including hydrological impacts to marshy grassland, road drainage into Bogenjoss Burn and disturbance to woodland habitats.	Medium negative	Moderate adverse
N38	Open Habitats along Bogenjoss Burn within Kirkhill Forest County	Direct habitat loss of stream habitats due to realignment of burn from a point approx. 200m upstream of ch319950 to approximately 800m downstream (1ha of improved grassland and 0.036ha of coniferous woodland plantation) Severance and fragmentation of burn habitats up and downstream of the realigned section. Potential road drainage pollution and disturbance.	High negative	Moderate adverse
N39	Agricultural fields around Standingstones Farm Local	Direct habitat loss between ch319300 and ch319700 and between ch319850 and ch319950 (0.16ha arable, 0.798ha improved grassland and 0.075ha scattered scrub) Loss of six to seven dry stone walls. Severance and fragmentation of farmland habitats on either side of route. Potential secondary impacts including pollution, run-off and disturbance	Medium negative	Minor Adverse
N40	Lower Overton Wood Local	No direct habitat loss as woodland is approximately 150 – 500m from route. Severance of wood from Kirkhill Forest to the west.	Medium negative	Minor Adverse
N41	Agricultural fields between Lower Overton Wood and East Woodlands Local	Direct habitat loss between ch320400 and ch321200, with road on embankment (0.171ha scattered scrub, 0.052ha continuous herb fern bracken, 0.88ha poor semi-natural grassland, 0.048ha broadleaved semi-natural woodland and 1.502ha improved grassland) Severance and fragmentation of habitats remaining on either side of route. Potential secondary impacts including pollution, disturbance and hydrological impacts.	High negative	Minor Adverse
N42	Bogenjoss Burn downstream of Kirkhill Forest County	Direct habitat loss of habitats along burn, where route crosses burn at ch320875. (0.034ha improved grassland and 0.095ha broadleaved semi-natural woodland) Severance of habitats on either side of embankment. Potential impacts of road drainage, pollution and disturbance to remaining habitats	Medium negative	Moderate adverse
N43	East Woodlands County	Habitat loss of plantation woodland (0.61ha) associated with construction of detention basins and access road on left bank of Bogenjoss Burn. Severance of wood from Overton Wood to the east.	Low negative	Minor Adverse
N44	Agricultural fields west of Bogenjoss Burn Less than local	No direct habitat loss as woodland is approximately 100 – 125m from route. No observable secondary impacts predicted.	Negligible	Negligible
N45	Bogenjoss Burn and grounds of Pitmedden House County	No direct habitat loss as woodland is approximately 200 – 500m from route. Severance of habitat area from Monument and Overton Woods to the south.	Low negative	Minor Adverse

HA in NL3	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N46	Agricultural fields southeast of Bogenjoss Burn Local	Direct habitat loss along south edge of fields adjacent to Monument Wood (0.024ha improved grassland) Loss of two to three dry stone walls. Severance of habitats from habitats to the south. Potential secondary impacts including pollution and disturbance.	Low negative	Minor Adverse
N47	Monument Wood Local	Direct habitat loss along north edge of woodland block, between ch321200 and ch321600 (0.32ha improved grassland, 0.023ha poor semi-improved grassland and 0.773ha coniferous woodland plantation) Severance of remaining woodland form habitats to north of route. Potential secondary impacts including pollution and disturbance.	Medium negative	Minor Adverse
N48	Agricultural fields between Monument Wood and Lower Overton Wood Local	No direct habitat loss as woodland is approximately 250 – 500m from route. Potential secondary impacts including pollution and disturbance although of reduced significance as buffered by Monument Wood to the north.	Negligible	Negligible

Table 18 – Assessment of Construction Impacts on Individual Habitat Areas – Section NL4

HA in NL4	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N49	Agricultural fields and quarry north of railway line Less than local	No direct impacts as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N50	Agricultural fields on either side of Dyce Drive, south of railway line Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N51	Agricultural fields on southwest bank of River Don valley Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N52	River Don Regional	Severance of riparian habitats on either side of route. Potential damage to riparian habitats from pollution, including run-off, drainage and disturbance.	Medium negative	Moderate adverse
N53	Woodland around Goval House Local	No direct impacts as habitats >500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N54	Farmland between River Don and the B977 Local	Severance and disturbance leading to fragmentation of farmland and shelterbelt remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N55	Agricultural fields surrounding Goval Farm Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of route, with narrow fragments to south of alignment, to north of Goval Burn. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N56	Goval Wood County	No impacts as habitats >400m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N57	Plantation north of Goval Wood Local	No direct impacts as habitats >750m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N58	Goval Belt County	New A947 would sever the two strips of Goval Belt, although the long-term impacts are likely to be similar to the existing road layout.	Low negative	Minor Adverse
N59	Agricultural fields north of Goval Belt Less than local	Disturbance and pollution impacts in areas adjacent to new A947during construction.	Low negative	Minor Adverse
N60	Agricultural fields south of Goval Belt, between the A947 and Formartine & Buchan Way Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of AWPR and new alignment of the A947, with small fragments remaining to south of alignment, to north of Goval Burn. Potential pollution and disturbance to remaining habitats, particularly to habitats along Goval Burn.	Medium negative	Minor Adverse

HA in NL4	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N61	Goval Burn and The Goval Mill Lade County	Severance and disturbance leading to fragmentation of habitats along two watercourses, Goval Burn and Parkhill Mill Lade. Potential pollution and disturbance to habitats along Goval Burn, including runoff and road drainage.	Medium negative	Moderate adverse
N62	Formartine & Buchan Way County	Severance of linear wildlife corridor and semi-natural habitats on either side of route. Potential damage to remaining habitats from pollution, including runoff, drainage and disturbance.	Medium negative	Moderate adverse
N63	Park Hill Estate County	Pollution and disturbance may occur.	Low negative	Minor Adverse
N64	Agricultural fields southeast of Formartine & Buchan Way Less than local	Severance and disturbance leading to fragmentation of farmland habitats remaining on either side of route and junction. Potential pollution and disturbance impacts, including road drainage.	Medium negative	Minor Adverse
N65	Skate Wood County	No direct impacts as habitats >50m from the A947 Goval junction and >250m from AWPR. Potential pollution and disturbance to habitats, particularly to woodland closest to AWPR.	Negligible	Negligible
N66	Roadside plantation and mature pine avenue at Little Goval Local	No direct impacts. No observable secondary impacts predicted.	Negligible	Negligible
N67	Den Wood and roadside plantations Local	No direct impacts as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N68	Agricultural fields between the B977 and Meadowhead Burn Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	High negative	Minor Adverse
N69	Agricultural fields north of Meadowhead Burn and east of Formartine & Buchan Way Local	Severance and disturbance leading to fragmentation of farmland remaining on either side of route and junction. Potential pollution and disturbance to remaining habitats.	Low negative	Minor Adverse
N70	Agricultural fields east of the B997 at Newpark Steading Local	Potential damage to remaining habitats from pollution, including run-off, drainage and disturbance. Potential hydrological impacts to marshy grassland.	Low negative	Minor Adverse

Table 19 – Assessment of Operational Impacts on Individual Habitat Areas – Section NL4

HA in NL4	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N49	Agricultural fields and quarry north of railway line Less than local	No direct habitat loss as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N50	Agricultural fields on either side of Dyce Drive, south of railway line Local	Direct habitat loss of farmland between ch321600 and ch322700 (0.866ha arablle, 1.889ha improved grassland, 0.127ha broadleaved woodland plantation and 0.024ha semi-improved acid grassland). Loss of recently planted mixed plantations and six - seven dry stone walls. Severance and fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N51	Agricultural fields on southwest bank of River Don valley Local	Direct loss of improved grassland between ch322700 and River Don bridge at ch323100 (0.944ha improved grassland), detention basin and a maintenance access road.. Severance and fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N52	River Don Regional	Direct habitat loss of habitats where crossed by route, at ch323100 (0.08ha improved grassland 0.08ha, 0.028ha marshy grassland and 0.08ha open water). Severance of riparian habitats on either side of route. Potential damage to riparian habitats from pollution, including runoff, drainage and disturbance.	Medium negative	Moderate adverse
N53	Woodland around Goval House Local	No direct habitat loss as habitats >500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N54	Farmland between River Don and the B977 Local	Direct habitat loss of farmland and woodland shelterbelt between ch323175 and ch323500 and associated with road bridge at the B977 (0.67ha arable, 0.405ha improved grassland and 0.053ha mixed woodland plantation). Loss of two to three dry stone walls. Severance and fragmentation of farmland and shelterbelt remaining on either side of route. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N55	Agricultural fields surrounding Goval Farm Local	Direct habitat loss of farmland between ch323500 and ch324050 and associated with the B977 Overbridge (1.972ha arable, 0.079ha continuous herb fern bracken, 0.503ha improved grassland and 0.327ha poor semi-improved grassland). Loss of five to six dry stone walls. Severance and fragmentation of farmland remaining on either side of route, with narrow fragments to south of alignment, to north of Goval Burn. Potential pollution and disturbance to remaining habitats.	Medium negative	Minor Adverse
N56	Goval Wood County	No direct habitat loss as habitats >400m from alignment. No observable secondary impacts predicted.	Negligible	Negligible

HA in NL4	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N57	Plantation north of Goval Wood Local	No direct habitat loss as habitats >750m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N58	Goval Belt County	Habitat loss of mature broad-leaved woodland east of the existing A947 due to construction of new alignment of the A947 (0.019ha improved grassland, 0.065ha broadleaved plantation woodland). New A947 would sever the two strips of Goval Belt, although the long-term impacts are likely to be similar to the existing road layout.	Low negative	Minor Adverse
N59	Agricultural fields north of Goval Belt Less than local	Small amount of habitat loss associated with online works on the A947, north of Goval Belt (0.043ha improved grassland). Disturbance and pollution impacts in areas adjacent to the new A947during construction.	Low negative	Minor Adverse
N60	Agricultural fields south of Goval Belt, between the A947 and Formartine & Buchan Way Local	Direct habitat loss of 2.964ha of farmland between ch324050 and ch324500 and associated with new alignment of the A947 between Goval Belt and Formartine and Buchan Way (0.842ha arable, 2.111ha grassland, 0.011ha neutral grassland semi-improved plus 0.015ha broadleaved woodland plantation). Loss of two to three dry stone walls. Severance and fragmentation of farmland remaining on either side of AWPR and new alignment of the A947, with small fragments remaining to south of alignment, to north of Goval Burn. Potential pollution and disturbance to remaining habitats, particularly to habitats along Goval Burn.	Medium negative	Minor Adverse
N61	Goval Burn and The Goval Mill Lade County	Direct habitat loss of riparian habitats along Goval Burn, immediately to the south of The Lade reservoir; semi-improved grassland and marginal habitats between Goval Burn and Formartine & Buchan Way between ch324500 and ch324650, and by new alignment of the A947, directly north and south of ch324350 (0.01ha improved grassland, 0.05ha semi-improved neutral grassland and 0.319ha semi-improved poor grassland). Severance and fragmentation of habitats along two watercourses, Goval Burn and Parkhill Mill Lade. Potential pollution and disturbance to habitats along Goval Burn, including run-off and road drainage.	Medium negative	Moderate adverse
N62	Formartine & Buchan Way County	Direct habitat loss of approx. 200m of linear habitats where Formartine & Buchan Way crossed by route, at ch324600. Further impacts predicted where crossed by the proposed A947 link road. Severance of linear wildlife corridor and semi-natural habitats on either side of route. Potential damage to remaining habitats from pollution, including runoff, drainage and disturbance.	Medium negative	Moderate adverse
N63	Park Hill Estate County	Loss of small area of mature woodland habitat due to realignment of the A947 (0.116ha semi-natural broadleaved, 0.133ha coniferous plantation and 0.009ha mixed plantation woodland plus 0.749ha arable and 0.148ha improved grassland). No other direct habitat loss as habitats >400m from alignment of AWPR. Pollution and disturbance may occur.	Low negative	Minor Adverse
N64	Agricultural fields southeast of Formartine & Buchan Way Less than local	Direct habitat loss in north of Habitat Area between ch324600 and ch324800, and associated with proposed junction with the A947 (0.643ha arable, 0.84ha improved grassland, semi-improved neutral grassland 0.052ha and 0.006ha coniferous woodland plantation). Severance and fragmentation of farmland habitats remaining on either side of route and junction. Potential pollution and disturbance impacts, including road drainage.	Medium negative	Minor Adverse

HA in NL4	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N65	Skate Wood County	No direct habitat loss as habitats >50m from the A947 Goval junction and >250m from AWPR. Potential pollution and disturbance to habitats, particularly to woodland closest to AWPR.	Negligible	Negligible
N66	Roadside plantation and mature pine avenue at Little Goval Local	Direct habitat loss of pine avenue under proposed junction and minor amounts of plantation associated with new slip road construction.	Medium negative	Minor Adverse
N67	Den Wood and roadside plantations Local	No direct habitat loss as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N68	Agricultural fields between the B977 and Meadowhead Burn Local	Direct habitat loss of farmland (1.76ha improved and 0.23ha arable) between ch324900 and ch325500 Loss of 8-10 dry stone walls and loss of stream habitats where AWPR crosses Meadowhead Burn. Severance and fragmentation of farmland remaining on either side of route. Potential pollution and disturbance to remaining habitats.	High negative	Minor Adverse
N69	Agricultural fields north of Meadowhead Burn and east of Formartine & Buchan Way Local	Direct habitat loss of arable land (0.35ha) between ch324800 and ch324900 and associated with the A947 Goval junction. Loss of one to two dry stone walls. Severance and fragmentation of farmland remaining on either side of route and junction. Potential pollution and disturbance to remaining habitats.	Low negative	Minor Adverse
N70	Agricultural fields east of the B997 at Newpark Steading Local	Habitat loss of improved grassland (0.15ha), marshy grassland (0.132ha) and semi-natural broadleaved woodland (0.11ha) along south of habitat area, due to construction of new alignment for Newmachar Church Road and its junction with the B977. Potential damage to remaining habitats from pollution, including runoff, drainage and disturbance. Potential hydrological impacts to marshy grassland.	Low negative	Minor Adverse

Table 20 – Assessment of Construction Impacts on Individual Habitat Areas – Section NL5

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N71	Corsehill Wood County	Severance and disturbance leading to fragmentation of woodland habitats remaining on either side of route. Potential secondary impacts including pollution and disturbance to woodland habitats.	Low negative	Minor Adverse
N72	Littlejohn's Wood County	Severance and disturbance leading to fragmentation of woodland habitats to north and south of route. Potential secondary impacts including pollution and disturbance to woodland habitats.	Medium negative	Moderate adverse
N74	Woodland at Red Moss, north of the B977 County	Potential pollution and disturbance.	Low negative	Minor Adverse
N75	Raised bog at Red Moss, north of the B977 Regional	No direct impacts as habitats > 500m from alignment. No observable secondary impacts predicted – habitat area considered too far from proposed alignment to be sensitive to hydrological impacts.	Negligible	Negligible
N76	Farmland and bare ground at Moss-side, north of the B977 Less than local	No direct impacts as habitats 400 – 800m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N77	Plantation northeast of Red Moss, north of the B977 Local	No direct impacts as habitats > 800m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N78	Mosaic of scrub and grassland west of Moss Belt Local	No direct impacts as habitats 200 – 300m from alignment. Severance of habitat area from semi-natural areas to south of route, including quarry areas and Corby and Lily Lochs. Potential secondary impacts, including pollution and disturbance, particularly during construction.	Low negative	Minor Adverse
N79	Moss Belt Plantation Local	No direct impacts as habitats 350 – 500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N80	Agricultural fields between the B977 and Loch Hills Quarry Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	High negative	Minor Adverse
N81	Loch Hills Quarry Less than local	No direct impacts as habitats 300 – 500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N82	Red Moss, south of the B977 Regional	No direct impacts as habitats >400m from alignment. Severance of habitat area from peatland habitats associated with Corby and Lily Lochs. Potential hydrological impacts associated with adverse impacts on drainage channel flowing from Red Moss towards Lily Loch. Potential secondary impacts related to pollution and disturbance.	Low negative	Minor Adverse

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N83	Woodland between Red Moss and Lochgreens Farm County	No direct impacts as habitats 300-600m from alignment. Severance of habitat area from habitats associated with Corby and Lily Lochs. Potential secondary impacts related to pollution and disturbance.	Low negative	Minor Adverse
N84	Agricultural fields south of Lochgreens Farm Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N85	Corby and Lily Lochs and associated habitats National	No direct impacts, as habitats are located 200-800m from route, with closest section of SSSI 250m from alignment. Severance of habitats from raised bog and woodland habitats at Red Moss to the north. Potential severe hydrological impacts arising from adverse impacts on drainage channels that flow into the lochs from the north, and crossed by route. Potential pollution and disturbance impacts.	Medium negative	Major adverse
N86	Agricultural fields between Red Moss and Newtonhill Farm Local	No direct impacts as habitats 200 – 500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N87	Agricultural fields between Lochgreens Road and Gravel Pit Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N88	Newton of Shielhill DWS County	No direct impacts as habitats >300m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N89	Agricultural fields between unclassified road and the B999 (north) Local	No direct impacts as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N90	Agricultural fields between unclassified road and the B999 (south) Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N91	Agricultural fields adjacent to Blackdog Burn, east of the B999 Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats adjacent to route.	Medium negative	Minor Adverse
N92	Agricultural fields between the B999 and Harehill Farm Less than local	No direct impacts as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N93	Agricultural fields between Harehill Farm and the A90, south of Blackdog Burn Local	No direct impacts as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N94	Agricultural fields west of the A90, north of Blackdog Burn Local	Severance and disturbance leading to fragmentation of farmland on either side of route. Potential secondary impacts related to road drainage pollution and increased disturbance.	Medium negative	Minor Adverse
N95	Grassland east of the A90, south of Blackdog Local	Potential pollution and disturbance impacts during construction of an access road and detention ponds.	Low negative	Minor Adverse
N96	Agricultural fields, west of A90, either side of Potterton Road Local	Severance and disturbance leading to fragmentation of farmland adjacent to the A90. Severence and disturbance of young broad-leaved plantation woodland and semi-improved grassland with habitat loss Potential disturbance impacts during construction.	Medium negative	Minor Adverse
N97	Agricultural fields east of the A90, north of Blackdog Local	Severance and disturbance leading to fragmentation of farmland adjacent to the A90. Potential disturbance impacts during construction.	Negligible	Negligible

Table 21 – Assessment of Operational Impacts on Individual Habitat Areas – Section NL5

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N71	Corsehill Wood County	Direct habitat loss of plantation woodland in north of habitat area between ch325500 and 325600 (0.04ha). However, AWPR route passes to north of more important areas of semi-natural broad-leaved woodland. Severance and fragmentation of woodland habitats remaining on either side of route. Potential secondary impacts including pollution and disturbance to woodland habitats.	Low negative	Minor Adverse
N72	Littlejohn's Wood County	Direct habitat loss of woodland between ch325600 and ch325950, including plantation woodland (0.21ha broadleaved and 0.94 coniferous) and areas of semi-natural mature and young, naturally regenerating broad-leaved woodland (0.07ha). Habitat loss would occur along the AWPR route and new junction of the B977 and Newmachar Church Road, north of the AWPR. Severance and fragmentation of woodland habitats to north and south of route. Potential secondary impacts including pollution and disturbance to woodland habitats.	Medium negative	Moderate adverse
N74	Woodland at Red Moss, north of the B977 County	Small area of habitat loss in southwest corner of Habitat Area, adjacent to the existing B977, associated with new road layout (0.21 ha). Potential pollution and disturbance, particularly during construction.	Low negative	Minor Adverse
N75	Raised bog at Red Moss, north of the B977 Regional	No direct habitat loss as habitats > 500m from alignment. No observable secondary impacts predicted – Habitat Area considered too far from proposed alignment to be sensitive to hydrological impacts.	Negligible	Negligible
N76	Farmland and bare ground at Moss-side, north of the B977 Less than local	No direct habitat loss as habitats 400 – 800m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N77	Plantation northeast of Red Moss, north of the B977 Local	No direct habitat loss as habitats > 800m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N78	Mosaic of scrub and grassland west of Moss Belt Local	No direct habitat loss as habitats 200 – 300m from alignment. Severance of habitat area from semi-natural areas to south of route, including quarry areas and Corby and Lily Lochs. Potential secondary impacts, including pollution and disturbance.	Low negative	Minor Adverse
N79	Moss Belt Plantation Local	No direct habitat loss as habitats 350 – 500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N80	Agricultural fields between the B977 and Loch Hills Quarry Local	Direct habitat loss of arable (1.27ha) and improved/ poor semi-improved grassland fields (0.86ha) along alignment between ch326000 and ch326800. Loss of farmland, four to five dry stone walls, Lochgreens pond and associated marshy grassland (0.18ha). Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N81	Loch Hills Quarry Less than local	No direct habitat loss as habitats 300 – 500m from alignment No observable secondary impacts predicted.	Negligible	Negligible
N82	Red Moss, south of the B977 Regional	No direct habitat loss as habitats >400m from alignment. Severance of Habitat Area from peatland habitats associated with Corby and Lily Lochs. Potential hydrological impacts associated with adverse impacts on drainage channel flowing from Red Moss towards Lily Loch. Potential secondary impacts related to pollution and disturbance.	Low negative	Minor Adverse
N83	Woodland between Red Moss and Lochgreens Farm County	No direct habitat loss as habitats 300 - 600m from alignment. Severance of Habitat Area from habitats associated with Corby and Lily Lochs. Potential secondary impacts related to pollution and disturbance.	Low negative	Minor Adverse
N84	Agricultural fields south of Lochgreens Farm Local	Direct habitat loss of farmland (1.26ha improved and 0.47ha arable) along alignment between ch326800 and ch327500 and associated with detention basins north of Corby Loch. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N85	Corby and Lily Lochs and associated habitats National	No direct habitat loss, as habitats are located 200 - 800m from route, with closest section of SSSI 250m from alignment. Severance of habitats from raised bog and woodland habitats at Red Moss to the north. Potential severe hydrological impacts arising from adverse impacts on drainage channels that flow into the lochs from the north, and crossed by route. Potential pollution and disturbance impacts.	Medium negative	Major adverse
N86	Agricultural fields between Red Moss and Newtonhill Farm Local	No direct habitat loss as habitats 200 – 500m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N87	Agricultural fields between Lochgreens Road and Gravel Pit Local	Direct habitat loss of improved (1.22ha) and semi-improved (0.71ha) grassland along alignment between ch327500 and ch328550. Habitat lost includes farmland with dry stone walls and areas of marshy grassland (>0.01ha) and dense gorse scrub (0.20ha). Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N88	Newton of Shielhill DWS County	No direct habitat loss as habitats >300m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N89	Agricultural fields between unclassified road and the B999 (north) Local	No direct habitat loss as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible

HA in NL5	Feature / Asset Evaluation	Criteria	Impact Magnitude	Impact significance
N90	Agricultural fields between unclassified road and the B999 (south) Local	Direct habitat loss of farmland (1.66ha arable and 1.34ha improved grassland) along alignment between ch328550 and ch329500 Habitat lost includes approx. five dry stone walls with mature trees lost where the AWPR crosses linear shelter belts. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats on either side of route.	Medium negative	Minor Adverse
N91	Agricultural fields adjacent to Blackdog Burn, east of the B999 Local	Direct habitat loss of farmland (0.84ha arable and 0.57ha improved grassland) along alignment between ch329500 and ch330050. Habitat lost includes one to two dry stone walls. Severance and fragmentation of farmland on either side of route. Potential pollution and disturbance to remaining habitats adjacent to route.	Medium negative	Minor Adverse
N92	Agricultural fields between the B999 and Harehill Farm Less than local	Direct habitat loss of improved grassland (0.045ha) between ch329500 – ch329600..	Low negative	Negligible
N93	Agricultural fields between Harehill Farm and the A90, south of Blackdog Burn Local	No direct habitat loss as habitats >250m from alignment. No observable secondary impacts predicted.	Negligible	Negligible
N94	Agricultural fields west of the A90, north of Blackdog Burn Local	Habitat loss of arable (1.51ha) and semi-improved grassland (0.23ha) fields with 0.24ha of scrub between ch330050 and ch330750 due to construction of AWPR and access road leading to Middleton Steading. Severance and fragmentation of farmland on either side of route. Potential secondary impacts related to road drainage pollution and increased disturbance.	Medium negative	Minor Adverse
N95	Grassland east of the A90, south of Blackdog Local	Direct habitat loss (improved/ poor semi-improved grassland 0.23ha and 0.03ha marsh/ marshy grassland) associated with local road network at the A90 junction.	Low negative	Minor Adverse
N96	Agricultural fields, west of the A90, either side of Potterton Road Local	Direct habitat loss associated with the A90 north junction, north of Blackdog, and with new road layout of minor roads and farm access tracks (0.89ha arable, 0.99ha improved, 0.34ha acid semi-improved grassland and 0.06ha dense scrub). Severance and fragmentation of farmland adjacent to the A90. Direct habitat loss and severence of young broad-leaved plantation woodland and semi-improved grassland with habitat loss	Medium negative	Minor Adverse
N97	Agricultural fields east of the A90, north of Blackdog Local	Direct habitat loss associated with the A90 north junction, north of Blackdog, and with new road layout of minor roads (1.10ha improved grassland and 0.95ha arable). Severance and fragmentation of farmland adjacent to the A90.	Negligible	Negligible

6 Mitigation and Residual Impacts

6.1 Introduction

6.1.1 Mitigation is an integral part of the design and planning of a scheme. It is important to note that the proposed scheme is a result of an iterative process and some mitigation measures have been incorporated into the final design.

6.1.2 Ecological mitigation measures that are required 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, and detention and balancing basins required to treat road run-off can often be managed in a manner that enhances local biodiversity. Such synergistic planning of mitigation measures can result in cost-effective use of resources and net benefits to the local environment.

6.1.3 Within the context of EIA, mitigation is one of a hierarchy of measures that are undertaken to prevent or reduce adverse impacts:

- **Avoidance/Prevention:** measures taken to avoid or prevent adverse impacts, e.g. scheme layout; timing of site works.
- **Impact Reduction:** measures taken to reduce adverse impacts, e.g. retaining walls; pollution interceptors.
- **Compensation:** measures taken to offset significant residual adverse impacts, i.e. those that cannot be entirely avoided or mitigated to the point that they become insignificant, e.g. habitat creation or enhancement.

6.1.4 Furthermore, recommendations for suitable measures that deliver ecological enhancements are increasingly being incorporated into planning policies (PPG9); in addition, the Nature Conservation (Scotland) Act 2004 requires public bodies to further biodiversity in the course of their actions.

6.1.5 In this section of the report, mitigation measures are proposed for all ecological impacts on terrestrial habitats identified in the preceding sections. Generic mitigation measures are proposed to cover all of the study area affected by the proposed road, and require implementation in all areas. In addition specific mitigation measures are proposed for areas where impacts of Moderate adverse significance are predicted, or where impacts are of high magnitude.

6.1.6 A key factor in the successful implementation of these and other ecological mitigation measures is the development of an Environmental Action Plan (EAP) that pulls together all mitigation, compensation, enhancement, management and monitoring proposals, into a schedule of commitments that can be enforced by a legal agreement.

6.2 Generic Mitigation

6.2.1 The following measures are proposed to avoid or mitigate these generic impacts throughout the route corridor during construction and operation.

6.2.2 Current guidelines highlight the importance of an agreed approach to mitigation with the developer prior to the publication of the ES. For example, the Draft IEEM Guidelines for Ecological Impact Assessment (IEEM, 2006) states that 'An EcIA is effectively meaningless if it provides an assessment of the significance of the residual impacts of a scheme based on the proposed mitigation measures being implemented even though these measures have not been agreed by the developer'. Furthermore, the DMRB (Highways Agency 2000; 2001; 2005), states that 'The aims and objectives of the mitigation and any post construction monitoring should be agreed before the mitigation design process starts'.

6.2.3 Therefore this document aims to state the overall objectives for ecology associated with the AWPR. These include a hierarchical approach to mitigation that in summary includes measures:

- 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 Negligible significance;
- where adverse residual impacts remain, measures to **offset** the adverse impacts at the specific site may be required. For example, habitat creation may be required 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, for example, 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).

6.2.4 The ecological mitigation strategy for the AWPR has adopted these principles, and has aimed to provide mitigation that minimises the adverse effects of the proposed road, in accordance with UK, Scottish and Local Policies. Articles of legislation relating to the requirements for mitigation are presented in Table 23.

6.2.5 Generic mitigation includes best practice methods and principles that are applied to the scheme as a whole, and site-specific mitigation measures applied to individual locations where appropriate. As summarised in the opening paragraph, prevention or avoidance of these adverse impacts is the primary aim of ecological mitigation. If this is not possible measures will be proposed to reduce the impact and if this is also not possible then measures to offset the impact will be included in the mitigation strategy (IEEM 2005).

6.2.6 After assessing the significance of impacts on ecological receptors assessed using the four point scale, involving impacts ranging from **Major**, through **Moderate**, **Minor** to **Negligible** adverse impacts, a mitigation strategy was devised.

6.2.7 In developing the strategy, it was decided to adopt a general approach whereby, for impacts assessed as being of Minor significance, generic mitigation measures would be sufficient/appropriate to reduce the residual impacts to being of Negligible significance. For example, avoiding sensitive times of year, use of appropriate fencing, adopting best practice procedures for site clearance etc. A summary of these generic mitigation measures is presented in Table 22.

Table 22 – Ecological Mitigation Measures for Habitats

Effect	Generic Measures
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; and Follow SEPA pollution prevention guidelines (PPG01, PPG02, PPG03, PPG05 and PPG06) to prevent pollution of water courses through siltation or chemicals.
Reduce	Restrict workforce to working areas through the erection of fencing, to prevent additional damage; Best Practice methods will be followed throughout.
Offset	New landscape planting will comprise native species.

6.2.8 For ecological features where impacts were assessed as being of **Moderate significance** or above, further site-specific mitigation measures are required to minimise impacts to a satisfactory level of **Negligible significance,** where possible.

6.2.9 This approach is considered on a site-by-site basis and has been adopted to provide a guiding principle in developing a general mitigation strategy. In some cases, generic and site-specific mitigation may still result in residual impacts. Furthermore, it should be emphasised that the four-point scale for assessing impact significance, is designed to be used as a guide for interpreting impacts that in reality cannot be classified in such a simplistic manner, and occur on a gradual scale. Selected legislation and guidance is presented in Table 23.

Table 23 – Selected Legislation and Guidance for Mitigation

Selected relevant extracts from Legislation/guidance for mitigation
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."
Environmental Impact Assessment Regulations (Scotland) 1999 (as amended): 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."
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 act to 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.'
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.'
Scottish Transport Appraisal Guidance (STAG): http://www.scotland.gov.uk/library5/transport/stag-07.asp **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: • 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;

Selected relevant extracts from Legislation/guidance for mitigation
• 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. “
WebTAG – Biodiversity Sub-objective: http://www.webtag.org.uk/webdocuments/3_Expert/3_Environment_Objective/3.3.10.htm “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: • design proposals to minimise the impact of the proposal on the site (reducing run-off, 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. These categories should be developed sequentially in scheme design 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. 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.

6.2.10 The following outlines general principles employed during the development of mitigation strategies for impact on habitats and species, all mitigation is approved by the appropriate body, i.e. SNH, SEPA etc.

6.2.11 Mitigation of ecological impacts on semi-natural habitats has been incorporated into all stages of the design process, including route selection. Such measures have prevented unnecessary impacts associated with important ecological habitats and designated sites.

6.2.12 However, the proposed AWPR will result in habitat loss, fragmentation, severance and pollution impacts. Tables 11 to 20 list some of the major constraints imposed on habitats due to the proposed development. These impacts will be avoided or reduced via measures aimed at reducing the significance of these impacts to Minor/Negligible levels, such as best practice construction measures, translocation of vegetation where practical, restricting work to the route corridor and minimising the size of site compounds.

6.2.13 Where the AWPR results in ecological impacts that cannot be sufficiently generally mitigated, such as loss of woodland, wetland and other ecologically important habitats, habitat creation will be implemented to attempt to compensate for these impacts.

6.2.14 Along with general ecological mitigation strategies across the whole AWPR, habitat creation will be aimed at contributing directly to biodiversity targets identified in LBAP and UK BAP strategies. For example, wych elm (L BAP species) will be widely incorporated into roadside planting schemes, wet and riparian woodland (UK and L BAP habitats respectively) will be created along watercourses and localised woodland planting will be designed to improve landscape connectivity for red squirrels (UK and L BAP species).

6.2.15 Specific habitat creation is detailed within the following tables and on Figures 11.5a-p.

Direct Habitat Loss

6.2.16 The construction of the proposed route would result in the loss of significant areas of semi-natural habitat along the route corridor itself. The footprint of the whole of the route, including junctions and earthworks, is estimated to occupy an area most of which is designated as Green Belt.

6.2.17 Avoidance of Major Adverse impacts has been an objective throughout the design of the route and this has resulted in the route avoiding sensitive ecological areas such as SSSIs and DWSs where possible.

6.2.18 Compensation for the loss of ecologically important habitats that have been assessed as resulting in impacts of Moderate significance is required through habitat creation schemes. These are detailed in the sections below relating to specific mitigation measures.

6.2.19 During the operation of the proposed road, management and maintenance roadside verges should be undertaken annually 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.

Severance or Fragmentation of Existing Habitat Areas

6.2.20 The proposed scheme is likely to result in increased fragmentation of existing habitats along the whole route, with particularly significant impacts where the proposed road passes through individual habitat areas, resulting in fragments of habitat being severed by the road. Compensation for these impacts will be achieved through measures that aim to increase the ecological connectivity of habitats following construction. In addition, 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, compensatory measures will include enhancement of the riparian habitats where possible. For example, fencing and planting of the riparian zone can create important habitat, enhance the connectivity of habitats within the wider landscape and also protect the stream banks from erosion and poaching from livestock. The creation of underpasses for mammals, and ensuring bridges with mammal passes will be used in preference to culverts, to further mitigate for such impacts.

6.2.21 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 linkages between similar habitats along the route corridor.

Pollution: Air, Runoff and Spray

6.2.22 During construction particulates such as discharge from machinery, sediments and exposed topsoils may result in direct pollution. An increase in traffic volume may result in increased runoff pollution and spray from traffic. Measures to minimise such pollution impacts will be implemented into the design and construction of the scheme. For example measures aimed at intercepting runoff pollution, such as filter drains, soak-aways, infiltration trenches and oil separators will be implemented to reduce runoff. All road drainage will be held in detention basins that will also act as a filtering system before discharging into local waterways. During the construction phase, SEPA pollution prevention guidelines will be strictly adhered to.

Visual and Light Pollution

6.2.23 Measures to limit increased levels of nighttime light pollution will be implemented, particularly in rural areas of the route, or where the road passes through ecologically valuable habitats. For example, downward facing lights and the use of deflectors away from ecologically sensitive habitats will reduce potential adverse impacts on bats, migrating birds, and plant communities.

Disturbance During Construction

6.2.24 Habitat clearance required for the proposed scheme will be undertaken outside the bird breeding season, and conflicts with other protected species such as bats, badgers and reptiles avoided. A method statement will be prepared in advance for all areas where tree and scrub removal is required and will be undertaken under the guidance of an onsite ecologist.

6.3 Specific Mitigation

6.3.1 For each Section there is an introductory paragraph describing mitigation for specific impacts followed by a Table showing individual assessments by Habitat Area.

Section NL1: ch314800 – 316000 (Derbeth to Tulloch Road)

6.3.2 There were no impacts above Minor significance for Section NL1. The habitat loss in this Section was largely due to agricultural fields and small areas of scrub. The landscape planting and scrub planting proposed for badgers (A10.2, Figure 11.5a-b) will offset Habitat Loss. Generic mitigation will minimise damage to impacted areas, therefore the overall residual impact for this Section is Negligible.

Section NL2: Ch316000 – 317400 (SAC Craibstone)

6.3.3 There are impacts of Moderate significance due to Habitat Loss Disturbance and Fragmentation in the Craibstone Burn (HA N24), Gough Burn and Craibstone Campus (HA N24-N26). The specific habitat creation as detailed in Table 25 below and Figures 11.5c include the planting of coniferous woodland to extend Craibstone North Wood in HA N25 and N28 and mixed woodland in N28 partially offset Habitat Loss and Fragmentation of woodland habitats at SAC Craibstone, as well as enhancing the local woodland resource and improving ecological connectivity between remaining habitats at Craibstone, Parkhead and West Woods. Therefore, the residual impacts in this section are of Minor significance.

Section NL3: ch317400 – 322600 (A96 to Nether Kirkton)

6.3.4 There are impacts of Moderate significance due to Habitat Loss, Disturbance and Fragmentation in the agricultural land surrounding Howemoss (HA N32 and N33) and in Kirkhill Forest North (N37), Standingstones Wood (N35) and East Woodlands (N43) due to loss of woodland and riparian habitat. In addition to the provision of appropriate dry stone walls to enclose fields alongside the route, there will be habitat creation. The specific habitat creation as detailed in the Tables below and Figures 11.5 f-h include the planting of coniferous woodland to extend Kirkhill Forest North and Standingstones Wood (HAs N33 to N35) and East Woodlands (N46). Mixed, riparian and scrub woodland is also being planted surrounding Bogenjoss Burn (N37 and N41) and north of Monument Wood (N50) to connect Habitat Areas, thus minimising Fragmentation and offsetting Habitat Loss N28. Therefore, the residual impacts in this section are predicted to be of Minor significance.

Section NL4: ch322600 – 325370 (Nether Kirkton to Corsehill)

6.3.5 There are impacts of Moderate significance due to Habitat Loss, Disturbance and Fragmentation in the riparian habitats surrounding the River Don (HA N52), the Goval Burn and the Mill Lade (N61) and to the Goval Belt Wood (N58) and the Formartine and Buchan Way (N62). The specific habitat creation as detailed in the Table below and Figures 11.5 i-j includes the planting of riparian woodland alongside Goval Burn (N61) and additional mixed woodland in the Goval Burn area. These areas of habitat creation will minimise Fragmentation and off-set Habitat Loss in HA N28. Potential Pollution of the River Don and Goval Burn are also impacts assessed as being of Moderate significance. In addition to generic mitigation measures for pollution, the mitigation proposed in the Water Chapter 9 (Water Environment), and in the Freshwater Habitat, Fish and

Otter mitigation sections of Chapter 10 (Ecology) are considered appropriate to minimise this impact. Therefore, the residual impacts in this section are predicted to be of Minor significance.

Section NL5: ch325370 – 331000 (Corsehill – Blackdog)

6.3.6 There are indirect impacts of fragmentation and disturbance of wetland habitats due to hydrological disruption to the habitat surrounding Lily and Corby Lochs (HA N85). Generic mitigation including that detailed in Chapter 9 (Water Environment), and in the Freshwater Habitat, Fish and Otter mitigation sections minimise this impact. Therefore, the residual impacts in this section are predicted to be of Minor significance.

Table 24 – Specific Mitigation Measures for Individual Habitat Areas (Operation) – Section NL1

HA in NL1	Feature / Asset Evaluation	Criteria	Potential Impact Significance	Residual Impact Significance
N1	Kingswells Local - County	No specific mitigation required.	Minor	Minor
N2	Agricultural fields north of Clog Hill Local	No specific mitigation required.	Negligible	Negligible
N3	Woodland at Fairley Home Farm and Derbeth Farm Local	Sympathetic landscsape planting of native species including the planting of the NES LBAP species wych elm will offset this habitat loss.	Minor	Negligible
N4	Agricultural land around Fairley Home Farm and Derbeth Farm Less than local	Landscape creation of species-rich grassland on cutting slopes and restoration of dry stone walls along road boundary in areas where linear habitat lost.	Negligible	Negligible
N5	Kingswells Local - County	No specific mitigation required.	Negligible	Negligible
N6	Woodland west of Hillhead of Derbeth Farm County	No specific mitigation required.	Negligible	Negligible
N7	Woodland and shelterbelt east of Hillhead of Derbeth Farm Local	Habitat loss compensated for by planting of 0.78ha scrub south of North Kingswells Junction, west and east of the proposed road. (HA N11).	Minor	Negligible
N8	Scrub and bracken on lower slopes of Brimmond Hill - SINS County	No specific mitigation required.	Minor	Minor
N9	Dry Heath on upper slopes of Brimmond Hill - SINS Regional	No specific mitigation required.	Negligible	Negligible
N10	Agricultural fields south of C89c and Overhills Farm Less than local	No specific mitigation required.	Negligible	Negligible

HA in NL1	Feature / Asset Evaluation	Criteria	Potential Impact Significance	Residual Impact Significance
N11	Agricultural fields north of C89c and east of Brimmond Hill Local	Generic mitigation including landscape planting and cutting slopes to be planted with species-rich grassland, with localised areas of native mixed woodland and scrub for landscape mitigation and will offset habitat loss. Restoration of dry stone walls along crests of cutting slopes on either side of junction slip roads.	Minor	Negligible
N12	Agricultural fields surrounding Kepplestone Farm Local	Generic mitigation including landscape planting and cutting and embankment slopes to be planted with species-rich grassland and scrub for landscape mitigation. Restoration of dry stone walls along road boundaries.	Minor	Negligible
N13	Agricultural fields between Brimmond Hill and Kepplestone Local	No specific mitigation required. Restoration of dry stone walls along road boundaries will retain linear habitats.	Minor	Negligible
N14	Gough Burn DWS Regional	No specific mitigation required. No works within 50m of site to prevent hydrological impacts on wetland habitats.	Minor	Negligible
N15	Agricultural fields between Gough Burn DWS and Newhills Wood Less than local	Cutting and embankment slopes to be planted with species-rich grassland and scrub for landscape mitigation. These will offset habitat loss and enhance the habitat diversity along the route corridor.	Negligible	Negligible
N16	Newhills Wood Local	No specific mitigation required.. At Derbeth, the broad-leaved woodland and scrub planted between plantation and AWPR for landscape mitigation will reduce pollution and disturbance to woodland.	Minor	Negligible
N17	Agricultural fields and cemetery at Newhills Less than local	No specific mitigation required.	Negligible	Negligible

Table 25 – Specific Mitigation Measures for Individual Habitat Areas (Operation) – Section NL2

HA in NL2	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N18	Agricultural fields between Gough Burn and Golf Course Local	No specific mitigation required. At Derbeth, the broad-leaved woodland and scrub planted east of AWPR for landscape mitigation will offset habitat loss and enhance the habitat diversity along the route corridor.	Minor	Negligible
N19	Craibstone Golf Course Less than local	No specific mitigation required.	Negligible	Negligible
N20	Agricultural fields east of C88c between Newhills Wood and Craibstone Estate Less than local	Adherence to best practice measures to prevent pollution and sediment run-off during construction.	Negligible	Negligible
N21	Parkhead Wood Local	No specific mitigation required.	Negligible	Negligible
N22	West Woods County	No specific mitigation required.	Negligible	Negligible
N23	Woodland/ Farmland west of C88c, north of Parkhead Wood Local	There are three blocks of coniferous woodland to the west of the road of 1.69ha in total in HAs N25 and N28 at ch316450 – 316800 that extend the habitat of Craibstone Wood North (Figure 11.5c). 0.17ha of mixed woodland to the west of the road that extend the habitat of Craibstone Wood North in HA N25 at ch316800-316900 (Figure 11.5c). Coniferous plantation in two blocks (2.05ha) to the west of the road either side of the A96 junction in HA N28 at ch317000 – ch317150 that further extend the habitat of Craibstone Wood North (Figure 11.5c). Block of coniferous plantation of 0.67ha to east of the road and south of A96 that extends the habitat of Craibstone Wood. HA N28 at ch317000-317050 (Figure 11.5c). Narrow linear corridor of mixed plantation to the east of the road and surrounding the attenuation ponds (1.17ha) from ch317100 – 317310 (Figure 11.5c).	Minor	Negligible
N24	Woodland along Gough Burn County	The above specific mitigation in HAs N25 and N28 will partially offset Habitat Loss, Disturbance and Fragmentation.	Moderate	Minor
N25	Woodland in west of SAC campus County	The above specific mitigation for HAs N25 and N28 detailed in HA N23 will partially offset Habitat Loss, Disturbance and Fragmentation	Moderate	Minor

HA in NL2	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N26	Woodland along Craibstone Burn County	The above specific mitigation for HAs N25 and N28 detailed in HA N23 will partially offset Habitat Loss, Disturbance and Fragmentation of pond and stream habitats. The second stage detention basins in HA N28 will be sympathetically managed for nature conservation value.	Moderate	Minor
N27	Woodland along Green Burn Local	Compensation for woodland habitat loss by creation of Mitigation areas as above.	Minor	Negligible
N28	Agricultural land in SAC campus east of C88c Road. Local	The above specific mitigation for HAs N25 and N28 detailed in HA N23 will partially offset Habitat Loss, Disturbance and Fragmentation.	Minor	Negligible

Table 26 – Specific Mitigation Measures for Individual Habitat Areas (Operation) – Section NL3

HA in NL3	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N29	Agricultural land northeast of Dyce Drive Less than local	No specific mitigation required.	Negligible	Negligible
N30	Agricultural between the A96 and Dyce Drive Less than local	Restoration of dry stone walls in areas where linear habitat lost. Scrub and tree planting for landscape purposes will provide habitat enhancement.	Minor	Negligible
N31	Chapelbrae Wood Local	No specific mitigation required.	Minor	Negligible
N32	Agricultural land between Newton and Upper Corsehill Local	Habitat Loss of agricultural fields. No specific mitigation required. Restoration of dry stone walls along boundary of AWPR. Landscape planting including creation of species-rich grassland, scattered scrub and wayside trees on embankment slopes and around South Kirkhill; regrading of embankment slopes to allow reversion to agriculture reduces habitat loss of farmland habitat.	Moderate	Minor
N33	Agricultural land south of Standingstones Wood and east of Kirkhill Forest County	Small habitat loss, but avoids damage to species-rich hay meadows and verges. Restoration of dry stone walls to offset areas where linear habitat lost. Landscape planting including creation of species-rich grassland, scattered scrub and wayside trees on embankment slopes and around South Kirkhill; regrading of embankment slopes to allow reversion to agriculture reduces habitat loss of farmland habitat. Mitigation Area MA37 to be created in two field fragments adjacent to Standingstones Wood (N35) and will enhance habitat diversity.	Moderate	Minor
N34	Kirkhill Forest South County	No specific mitigation required.	Negligible	Negligible

HA in NL3	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N35	Standingstones Wood County	Habitat loss and severance impacts offset by creation of appropriate dry stone walls are proposed along the boundary of the road corridor generally to enclose fields alongside the route. Habitat creation of a block of mixed woodland 0.33ha in HA N33, starting at ch318900 will increase the habitat area of Kirkhill Forest (South and Standingstones Wood, Figure 11.5e). Mixed woodland strip of 0.85ha to the west of the road in HA N54 at ch319150 to ch319430 will minimise disturbance to the habitat of Standingstones Wood (Figure 11.5f). Coniferous woodland of 4.0ha to the west of the road in HA N54 at ch319430 to ch319730 will extend the habitat of Standingstones Wood (Figure 11.5f). Block of mixed woodland 0.21ha on the west of the road in HA N41 and at ch320400 will extend the habitat of East Woodlands (Figure 11.5g). Coniferous woodland of 0.89ha to the north of the road in HA N46 and N47 at ch321400 to ch321500 will extend the habitat of the eastern leg of East Woodlands (Figure 11.5h). Three blocks of mixed woodland 3.92 ha on the north of the road in HA N47 & N50 and at ch321630-ch322130 will replace the habitat lost from Monument Wood (Figure 11.5h).	Moderate	Minor
N36	Farburn Wood DWS County	No specific mitigation required.	Minor	Negligible
N37	Kirkhill Forest North County	Habitat loss and severance impacts offset by creation of Mitigation Areas in N33, N35, N37, N41, N42 and N46 as detailed above in HA N35. Severance impacts to be reduced by provision of wildlife overbridges at ch319940 and ch320200 to include vegetated cover to enhance use by animal species. Mitigation measures required to offset impacts associated with the realignment of Bogenjoss Burn will enhance the local habitat resource.	Moderate	Minor

HA in NL3	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N38	Open Habitats along Bogenjoss Burn within Kirkhill Forest County	Where Bogenjoss Burn is to be re-aligned between ch319950 and ch320500, the new channel will be restored to maximise its ecological value to otters as well as other species such as fish and aquatic invertebrates. This will include the incorporation of natural bank sides, meanders (where possible) and the planting of emergent vegetation as well as a 10m wide 500m long riparian strip on the west of the re-aligned burn (0.44ha) in HA N37 and N41 between ch320000 and ch320500 and a 10m wide 500m long strip of scrub woodland to the east of the burn in HA N37 at ch319970-320400. This will also include 0.77ha of localised scrub patches to be planted in HAs N41 and N42 between ch320450-320950 (Figure 11.5g). Severance impacts to be reduced by provision of wildlife overbridge at ch319960 and Green bridge at ch320190 to include vegetated cover to enhance use by animal species. This will also minimise severance and fragmentation.	Moderate	Minor
N39	Agricultural fields around Standingstones Farm Local	Restoration of dry stone walls along east boundary of proposed route. Creation of native coniferous woodland in Mitigation Area to west of route as required to offset loss of habitat at Standingstones Wood and Kirkhill Forest (N35 and N37).	Minor	Negligible
N40	Lower Overton Wood Local	No specific mitigation required.	Minor	Negligible
N41	Agricultural fields between Lower Overton Wood and East Woodlands Local	Restoration of dry stone walls along east boundary of proposed route. Landscape planting causing creation of species-rich grassland with patches of scrub habitat on embankment slopes. Severance of habitats reduced by construction of bridge at ch319960 and Green bridge at ch320190. Mitigation areas described above will create riparian habitat. These areas will offset impacts on riparian habitats of the realignment of Bogenjoss Burn and will enhance the local habitat diversity within the valley.	Minor	Negligible
N42	Bogenjoss Burn downstream of Kirkhill Forest County	Bridge to be constructed at ch319960 and Green bridge at ch320190 will minimise fragmentation. Creation of riparian woodland and species-rich grassland with patches of scrub habitat in Mitigation Area as described above will offset habitat loss and reduce severance and fragmentation.	Moderate	Minor
N43	East Woodlands County	No specific mitigation required. Severance impacts to be reduced by construction of Wildlife bridge at ch319960 and a Green bridge at ch320190. Habitat created in N46 as described above will offset habitat loss.	Minor	Negligible

HA in NL3	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N44	Agricultural fields west of Bogenjoss Burn Less than local	No specific mitigation required.	Negligible	Negligible
N45	Bogenjoss Burn and grounds of Pitmedden House County	Mitigation Area in N46, comprising a strip of coniferous woodland connecting Pitmedden House Woods to Monument Wood, will reduce severance impacts.	Minor	Negligible
N46	Agricultural fields southeast of Bogenjoss Burn Local	Creation of species-rich grassland on embankment slopes using translocated turves from existing semi-improved acid grassland. Mitigation Area in N46, comprising a strip of coniferous woodland connecting Pitmedden House Woods to Monument Wood, will reduce severance impacts.	Minor	Negligible
N47	Monument Wood Local	Habitat loss will be offset by Mitigation Area on north side of route of mixed woodland (in fields within HA N50). Mitigation Area MA43, comprising a strip of coniferous woodland connecting Pitmedden House Woods to Monument Wood, will reduce severance impacts.	Minor	Negligible
N48	Agricultural fields between Monument Wood and Lower Overton Wood Local	No specific mitigation required.	Negligible	Negligible

Table 27 – Specific Mitigation Measures for individual Habitat Areas (Operation) – Section NL4

HA in NL4	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N49	Agricultural fields and quarry north of railway line Less than local	No specific mitigation required.	Negligible	Negligible
N50	Agricultural fields on either side of Dyce Drive, south of railway line Local	Restoration of dry stone walls where linear habitat lost. Regrading of embankments for landscape mitigation will reduce loss of farmland habitat.	Minor	Negligible
N51	Agricultural fields on southwest bank of River Don valley Local	Creation of species-rich grassland and scrub habitat for landscape mitigation on embankment slopes approaching River Don Bridge will enhance habitat diversity and improve connectivity to riparian habitats along River Don.	Minor	Negligible
N52	River Don Regional	Construction of wide span bridge to avoid channel disturbance and maintain riparian habitat. Soft banks to be maintained on both banks to reduce severance impacts.	Moderate	Minor
N53	Woodland around Goval House Local	No specific mitigation required.	Negligible	Negligible
N54	Farmland between River Don and the B977 Local	Mixed woodland and scrub planted for landscape mitigation around the B977 Overbridge will offset habitat loss and enhance local habitat diversity and connectivity. Species-rich grassland to be created on embankment slopes.	Minor	Negligible
N55	Agricultural fields surrounding Goval Farm Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on embankment slopes and loss of farmland habitat reduced by regrading of embankments to allow reversion to agriculture (landscape mitigation). Small areas of native broad-leaved woodland to be created in isolated field fragments, between new overbridge and the existing B977.	Minor	Negligible
N56	Goval Wood County	No specific mitigation required.	Negligible	Negligible
N57	Plantation north of Goval Wood Local	No specific mitigation required.	Negligible	Negligible

HA in NL4	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N58	Goval Belt County	No specific mitigation required.	Minor	Negligible
N59	Agricultural fields north of Goval Belt Less than local	No specific mitigation required.	Minor	Negligible
N60	Agricultural fields south of Goval Belt, between the A947 and Formartine & Buchan Way Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on embankment slopes. Habitat creation in Mitigation Area MA49 south of Goval Belt (providing mitigation for otter and badger), in isolated fragments of improved grassland and arable fields. These areas will enhance habitat diversity in the Goval Burn riparian corridor and reduce pollution and disturbance from existing habitat.	Minor	Negligible
N61	Goval Burn and The Lade County	Severance and fragmentation to be reduced by Habitat creation of mixed and riparian woodland in HA N61 south of Goval Belt. At Goval, north of the road, east of the A947 in HA N61 creation of 0.54ha of mixed woodland including a 50m long 10m wide strip of riparian woodland (0.04ha) along the Mill Lade at ch324400 (Figure 11.5j). At Goval, south of the road east of the A947 in HA N61 at ch324400 0.66ha of mixed woodland including a strip of riparian woodland 150m long 10m wide north of Goval Burn 0.22ha (Figure 11.5j). South of Goval Burn east of the A947 in HA N61 at ch324400. Small triangle of mixed woodland 0.17ha (Figure 11.5j). Secondary mitigation is provided by landscaping in the form of mosaics of scrub and mixed woodland in flood plain field fragments adjacent to Goval Burn, N61, N68 and N69 (Figure 11.5j) (providing mitigation for otter and badger), will offset habitat lost and offset severance and fragmentation impacts.	Moderate	Minor
N62	Formartine & Buchan Way County	Habitat loss and severance to be reduced by bridges over Formartine & Buchan Way in both locations crossed by the AWPR and A947. Underpasses to maintain link between linear habitats along Formartine & Buchan Way where crossed by route. Fragmentation impacts will be reduced by habitat creation in N61 as detailed above.	Moderate	Minor
N63	Park Hill Estate County	Loss of mature broad-leaved woodland habitat offset by creation of native broad-leaved woodland strip (30m wide) along southeast boundary of the realigned A947 to also act as a shelterbelt to rest of Park Hill estate.	Minor	Negligible

HA in NL4	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N64	Agricultural fields southeast of Formartine & Buchan Way Less than local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on embankment slopes and within junction roundabout. Creation of riparian woodland along course of Corsehill Burn adjacent to the A947 Goval Junction will enhance the local habitat diversity.	Minor	Negligible
N65	Skate Wood County	No specific mitigation required.	Negligible	Negligible
N66	Roadside plantation and mature pine avenue at Little Goval Local	Avoidance of loss of mature pine trees within junction layout unless under footprint of proposed road and/or embankments.	Minor	Negligible
N67	Den Wood and roadside plantations Local	No specific mitigation required.	Negligible	Negligible
N68	Agricultural fields between the B977 and Meadowhead Burn Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Meadowhead Burn to be realigned and culverted (for culvert details see Chapter 9, Water Environment). Scrub habitats and species-rich grassland to be created for landscape mitigation on embankment slopes and within junction roundabout. These habitats will enhance local habitat diversity.	Minor	Negligible
N69	Agricultural fields north of Meadowhead Burn and east of Formartine & Buchan Way Local	Scrub habitats and species-rich grassland to be created for landscape mitigation on embankment slopes and within junction roundabout. These habitats will enhance the local habitat diversity.	Minor	Negligible
N70	Agricultural fields east of the B997 at Newpark Steading Local	No specific mitigation required.	Minor	Negligible

Table 28 – Specific Mitigation Measures for individual Habitat Areas (Operation) – Section NL5

HA in NL5	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N71	Corsehill Wood County	Mixed woodland planting for landscape mitigation, south of AWPR, will offset habitat loss and severance impacts. Creation of new ecological pond at ch325400.	Minor	Negligible
N72	Littlejohn's Wood County	Habitat loss, severance and fragmentation to be compensated by creation of woodland south of the route, 0.66ha of mixed woodland is required for landscape and ecological mitigation. Mixed woodland south of the road in HA N72 at ch325700 1.27ha solely for ecological mitigation will be planted in felled areas extending Littlejohn's Wood (Figure 11.5k). This habitat creation will involve planting of localised clumps of Scot's pine, with the rest of the area left unmanaged to allow natural regeneration to occur, as has occurred in northwest corner of existing wood.	Moderate	Minor
N74	Woodland at Red Moss, north of the B977 County	Avoidance of damage to existing woodland and minimisation of tree felling.	Minor	Negligible
N75	Raised bog at Red Moss, north of the B977 Regional	No specific mitigation required.	Negligible	Negligible
N76	Farmland and bare ground at Moss-side, north of the B977 Less than local	No specific mitigation required.	Negligible	Negligible
N77	Plantation northeast of Red Moss, north of the B977 Local	No specific mitigation required.	Negligible	Negligible
N78	Mosaic of scrub and grassland west of Moss Belt Local	No specific mitigation required.	Minor	Negligible
N79	Moss Belt Plantation Local	No specific mitigation required.	Negligible	Negligible
N80	Agricultural fields between the B977 and Loch Hills Quarry Local	Species-rich grassland to be created on embankment slopes. Marshy grassland to be created adjacent to route to compensate for lost habitat.	Minor	Negligible

HA in NL5	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N81	Loch Hills Quarry Less than local	No specific mitigation required.	Negligible	Negligible
N82	Red Moss, south of the B977 Regional	No specific mitigation required. Pollution control through best practice at site over and above SEPA pollution prevention guidelines to prevent hydrological and/or pollution impacts on drainage channels connecting Red Moss and Lily and Corby Lochs.	Minor	Negligible
N83	Woodland between Red Moss and Lochgreens Farm County	No specific mitigation required.	Minor	Negligible
N84	Agricultural fields south of Lochgreens Farm Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on embankment slopes.	Minor	Negligible
N85	Corby and Lily Lochs and associated habitats National	Culverts along Red Moss Burn to reduce severance from habitats at Red Moss, north of AWPR (for culvert details see Chapter 9, Water Environment) Avoidance of hydrological and/or pollution impacts by ensuring no loss of flow into Corby Loch along Red Moss Burn and adoption of pollution control through best practice over and above SEPA pollution prevention guidelines. These measures include the construction of attenuation ponds north of the AWPR, adjacent to Red Moss Burn. Detention basins will provide treatment of road drainage and prevent pollution to freshwater habitats. Adherence to best practice measures to prevent pollution and sediment runoff during construction.	Major	Negligible
N86	Agricultural fields between Red Moss and Newtonhill Farm Local	No specific mitigation required.	Negligible	Negligible
N87	Agricultural fields between Lochgreens Road and Gravel Pit. Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on cutting and embankment slopes. Creation of scrub woodland on north side of AWPR in HA N87 between ch328040 and 328300 0.81ha of scrub woodland (Figure 11.5m) in isolated field fragments to offset habitat loss and fragmentation.	Minor	Negligible

HA in NL5	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N88	Newton of Shielhill DWS County	No specific mitigation required.	Negligible	Negligible
N89	Agricultural fields between unclassified Road and B999 (north) Local	No specific mitigation required.	Negligible	Negligible
N90	Agricultural fields between unclassified Road and B999 (south) Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Loss of linear shelterbelts avoided by route design to ensure they are retained as landscape feature and as a linear habitat.	Minor	Negligible
N91	Agricultural fields adjacent to Blackdog Burn, east of the B999 Local	Riparian woodland to be created along Blackdog Burn on either side of the AWPR. South of AWPR and east of Blackdog Burn. 0.37ha in HA N91 at ch330000 (Figure 11.5n). Scrub and riparian mosaic north of road and either side of Blackdog Burn 0.17ha in HA N91 ch329900 to ch329950 (Figure 11.5n). This woodland, primarily to provide otter mitigation, will enhance the local habitat diversity and improve the ecological value of the riparian corridor along the burn.	Negligible	Negligible
N92	Agricultural fields between the B999 and Harehill Farm Less than local	No specific mitigation required.	Negligible	Negligible
N93	Agricultural fields between Harehill Farm and the A90, south of Blackdog Burn Local	No specific mitigation required.	Negligible	Negligible
N94	Agricultural fields west of the A90, north of Blackdog Burn Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland to be created on embankment slopes. Isolated field fragments between Potterton Road and the A90 to be planted with mixed woodland to create buffer strip of habitat.	Negligible	Negligible
N95	Grassland east of the A90, south of Blackdog Local	The provision of new wetland areas and planting of scrub woodland for landscape mitigation will offset habitat loss and enhance local habitat diversity.	Minor	Negligible

HA in NL5	Feature / Asset Evaluation	Criteria	Impact significance	Residual
N96	Agricultural fields, west of the A90, either side of Potterton Road Local	Restoration of dry stone walls along boundaries of new roads where linear habitat lost. Species-rich grassland and scattered scrub to be created on embankment and cutting slopes around the A90 north junction to offset habitat loss and enhance habitat diversity of new road layout.	Minor	Negligible
N97	Agricultural fields west of the A90, north of Blackdog Local	Species-rich grassland and scattered scrub to be created on embankment and cutting slopes around the A90 north junction to offset habitat loss and enhance habitat diversity of new road layout. 2.8ha of riparian woodland to be planted on both banks of Middlefield Burn to enhance riparian corridor and offset impacts on otter populations. Above Fife Hill (HA N97) east of the road and east of the A90 Junction there will be 0.47 ha strip of scrub woodland surrounding an attenuation pond, and 1.07 ha east of the A90 junction next to road. East and west of AWPR at the A90 junction there is a 1.30 ha of scrub woodland.	Negligible	Negligible

7 Summary

7.1.1 There are no impacts of Moderate significance or greater in Section NL1. The Minor impacts to agricultural land around due to habitat loss are mitigated by landscape planting. All residual impacts in Section NL1 are therefore Negligible.

7.1.2 Habitat Loss, Disturbance and Fragmentation in the Craibstone Burn (HA N24), Gough Burn and Craibstone Campus (HA N24-N26) have been reduced to a residual Minor significance due to specific habitat creation in HA N25 and N28 (Figure 11.5c). All other Minor impacts are reduced to Negligible.

7.1.3 There are impacts of Moderate significance due to Habitat Loss, Disturbance and Fragmentation in the agricultural land surrounding Howemoss (HA N32 and N33) and in Kirkhill Forest North (N37) Standingstones Wood (N35) and East Woodlands (N43) due to loss of woodland and riparian habitat. These will be mitigated for by bridging and specific habitat creation (Figures 11.5e-h) (HAs N33-N35, N46, N37, N41 and N50). The residual impacts in these sections are reduced to Negligible-Minor significance.

7.1.4 There are impacts of Moderate significance due to Habitat Loss, Disturbance and Fragmentation at the River Don (HA N52), Goval Burn, the Mill Lade (N61) and the Formartine and Buchan Way (N62). These will be reduced to Minor due to specific habitat creation in HA N61, generic mitigation measures for pollution, the mitigation proposed in Chapter 9 (Water Environment), and sympathetic landscape planting. The Minor impact on Goval belt will be reduced to Negligible through generic impacts and additional mixed woodland in the Goval Burn area.

7.1.5 There are Major indirect impacts of Fragmentation and Disturbance of wetland habitats due to hydrological disruption to the habitat surrounding Lily and Corby Lochs (HA N85). Generic mitigation including that detailed in Chapter 9 (Water Environment), and in the Freshwater Habitat, Fish and Otter mitigation sections minimise this impact (refer to A10.16, A10.15 and A10.6). Therefore, the residual impacts in this section are predicted to be of Negligible significance.

8 References

Highways Agency (2001) Design Manual for Roads and Bridges. Volume 10. HMSO, London.

Highways Agency (2000) Design Manual for Roads and Bridges, Volume 10. HMSO, London.

Highways Agency (2005) Design Manuals for Roads and Bridges, Volume 10. HMSO, London

Highways Agency (2001) Design Manual for Roads and Bridges. Volume 11. HMSO, London.

Highways Agency (2000) Design Manual for Roads and Bridges, Volume 11. HMSO, London.

Highways Agency (2005) Design Manuals for Roads and Bridges, Volume 11. HMSO, London.

IEEM (2002) Draft Guidelines for Ecological Impact Assessment. Institute of Ecology and Environmental Management, UK.

IEEM (2006) Guidelines for Ecological Impact Assessment in the United Kingdom. Institute of Ecology and Environmental Management, UK.

IEMA (1995) Guideline to Environmental Impact Assessment, Institute of Environmental Management and Assessment, Lincoln, UK.

Jackson D.L., (2000). Guidance on the interpretation of the Biodiversity Broad Habitat Classification (terrestrial and freshwater types): Definitions and the relationship with other classifications, JNCC Report 307.

Jackson, D.L. & McLeod, C.R. (Editors), (2000). Handbook on the UK status of EC Habitats Directive interest features: provisional data on the UK distribution and extent of Annex I habitats and the UK distribution and population size of Annex II species, Revised 2002, JNCC Report 312.

JNCC (1993) Handbook for Phase 1 Habitat Survey – a technique for environmental audit. Joint Nature Conservation Committee, Peterborough, UK.

Ratcliffe, D.A. (1977) A Nature Conservation Review. Cambridge University Press, Cambridge.

Stace, C.A., (1997) New Flora of the British Isles. 2nd ed. Cambridge University Press.

UK Biodiversity Steering Group. (1995) Biodiversity: The UK Steering Group Report. HMSO, London.

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

Target Note No	Grid Ref	Description
1	NJ857073	Mixed Plantation woodland around southern edge of Clog Hill, and along field margins between horse pastures. Canopy of semi-mature Scot's pine, Wild cherry, Ash, Beech, Wych elm, Douglas fir, Sycamore and Rowan over ground flora with Yorkshire-fog, Creeping soft-grass, Rough meadow-grass, Bramble, Common nettle. In localised areas, the canopy is relatively open with small patches of gorse scrub.
2	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, Cock's-foot 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's sorrel are locally dominant with Heath bedstraw, Tormentil, Cat's-ear, Heath wood-rush, Foxglove, Bramble, and occasional Common ramping-fumitory (*Fumaria muralis*). 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.
3	NJ852076	Northwest slopes around Clog Hill. Small area around a derelict cottage comprising improved grassland (dominated by Yorkshire-fog, Cock's-foot 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, European larch over a ground flora of Cock's-foot, 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, Cock's-foot, Foxglove, and Cleavers.
4	NJ857081	Small pond north of Cloghill. Artificial pond with scattered Goat willow (*Salix caprea*) and Grey willow (*Salix cineraea*) trees around the perimeter and Yellow iris (*Iris pseudacorus*) and Reed canary-grass (*Phalaris arundinacea*) around the margins.
5	NJ861081	Semi-mature broad-leaved woodland north of Fairley Home Farm. Woodland of plantation origin adjacent to farm roads and comprising a canopy of dense Rowan (*Sorbus aucuparia*) with occasional Beech (*Fagus sylvatica*), Ash (*Fraxinus excelsior*), Wild cherry (*Prunus avium*), European larch (*Larix decidua*), Scot's pine (*Pinus sylvestris*) and common whitebeam (*Sorbus aria*) over a ground flora dominated by Creeping soft-grass, Broad buckler-fern (*Dryopteris diltata*), Bramble (*Rubus fruticosus* agg.) and Rosebay willowherb (*Chamerion angustifolium*). To the south, around Fairley House, the woodland is more mature and is of long established plantation origin. The canopy is comprised of mature Beech and Sycamore (*Acer pseudoplatanus*) with frequent Rowan and occasional Wych elm (*Ulmus glabra*). The ground flora is dominated by grassland and fern species such as Creeping soft-grass (*Holcus mollis*), Wavy hair-grass (*Deschampsia flexuosa*), Male-fern (*Dryopteris felix-mas*), Wood meadow-grass (*Poa nemoralis*), Broad buckler-fern, Great wood-rush (*Luzula sylvatica*), with abundant Wood-sorrel (*Oxalis acetosella*), Common dog-violet (*Viola riviniana*), Honeysuckle (*Lonicera periclymenum*), Bilberry (*Vaccinium myrtillis*) and Bracken (*Pteridium aquilinum*) in more open areas. Along Fairley Home Farm Drive, Broad-leaved woodland comprising a canopy of Beech with occasional Sycamore, Wych elm, Common Lime (*Tilia x europaea*) and Ash over a ground flora as above but with additional Cow parsley (*Anthriscus sylvestris*), Common nettle (*Urtica dioica*), Yorkshire-fog (*Holcus lanatus*), Sweet cicely (*Myrrhis odorata*), Ground elder (*Aegopodium podagraria*), and Ivy (*Hedera helix*) with occasional Rhododendron (Rhododendron *ponticum*) bushes.
6	NJ862083	Woodland shelter belts, approx. 10m wide, west of Derbeth Farm. At north end, shelter belt supports canopy comprising mature Scot's pine, and semi-mature European larch, Spruce sp. (*Picea* sp.) and Rowan with occasional Elder (*Sambucus nigra*) scrub over a ground flora that includes Yorkshire-fog, Creeping soft-grass, Cock's-foot (*Dactylis glomerata*), Common nettle, Bramble, Raspberry (*Rubus idaeus)* and Foxglove (*Digitalis purpurea*). At the south end, the shelter belt is adjacent to two areas of mature Sitka spruce (*Picea stichensis*) plantation, and develops mixed woodland composition with Common whitebeam and Beech also present in the canopy

Target Note No	Grid Ref	Description
7	NJ857087	Mosaic of habitats south of Brimmond Hill and to north of Hillhead of Derbeth steading. Coniferous plantation is present that comprises a small area of mature Scot's pine plantation with a relatively open canopy over a ground flora dominated by Bracken with Yorkshire-fog, Creeping soft-grass and Broad buckler-fern also present. East of this plantation is a larger area of young, dense Sitka spruce plantation with a species–poor ground flora. West of the steading, there is a relatively extensive area that includes a relatively large constructed pond that is surrounded by Alder (*Alnus glutinosa*) and occasional Birch (*Betula* sp.) trees with marginal vegetation dominated by Soft rush (*Juncus effusus*). In the immediate vicinity of the pond, the habitats comprise relatively open Broad-leaved woodland with a canopy of naturally developing Rowan and Birch over a Bracken-dominated ground flora, with occasional clumps of gorse (*Ulex europaeus*) scrub scattered in gaps. The ground flora also supports Wavy hair-grass, Heath bedstraw (*Galium saxatilis*), Yorkshire-fog and Tormentil (*Potentilla erecta*). The rest of this Habitat Area is comprised of young and semi-mature stands of coniferous plantation (Norway spruce (*Picea abies*)) with occasional mature Pine sp. (*Pinus* sp.) trees. This area is designated as a SINS and a DWS.
8	NJ861087	Mixed plantation east of Hillhead of Derbeth Farm. Canopy comprises stands of dense conifer plantation and broad-leaved woodland. At the western end young Spruce sp. plantation Is present with Sitka spruce and occasional European larch and Rowan and Common whitebeam around the edges over a species-poor ground flora. In the central section of this Habitat Area, broad-leaved woodland is dominated by Rowan, Birch and Goat willow over a ground flora with scattered Gorse and Broom and dominated by Yorkshire-fog, Creeping soft-grass and Broad buckler-fern with occasional Wood-sorrel, Wavy hair-grass, Pignut (*Conopodium majus*), Broad-leaved dock (*Rumex obtusifolius*) and Cock's-foot. At the west end of the woodland the canopy is comprised of mature Sitka spruce, Norway spruce and Scot's pine with occasional Rowan and Wild cherry present as understorey species in more open areas. This area is designated as a SINS and a DWS.
9	NJ865087	Habitats adjacent to rough and neglected farm track leading in E-W direction towards Hillhead of Derbeth farm. South of the track, there is an approx. 30m wide strip of land that acts as a shelter belt. At the east end of the track, scattered semi-mature Goat willow, Grey willow, Common whitebeam and occasional Norway spruce are present over a mosaic of dense scrub and tall herb that includes dominant Gorse, Broom (Cytisus scoparius), Rosebay willowherb, and Creeping thistle (*Cirsium arvense*). The verges of the track support a more diverse range of species and include Silverweed (*Potentilla anserina*), Common bird's-foot-trefoil (*Lotus corniculatus*), Raspberry, Common sorrel (*Rumex acetosa*), Broad-leaved dock, Soft rush, Yorkshire-fog, Cock's-foot with additional Rowan and Beech. Abundant piles of rocks, presumably cleared from old dry stone walls are located along the track edge. In the central section of the shelterbelt, mixed plantation habitat becomes predominant with young Spruce sp. present with occasional Beech and young Birch, Rowan, over a ground flora with tall herb species and scrub as listed above. At the west end, the track runs adjacent to dense scrub forming part of the lower slopes of Brimmond Hill, as noted in TN10 below. Here, semi-natural broad-leaved woodland is present south of the track, with mature Willow sp., Rowan and occasional mature Beech over open canopy with dense Gorse, Broom, Raspberry, Broad buckler-fern, Yorkshire-fog, Creeping soft-grass, Germander speedwell (*Veronica chamaedrys*), Common daisy (*Bellis perennis*), Foxglove and Cock's-foot. In localised areas dense thickets of young Beech and Rowan are present.
10	NJ860090	Brimmond Hill – High er ground around summit and slopes on east side of hill. The summit of Brimmond Hill is Heather-dominated dry heath habitat with scattered clumps of Gorse scrub. Heather occupies approx. 90-100% of the vegetation cover with occasional Deergrass (*Trichophorum cespitosum*), and Sedge sp (*Carex* sp.), with Cross-leaved heath (*Erica tetralix*) and *Sphagnum spp.* occasional in wetter areas. On the lower, eastern slopes, the amount of Gorse scrub increases and forms extensive dense stands in a mosaic with dry heath that includes Heather (*Calluna vulgaris*) and also Bilberry and Deergrass. Around the lower slopes, dense Gorse becomes dominant and forms a continuous habitat with scattered Birch and Rowan trees scattered throughout. The scrub habitat also includes scattered Broom. Towards the southeast of the hill, the lower slopes have localised areas where Bracken and semi-improved acid grassland form stands of vegetation amongst the dense scrub. Brimmond Hill is designated as a DWS.
11	NJ867092	Field vegetated with dense Gorse scrub with occasional Broom and Rowan trees and localised areas of heavily grazed and poached semi-improved grassland, dominated by Yorkshire-fog and Soft rush with Marsh thistle (*Cirsium palustre*), Tormentil, Creeping buttercup (*Ranunculus repens*) and Common sorrel.

Target Note No	Grid Ref	Description
12	NJ865093	Small pond in corner of cultivated field. Approx. 20m x 10m in size with minimal aquatic vegetation. Marginal vegetation comprises Soft rush, Floating sweet-grass (*Glyceria fluitans*), Water forget-me-not (*Myosotis scorpioides*) with Marsh thistle, Monkey flower (*Mimulus guttatus*), Dock spp., (*Rumex* sp.) Cock's-foot and Common nettle around the banks. A small stream flows from the pond to the north with dense Gorse and Broom along each bank.
13	NJ863096	Fields of unimproved acid grassland and marshy grassland west of Gough Burn District Wildlife Site. Network of small fields, no longer managed for agriculture. At the western end of these fields the sward comprises acid grassland with Yorkshire-fog, Sweet vernal-grass (*Anthoxanthum odoratum*), Creeping bent (*Agrostis stolonifera*), with marshy grassland in wetter areas associated with head of Gough Burn. Marshy area resembles rush pasture, dominated by Soft rush, with abundant Marsh thistle, Common sedge (*Carex nigra*), Field horsetail (*Equisetum arvense*), Wood horsetail (*Equisetum sylvaticum)*, and occasional Red fescue (*Festuca rubra* agg.), Tormentil, Water mint (*Mentha aquatica*), Water forget-me-not, Creeping buttercup and Cuckoo-flower (*Cardamine pratensis*). At the eastern end of these fields, adjacent to the more extensive area of Gough Burn, marshy grassland becomes the dominant habitat type, with Soft rush and Yorkshire-fog dominant and abundant Red fescue, Sweet vernal-grass, Tufted hair-grass (*Deschampsia cespitosa*), Sheep's sorrel, Common sorrel, Marsh thistle. In localised areas, small clumps of Heather occur accompanied by Cross-leaved heath, Tormentil, Heath bedstraw and Narrow buckler-fern (*Dryopteris carthusiana*). Willow carr is scattered along the central drainage axis of Gough Burn, comprised of Grey willow and Goat willow.
14	NJ866097	Gough Burn. This Habitat Area occupies low-lying ground at the foot of Brimmond Hill. Part of the site has been lost to landfill and the Majority of habitats are at a lower level than surrounding agricultural fields. The site is a mosaic of wetland habitats comprising rush pasture marshy grassland, willow carr woodland and gorse scrub, with a small section of mire vegetation in the central section of the site. The Majority of the site is comprised of marshy grassland dominated by Soft rush, Sharp-flowered rush (*Juncus acutifloris*), Tufted hair-grass, Common sedge, and Yorkshire-fog with abundant herb species that include Common marsh-bedstraw (*Galium palustre*), Common sorrel, Devil's-bit scabious (*Succisa pratensis*), Creeping buttercup, Meadow buttercup (*Ranunculus acris*), Marsh pennywort (*Hydrocotyle vulgaris*), Ragged-robin (*Lychnis flos-cuculi*), and Yellow-rattle (*Rhinanthus Minor*). Other species present included Marsh thistle, Creeping bent, Red fescue, Common spotted-orchid (*Dactylorhiza fuchsii*), Marsh cinquefoil (*Potentilla palustris*), Marsh violet (*Viola palustris*), bog stichwort (*Stellaria ulginosa*), Common valerian (*Valeriana officinalis*), Greater bird's-foot-trefoil (*Lotus pedunculatus*) and Marsh ragwort (*Senecio aquaticus*). The wettest area in the central section of the site supports a small area of Bottle sedge (*Carex rostrata*) mire, which forms a locally dominant stand of vegetation that includes locally abundant Marsh cinquefoil, Ragged-robin and Water horsetail (*Equisetum fluviatile*). In addition, wet heath species are also abundant including Heather, Cross-leaved heath, Bell heather (*Erica cinerea*), Tormentil and occasional cushions of *Sphagnum spp.* and Polytrichum sp. mosses. Willow carr is developing in several locations throughout the site, particularly along the axis of Gough Burn along the NW edge and in an extensive stand in the south of the site. In addition Willow sp. scrub is scattered throughout the site. The willow carr supports a ground flora with Water horsetail, Opposite-leaved golden-saxifrage (*Chrysosplenium oppositifolium*), Water mint, Monkey flower, Broad buckler-fern,Creeping buttercup and Soft rush. Animal wildlife was abundant: breeding birds were widespread and included willow warbler, whitethroat and curlew. Numerous roe deer were observed and a single brown hare was flushed from the southern section of the site. This area is designated as a SINS and a DWS.
15	NJ873098	Coniferous plantation adjacent to crossroads at Newhills. Large woodland block comprising semi-mature coniferous plantation dominated by Sitka spruce with occasional broad-leaved woodland species around the edge, including Rowan, Wych elm, Common whitebeam and Birch. The ground flora is generally species-poor with Wavy hair-grass locally abundant in open areas along with Rosebay willowherb and Bramble.
16	NJ868100	Gough Burn north of District Wildlife Site and unclassified road. After passing through a culvert under an unclassified road, Gough Burn flows northwards though a gully with dense Gorse, Broom on each bank. The burn is approx. 1 – 1.5m wide and relatively fast flowing with little or no channel vegetation.

Target Note No	Grid Ref	Description
17	NJ871102	Woodland in south of SAC estate at Craibstone. Mixed woodland east of unclassified road, at southern limit of Craibstone estate, on either side of campus road. North and south of a disused chicken shed, which is surrounded by made ground with short ephemeral vegetation, are a mature Leyland cypress (*x Cupressocyparis leylandii*) and mature Beech hedge respectively. North of the campus road, a young mixed plantation is present with extensive natural regeneration of trees and scrub. Tree species include European larch, Ash, Silver birch (*Betula pendula*), Wych elm and Rowan with extensive areas of Bramble, Raspberry, and Elder scrub. In addition, Foxglove, Yorkshire-fog and Common nettle are locally abundant in gaps. A line of mature Leyland cypress extends along the south of the campus road, with semi-mature broad-leaved woodland developing behind it and to the east of the chicken shed. The woodland is of plantation origin, but appears to be developing with secondary characteristics with a canopy dominated by semi-mature Silver birch, Downy birch (*Betula pubescens*), and Rowan with occasional Common Lime, Elder, Beech and other introduced species. The ground flora has localised areas dominated by Bramble and other more open areas with Broad buckler-fern, Chickweed-wintergreen, Male-fern, and Foxglove.
18	NJ870103	Semi-natural broad-leaved woodland in SAC Craibstone estate – north of Gough Burn. In this section of the study area, Gough Burn is approx. 1m wide with banks dominated by woodland habitat. North of the burn, mature Beech woodland is present that is of long-established origin, with an understorey that includes Hazel, Wych elm, Holly, Laurel and Rhododendron. Near to Gough Burn, the ground flora includes abundant Ramsons (*Allium ursinum*), Pink purslane (*Claytonia sibirica*), Tufted hair-grass, Wavy hair-grass, Broad buckler-fern, Hard-fern, Common comfrey, and Sycamore seedlings. The mature Beech woodland extends as a shelter belt northwards, with a more open canopy with occasional European larch, Common Lime, Rowan, Laburnum (*Laburnum anagyroides*), and Holly (*Ilex aquifolium*) over a relatively species-poor ground flora with Creeping soft-grass and Laurel (*Prunus laurocerasus*) with occasional Wavy hair-grass, Honeysuckle and Chickweed-wintergreen (*Trientalis europaea*). A large field of improved grassland is located northeast of this woodland, the northwest section of which has been recently planted with Broad-leaved woodland saplings. The northeast of this field has recently been developed as a car park surrounded by amenity grassland and planted young broad-leaved woodland trees.
19	NJ870105	Arboretum north of campus road in SAC Craibstone Estate. Relatively extensive area comprising a mixture of mature and recently planted young trees, forming an arboretum with footpaths. Most of the trees are broad-leaved, with coniferous comprising approximately 10-20% of the trees. The ground flora throughout the arboretum is characteristic of native woodland habitats with abundant species including Broad buckler-fern, Male-fern, Lady-fern (*Athyrium felix-femina*), Creeping buttercup, Foxglove, Cleavers (*Galium aparine*), Yorkshire-fog, Common nettle, Red campion (*Silene dioica*), Wood sage (*Teucrium scorodonia*), Raspberry, Bramble, Bluebell (*Hyacinthoides non-scripta*), and Common comfrey.
20	NJ868106	Mixed woodland of plantation origin adjacent to unclassified road in west of SAC Craibstone campus. Many of the canopy species are non-native and include Sycamore, *Tsuga* sp., Silver birch, Downy birch, Ash, Sitka spruce, Norway spruce, and Alder. The ground flora includes abundant fern species, such as Broad buckler-fern and Male-fern with abundant Wavy hair-grass, Tufted hair-grass, Yorkshire-fog, Creeping soft-grass, Foxglove, Common nettle, and occasional Red campion, Soft rush, and Cleavers. Within the area of mixed woodland, two blocks of young Sitka spruce plantation are present.
21	NJ869107	Relatively extensive area of woodland comprising approximately 6ha of mixed woodland in the north of the SAC Craibstone estate, on either side of a campus road that leads from the central buildings towards the West Lodge. The woodland consists of areas of broad-leaved woodland, mixed and coniferous woodland, which is of plantation origin. A range of types of broad-leaved woodland is present. To the south of a burn that flows through the woodland area, the canopy is predominantly comprised of relatively mature Beech woodland with an understorey of semi-mature Silver birch and Spruce sp., over a ground flora with Broad buckler-fern, and Honeysuckle. In other areas, Silver birch dominates the canopy, and here the ground flora is more species-diverse with additional Creeping soft-grass, Tufted hair-grass, Wavy hair-grass, Raspberry, Hard-fern, Common nettle and Chickweed-wintergreen. Throughout the canopy, Sycamore, Wych elm and Aspen (*Populus tremula*) are occasional species with introduced shrub species such as Domestic rose (*Rosa* sp.), Mock-orange sp. (*Philadelphus sp.*), Rhododendron and Laurel frequent. The woodland immediately to the northwest of the campus buildings comprises blocks of mature

Target Note No	Grid Ref	Description
		coniferous plantation and young or semi-mature mixed plantations. Canopy species include Scot's pine, Sitka spruce, and Douglas fir (*Pseudotsuga menziesii*) with Downy birch, Silver birch, Beech, Sycamore and Goat willow abundant in mixed areas.
22	NJ870109	Narrow strip of semi-natural vegetation between two cattle pastures with improved grassland. At western end, of the strip, an area of bare ground that is used as an agricultural spoil dump is surrounded by young broad-leaved woodland of plantation origin but with semi-natural characteristics. The canopy comprises semi-mature Silver birch and Hazel (*Corylus avellana*) over a ground flora dominated by Bracken, and Creeping soft-grass with occasional Sweet vernal-grass, Common chickweed, Cleavers, and scattered Gorse scrub. To the east of this area, the woodland strip narrows, before widening at the eastern end where the vegetation is open, dominated by Bracken with scattered Gorse and Broom. A line of semi-mature Beech trees forms a narrow belt along the southern margin of this area of Bracken.
23	NJ868109	Relatively large pond to north of campus road leading to West Lodge of SAC Craibstone estate. Extensive stands of aquatic vegetation with Water forget-me-not, Floating sweet-grass, Broad-leaved pondweed (*Potamogeton natans*), Brooklime (*Veronica beccabunga*), Common water-starwort (*Callitriche stagnalis sens. lat.*) present as emergent species and marginal vegetation comprising Water mint, Creeping buttercup, Marsh-marigold (*Caltha palustris*), Yellow iris, Common club-rush (*Schoenoplectus lacustris*), Bulrush (*Typha latifolia*), Common marsh-bedstraw and Foxglove. Around the banks of the pond there are areas of Silver birch, Alder and Willow sp. carr woodland with Elder, Crack willow (*Salix fragilis*) and Goat willow scrub with Soft rush, Rosebay willowherb, Bramble, Yorkshire-fog and Cleavers present in more open areas. Bird species were abundant in the vicinity of the pond with breeding blackcap, sedge Warbler, whitethroat, willow warbler and moorhen recorded. North of the pond, a strip of woodland is located along an escarpment, with a relatively large semi-mature Scot's pine plantation at the western end and other areas have broad-leaved woodland with Pedunculate oak (*Quercus robur*), Silver birch and occasional Spruce sp. and Pine sp.. A main badger sett was located within the woodland strip.
24	NJ869111	Mixed woodland along banks of Green Burn to south of A96. Mature woodland of plantation origin, with a canopy of Norway spruce, Sitka spruce, Silver birch, Beech, Ash and Wych elm over a ground flora dominated by grassland and tall herb species such as Cow parsley, Creeping soft-grass, Yorkshire-fog, Broad buckler-fern and Common nettle.
25	NJ865110	Broad-leaved woodland plantation west of unclassified road and south of A96. Avenue of semi-mature Sycamore beside farm track over a grass-dominated ground flora including Yorkshire-fog, Cock's-foot, Sweet cicely, Common nettle and Bracken. South of the track, a small area of broad-leaved woodland plantation is present with young Birch over dense Gorse and a similar ground flora to the avenue.
26	NJ864116	Chapel Brae Wood - broad-leaved woodland of plantation origin to south of farm track. Canopy is comprised of semi-mature Rowan trees, which appear to have been coppiced in the past with several stems originating from each root base. The ground flora is relatively species–poor, dominated by Creeping soft-grass, Broad buckler-fern, and Bramble with abundant moss spp and occasional Rough meadow-grass (*Poa trivialis*), Wavy hair-grass and Wood-sorrel.
27	NJ863118	Farm tracks northwest of Chapel Brae Wood. Wide lanes with dry stone walls on each side with scattered Sycamore and Rowan trees, patches of dense Gorse scrub and extensive stands of Lady-fern, Broom, Foxglove and Rosebay willowherb. Species-rich grassland is present along other stretches of verge with a diverse range of grass, herb and fern species, including Crested dog's-tail (*Cynosurus cristatus*), Yorkshire-fog, Cock's-foot, Cow parsley, Pignut, Lady-fern, Male-fern, Scaly male-fern (*Dryopteris affinis*), Broom, Gorse, Raspberry, Bramble, Common sorrel, Foxglove, Bilberry, Lesser stitchwort (*Stellaria graminea*), Common vetch (*Vicia sativa*), Rosebay willowherb, Tormentil, Selfheal (*Prunella vulgaris*) and Yellow-rattle. These species are also present in areas of Semi-improved grassland within the remnant walls of a derelict steading at the west end of the lane at Balgosie (SJ858120).
28	NJ862127	Farburn Wood. District Wildlife Site. Relatively small area (approx. 1ha) of semi-natural broad-leaved woodland with a canopy dominated by Birch, Rowan, Sycamore, Ash, with Grey willow and Alder in wetter areas associated with a small burn that flows through the area. The ground flora is relatively diverse with Broad buckler-fern, Bramble, and Creeping soft-grass dominant and occasional Yorkshire-fog, Common nettle, Honeysuckle, Herb-robert (*Geranium robertianum*), Cleavers, Male-fern, and Northern marsh-orchid (*Dactylorhiza purpurella*). At the west side of the wood, an open area maintains tall herb vegetation including Rosebay willowherb, Broad-leaved dock, Common nettle, Hogweed (*Heracleum spondylium*) and Creeping thistle.

Target Note No	Grid Ref	Description
		To the north of the wood, a farm track leading to Standingstones Farm has an avenue of mature Broad-leaved woodland trees on either side including Horse chestnut (*Aesculus hippocastanum*), Sycamore, Common Lime, Ash, Wych elm and Beech with the burn flowing along the east side of the road towards Farburn Wood.
29	NJ859127	Block of young coniferous plantation on lower slopes of Standingstones Wood north of Howe Moss Farm. Most of area is comprised of young Sitka spruce with occasional European larch particularly on the lower slopes to the east of the block. Along the east margin, a small area of mature broad-leaved woodland plantation is present with Silver birch and occasional Rowan.; Alder trees are scattered around the margins of the forest block. A forest track winds up through the forest block. At the east side this track has semi-improved acid grassland on either side with scattered Gorse, Birch, Elder, Grey willow, White willow (*Salix alba*), Bramble and Raspberry scrub. Grassland species include dominant Yorkshire-fog, Tufted hair-grass, Heath bedstraw, Great wood-rush and Broad buckler-fern with occasional Red fescue, Cat's-ear (*Hypochaeris radicata*), Foxglove, Male-fern, Tormentil, Common nettle, Wood horsetail and Trailing St-John's-wort (*Hypericum humifusum*). Farther up the slope the grassland has been totally encroached by dense Gorse and Broom scrub that forms a dense strip of scrub habitat either side of the forest track.
30	NJ857125	Dry valley south of forest block detailed in TN31 with extensive areas of tall herb, ferns and dry heath along the valley sides, including Rosebay willowherb, Foxglove, Broad buckler-fern, Heather, Bilberry and Pill sedge (*Carex pilulifera*), with locally abundant areas of Gorse, Bramble and Broom scrub and Birch saplings scattered throughout. To the south of the valley, naturally developing broad-leaved woodland is developing dominated by Birch saplings. The valley extends west of a forest track, where a mosaic of dry heath, dense scrub is present with localised areas of acid grassland. Heathland areas are dominated by Heather, Bell heather, Wavy hair-grass, and Yorkshire-fog with abundant Heath bedstraw, Sedge sp, Tormentil, Tufted hair-grass. In localised areas Gorse, Broom, Bramble and Raspberry form stands of dense scrub. In other areas, particularly on flatter areas above the valley, debris from felling operations is extensive with abundant Broad buckler-fern, Climbing corydalis (*Ceratocapnos claviculata*), Foxglove, Raspberry, Bramble, Wavy hair-grass and Gorse. Towards the head of the valley, several large stands of Bracken and a small area of Willow sp. carr are present.
31	NJ857127	Block of young coniferous plantation at Standingstones Wood, west of TN29 above. Canopy comprised of young, densely planted Sitka spruce and European larch with European larch more frequent and dominant to the north of forest block. Dense Gorse scrub forms a strip of vegetation along the sides of a forest track that passes through the forest with occasional open areas that support heathland species such as Heather, Heath bedstraw, Red fescue, Bell heather, Sedge sp, Bilberry and Broom.
32	NJ855127	Established coniferous plantation in Kirkhill Forest/Standingstones Wood, with forest blocks with mature and semi-mature woodland with canopies dominated by more or less monospecific stands of Spruce sp., Pine sp. or European larch. Most Spruce sp. blocks within the study area are comprised of semi-mature woodland with a relatively species-poor ground flora. Blocks of European larch and Pine sp. blocks are generally semi-mature or mature with a more open canopy and ground flora that includes Bracken, Creeping soft-grass, Yorkshire-fog, Bramble, Wood-sorrel, Wavy hair-grass, Broad buckler-fern, Rough meadow-grass, with occasional Red campion, Germander speedwell, Common nettle etc. Forest blocks are mapped by species code in Phase 1 Habitat maps.
33	NJ854128	Wide ride and open habitats forming linear feature beside forest track in Kirkhill Forest. Mosaic of habitats dominated by semi-improved acid grassland, with localised areas with scattered scrub and dry heath habitats. Self-sown saplings are scattered along the track sides including Sitka spruce, Pine sp., European larch, Birch, and Rowan. Grassland habitats are dominated by Yorkshire-fog, Wavy hair-grass, Red fescue, Devil's-bit scabious, Tormentil, Common knapweed (*Centaurea nigra*), Selfheal, White clover (*Trifolium repens*), Colt's-foot (*Tussilago farafara*), Creeping thistle, Hard-fern, and a small population of Northern marsh-orchid at the north end of the track. Localised areas of heath vegetation comprise stands of Heather and Bilberry with Wavy hair-grass, Tormentil and Heath bedstraw abundant. Scattered scrub species include Gorse, Bramble and Raspberry.
34	NJ859132	Standingstones stone circle. Mature Beech copse east of the stone circle with several very mature trees. The ground flora comprises semi-improved grassland with Yorkshire-fog, Cock's-foot, Pignut, Common sorrel, Common chickweed, Creeping bent and Smooth meadow-grass. To the south of the copse, a rocky outcrop in the middle of a field of improved grassland supports a few semi-mature Scot's pine and scattered Gorse scrub.

Target Note No	Grid Ref	Description
35	NJ854132	Wide ride and open habitats near forest track in Bogenjoss area of Kirkhill Forest. Similar range of habitats to that described in TN33, with Semi-improved acid grassland, scattered scrub and localised areas of heath vegetation. North of the forest track, Bogenjoss Burn flows in a northeast direction, passing under the track via culvert. Areas of marshy grassland habitat are located along the burn, dominated by Soft rush and Tufted hair-grass with occasional Common valerian, Marsh thistle, Wood horsetail, Climbing corydalis and Common nettle. To the north of the forest track, open fenced areas have recently been planted with Spruce sp. saplings.
36	NJ857134	Field of marshy grassland within Kirkhill Forest. Sward dominated by Soft rush, Yorkshire-fog, and Tufted hair-grass with abundant Sharp-flowered rush, Male-fern, Scaly male-fern, Common valerian, Broad-leaved dock, Common nettle, Common sorrel, Cleavers, Marsh thistle, and Meadow vetchling (*Lathyrus pratensis*).
37	NJ860137	Area of naturally developing broad-leaved woodland east of Bogenjoss Farm and north of forest track. Young trees (3-5m high) forming a relatively open canopy ofSilver birch and Rowan with occasional Sitka spruce, Ash, Wild cherry, and Rowan. The remaining vegetation is a mosaic of dense scrub (Gorse, Broom, Bramble, Raspberry and Hawthorn tall herb (Rosebay willowherb, Male-fern and Hogweed) and grassland (Yorkshire-fog, Cock's-foot, Tufted hair-grass, White clover, Soft rush and Common valerian). South of the track, marshy grassland has developed with dense Grey willow, Goat willow, Rowan, Gorse and Broom scrub. The marshy areas are dominated by Soft rush and Tufted hair-grass with Rosebay willowherb, Foxglove and Yorkshire-fog abundant.
38	NJ858137	Forest block, south of Bogenjoss Farm, comprising mixed plantation woodland. Canopy comprises young 2-4m high mixed plantation with Douglas fir, Birch and occasional Sycamore and Rowan with abundant scattered Gorse, Bramble, Raspberry scrub and Broad buckler-fern.
39	NJ855140	Small block of broad-leaved woodland of plantation origin forming connection between Kirkhill Forest to south and East Woodlands (to north). Canopy dominated by Rowan, that was probably coppiced in the past, with mature and very mature Beech trees present along the lines of old dry stone walls. Silver birch and Goat willow are occasional canopy species over a relatively species-poor ground flora with Creeping soft-grass, Broad buckler-fern, Common chickweed (*Stellaria media*), and Germander speedwell with occasional Wood-sorrel, Great wood-rush and Wavy hair-grass with scattered patches of Bracken.
40	NJ856142	Relatively open area within East Woodlands comprising area of felled plantation that now maintains semi-improved acid grassland with scattered trees and scrub. Along the south of this area, a line of semi-mature and mature Beech extends through East Woodlands from TN39 in a northeast direction. Areas of semi-improved acid grassland are dominated by Yorkshire-fog, Red fescue, Broad buckler-fern, Male-fern, Scaly male-fern, Sweet vernal-grass, Climbing corydalis, Wood-sorrel, Foxglove and Bramble with scattered trees that have been both planted and self-sown, including Sycamore, Wild cherry, Rowan, Elder, Sitka spruce, Pedunculate oak and Ash.
41	NJ860140	Field of semi-improved grassland with fenced-off area in centre around ruins of former steading. Within fenced-off area, there are several mature Wild cherry and Wych elm trees with patches of dense and scattered Gorse and Broom scrub with ungrazed semi-improved grassland in the remaining areas.
42	NJ860142	Extension of acid grassland habitat noted at TN41 and TN46. West-facing slopes of hill forming valley side to east of Bogenjoss Burn. On upper slopes of hill, Semi-improved acid grassland supports a species-rich sward similar to that noted above. Dominant species include Red fescue, Yorkshire-fog, Wavy hair-grass, Common sorrel, Bracken, Creeping buttercup, Creeping soft-grass, Meadow buttercup and Sheep's sorrel with abundant Heath wood-rush (*Luzula multiflora*), Common ragwort (*Senecio jacobea*), White clover, Germander speedwell, Common mouse-ear (*Cerastium fontanum*)and Sweet vernal-grass. In localised rocky areas the sward includes Bilberry, Tormentil, Chickweed-wintergreen, Lesser stitchwort and Eyebright (*Euphrasia officinalis agg.*). Farther down the slope, Bracken gradually increases and forms a dominant sward with increasing amounts of Gorse scrub that forms a dense cover close to the river with scattered Rowan trees amongst the gorse.
43	NJ859144	Woodland habitats associated with valley of Bogenjoss Burn in section east of TN40. Woodland is mainly broad-leaved woodland, with Rowan, Ash and occasional Silver birch, Beech, Wych elm, European larch and Scot's pine. The valley sides are relatively steep in this section, with patches of dense Gorse and other areas with stands of Bracken and grassland that includes Yorkshire-fog, Creeping soft-grass, Foxglove, Cleavers, Scaly male-fern, Common nettle, Wavy hair-grass,

Target Note No	Grid Ref	Description
		Climbing corydalis and Red fescue. Along the stream margins, there are occasional Marsh-marigold, Water forget-me-not, Meadowsweet (*Filipendula ulmaria*), Common valerian and Lady-fern with a stand of Toad rush (*Juncus bufonius*) on bare mud at cattle watering spot. Farther downstream, the woodland connects to the extensive area of plantation at East Woodlands, to the west. In this section Broad-leaved woodland species dominated along the burn valley, with additional mature Alder in the canopy and occasional Willow sp.. Bracken is dominant in open areas, while under the canopy, the ground flora is dominated by Creeping soft-grass, Yorkshire-fog, Broad buckler-fern, Pignut and Cock's-foot.

Target Note No	Grid Ref	Description
44	NJ859147	Semi-mature coniferous plantation, west of Pitmedden House. Canopy comprised of even-aged Scot's pine over a species-poor ground flora dominated by Cock's-foot and Common nettle with occasional Broad-leaved dock and Yorkshire-fog.
45	NJ860146	Broad-leaved woodland on either side of Bogenjoss Burn, downstream of habitats at TN42 and TN43 above. Valley is relatively wide with shallow-sloping sides. Canopy is semi-natural, comprised of Sycamore, Ash, Beech, Silver birch, Wild cherry, with Rhododendron locally abundant on the north side of the burn. The ground flora is comprised of a diverse range of tall herb and grassland species and includes, Hogweed, Cleavers, Cow parsley, Common nettle, Nipplewort (*Lapsana communis*), Meadowsweet, Ground elder, Herb-robert, Pink purslane, Lady-fern, Male-fern, Wood avens (*Geum urbanum*), Common dog-violet, and Wood anemone (*Anemone nemorosa*).
46	NJ862142	Large meadow on north-facing slopes of hill, south of Pitmedden House. Most of field comprised of semi-improved acid grassland with Red fescue, Perennial rye-grass, Cock's-foot, Wavy hair-grass and Broad-leaved dock, Common sorrel, Cat's-ear. In localised areas, rocky outcrops support thinner and less enriched soil with a more diverse community with dominant species including Wavy hair-grass, Sheep's sorrel, Curled dock (*Rumex crispus*), Bilberry, Heath wood-rush, Cat's-ear, Creeping soft-grass, Heath speedwell (*Veronica officinalis*), Heath bedstraw, Tormentil, Eyebright, White clover, Ribwort plantain (*Plantago lanceolata*), Germander speedwell, Creeping buttercup and occasional Bracken individuals. To the west of this area of grassland, a young conifer plantation has been recently planted with Douglas fir and Sitka spruce and an extensive area of Bracken with localised areas of semi-improved acid grassland remaining in the ground flora.
47	NJ863148	Mature broad-leaved woodland east of main drive to Pitmedden House. Probably of plantation origin but mature, long-established woodland with semi-natural characteristics. Canopy comprising a diverse age structure with mature Beech, Sycamore, Common Lime and Elder over a ground flora with grassland and herb species such Rough meadow-grass, Creeping soft-grass, Ground elder Pink purslane, Germander speedwell, Common nettle, Hogweed, Wavy hair-grass, Herb-robert, and Wood avens. Similar woodland is present west of the drive with extensive Laurel in the understorey. South of the house, the woodland canopy has Beech, Sycamore and Wych elm with ground layer predominantly composed of leaf litter.
48	NJ865145	Monument Wood. Relatively extensive conifer plantation south of Pitmedden House. Most of woodland area is comprised of semi-mature European larch plantation forming a relatively dense canopy over a relatively species-poor ground flora that includes Broad buckler-fern, Wood-sorrel, Rough meadow-grass, Creeping soft-grass and Chickweed-wintergreen. In the northwest corner the canopy is comprised of semi-mature Scot's pine. In the southwest corner of the woodland, a Victorian monument is surrounded by mature Scot's pine woodland that is relatively open with numerous gaps in the canopy. Here, the ground flora is more diverse, with Broad buckler-fern, Creeping soft-grass and Wavy hair-grass dominant with occasional European larch and Rowan present in the canopy.
49	NJ867140	Semi-mature broad-leaved woodland developing naturally on slopes below larger area of coniferous plantation. Self-sown Birch, Rowan, Ash are present in an area dominated by Bracken with patches of dense Gorse scrub.
50	NJ865148	Small block of recently planted conifer plantation with young 2-4m high Sitka spruce, Norway spruce, and Pine sp. over Gorse and Broom scrub and Yorkshire-fog, Tufted hair-grass, and

Target Note No	Grid Ref	Description
		Cock's-foot dominated ground flora.
51	NJ867146	Young recently planted Broad-leaved woodland plantation, with young saplings still in protective sleeves. Ground vegetation comprises Bracken-dominated habitat with occasional Yorkshire-fog, Cleavers, Cock's-foot, Climbing corydalis, with localised areas of semi-improved acid grassland with Wavy hair-grass, Tormentil, Bilberry, Heath bedstraw, Pignut and Common sorrel.
52	NJ869145	Fenced-off section of silage field consisting of recently planted Broad-leaved woodland plantation with young trees 1-3m high and including Swedish whitebeam (*Sorbus intermedia*), Ash, Wych elm, Pedunculate oak and Rowan over a ground flora dominated by semi-improved grassland with Yorkshire-fog, Cock's-foot, False oat-grass, Red fescue, Creeping thistle, Common nettle and Broad-leaved dock.
53	NJ873148	Large Quarry north of railway line. Industrial site with extensive areas of bare ground. At the south end of the quarry, a small pond is present close to a series of industrial buildings with scattered patches of tall herb vegetation on its banks. Along the railway embankment to the south there are relatively extensive stands of tall herb vegetation dominated by Rosebay willowherb, Common nettle and Bramble with occasional young Rowan and Birch trees and Grey willow, Domestic rose, Raspberry, Bramble, Gorse and Broom scrub. Other embankments within the quarry also include tall-herb dominated vegetation.
54	NJ877150	River Don. River flows through study area in a North-South direction before turning towards the southeast. The river generally flows through agricultural fields comprising grazed improved grassland or arable crops. In most areas, the riverbanks are fenced to prevent stock gaining access to the river although in a few places; sheep are able to reach some sections. The riverbanks are managed as a fishery with some areas mown to improve access, but generally supporting diverse range of tall herb, fern, scrub and grassland species. In the north of the study area, the right bank of the river (on the west of the river) supports semi-improved grassland and tall herb vegetation while on the opposite left bank of the river there is an area of mature Broad-leaved woodland with a canopy including Beech, Sycamore, Silver birch, Horse chestnut, over a generally species-poor ground flora including Creeping soft-grass, Broad buckler-fern and Bramble. Farther downstream, towards the south of the study area, improved grassland meadows extend down to the right bank of the river with a strip of semi-improved grassland along the left bank of the river between it and agricultural fields. Riparian areas of vegetation include tall herb vegetation (Elder, Ground elder, Hogweed, Common nettle, Leopard's-bane (*Doronicum pardalianches*), Common comfrey, Meadowsweet, Broad-leaved dock, and Sweet cicely). Grassland species include a diverse range of species that include Reed sweet-grass (*Glyceria maxima*), Yorkshire-fog, Cock's-foot, Dog rose (*Rosa canina* agg.), Water forget-me-not, Cleavers, Male-fern, Hedge woundwort (*Stachys sylvatica*), Nipplewort, Cat's-ear, Common knapweed, Meadow vetchling, White clover, Common vetch, Tufted vetch (*Vicia cracca*), Monkey flower and Common blue-sowthistle (*Cicerbita macrophylla*). Along the margins of the River Don, there are local stands of Reed sweet-grass, Floating sweet-grass, Branched bur-reed, Monkey flower, Common valerian and Meadowsweet, with small clumps of Reed sweet-grass persisting on small rocky islands within the main channel. Within the river channel, there are extensive stands of water crowfoot (*Ranunculus aquatilis*), with occasional clumps of Canadian waterweed (*Elodea canadensis*) in slow-flowing sections.
55	NJ882147	Small areas of mixed plantation northeast of River Don, between river and B977. Canopy comprising semi-mature woodland with Pine sp., Sycamore, Beech and Spruce sp. over Bracken-dominated ground flora with Creeping soft-grass, Bramble and Common nettle.
56	NJ887147	Canalised section of Goval Burn between pumping station and River Don. Straightened channel with relatively fast-flowing water with tall herb vegetation on both banks, including extensive stands of Rosebay willowherb, Common nettle, Sweet cicely, Meadowsweet, Reed sweet-grass, Floating sweet-grass, Butterbur (*Petasites hybridus*), Cow parsley, Hogweed and Common comfrey.
57	NJ882155	North section of Goval Wood, east of Goval House. Mosaic of woodland habitats with predominantly wet semi-natural broad-leaved woodland woodland with localised patches of semi-mature conifer plantation and more open habitats with wet heath habitats where two sets of Electricity Transmission Lines cross the area. broad-leaved woodland areas are comprised of mature Silver birch and Downy birch with occasional Rowan, Goat willow and coniferous areas comprise Scot's pine with occasional Spruce sp.. The ground flora under these woodland areas is

Target Note No	Grid Ref	Description
		dominated by Common sedge, Wavy hair-grass, Polytrichum sp., Broad buckler-fern, Chickweed-wintergreen, Heath wood-rush and Wood-sorrel with occasional Soft rush, Heather, Cross-leaved heath and other species characteristic of wet heath habitats. Under the Electricity Transmission Lines, wet heath habitats are present, dominated Heather, Cross-leaved heath, Soft rush, with locally abundant Common sedge, Heath rush (*Juncus squarrosus*), Jointed rush (*Juncus articulatus*), Wavy hair-grass, and frequent Chickweed-wintergreen, Crowberry (*Empetrum nigrum*), Hare's-tail cotton-grass (*Eriophorum vaginatum*), Common cotton-grass (*Eriophorum angustifolium*), Tormentil and Star sedge (*Carex echinata*) . Bryophytes are an important feature of the ground flora in all habitats with well developed *Sphagnum spp.* and Polytrichum sp. cushions
58	NJ884157	Conifer plantation, north of Goval Wood. Semi-mature plantation with dense canopy of Norway spruce, Sitka spruce and occasional Downy birch, Rowan and Scot's pine around the edges and in gaps within the wood. The ground flora is generally species-poor with occasional Broad buckler-fern, Wavy hair-grass, Wood-sorrel and moss species.
59	NJ886155	Goval Wood, occupying extensive area north of Goval Farm and south of conifer plantation discussed in TN58 above. Semi-natural broad-leaved woodland, dominated by mature Silver birch and Downy birch with occasional Scot's pine and Rowan. The woodland ground flora is dominated by grass species such as Yorkshire-fog, Creeping soft-grass and Wavy hair-grass with abundant Wood-sorrel, Broad buckler-fern, Red fescue, Bilberry and Chickweed-wintergreen. The woodland ha many open areas within the canopy that support localised areas with a mosaic of wet heath and acid grassland that includes Heather, Cross-leaved heath, Heath rush, Yorkshire-fog, Soft rush, Common cotton-grass, Tormentil, Bilberry, Mat-grass (*Nardus stricta*), Heath wood-rush, Sedge sp, Creeping bent, Wavy hair-grass and Red fescue.
60	887154	Open habitats southeast of birchwood discussed in TN57 and TN59, with scattered patches of Downy birch woodland and extensive areas comprised of unimproved acid grassland dominated by Sweet vernal-grass, Red fescue and Wavy hair-grass with abundant Soft rush, Heath rush, Tormentil, Heath bedstraw, Mat-grass (*Nardus stricta*), Yorkshire-fog. Heather and Bilberry are locally abundant in places with Deergrass, Sheep's sorrel, Common mouse-ear, Heath wood-rush. Scattered Downy birch, Silver birch and Rowan trees and Broom scrub are present throughout. In the south part of this Habitat Area, north of Goval Farm, the grassland has been improved and reseeded with a Perennial rye-grass (*Lolium perenne*) and White clover dominated seed mix.
61	NJ889150	Canal flowing through engineered channel, east of Goval Farm, towards pumping station. Canal banks comprised of tall herb vegetation dominated by Rosebay willowherb, Reed sweet-grass, Soft rush, and Raspberry with frequent Dock spp., Large bitter-cress (*Cardamine amara*), Water cress (*Rorippa nasturtium aquaticum* agg.), Reed canary-grass, Broom, Water forget-me-not and Meadowsweet. Brooklime is present within the channel. Scattered trees and scrub are located along the banks with Bramble, Elder, and occasional Willow sp.. A single plant of Celery-leaved buttercup (*Ranunculus sceleratus*) was recorded within the canal at the pumping station. This species is scarce in NE Scotland and usually located close to the coast (D. Welsh, pers comm.) A large stand of is present adjacent to the pumping station, with a stand of mature trees on the banks of the Goval Burn south of the pumping station, comprising Common whitebeam, Crack willow, Sycamore, Beech and Ash.
62	NJ892153	Goval Belt. Strip of Broad-leaved woodland plantation extending both sides of A947 southeast of Hill of Goval Farm. West of the road, the canopy is comprised of mature Beech, Sycamore, and Rowan with occasional Downy birch, Pedunculate oak and Wych elm. The ground flora is dominated by Yorkshire-fog, Creeping soft-grass, and Cleavers with occasional Wavy hair-grass, Rough meadow-grass, Smooth meadow-grass and Wood-sorrel. Goat willow and Soft rush are locally abundant adjacent to the road. East of the A947, the woodland canopy is similar with a canopy dominated by Rowan with mature Beech along the edges of the belt and occasional Downy birch. The ground flora is grass-dominated with Yorkshire-fog, Creeping soft-grass, Wood-sorrel, Male-fern, Common nettle, Chickweed-wintergreen, Heath bedstraw and Broad buckler-fern.
63	NJ891146	Formartine and Buchan Way – section north of bridge over A947 at NJ889144. Former railway converted to long-distance cycle and footpath. In south of study area, the pathway passes through a predominantly rural landscape with agricultural fields of arable crops and occasionally improved grassland (grazed by sheep). North of the way, a small area of broad-leaved woodland

Target Note No	Grid Ref	Description
		plantation supports young Wild cherry, Common Lime, Hawthorn, Silver birch, Downy birch, Blackthorn (*Prunus spinosa*), Wych elm, Rowan and Ash trees. Along the pathway itself, the verges and embankments are vegetated with acid grassland and occasional patches of tall herb (Rosebay willowherb and Raspberry) and scrub habitat (Grey willow, Silver birch and Dog rose). Grassland areas are dominated by False oat-grass, Red fescue, Creeping bent, Yorkshire-fog and Cock's-foot with abundant herbaceous species including Ribwort plantain, Germander speedwell, Hogweed, Creeping thistle, Meadow vetchling, Water forget-me-not, Common mouse-ear, Yarrow (*Achillea millefolium*), Meadow vetchling, Common vetch, Fox-and-cubs (*Pilosella aurantiacum*), Smooth hawk's-beard (*Crepis capillaris)*, Mouse-ear hawkweed (*Pilosella officinarum*) and Common knapweed. The Formartine and Buchan Way is designated as a DWS.
64	NJ893148	Goval Burn – flows southwards close to Formartine and Buchan Way through northern part of study area. Downstream of confluence with a smaller burn (Meadowhead Burn), the channel is modified as noted at TN56. Upstream of the confluence, the Goval Burn is a fast-flowing stream over a streambed with cobbles and localised areas of sand and gravel. A narrow strip of semi-natural Broad-leaved woodland is present along the banks of the burn, with mature Sycamore, Ash and Wild cherry, with a ground flora that includes Sweet cicely, Broad buckler-fern, Common nettle, Bramble, Raspberry, Meadowsweet, and Male-fern. In open areas there are localised stands of Rosebay willowherb, Bramble and Raspberry. Upstream, the Goval Burn and the F&B Way are separated by a series of hay meadows with species-poor semi-improved grassland. On the west bank, the woodland becomes mixed in nature with mature planted Scot's pine in the canopy along with Sycamore, Ash and Grey willow over a Bracken dominated ground flora.
65	NJ895152	Formartine and Buchan Way – northern section, between agricultural fields. Verges and banks of path are dominated by tall herb and grassland habitats similar to those noted in TN63 with scattered trees including Downy birch, Silver birch and Willow sp..
66	NJ895153	Meadow beside east (left) bank of Goval Burn with semi-improved grassland and tall herb habitats. Semi-improved grassland is present in the south of the field, dominated by Yorkshire-fog, Soft rush, Tufted hair-grass, Cock's-foot and diverse herb species including Broad-leaved dock, Common sorrel, Creeping buttercup, Meadow vetchling, Common vetch, Marsh willowherb (*Epilobium palustre*), Lesser stitchwort, and Greater bird's-foot-trefoil. Along the banks of the Goval Burn, there are species rich tall herb communities with Meadowsweet, Reed sweet-grass, Floating sweet-grass, Red dead-nettle (*Lamium purpureum*), Creeping thistle, Common valerian, Common comfrey, Cow parsley, Foxglove, False oat-grass, Yellow iris, Broom, Rosebay willowherb, Monkey flower, Hedge woundwort, Water forget-me-not, Field forget-me-not and Hogweed. In the north of this field, Rosebay willowherb, Broad-leaved dock and Foxglove-dominated tall herb has colonised raised areas that appear to have been formed from agricultural spoil.
67	NJ894154	The lade and feeder canal. relatively large water body (approx. 200 x 50m) constructed as reservoir with feeder canal flowing from south end to provide water to pumping station noted at TN61 above. The lade is constructed with stone-faced surfacing on the east side and mown grass along the west with mature broad-leaved woodland with Beech, Pedunculate oak, Rowan, Sycamore and Scot's pine that connects to Goval Belt (TN62). Within the waterbody, there are few aquatic species, vegetation limited to occasional clumps of Canadian waterweed. The lade is elevated above the level of the adjacent Goval Burn, the slope in-between being vegetated with semi-mature planted Aspen and scattered Willow sp. and Birch scrub. Canal is 7-8m wide with scattered Birch and Sycamore trees along the banks with tall herb and grassland vegetation.
68	NJ895157	Semi-improved grassland between Goval Burn and Formartine and Buchan Way. Meadows adjacent to river with Perennial rye-grass, Yorkshire-fog, Timothy (*Phelum pratense*) and Cock's-foot with abundant herbaceous species including Large-flowered hemp-nettle (*Galeopsis speciosa*), Common hemp-nettle (*Galeopsis tetrahit*), Poppy sp. (*Papaver sp.*), Creeping thistle, Oxeye daisy (*Leucanthemum vulgare*) and Knotgrass (*Polygonum aviculare*).
69	NJ894144	Mature Beech plantation south of farm road leading to Home Farm. Canopy comprised of relatively open, even-aged mature Beech, with a ground flora with Wavy hair-grass and Bilberry with occasional Chickweed-wintergreen, Heath bedstraw and Creeping soft-grass.
70	NJ897149	Small mixed plantation adjacent to B977 east of Little Goval. Canopy dominated by semi-mature

Target Note No	Grid Ref	Description
		Pine sp., with occasional Ash, Spruce sp., Beech, Rowan and Birch. The ground flora is grass-dominated with Yorkshire-fog, Creeping soft-grass and Cock's-foot and occasional Bramble, Welsh poppy (*Meconopsis cambrica*), Cleavers, Foxglove, Common nettle, Hard-fern and Polypody (*Polypodium vulgare*).
71	NJ899148	Skate Wood – Mature broad-leaved woodland of plantation origin but with semi-natural characteristics. Canopy comprised of mature Downy birch, Rowan and occasional Scot's pine with naturally regenerating young trees and saplings. The ground flora is dominated by Yorkshire-fog, Creeping soft-grass, Broad buckler-fern and Lady-fern, with occasional Sweet vernal-grass, Wood meadow-grass, Wood-sorrel. In localised areas, a network of narrow wet drainage ditches is present with Water forget-me-not, *Sphagnum spp.* and other moss spp present. Around the edges of the wood mature Wych elm are located.
72	NJ905154	Northwest corner of Littlejohn's Wood. Young semi-natural broad-leaved woodland in area with numerous trees stumps indicating presence of former plantation. Most of habitat area comprises Birch woodland with young, dense canopy of Downy birch and Silver birch and occasional Rowan over a ground flora with Broad buckler-fern, Wavy hair-grass, Wood-sorrel and Chickweed-wintergreen. Towards the north of the habitat area, the canopy becomes increasingly open with a mosaic of wet heath and acid grassland being the dominant habitat type. Wavy hair-grass and Heather are dominant with occasional Chickweed-wintergreen, Heath bedstraw, Common sedge, Red fescue, Purple moor-grass (*Molinia caerulaea*), *Sphagnum spp.* , Bilberry, Hard-fern, Heath wood-rush, Climbing corydalis, Cross-leaved heath, Heath rush, Mat-grass and Tormentil. Along the north and west boundaries of the wood, a line of mature Beech is present, planted along the lines of old and defunct dry stone walls.
73	NJ907153	Semi-mature coniferous plantation, comprising blocks with semi-mature Sitka spruce and occasional broad-leaved species such as Rowan, Birch and Beech around the edges of the woodland.
74	NJ907154	Semi-mature broad-leaved woodland of plantation origin, with semi-natural characteristics. Canopy dominated by mature Downy birch with occasional Rowan and Silver birch over a ground flora comprising ericoid and grassland species. Dominant species include Heather, Wavy hair-grass, Cross-leaved heath, *Sphagnum spp.* and Soft rush with occasional Star sedge, Common sedge, Broad buckler-fern, Climbing corydalis, Chickweed-wintergreen, Creeping bent, Wood-sorrel and Heath bedstraw. Mature Beech trees along the boundary with the coniferous plantation to the south are a continuation of the line noted in TN72.
75	NJ907155	Marshy grassland to north of Littlejohn's Wood (TN72- TN74). Large field predominantly comprised of marshy grassland. Sward dominated by Yorkshire-fog, Soft rush and Creeping buttercup with abundant Greater bird's-foot-trefoil, Common nettle, Common ragwort, Meadow vetchling, Common mouse-ear, Tufted hair-grass, Cock's-foot, Creeping thistle and Common valerian.
76	NJ908156	Mature broad-leaved woodland north of B977 and at west end of Red Moss (Parkhill) (see TN79). Canopy comprising semi-natural Birch woodland with a diverse age structure. Canopy species include dominant Downy birch and Silver birch with abundant Rowan. In localised areas Willow sp. carr (with Grey willow and Goat willow) is located in areas with poor drainage, particularly along drainage ditches in the north of the habitat area. In most of the woodland the ground conditions are generally dry with a woodland ground flora dominated by species such as Wavy hair-grass, Sweet vernal-grass, Creeping soft-grass, Broad buckler-fern, Common bent, Climbing corydalis and Lady-fern with occasional Wood-sorrel, Chickweed-wintergreen, Yorkshire-fog, and Male-fern. In wetter areas, the ground flora comprises Soft rush, Yorkshire-fog and *Sphagnum spp.* with occasional Common sedge and Wood horsetail In the southeast of the wood, an overgrown track leads northward from the B977 into the wood. The birch woodland extends to this path with extensive areas with a wet ground flora that includes Soft rush and Common cotton-grass tussocks with abundant Wavy hair-grass and Common sedge. Numerous small open areas remain within the wood which maintains localised areas of wet heath and acid grassland habitats dominated by Heather, Wavy hair-grass, Cross-leaved heath, Heath bedstraw and Common sedge. Adjacent to the path, there are localised areas with grass species and introduced escapes. These include naturalised stands of Japanese Knotweed (*Fallopia japonica*), Monbretia (*Crocosmia x crocosmiflora*), Bridewort (*Spiraea sp.*), and Glandular globe-thistle (*Echinops sphaerocephalus*).
77	NJ912154	Habitat area to south of B977, with line of mature Beech along roadside, with mosaic of wet heath, acid grassland and dense scrub habitats. Wet heath is mainly present in a zone

Target Note No	Grid Ref	Description
		approximately 30-50m wide, adjacent to the road, and is dominated by Heather, Cross-leaved heath and Bilberry. Acid grassland is dominated by Wavy hair-grass, Yorkshire-fog, Tormentil and Heath bedstraw and occurs in between areas of dense and scattered Gorse scrub. Other species present include Heath wood-rush, Climbing corydalis, Broad buckler-fern, Lady-fern, Chickweed-wintergreen, Common sorrel and Common sedge. Scattered young and semi-mature trees are located throughout the habitat area, including Silver birch, Downy birch, Rowan, and occasional Sycamore and Ash.
78	NJ912156	Extensive area comprising a mosaic of wet heath, acid grassland and semi-natural broad-leaved woodland. Most of the area maintains wet heath vegetation, dominated by ericoid shrubs including Heather, Cross-leaved heath, Bell heather, with abundant Wavy hair-grass, Heath bedstraw, Tormentil, Common sedge. Woodland is encroaching in many areas with Birch saplings abundant throughout. Around the north, west and south sides of the heath habitat, broad-leaved woodland forms a closed canopy of Downy birch, Silver birch, Rowan and Goat willow over a ground flora with Wavy hair-grass, Creeping soft-grass, Common sedge, Climbing corydalis and Yorkshire-fog co-dominant. Along the east side, adjacent to a field of improved grassland, a strip of semi-improved acid grassland is present, dominated by Wavy hair-grass, Red fescue with Common sedge, Tormentil and Heath bedstraw.
79	NJ913160	Red Moss-Parkhill. Raised bog habitats to north of B977. Extensive area of raised bog habitat, most of which has been affected by peat extraction, drainage and encroachment by birch woodland. An elevated dome structure is present within the raised bog despite the degraded nature of large areas of the moss. The highest point of the moss in the northeast of the habitat area has localised areas with dry modified bog habitat with well-drained, leggy Heather-dominated vegetation with a few areas that retain peat hags. The majority of the bog vegetation comprises wet modified bog vegetation with mature well-drained areas of peat, dominated by mature Heather with *Cladonia* sp. lichens abundant amongst the Heather and occasional Wavy hair-grass, Hare's-tail cotton-grass, Deergrass, Narrow buckler-fern and Cross-leaved heath. In areas where the effects of drainage are less pronounced, species such as Hare's-tail cotton-grass become co-dominant with Heather, and *Sphagnum spp.* present in wet hollows. In many areas of the bog, the evidence of past peat cutting activities remain in the form of cutting edges in the peat and level areas of bog of different heights. In these lower areas, the peat surface is much wetter and the vegetation shows increased Hare's-tail cotton-grass and *Sphagnum spp.* with occasional bog pools present. In the southeast corner of the bog Birch-dominated lagg woodland has developed on lower ground around the bog.
80	NJ914158	Former landfill site, now closed and comprising bare ground with sparse cover of short ephemeral species. Around the north edge of the dump, a line of dumped rubble and gravel marks the boundary between it and the bog. This substrate has become vegetated with grass species such as Yorkshire-fog, False oat-grass (*Arrhenatherum elatius*) and Cock's-foot, and herbaceous species that include locally abundant Lady's-mantle (*Alchemilla vulgaris agg.*), Viper's bugloss (*Echium vulgare*), Selfheal, Tormentil, Creeping buttercup, Bramble, and Climbing corydalis.
81	NJ915156	Moss Belt. Semi-mature Mixed Woodland of plantation origin with a canopy dominated by Norway spruce with abundant Rowan, Sycamore and a line of mature Beech that continues from a similar feature to the west. The ground flora is relatively species–poor with Broad buckler-fern, Yorkshire-fog, Wavy hair-grass and Wood-sorrel abundant.
82	NJ916155	Narrow strip of mature broad-leaved woodland, of plantation origin but long-established and with semi-natural characteristics. Canopy comprised of mature Beech with occasional Rowan and Birch over a species-poor ground flora with Broad buckler-fern, Creeping soft-grass and Wood-sorrel.
83	NJ917155	Broad-leaved woodland in southwest corner of Red Moss (south of B977), east of Lochgreens Road. Most of woodland is comprised of mature Rowan and Downy birch with mature Beech around the southern edge and occasional localised stands of Norway spruce scattered throughout. Ground flora is relatively species-poor dominated by Broad buckler-fern with occasional Creeping soft-grass, Rough meadow-grass, Wood-sorrel and Bramble. A ride/path beside a deep, wet drainage ditch passes through the woodland in a roughly west-east direction, with more open conditions supporting a more diverse ground layer that includes Cock's-foot, Soft rush, Sharp-flowered rush, Broad-leaved dock, Tormentil, Selfheal, Oval sedge (*Carex ovalis*) and Common sorrel.
84	NJ917157	Open habitats under Electricity Transmission Lines that extend in north-south direction. South of the ride/path, these habitats are mainly Broad buckler-fern-dominated tall non-ruderal habitats, with a small area of Soft rush-dominated marshy grassland adjacent to the path, with additional

Target Note No	Grid Ref	Description
		Yorkshire-fog, Wavy hair-grass and Common sorrel. North of the ride, marshy grassland is more extensive adjacent to a wet drainage ditch, with Soft rush, Sharp-flowered rush, Common sorrel, Yorkshire-fog, Creeping thistle, and occasional Broad buckler-fern, Foxglove, Greater bird's-foot-trefoil. North of the wet ditch, there is a mosaic of wet heath and acid grassland with Heather dominant with occasional Yorkshire-fog, Cross-leaved heath, Yorkshire-fog, Wavy hair-grass, Common sedge, Hare's-tail cotton-grass, Chickweed-wintergreen, Red fescue, Tormentil, Heath bedstraw and abundant Birch saplings
85	NJ920158	Raised Bog vegetation on Red Moss (Parkhill), south of B977, with a strip of dense Gorse scrub present along the south side of the B977. Wet modified bog habitats comprise the majority of this habitat area. In the northeast of this habitat area, the bog has been degraded by drainage and cutting to resemble a wet heath and acid grassland mosaic, dominated by Heather with Heath bedstraw, Wavy hair-grass, and occasional Cross-leaved heath, with Soft rush, *Sphagnum spp.* , Lady-fern and Grey willow scattered along ditches. The majority of the moss comprises Heather-dominated bog vegetation, with extensive indications of past cutting activities. Numerous paths lead from the southern edge of the moss into the peat deposits where block cutting has resulted in large areas of different levels of peat. The highest ground, with deepest peat retains a raised bog appearance with relatively dry and mature Heather-dominated vegetation. On lower levels, the peat surface is wetter, and Hare's-tail cotton-grass and Cross-leaved heath are co-dominant with Heather often with abundant Wavy hair-grass, and *Sphagnum spp.* pools. In the lower areas of the moss, the vegetation is dominated by Hare's-tail cotton-grass tussocks and *Sphagnum spp.* pools. Encroachment by young trees is occurring in most areas of the moss, mostly Birch with occasional Rowan and Spruce sp.. Birch density increases towards the south and southeast of the moss where semi-natural Birch woodland is dominant, with occasional Rowan, Goat willow and Grey willow in wetter areas and adjacent to drainage ditches. In these areas of woodland, the ground flora includes *Sphagnum spp.* , Creeping soft-grass, Lady-fern, Male-fern, Broad buckler-fern, Bramble, Wavy hair-grass, Yorkshire-fog and Bracken in more open areas.
86	NJ925156	Mature broad-leaved woodland along south of Red Moss. Canopy dominated by Birch with occasional Goat willow and Rowan with wet ground conditions in many areas, and a ground flora that includes abundant Creeping soft-grass, Broad buckler-fern, Lady-fern, Male-fern and *Sphagnum spp.* . South of the west-east path and wet ditch, the woodland is drier with mature Beech and Spruce sp. trees present around the edges.
87	NJ921154	Red Moss (Parkhill) – eastern section. East of large drainage ditch, the moss comprises wet modified bog habitats dominated by Heather, with Cross-leaved heath, Hare's-tail cotton-grass and Wavy hair-grass. Localised areas of dense broad-leaved plantation woodland are present with relatively extensive stands of Bracken, particularly along the southeast edge of the moss.
88	NJ911147	Loch Hills Farm Quarry. Predominantly bare ground but with localised area of short ephemeral and Semi-improved grassland on disturbed ground around the edge of the quarry. Ruderal species include Creeping buttercup, Yorkshire-fog, Sheep's sorrel, Pineappleweed (*Matricaria discoidea*), Broad-leaved willowherb (*Epilobium montanum*), Rosebay willowherb, Creeping thistle, Curled dock, Greater plantain (*Plantago major*), Common ragwort, White clover and Field forget-me-not (*Myosotis arvensis*).
89	NJ912149	Artificial pond adjacent to farm track and north of Loch Hills Farm. Medium-sized pond approximately 50 x 10m with aquatic spp including Water cress, and Branched bur-reed (*Sparganium erectum*) and marginal species including Soft rush, Celery-leaved buttercup, Broad-leaved dock, Common spike-rush (*Eleocharis palustris*) and Common club-rush . The banks of the pond support tall herb vegetation (Rosebay willowherb, Broad-leaved dock and Creeping thistle), grassland species (False oat-grass, Yorkshire-fog, Cleavers and Common vetch) and scattered Grey willow scrub around the south end of the pond.
90	NJ913152	Area of marshy grassland with a small pond in northeast corner of improved grassland field. Marshy grassland dominated by Soft rush, Yorkshire-fog, and Creeping buttercup with abundant Heath bedstraw, Tormentil, Cock's-foot, Sweet vernal-grass, Red fescue and Common sorrel. The pond has Soft rush around the margins with no aquatic vegetation noted.
91		Beech copse south of Lochgreen Farm. Small copse of mature Beech around dry stone walls enclosing small area of semi-improved acid grassland on acid, sandy soil. Approximately six mature trees and several planted young trees over grass dominated by Red fescue, Yorkshire-fog, Creeping soft-grass, and Sweet vernal-grass. A single badger sett was located in this area and tracks were observed around the edges of the surrounding field.
92		Marshy grassland located to north of Corby Loch and occupying southern end of field between it and Lochgreens Farm. Species-rich sward dominated by Yorkshire-fog, Soft rush, Common

Target Note No	Grid Ref	Description
		sorrel, Marsh thistle, Cock's-foot, Greater bird's-foot-trefoil, Creeping buttercup, Common vetch, and Lesser stitchwort in drier areas closest to the field. The ground becomes wetter along the southern edge of the marshy grassland, adjacent to willow carr, where the sward includes dominant Sharp-flowered rush, Meadow buttercup, Marsh cinquefoil, Common reed (*Phragmites australis*) and occasional Common marsh-bedstraw, Cuckoo-flower, Ragged-robin, Yellow-rattle and Meadow vetchling.
93		Willow carr along northern edge of Corby/Lily Loch SSSI, comprised of a dominant but uncontinuous canopy of Goat willow and Grey willow> 5m in height, interspersed with Common reed-dominated swamp/marshy grassland. The Common reed extends under the Willow sp. canopy, with other species present including Marsh pennywort, Common marsh-bedstraw, Meadow buttercup, Sharp-flowered rush, Rough meadow-grass, Marsh cinquefoil, Marsh thistle, and occasional Marsh violet and Devil's-bit scabious. Corby and Lily Loch are designated as a SSSI.
94		Marshy grassland forming a strip of habitat north of Lily Loch, along northern edge of SSSI area, immediately to south of rocky outcrop with dense Gorse scrub. Sward is dominated by Soft rush, Marsh thistle with occasional Common sedge, Carnation sedge (*Carex panicea*), Bottle sedge, and Hare's-tail cotton-grass with numerous drier areas with Common sedge, Wavy hair-grass, Heath wood-rush, Sweet vernal-grass, and Tormentil. Corby and Lily Loch are designated as a SSSI.
95		Basin mire / swamp vegetation southwest of Lily Loch. Floating mat of vegetation dominated by Bottle sedge (approximately 60-70% cover) with clumps of Heather (ca. 20-30% cover). *Sphagnum spp.* is very abundant throughout, with abundant Heath spotted-orchid (*Dactylorhiza maculata*), Chickweed-wintergreen, Marsh cinquefoil, Marsh violet, Common marsh-bedstraw, White sedge (*Carex curta*), Hare's-tail cotton-grass, Marsh willowherb (*Epilobium palustre*), Bog stitchwort and occasional Devil's-bit scabious. Occasional Willow sp. and Birch saplings have become established within the mire vegetation. Corby and Lily Loch are designated as a SSSI.
96		Lily Loch – open water with swamp vegetation forming margins around the N, NW and NE, and dominated by Bottle sedge, with occasional Reed sweet-grass, Marsh-marigold, Water forget-me-not, Common marsh-bedstraw and Water cress. In the NW corner of the loch, the swamp forms a wide margin (>10m) with Bottle sedge, Reed canary-grass, Soft rush, Water horsetail and Reed sweet-grass co-dominant. A former drain extends in an east direction from Southern end of Lily Loch towards Corby Loch. Vegetation has choked the drain, and now comprises a strip of marshy grassland dominated by Soft rush, Yorkshire-fog, Marsh thistle, Common sorrel, Common marsh-bedstraw, Tufted hair-grass and Reed sweet-grass and occasional Heath spotted-orchid, Broad buckler-fern, Tormentil, and Common sedge. Corby and Lily Loch are designated as a SSSI.
97		Extensive area of wet heath habitat located between Lily Loch and Corby Loch forming relatively well-drained area of the basin mire system. Heather forms approximately 50-60% cover, with co-dominant Cross-leaved heath and occasional *Sphagnum spp.* and other moss species abundant in wetter areas. Wavy hair-grass is locally dominant in areas of acid grassland, forming tussocks with abundant Yorkshire-fog, Common sorrel, Heath wood-rush, Marsh thistle, Sheep's sorrel, Tormentil, Hare's-tail cotton-grass, Crowberry. Throughout the habitat area, there are scattered Silver birch, Downy birch, Goat willow,and Grey willow trees and Gorse scrub. Occasional waterlogged drains are present that support Water forget-me-not, Water cress and occasional Reed sweet-grass. Corby and Lily Loch are designated as a SSSI.
98		Corby Loch. Western shore of Loch is fringed with reedbeds comprised of *Phragmites*-dominated swamp vegetation, backed by willow carr as described inTN93. Corby and Lily Loch are designated as a SSSI.
99		Corby Loch – North and east shore are comprised of grazed grassland (semi-improved) extending to the shoreline. An angling association manages these areas and there are numerous rocky areas along the shore. In localised areas, a relatively species-rich herbaceous cover has developed with Marsh cinquefoil, Heath bedstraw,Marsh ragwort, Hedge woundwort, Water

Target Note No	Grid Ref	Description
		forget-me-not, Reed sweet-grass, Common nettle, Common sorrel, Reed canary-grass, all abundant with occasional Grey willow scrub. Within the loch, there is occasional Common spike-rush, with Yellow water-lily (*Nuphea lutea*) present along the northern shore west of the boathouse. Corby and Lily Loch are designated as a SSSI.
100		Extensive area of marshy grassland north of Corby Loch and extending to northern shore. Grazed with sward dominated by Soft rush, Bottle sedge, and abundant Yorkshire-fog, Common sorrel, Marsh cinquefoil, Marsh thistle, Heath spotted-orchid, Northern marsh-orchid, Marsh pennywort, and occasional Marsh-marigold, Ragged-robin, Yellow-rattle, Meadow vetchling, Lesser stitchwort and Willow sp. scrub. In Bottle sedge dominated areas, the ground is permanently wet with abundant Broad-leaved pondweed, Sharp-flowered rush, Cuckoo-flower, and Lesser spearwort (*Ranunculus flammula*).
101		Low intensity pasture in fields northeast of Corby Loch. Most areas comprise species-poor semi-improved grassland, with frequent clumps of Gorse along field margins and in field corners. Marsh grassland is present in low-lying areas with impeded drainage, dominated by Soft rush, Tufted hair-grass and Yorkshire-fog.
102		Recently planted plantation over former agricultural fields. Trees young, many still in protective collars, planted in blocks surrounded by species-poor semi-improved grassland with dominant Yorkshire-fog, Cock's-foot, Broad-leaved dock, Creeping thistle and False oat-grass. Broad-leaved woodland plantation blocks around edges of area with larger blocks of Sitka spruce in central areas.
103		District Wildlife Site. Pond adjacent to unclassified road near Newton of Shielhill and adjacent to sand/gravel quarry. Managed by local angling club, with swamp and marginal vegetation around edges, including Soft rush, Common club-rush, Bogbean (*Menyanthes trifoliata*), Celery-leaved buttercup, Meadow buttercup, Yorkshire-fog, Common sorrel and Great willowherb (*Epilobium hirsutum*).
104		Small broad-leaved woodland plantation along banks of Gourdie Burn. Canopy comprised of semi-mature Goat willow, Alder and White willow over a ground layer of semi-improved grassland, which is wet in localised areas, and dominated by Yorkshire-fog, Creeping buttercup, Broad-leaved dock, Meadowsweet, Hedge woundwort, Ground elder and occasional Soft rush. Downstream of this plantation, the Gourdie Burn flows through a heavily grazed meadow of improved grassland that has dense stands of Gorse scrub and occasional Common nettle, Broad-leaved dock, Creeping thistle and Creeping buttercup
105		Mature Beech plantation south of Butterywells farm. Canopy of relatively open Beech, over a ground layer dominated by species-poor semi-improved grassland, including Yorkshire-fog, Creeping soft-grass and Cock's-foot.
106		Coniferous plantation to north of Harehill Farm, comprising blocks of relatively young and semi-mature spruce. Northeast of the farm there is a relatively young mixed plantation.
107		Scattered scrub and bracken vegetation in areas of species-poor semi-improved grassland on relatively steep slopes on either bank of Gourdie Burn, north of Harehill Farm.
108		Plantation woodland east of Blackdog Industrial estate. Young plantation woodland dominated by Spruce sp. with scattered broad-leaved species around the perimeter including Ash, Sycamore and Alder. East of this area there is a small block of broad-leaved woodland plantation with young Ash, Sycamore, Birch, Alder and Willow sp. over species-poor semi-improved grassland with abundant Creeping thistle and Curled dock.
109		Mosaic of open grassland habitats associated with a firing range, comprising predominantly semi-improved acid grassland with areas of marshy grassland at the north and south ends. The acid grassland is dominated by Yorkshire-fog, Red fescue and Cock's-foot with abundant tall ruderal and scattered scrub species that include Creeping thistle, Curled dock, Common nettle and Soft rush with scattered Gorse throughout. In areas of poor drainage, Soft rush becomes dominant with Tufted hair-grass and occasional Marsh ragwort, Common mouse-ear, Wild pansy (*Viola tricolor*), Creeping buttercup and Red clover (*Trifolium pratense*).
		Mosaic of habitats west of existing A90, associated with southeast end of sand and gravel quarry. Along the roadside there is an area of semi-improved acid grassland, with Red fescue, Yorkshire-fog, Cock's-foot, Tufted hair-grass and occasional Creeping thistle, Common ragwort and Ribwort

Target Note No	Grid Ref	Description
		plantain. To the north of this is a small block of mixed plantation woodland with Spruce sp., Pine sp., Beech, White poplar (*Populus alba*), Alder, Willow sp. and occasional Gorse and Broom. West of this area, the vegetation comprised scattered tall ruderal and scrub species over species-poor semi-improved grassland, including abundant Broom, Gorse, Creeping thistle and Curled dock. In the southwest of this habitat area, a small waterbody supports open water with little marginal vegetation.

Species List

Latin Name	Common Name
Abies sp.	Fir sp.
Acer platanoides	Norway maple
Acer pseudoplatanus	Sycamore
Achillea millefolium	Yarrow
Aegopodium podagraria	Ground elder
Aesculus hippocastanum	Horse chestnut
Agrostis capillaris	Common bent
Agrostis stolonifera	Creeping bent
Ajuga reptans	Bugle
Alchemilla vulgaris agg.	Lady's-mantle
Alliaria petiolata	Garlic mustard
Allium ursinum	Ramsons
Alnus glutinosa	Alder
Alopecurus geniculatus	Marsh foxtail
Alopecurus pratensis	Meadow foxtail
Anemone nemorosa	Wood anemone
Anthoxanthum odoratum	Sweet vernal-grass
Anthriscus sylvestris	Cow parsley
Arrhenatherum elatius	False oat-grass
Athyrium felix-femina	Lady-fern
Bellis perennis	Common daisy
Betula pendula	Silver birch
Betula pubescens	Downy birch
Betula sp.	Birch
Blechnum spicant	Hard-fern
Callitriche stagnalis sens. lat.	Common water-starwort
Calluna vulgaris	Heather
Caltha palustris	Marsh-marigold
Cardamine amara	Large bitter-cress
Cardamine pratensis	Cuckoo-flower
Carex binervis	Green-ribbed sedge
Carex curta	White sedge
Carex echinata	Star sedge
Carex flacca	Glaucous sedge
Carex nigra	Common sedge
Carex ovalis	Oval sedge

Latin Name	Common Name
Carex panicea	Carnation sedge
Carex pilulifera	Pill sedge
Carex rostrata	Bottle sedge
Carex sp.	Sedge sp
Castanea sativa	Sweet chestnut
Centaurea nigra	Common knapweed
Cerastium fontanum	Common mouse-ear
Chamerion angustifolium	Rosebay willowherb
Chrysosplenium oppositifolium	Opposite-leaved golden-saxifrage
Cicerbita macrophylla	Common blue-sowthistle
Cirsium arvense	Creeping thistle
Cirsium palustre	Marsh thistle
Cirsium vulgare	Spear thistle
Claytonia sibirica	Pink purslane
Conopodium majus	Pignut
Cornus sp.	Dogwood sp.
Ceratocapnos claviculata	Climbing corydalis
Corylus avellana	Hazel
Crassula helmsii	New Zealand pygmyweed
Crataegus monogyna	Hawthorn
Crepis capillaris	Smooth hawk's-beard
Crocosmia x crocosmiflora	Monbretia
Cynosurus cristatus	Crested dog's-tail
Cytisus scoparius	Broom
Dactylis glomerata	Cock's-foot
Dactylorhiza fuchsii	Common spotted-orchid
Dactylorhiza maculata	Heath spotted-orchid
Dactylorhiza purpurella	Northern marsh-orchid
Deschampsia cespitosa	Tufted hair-grass
Deschampsia flexuosa	Wavy hair-grass
Digitalis purpurea	Foxglove
Doronicum pardalianches	Leopard's-bane
Dryopteris affinis	Scaly male-fern
Dryopteris carthusiana	Narrow buckler-fern
Dryopteris diltata	Broad buckler-fern
Dryopteris felix-mas	Male-fern

Latin Name	Common Name
Echinops sphaerocephalus	Glandular globe-thistle
Echium vulgare	Viper's bugloss
Eleocharis palustris	Common spike-rush
Elodea canadensis	Canadian waterweed
Elytrigia repens	Common couch
Empetrum nigrum	Crowberry
Epilobium hirsutum	Great willowherb
Epilobium montanum	Broad-leaved willowherb
Epilobium palustre	Marsh willowherb
Equisetum arvense	Field horsetail
Equisetum fluviatile	Water horsetail
Equisetum sylvaticum	Wood horsetail
Equisetum x litorale	Shore horsetail
Erica cinerea	Bell heather
Erica tetralix	Cross-leaved heath
Eriophorum angustifolium	Common cotton-grass
Eriophorum vaginatum	Hare's-tail cotton-grass
Euphrasia officinalis agg.	Eyebright
Fagus sylvatica	Beech
Fallopia japonica	Japanese Knotweed
Festuca ovina agg.	Sheep's-fescue
Festuca rubra agg.	Red fescue
Filipendula ulmaria	Meadowsweet
Fontinalis antipyretica	Water moss
Fragaria vesca	Wild strawberry
Fraxinus excelsior	Ash
Fumaria muralis	Common ramping-fumitory
Galeopsis speciosa	Large-flowered hemp-nettle
Galeopsis tetrahit	Common hemp-nettle
Galium aparine	Cleavers
Galium odoratum	Woodruff
Galium palustre	Common marsh-bedstraw
Galium saxatilis	Heath bedstraw
Geranium pratense	Meadow crane's-bill
Geranium robertianum	Herb-robert
Geum rivale	Water avens
Geum urbanum	Wood avens
Glyceria fluitans	Floating sweet-grass

Latin Name	Common Name
Glyceria maxima	Reed sweet-grass
Hedera helix	Ivy
Heracleum mantegazzianum	Giant hogweed
Heracleum spondylium	Hogweed
Hesperis matronalis	Dame's violet
Hypericum humifusum	Trailing St-John's-wort
Hypericum perforatum	Perforate St-John's-wort
Hypericum pulchrum	Slender St-John's-wort
Hypericum sp.	St-John's wort
Ilex aquifolium	Holly
Iris pseudacorus	Yellow iris
Holcus lanatus	Yorkshire-fog
Holcus mollis	Creeping soft-grass
Hyancinthoides non-scripta	Bluebell
Hydrocotyle vulgaris	Marsh pennywort
Hypochaeris radicata	Cat's-ear
Juncus acutiflorus	Sharp-flowered rush
Juncus articulatus	Jointed rush
Juncus bufonius	Toad rush
Juncus effusus	Soft rush
Juncus filiformis	Thread rush
Juncus squarrosus	Heath rush
Laburnum anagyroides	Laburnum
Lamium purpureum	Red dead-nettle
Lapsana communis	Nipplewort
Larix decidua	European larch
Lathyrus pratensis	Meadow vetchling
Leontodon autumnalis	Autumn hawkbit
Leucanthemum vulgare	Oxeye daisy
Lolium perenne	Perennial rye-grass
Lonicera periclymenum	Honeysuckle
Lotus corniculatus	Common bird's-foot-trefoil
Lotus pedunculatus	Greater bird's-foot-trefoil
Luzula multiflora	Heath wood-rush
Luzula pilosa	Hairy wood-rush
Luzula sylvatica	Great wood-rush
Lychnis flos-cuculi	Ragged-robin

Latin Name	Common Name
Lysichiton americanus	American skunk-cabbage
Matricaria discoidea	Pineappleweed
Meconopsis cambrica	Welsh poppy
Mentha aquatica	Water mint
Menyanthes trifoliata	Bogbean
Mercurialis perennis	Dog's mercury
Milium effusum	Wood millet
Mimulus guttatus	Monkey flower
Molinia caerulaea	Purple moor-grass
Myosotis arvensis	Field forget-me-not
Myosotis discolor	Changing forget-me-not
Myosotis scorpioides	Water forget-me-not
Myosotis sylvatica	Wood forget-me-not
Myriophyllum spicatum	Spiked water-milfoil
Myrrhis odorata	Sweet cicely
Nardus stricta	Mat-grass
Nuphea lutea	Yellow water-lily
Oxalis acetosella	Wood-sorrel
Papaver sp.	Poppy sp.
Petasites hybridus	Butterbur
Phalaris arundinacea	Reed canary-grass
Philadelphus sp.	Mock-orange sp.
Phleum pratense	Timothy
Phragmites australis	Common reed
Picea abies	Norway spruce
Picea sitchensis	Sitka spruce
Picea sp.	Spruce sp.
Pilosella aurantiacum	Fox-and-cubs
Pilosella officnarum	Mouse-ear hawkweed
Pinus sp.	Pine sp.
Pinus sylvestris	Scot's pine
Plantago lanceolata	Ribwort plantain
Plantago major	Greater plantain
Poa nemoralis	Wood meadow-grass
Poa pratensis agg.	Smooth meadow-grass
Poa trivialis	Rough meadow-grass
Polygala serpyllifolia	Heath milkwort
Polygonum aviculare	Knotgrass

Latin Name	Common Name
Persicaria bistorta	Common bistort
Persicaria maculosa	Redshank
Polypodium vulgare	Polypody
Polytrichum sp.	Polytrichum sp.
Populus alba	White poplar
Populus sp.	Poplar sp.
Populus tremula	Aspen
Potamogeton natans	Broad-leaved pondweed
Potamogeton obtusifolius	Blunt-leaved pondweed
Potamogeton polygonifolius	Bog pondweed
Potamogeton pusillus	Lesser pondweed
Potamogeton sp.	Pondweed sp.
Potentilla anserina	Silverweed
Potentilla erecta	Tormentil
Potentilla palustris	Marsh cinquefoil
Prunella vulgaris	Selfheal
Prunus avium	Wild cherry
Prunus laurocerasus	Laurel
Prunus padus	Bird cherry
Prunus spinosa	Blackthorn
Pseudotsuga menziesii	Douglas fir
Pteridium aquilinum	Bracken
Quercus petraea	Sessile Oak
Quercus robur	Pedunculate oak
Quercus sp.	Oak
Ranunculus acris	Meadow buttercup
Ranunculus flammula	Lesser spearwort
Ranunculus repens	Creeping buttercup
Ranunculus sceleratus	Celery-leaved buttercup
Rhinanthus minor	Yellow-rattle
Rhododendron ponticum	Rhododendron
Ribes rubrum	Red currant
Rorippa nasturtium-aquaticum agg.	Water cress
Rosa canina agg..	Dog rose
Rosa sp.	Domestic rose
Rubus fruticosus agg.	Bramble
Rubus idaeus	Raspberry

Latin Name	Common Name
Rumex acetosa	Common sorrel
Rumex acetosella	Sheep's sorrel
Rumex crispus	Curled dock
Rumex obtusifolius	Broad-leaved dock
Rumex sp.	Dock spp.
Salix alba	White willow
Salix aurita	Eared willow
Salix caprea	Goat willow
Salix cineraea	Grey willow
Salix fragilis	Crack willow
Salix sp.	Willow sp.
Sambuca nigra	Elder
Schoenoplectus lacustris	Common club-rush
Scrophularia nodosa	Common figwort
Selaginella selaginoides	Lesser clubmoss
Senecio jacobea	Common ragwort
Senecio aquaticus	Marsh ragwort
Silene dioica	Red campion
Sorbus aria agg.	Common whitebeam
Sorbus aucuparia	Rowan
Sorbus intermedia	Swedish whitebeam
Sparganium angustifolium	Floating bur-reed
Sparganium erectum	Branched bur-reed
Sphagnum spp.	
Spiraea sp.	Bridewort
Stachys sylvatica	Hedge woundwort
Stellaria uliginosa	Bog stitchwort
Stellaria graminea	Lesser stitchwort
Stellaria media	Common chickweed
Succisa pratensis	Devil's-bit scabious
Symphoricarpos albus	Snowberry
Symphytum officinale	Common comfrey
Taraxacum agg.	Dandelion
Taxus baccata	Yew
Teucrium scorodonia	Wood sage
Tilia x europaea	Common Lime
Trichophorum cespitosum	Deergrass
Trientalis europaea	Chickweed-wintergreen

Latin Name	Common Name
Trifolium campestre	Hop trefoil
Trifolium pratense	Red clover
Trifolium repens	White clover
Tussilago farfara	Colt's-foot
Typha latifolia	Bulrush
Ulex europaeus	Gorse
Ulmus glabra	Wych elm
Urtica dioica	Common nettle
Vaccinium myrtillis	Bilberry
Valeriana officinalis	Common valerian
Veronica beccabunga	Brooklime
Veronica chamaedrys	Germander speedwell
Veronica officinalis	Heath speedwell
Vicia cracca	Tufted vetch
Vicia sativa	Common vetch
Vicia sepium	Bush vetch
Vinca minor	Lesser periwinkle
Viola palustris	Marsh violet
Viola riviniana	Common dog-violet
Viola tricolour	Wild pansy
x Cupressocyparis leylandii	Leyland cypress

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

Species Action Plans

Wych Elm (*Ulmus glabra*) L BAP

Wych elm is suffering from Dutch elm disease and an associated lack of planting across the UK. However, it remains common in NE Scotland, due to less favourable conditions for the disease than farther south. It is an important tree to the landscape, culture and wildlife of NE Scotland. The species is not listed in the UK BAP, but this L BAP reflects the importance of the species in the region.

Objectives:

- Principal objective is to ensure the survival of the wych elm population in NE 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

Local HAPs are in the process of being developed across six broad types of habitat. Of these, two 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

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 that are important to biodiversity and landscape, including dry stone walls (drystane dykes), hedges, ditches and burns.

National/Local Objectives

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 NE Scotland of 765 hectares of cereal margins created or managed for biodiversity by 2010.

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 NE Scotland.

Protection of all drystane 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)

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

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:

- Maintain, improve and restore by management, the biodiversity of 15,000 ha of cereal field margins on appropriate soil types in the UK by 2010.
- 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.

The principal local objective of the LHAP is to conserve and enhance the biodiversity of farmland in NE 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 NE Priority)

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.

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.

They are also more aesthetically pleasing than improved grasslands, contributing colour and character to the landscape.

Objectives

At a national level this broad habitat is broken down into narrower habitat definitions, each containing 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.

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

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 3,200 ha to native wet woodland.
- Create, by colonisation or planting, 6,750 ha on unwooded or ex-plantation sites.

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.
- 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

This LHAP covers the UK Priority Habitat of Lowland Wood Pastures and Parkland.

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 NE Scotland, parkland covers approximately 2,200ha, whereas wood pasture covers approximately 100ha.

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

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 2,500ha 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.

At local level objectives include:

- Maintain and enhance the ancient wood-pasture and parkland habitats and identified important boundary trees of NE 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.
- Protect and enhance existing habitat.
- Raise awareness of these habitats.

Habitat Type: Montane, Heath and Bog

Lowland Raised Bog LHAP

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

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 4,000ha of degraded bog.

- Rehabilitate a further 7,000ha of severely damaged sites, either cut-over or afforested, with the aim of encouraging raised bog vegetation.

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)

This LHAP covers the UK Broad/Locally Important habitat of Rivers and Streams. Running waters of NE 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

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.

At the local level, objectives include:

- Maintain and improve all NE 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 NE 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 NE river systems.
- Increase understanding of local people and public participation in lessening impact on water quality and habitats.

Other LHAPs in development

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 & Floodplain grazing marsh, and Fen, Carr, Marsh, Swamp and Reedbed.
- **Lochs and Ponds** – to cover Mesotrophic lochs, standing open water and Ponds.