Appendix A10.4 - Breeding Birds

B1033200 July 2007

Jacobs U.K. Limited 95 Bothwell Street, Glasgow G2 7HX

Tel 0141 204 2511 Fax 0141 226 3109

Contents

1 Introduction

1.1 Project Background

1.1.1 This Appendix reports the assessment of potential impacts on breeding birds 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 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 breeding birds 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 Environmental 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.

Survey Aims

1.1.4 This report provides an assessment of the current status of breeding bird populations in the vicinity of the Northern Leg of the proposed scheme and the potential impacts associated with construction and operation. Measures are proposed to mitigate these impacts, and an assessment is made of the residual impacts remaining after mitigation is implemented.

1.1.5 A wintering bird assessment has also been undertaken and is provided as Appendix A10.5.

Report Structure

1.1.6 This report is presented in the following structure:

- an overview of the legislative status and protection of bird populations;
- a summary of previous survey information;
- the objectives and limitations of the present survey;
- survey and impact assessment methods;
- baseline information including survey results;
- an evaluation of the area's sensitivity/importance for birds;
- an assessment of the potential development impacts;
- mitigation proposals are described, where and when appropriate; and
- an assessment of residual impacts of the proposed scheme following mitigation.

Study Area

1.1.7 For the purpose of this report, the study area is defined as comprising all areas within 500m of the Northern Leg of the proposed scheme.

1.2 Legislation and Conservation Status of Birds

National Legislative Protection

Wildlife and Countryside Act 1981 (as amended) and Conservation (Natural Habitats & c.) Regulations 1994

1.2.1 The Wildlife and Countryside Act 1981 (as amended) (WCA) is the principal mechanism for the legislative protection of wildlife in Great Britain and is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the 'Bern Convention') is implemented.

1.2.2 The Conservation (Natural Habitats & c.) Regulations 1994 is the means by which the European Union Directives on the Conservation of Wild Birds (79/409/EEC) and Natural Habitats and Wild Fauna and Flora (92/43/FFC) are implemented in Great Britain.

Nature Conservation (Scotland) Act 2004

1.2.3 The Nature Conservation (Scotland) Act 2004 (NCSA) implements a series of measures designed to conserve and enhance the natural features of Scotland (natural features referring in this context to flora or fauna or geological or geomorphological features) in the context of the natural environment within a wider British, European and global context.

1.2.4 The Act comprises three parts: Part 1 introduces a general duty on public bodies to further the conservation of biodiversity in exercising any of their functions, Part 2 introduces significant changes to the existing arrangements for the establishment and protection of Sites of Special Scientific Interest (SSSIs) while Part 3 extends the protection of birds, animals and plants by revising Part I of the WCA (1981) to include the term 'recklessly'.

1.2.5 The WCA (1981) and NCSA (2004) taken together ensure that all wild birds, their nests and eggs are protected, which with respect to the proposed scheme makes it an offence to;

- intentionally or recklessly kill, injure or take any wild bird;
- intentionally or recklessly take, damage or destroy the nest of any wild bird while it is in use or being built;
- intentionally or recklessly take or destroy the egg of any wild bird; and
- intentionally or recklessly disturb any wild bird listed on Schedule 1 while it is nest building or is at (or near) a nest with eggs or young; or disturb the dependent young of such a bird.

1.2.6 WCA Schedule 1 (WCA1i) bird species are protected by legal penalties at all times.

1.2.7 The Acts additionally provide protection for SSSI, in particular those that are designated for the presence of wild bird populations.

UK Conservation Status of Birds

Biodiversity Action Plans (UK BAP and LBAP)

1.2.8 The UK Biodiversity Action Plan (UK BAP) was the UK's response to the commitments of the Rio Convention on Biological Diversity. The plan outlines action for 26 species of bird of conservation importance/concern and can be viewed at www.ukbap.org.uk.

1.2.9 In addition to having national priorities and targets, action for biodiversity is also taken at a local level. The local North East Scotland Biodiversity Partnership outlines action for 12 national and 22 local bird species and can be viewed at http://www.ukbap.org.uk.

1.2.10 The Scottish Biodiversity Strategy (Scottish Executive, 2004) places a duty of care on public bodies to further the conservation of biodiversity in Scotland, the execution of which is implemented through the local Biodiversity Action Plans (LBAPs).

1.2.11 National Planning Policy Guidance 14 (NPPG 14) outlines planning guidance in relation to the conservation and enhancement of Scotland's natural heritage. NPPG 14 makes the presence of a protected species or habitats in addition to biodiversity habitats/species, a material consideration in the assessment of development proposals and requires planning authorities to take particular care to avoid harm to species or habitats protected under the WCA (1981), European Directives and/or identified as priorities in the UK BAP.

Scottish Biodiversity List

1.2.12 The Scottish Biodiversity List was developed to meet the requirements of Section 2 (4) of the Nature Conservation (Scotland) 2004 and includes a list of species and habitats considered to be of principal importance for the purposes of biodiversity in Scotland. The list provides a guide to empower decision-makers such as public bodies, including local authorities, in implementing their duty to further the conservation of biodiversity in Scotland. At present, the Scottish Biodiversity List includes 38 species of bird and can be viewed at http://www.biodiversityscotland.gov.uk.

Joint Nature Conservation Committee (JNCC) Birds of Conservation Concern 2002 - 2007

1.2.13 The leading government and non-government conservation organisations in the UK have jointly reviewed the population status of 247 bird species that are regularly found within the UK using data from national monitoring schemes.

1.2.14 On the basis of seven quantitative criteria, each species was placed on one of three lists:

- **red** globally threatened, have had an historical population decline in the UK from 1800 - 1995, a rapid (> or = 50%) decline in UK breeding population over the past 25 years or a rapid (> or = 50%) contraction of UK breeding range over the past 25 years).
- **amber** historical population decline from 1800 to 1995, but are recovering; population size has more than doubled over the past 25 years, a moderate (25-49%) decline in UK breeding population over the past 25 years, a moderate (25-49%) contraction of UK breeding range over the past 25 years, a moderate (25-49%) decline in UK non-breeding population over the past 25 years, or species with unfavourable conservation status in Europe also known as Species of European Conservation Concern (SPEC).
- **green** no identified threat to their population status.

1.2.15 Of the 247 species reviewed, 40 species were red-listed, 121 were amber-listed and the remaining 86 were green-listed. A full description of the study can be viewed at http://www.jncc.gov.uk.

2 Methods

2.1 Consultation

2.1.1 Consultation was undertaken with a variety of statutory and non-governmental organisations including Scottish Natural Heritage (SNH), North East Scotland Biological Records Centre (NESBReC), The Scottish Ornithologists' Club (SOC) and The Royal Society for the Protection of Birds (RSPB). These organisations were consulted regarding previous survey information/data and other bird records for the route corridor and wider study area.

2.2 Survey of Breeding Bird Assemblages

Rationale

2.2.1 The survey methods used were developed by Jacobs ecologists (Table 1), in consultation with SNH, from 2004 – 2006, as explained below. The methods used to assess and evaluate habitats within the study area for breeding bird assemblages are then detailed.

Table 1 – Ecologist Experience

Name	Qualifications	Years of Ornithological Experience
Andy Whitfield	MA. & Post-graduate Certificate	15 years
Jonathan Huckle	B.Sc., M.Sc. & PhD	12 years
Jonathan L. Durward	HND & B.Sc.	11 years
Graham A. Rankin	B.Sc. & M.Sc.	10 years
Jonathan Kendrew	B.Sc. & M.Sc.	7 years
Mark M. Jackson	B.Sc. & M.Res	5 years
Alastair J. Miller	B.Sc. & M.Sc.	2 years

2.2.2 Field surveys were directed/undertaken by Graham A. Rankin and Jonathan L. Durward with field assistance from Mark M. Jackson and Jonathan Kendrew. All surveyors are experienced ornithological surveyors with extensive background in identifying birds from observations and from bird song.

Development of Survey Strategy

2.2.3 A preliminary walkover survey of the 500m study area was undertaken in early spring 2004 (following initial consultation with SNH) to assist in the development of an appropriate survey strategy to sample the route corridor for breeding birds.

2.2.4 When developing the survey strategy it was determined through professional judgment and consultation with SNH that a full survey of the entire route corridor of the proposed scheme for breeding bird assemblages would be impractical due to its large size and the excessive resourcing demands such a survey would require. Therefore, it was agreed to survey the route corridor by targeting potentially 'high value' habitats and sampling remaining areas using a Line Transect and Quadrat sampling approach. These methods aimed to provide a 'best value' approach where the survey effort produced a level of baseline information that could be practically achieved while also being sufficient to allow the impacts on bird assemblages to be appropriately assessed.

2.2.5 Therefore, the two-stage breeding bird survey strategy outlined below was developed using survey standards outlined in Bird Census Techniques (Bibby et al., 1992) and Bird Monitoring Methods (Gilbert et al., 1998).

2.2.6 All methods were agreed through consultation with SNH prior to survey in the form of an Ecological Scoping Report (Jacobs, 2004).

Selection of Survey Areas - High Value Habitats

2.2.7 The first stage in the selection of survey areas involved the identification and selection of high value habitats throughout the 500m study area, referred to as Sites of Ornithological Value (SOVs). Potential SOVs located within and/or adjacent to the study area were identified by experienced ornithologists (identified in Table 1) based on the initial walkover survey together with an assessment of data supplied by NESBReC and analysis of aerial photographs and Ordnance Survey maps.

2.2.8 Selected SOVs were subject to a Breeding Bird Survey (BBS) as outlined in Section 2.2.13 below.

Selection of Survey Areas – Remaining Habitats

2.2.9 The second stage in the selection of survey areas involved the use of a Line Transect and Quadrat sampling system to survey habitats (outside of the SOVs) throughout the remainder of the 500m study area for breeding bird species. The Quadrat data, in addition data of SOVs, were used to infer the importance of all remaining non-surveyed areas throughout the route corridor for breeding birds.

2.2.10 A single transect was established centred over the route alignment along which 500m square Quadrats were established. A sampling ratio of 1:3 was used resulting in 11 Quadrats being selected along the length of the transect. This level of sampling was considered to provide field survey data of sufficient representation to allow an effective evaluation of the ecological importance of the breeding bird assemblages found in these areas and the remainder of the study area.

2.2.11 The selected 11 Quadrats were subject to a BBS as outlined in Section 2.2.13 below.

2.2.12 The following habitats within each selected Quadrat were not surveyed:

- whole or part of any SOV (as these areas would be surveyed anyway); and
- Urbanised zones including areas of existing road and/or hard standing

Breeding Bird Survey (BBS)

2.2.13 An adapted BBS (based on the Common Bird Census (CBC) standard mapping technique as developed by the British Trust for Ornithology (Bibby et al., 2000) was used to survey SOVs and Quadrats, but differed from a full CBC by the following:

- three rather than ten visits were made to each respective SOV/Quadrat; and
- each survey repetition was separated by more than ten days.

2.2.14 Clarification for the difference between the methods is outlined in Method Limitations (Section 2.6: Survey Limitations).

2.2.15 Definitions of the criteria used to classify observed birds as either confirmed breeding, potentially breeding and non-breeding are presented in Table 2.

Table 2 – Definitions of breeding, possible breeding and non-breeding (adapted from Buckland et al., 1990 and Gilbert et al., 1998)

Term	Definition
Breeding	A combination of registrations recorded on two or more survey visits including the following criteria: • male in song (on the ground or in flight); • male and/or female calling (on the ground or in flight); • male and/or female repeatedly calling (on the ground or in flight); • aggressive encounters between species (including the same species) perceived to be in the defence of territory, nest or young (on the ground or in flight); • a nest (with or without an adult in attendance) or man-made structure (e.g. nest box) containing either eggs or young; • adult bird/s carrying nesting material or entering/leaving nesting-site with nesting material; • adult bird/s carrying food or faecal sack or entering/leaving nesting-site with food or faecal sack; and • calling and/or silent juveniles with or without parents in attendance.
Possible Breeding	A combination of registrations recorded on a single survey visit including the above criteria and the following: • pair observed in suitable habitat in breeding season; and • building or excavating a nest site.
Non-Breeding	One or more registration (not including the criteria listed above) recorded on one or more survey visit including the following criteria: • adult bird/s carrying or foraging for food not presumed to be for young/juveniles; and • species observed during the breeding season, but not in habitat deemed suitable for nesting.

Incidental Observations

2.2.16 Observations of WCA1i, JNCC Red/Amber List and UK BAP/LBAP bird species present within or adjacent to each of the SOVs and Quadrats, in addition to the wider study area were noted during the other ecological surveys for the proposed scheme.

Dates of Survey

2.2.17 The reconnaissance surveys were undertaken from 22-26 March 2004. The BBS were undertaken from 05-09 April 2004, 10-14 May 2004 and 14-18 June 2004.

2.3 Habitat Assessment: SOVs, Quadrats and HAs

Habitat Value

2.3.1 Information obtained from the Phase 1 Habitat Survey was used to inform a description of the habitats represented within each SOV, Quadrat and Habitat Area (HA). A habitat value (expressed as high, medium or low) was assigned to each SOV, Quadrat and HA (as described in the Terrestrial Habitats Report, Appendix A10.1) based on the habitat descriptions derived from the Phase 1 Habitat Survey and following the criteria shown in Table 3.

Table 3 – Habitat Assessment Criteria

Habitat Value	Criteria
High	Habitats considered offering abundant good quality foraging and nesting opportunities for birds.
Medium	Habitats considered offering scattered and/or localised nesting or foraging opportunities for birds.
Low	Habitats considered offering occasional or limited nesting and foraging opportunities for birds.

2.4 Evaluation of Ecological Importance

Evaluation of Receptors

2.4.1 The method for assessing the value of an ecological receptor used all information collated in determining the baseline status of the resource. The ecological evaluation of a receptor was determined by reference to statutory and non-statutory site designations, the results of consultation, literature review (including reference to the North-East Scotland Bird Report (North-East Scotland Bird Club, 2004) and The Birds of North-East Scotland (Buckland et al., 1990) and field surveys. The evaluation method incorporated a geographical framework where ecological receptors were assessed according to a series of criteria that are presented in Table 4, which are based on the Ratcliffe Criteria (Ratcliffe, 1977) used in the selection of biological SSSI and include size (extent), naturalness, rarity, typicality, vulnerability and position in an ecological/geographical unit.

2.4.2 The evaluation method additionally included reference to the legal protection conferred on species or habitats as well as the conservation status of the receptor, such as presence of UK BAPs or LBAPs. These factors give rise to a level of conservation importance being assigned to species/ habitats that reflects the geographical framework used in the evaluation process. Thus, for example, Birds Directive Annex 1 species such as little ringed plover that are protected by international legislation are referred to as internationally important in terms of their conservation status. Other species such as barn owl, which are identified as priority species in the North-East Scotland Biodiversity Action Plan (NES BAP) are referred to as regionally important species.

Table 4 – 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

Value/ Importance	Criteria
	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
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.

Evaluation of Features and/or Habitats

2.4.3 The ecological evaluation of a feature or area of habitat took into account the level of conservation importance of the species, as well as other factors such as the level of use of the habitat or feature by a species, whether the species or habitat is locally or regionally common or rare, as well as other criteria that contribute to a feature's importance. In this way, the method of evaluation provides a system that combines legislative protection of species and/or habitats and conservation parameters that all contribute to the ecological importance of the receptor.

Evaluation of SOV, Quadrats and HAs

2.4.4 The ecological value of each SOV and Quadrat for breeding birds was determined by considering the evaluation of its habitat potential for breeding birds (derived from information in Appendix A10.1: Terrestrial Habitats) combined with the value of the breeding bird assemblage present.

2.4.5 An assessment was then made of the representativeness of the habitats found in each Quadrat or SOV in relation to the non surveyed areas adjacent. The ecological value of the remaining HAs in each route section was then determined by an initial evaluation of their habitat potential for breeding birds combined with the knowledge of the breeding bird assemblages found in adjacent representative Quadrats or SOVs.

2.5 Impact Assessment

2.5.1 Significance of impact, taking into account both the evaluated ecological importance (i.e. the value/sensitivity of the receiving environment or species, and the magnitude of impact.

Impact Magnitude

2.5.2 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 5, and include positive impact criteria in accordance with IEEM guidance (2002).

Table 5 – 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.
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 be significant in terms of its ecological objectives. Likely to result in changes in the localised or temporary distribution of a species but not affect its population status at a regional scale or permanently.
Low negative	The change may adversely affect the ecological receptor, but there will probably be no permanent effect on its integrity and/or key attributes and is unlikely to be significant in terms of its ecological objectives.
Negligible	The change may slightly adversely affect the receptor but will have no permanent effect on the integrity of the receptor or its key attributes. There are no predicted measurable changes to the species assemblage or population and the effect is unlikely to result in an increased vulnerability of the receptor to future impacts.
Positive	The change is likely to benefit the ecological receptor, and/or enhance the biodiversity resource of the receptor.
High positive	The change is likely to restore an ecological receptor to favourable conservation status, contribute to meeting BAP objectives (local and national) and/or create a feature that is of recognisable value for biodiversity.

Impact Significance

2.5.3 The significance of an impact has been determined according to the matrix system illustrated in Table 6. Impacts can be beneficial or adverse, either improving or decreasing the ecological status health or viability of a species, population or habitat.

2.5.4 Typically, negative impact significance greater than or equal to Moderate would require specific mitigation to be undertaken to ameliorate the impact significance to acceptable levels. In order to comply with Part 1 of the Nature Conservation (Scotland) Act (2004) generic mitigation is proposed for negative impacts of Minor or above.

Table 6 – 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

2.5.5 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.

2.6 Survey Limitations

Timing

2.6.1 The breeding bird season in the UK can extend from March to March – July inclusive (although a number of species breed out with this period) with the majority of bird species breeding or attempting to breed during the core period of April to June (this does not include multiple breeding attempts).

2.6.2 The breeding bird survey was undertaken from April to June, which is the optimal 'core' period in which to undertake breeding bird surveys.

2.6.3 All surveys were undertaken in early morning/dawn, which is the optimal time of day for recording breeding bird species

Weather

2.6.4 It has been shown that wind and rain are the two main factors that can limit the number of bird registrations recorded during a breeding bird survey (Gilbert et al., 1998).

2.6.5 The weather conditions throughout the survey period were moderate to good with limited rain and wind and moderate cloud cover. However, the temperature on each survey visit was below average, which may have resulted in under recording of bird registrations within the SOV and Quadrats. However, given the size of the study area, and the recommended timing of surveys, it was not possible to restrict surveys to those days when the weather was more suitable.

Quadrat and Line Transect Study Area

2.6.6 As outlined in Section 2.2, a 500m wide study area boundary was selected for the Line Transect Quadrat and sampling system based on available guidance in 2004 together with methods from Gilbert et al. (1998) regarding survey area boundaries for breeding bird surveys. The selection of a 500m study area was determined to be sufficient to obtain a representative sample of breeding bird species throughout the route corridor.

BBS Methodology

2.6.7 A full CBC comprises ten survey visits made between March and June, with a minimum of ten days between each of the survey repetition, which enables the calculation of bird territories across an entire season within a given site. However, the adopted methodology included only three survey visits to each SOV and Quadrat with more than ten days between each repetition. There were two primary reasons for reducing the number of survey repetitions and increasing the number of days between visits. Firstly, it was considered that three survey repetitions (made between April and June) would enable a sufficient representative data set to be collected in order to gain an accurate reflection of the breeding bird assemblage present within each SOV and Quadrat and secondly, it was considered more important to gather an accurate baseline of the bird assemblage within each SOV and Quadrat rather than a full picture of the spatial distribution of all bird territories.

2.6.8 The above 'scaled down' survey methodology which was included in the scoping report (Jacobs, 2004) and which is supported by SNH in their current guidance (SNH, 2005) was approved prior to the start of the surveys by SNH.

Changes to the Route Alignment

2.6.9 Changes to the location of the route corridor that occurred subsequent to the start of the BBS could not be incorporated into the BBS (for example, alterations to the boundaries of SOVs) because a BBS relies on consistency in terms of site boundaries/areas between survey repetitions (Bibby et al., 2000). As a result, the route corridor for the current design as assessed in the 2007 ES is likely to contain habitats of value to birds that have not been included or surveyed as part of this BBS[1]. However, part of the rationale behind using the Quadrat and Line Transect method was that it systematically sampled a range of habitats throughout the route corridor and therefore while small areas outside of SOVs and Quadrats may not have been surveyed it is likely that they will not differ significantly from surveyed areas, and therefore the value can be inferred from the evaluation of SOVs/Quadrats.

3 Baseline

3.1 Consultation

3.1.1 SNH did not provide any records of key breeding bird species for the proposed scheme in their initial consultation correspondence.

3.1.2 Consultation with the RSPB did not identify the presence of any RSPB nature reserves within or adjacent to the proposed scheme study area. However, a record of osprey (Status: WCA1i, JNCC Amber List and LBAP) near Fintry (ospreys have been observed fishing within the vicinity of the River Don) was provided by the RSPB, although a nesting location could not be specified (Ian Francis, pers.comm.).

3.1.3 Subsequent investigation by Jacobs has identified a breeding pair of osprey at a confidential location within 15km of the River Don. It is possible that this pair of nesting osprey is the same pair that has been recorded feeding on the River Don, although this has not been confirmed by vantage point surveys, as ospreys are known to travel up to 14km from their nest sites in search of food (Poole et al., 2002). Further breeding sites for osprey are known for other locations along the Don Valley, although at distances greater than 14km from the study area.

3.1.4 The SOC and the RSPB are jointly involved in a 5-year project to produce a Breeding Bird Atlas for Aberdeenshire in 2006. Records of confirmed, possible and probable breeding bird species are available for a selection of areas within the route corridor (not all areas within the route corridor have been surveyed to date) based on a $2km^2$ (tetrad) grid sampling system.

3.1.5 Existing survey data were not obtained from SOC and the RSPB for the following reasons:

- the data were not of sufficient detail in terms of the location of bird species for an EIA (i.e. the tetrads were too large); and
- data derived from SOC/RSPB's and Jacobs methodologies are incompatible due to differences employed to gather the data (SOC/RSPB used the Brown and Shepherd (1993) method for surveying upland breeding wader populations whilst Jacobs used the CBC methodology).

3.1.6 The North East Scotland Local Biodiversity Action Plan Co-ordinator supplied records of the following LBAP species for SAC (Scottish Agricultural College) Craibstone Estate (hereafter referred to as SAC Craibstone):

- barn owl (Status: WCA1i, JNCC Amber List and LBAP);
- bullfinch (Status: JNCC Red List, N BAP and LBAP);

[1] Measures to mitigate for this limitation will be proposed in the mitigation section.

- kestrel (Status: JNCC Amber List and LBAP);
- lapwing (Status: JNCC Amber List and LBAP);
- linnet (Status: JNCC Amber List, N BAP and LBAP);
- skylark (Status: JNCC Red List, N BAP and LBAP);
- song thrush (Status: JNCC Red List, N BAP and LBAP);
- tree sparrow (Status: JNCC Red List, N BAP and LBAP); and
- yellowhammer (Status: JNCC Red List and LBAP).

3.2 Incidental Observations

3.2.1 Records of nine key bird species that were made incidentally by other Jacobs surveyors during spring and summer 2004 are shown in Table 7.

Table 7 – Incidental Records of Key Bird Species

Month / Year	Species	Status	Location (NGR)	Comment
April 2004	woodcock (male)	JNCC Amber List	NJ 856 134	Flushed from dense vegetation in Kirkhill Forest.
April 2004	whooper swan	CWA1i JNCC Amber List	NJ 880 145	Recorded on banks of River Don.
May 2004	short-eared owl	JNCC Amber List	NJ 864 145	Pellet found adjacent to area of woodland near Pitmedden Farm.
May 2004.	barn owl	CWA1i, JNCC Amber List LBAP	NJ 933 152	Pellets were recorded in farm building near Middleton.
June 2004	Dunlin	JNCC Amber List	NJ 880 145	Recorded on banks of River Don.
June 2004	Dipper	LBAP	NJ 885 142	Recorded at confluence of Goval Burn and River Don.
June 2004	Dipper	LBAP	NJ 888 141	Recorded on River Don at Parkhill Bridge.
June 2004	Scaup	CWA1i JNCC Red List	NJ 924 144	Recorded on Corby Loch.
June 2004	red-backed shrike	CWA1i JNCC Red List UK BAP	NJ 932150	Recorded over two-day period in area of bramble scrub west of Gourdieburn.
July 2004	woodcock (male)	JNCC Amber List	NJ 861 092	Recorded in display flight over eastern edge of Brimmond Hill.
May 2005	common sandpiper	None	NJ 923 146	Recorded on north bank of Corby Loch displaying alarm calls.
June 2005	short-eared owl	JNCC Amber List	NJ 860 100	Recorded on north slopes of Brimmond Hill.

3.3 Survey of Breeding Bird Assemblages

Sites of Ornithological Value (SOVs)

3.3.1 A total of eight SOVs were identified in the Northern Leg study area (Figures 10.5a-g). A description of each SOV in terms of location and size is presented in Table 8.

Table 8 - Description of SOVs

Quadrat	Section	Location	Size (Hectares)
SAC Craibstone	NL2	NJ 868 107	20.8
Standingstones Wood	NL3	NJ 857 126	13.6
Kirkhill Forest	NL3	NJ 855 134	51.7
Bogenjoss Burn & Monument Woods	NL3	NJ 860 143	20.5
Red Moss (West)	NL5	NJ 908 156	27.6
Lily/Corby Loch	NL5	NJ 922 144	41.5
Gourdieburn	NL5	NJ 936 150	18.5
Cranfield Heath	NL5	NJ 944 144	4.2

3.3.2 Table 9 presents the results of the BBS undertaken on each SOV in terms of species recorded, their status and whether they were recorded as breeding (B), possible breeding (P) and non-breeding (N).

3.3.3 Scientific names of bird species are presented in Annex 1.

Table 9 – Bird Species Recorded Breeding (B), Possible Breeding (P) and Non-breeding (N) Birds within each SOV

Common Name	Status	SOV ID							
		Craibstone	Standingstones Wood	Kirkhill Forest	Bogenjoss Burn & Monument Woods	Red Moss (West)	Lily/Corby Loch	Gourdieburn	Cranfield Heath
red-throated diver	% +↑						N		
grey heron							B	P	
mallard					P		B		
tufted duck							B		
sparrowhawk					P				
buzzard		B	B	B	B	B	B	B	
Kestrel	+						P		
pheasant						P		P	
moorhen		P					P		
Coot		P					P		
oystercatcher	+	P		P			P	P	
dunlin	+						N		
curlew	+						P	P	
common sandpiper							P		
black-headed gull	+	N						N	
common gull	+			N					
herring gull	+			N					N
Woodpigeon			P	P	B		B		P
greater spotted woodpecker					P				
Skylark	x &				P		B	B	
sand martin	+						B	P	
swallow	+		B	P	P	B	P	B	
meadow pipit	+		B		B	P	B	B	P

Common Name	Status	SOV ID							
		Craibstone	Standingstones Wood	Kirkhill Forest	Bogenjoss Burn & Monument Woods	Red Moss (West)	Lily/Corby Loch	Gourdieburn	Cranfield Heath
pied wagtail					P				
wren		B	B	B	B	B	B	B	B
dunnock	+	B	B	B	B	P	B		
robin		B	B	B	B	B	P	B	
blackbird		B	P	B	B	B	B	B	B
song thrush	x &	B		B	B		P	P	P
mistle thrush	+	B		P	B				
grasshopper warbler	x		P						
sedge warbler							B	P	
lesser whitethroat				N					
Whitethroat		P	B	B				B	
garden warbler				P					
blackcap		P							
chiffchaff		B	B	B	B				
willow warbler	+	B	B	B	B	B	B	B	B
goldcrest	+	B	B	B	B		B		
long-tailed tit		B			B	B		P	
coal tit		B	B	B	B		P		
blue tit		B	P	B	B	B	B	P	
great tit		B	P	B	B	B		P	B
treecreeper			P	B	P				
magpie		P							P
rook									
carrion crow		P		B	B		B		P
starling	x	B			P			P	
tree sparrow	x &							P	
chaffinch		B	B	B	B	B	B	B	B
Greenfinch				P				P	
goldfinch		P		P	P		B	P	P
linnet	x &		B	B	B		B	B	
bullfinch	x &	P		B					
Hawfinch	+								
yellowhammer	x	P	B	B	B	P	B	B	B
reed bunting	x &					B	B	B	

Key: % = WCA1i; x = JNCC Red List; + = JNCC Amber List; & = UKBAP.

Quadrats

3.3.4 A total of 11 Quadrats were established in the Northern Leg study area (Figures 10.5a-g). A description of each Quadrat in terms of location is shown in Table 10.

Table 10 – Description of Quadrats

Quadrat	Section	Grid Reference
1	NL1	NJ 866 089
2	NL2	NJ 869 103
3	NL3	NJ 863 118
4	NL3	NJ 857 133
5	NL3	NJ 865 144
6	NL4	NJ 880 147
7	NL4	NJ 896 152
8	NL5	NJ 910 151
9	NL5	NJ 925 149
10	NL5	NJ 939 144
11	NL5	NJ 954 140

3.3.5 Table 11 presents the results of the BBS undertaken on each Quadrat in terms of species recorded, their status and whether they were recorded as breeding (B), possible breeding (P) and non-breeding (N).

3.3.6 Scientific names of bird species are presented in Annex 1.

Table 11 – Bird Species Recorded Breeding (B), Possible Breeding (P) and Non-breeding (N) within each Quadrat

Common Name	Status	Quadrat ID										
		1	2	3	4	5	6	7	8	9	10	11
grey heron							P	B				
mute swan	+						B					
mallard							P	P				P
Goosander							P					
sparrowhawk											P	
buzzard		P	P	P		B	B			B	P	B
kestrel	+									P		
grey partridge	x &			B		P	P					
Pheasant			P	P	P			P				
Moorhen									P			
oystercatcher	+		B	P	P	P	B	P	P		P	P
little ringed plover	%								N			
lapwing	+	B		B			P	B	B	B		P
curlew	+			P								
Snipe	+									B		P
black-headed gull	+		N				N		N	N		
common gull	+			N			N					
lesser black-backed gull	+			N		N						
herring gull	+			N		N	N		N	N		N
great black-backed gull				N								
common tern							N			N		
woodpigeon		B	B	P	B	B	B	P	P	P	P	
Swift							P					
green woodpecker	+											P
greater spotted woodpecker			B									

Common Name	Status	Quadrat ID										
		1	2	3	4	5	6	7	8	9	10	11
skylark	x &	B	B	B		P	B	P		B	P	B
sand martin	+								P	P		P
swallow	+	B		P	P	P	P	B	P	P	P	B
house martin	+						B	P				P
meadow pipit	+	B	P	B	P	P	P	P	B	B		B
grey wagtail	+						B	P				
pied wagtail		B	B	P			B	P		P	P	B
wren		B	B	B		P	B	B	B	B		B
dunnock	+	B	B	B	P	P		B	B			B
robin		P	B	B	P			P	B			B
Wheatear									P			
blackbird		P	B	B		P.	P	B	P			B
song thrush	x &	B										P
mistle thrush	+							P				
grasshopper warbler	x						P					P
sedge warbler							B	B		B		B
Whitethroat		P	P	P		P		P				
garden warbler			P			P		B				
chiffchaff		P	P									
Blackcap						P						
willow warbler	+	B		P		P		B		B		
goldcrest	+	B	B							P		
long-tailed tit										P		
coal tit			P	P				P				
blue tit		B	B	P	B	P		P	P			
great tit		P	P	P	P	P		P	B	P		B
magpie		P									P	B
jackdaw			B	P			P	P		P		B
rook		P	P			P	P	B			B	N
carrion crow		B	P	B	P	B	B	P	B	P	B	P
starling	x	B	P	B		P	B	P	P	B		
house sparrow	x			P					P		B	P
tree sparrow	x &		P								B	
chaffinch		B	B	P	B	P	B	B	B	B		B
Greenfinch		P						B	P			
goldfinch		P	P	P				P	P			
linnet	x &	B	P	B	B	B	B	B	B	B		P
yellowhammer	x	B	P	B	B	B	P	B	B	P	B	B
reed bunting	x &						B	B	P	B		P

Key: % = WCA1i; x = JNCC Red List; + = JNCC Amber List; & = UKBAP.

3.4 Habitat Descriptions: SOVs and Quadrats

3.4.1 The following section presents a description and value of the habitats represented within each SOV and Quadrat and their associated HAs.

Section NL1 (Derbeth to Tulloch Road)

3.4.2 Section NL1 includes extensive areas of farmland with large fields of predominantly improved grassland, amenity planting, scattered gorse and extensive areas of dense gorse scrub (mostly confined to the east of Brimmond Hill).

3.4.3 The remainder of Section NL1 comprises a mosaic of semi-natural habitats including; marshy grassland, wet heath/mire, swamp, wet woodland and scrub, with small areas of coniferous plantation.

3.4.4 Table 12 presents a detailed description and value of habitats present within each SOV and Quadrat.

Table 12 – Habitat Descriptions: Section NL1 (Derbeth to Tulloch Road)

SOV / Quadrat	Has	Value	Habitat Description
Quadrat Bb01	N11 N3 N1 N10	Low	Habitats within the Quadrat are typified by improved grassland and arable fields bounded by stone walls, with dense/scattered scrub and parkland and scattered trees located along field boundaries. A shelter belt of mixed woodland bisects the Quadrat to the north of Dykeside in a west – east orientation.

Section NL2 (SAC Craibstone)

3.4.5 Section NL2 includes extensive areas of farmland with improved grassland and riparian habitats together with extensive areas of mown grassland with scattered tree saplings.

3.4.6 The remainder of Section NL2 comprises relatively extensive areas of semi-mature mixed plantation and semi-natural broad-leaved woodland interlinked with a mosaic of farmland and areas of semi-mature coniferous plantation woodland (around SAC Craibstone).

3.4.7 Table 13 presents a detailed description and value of habitats present within each SOV and Quadrat.

Table 13 – Habitat Descriptions: Section NL2 (SAC Craibstone)

SOV / Quadrat	Has	Value	Habitat Description
Craibstone SOV	N21 N25 N26	High	Craibstone SOV comprises a mosaic of woodland habitats including; semi-natural broad-leaved woodland (mature), deciduous plantation woodland (mature and immature), coniferous plantation woodland (mature and semi-mature), mixed woodland (mature), scattered/dense scrub, continuous bracken and running/standing water.
Quadrat Bb02	N18 N19 N20 N21 N24 N25 N28	Medium	Habitats to the west of the minor road that bisects the Quadrat are typified by amenity grassland (Craibstone Golf Course) and an area of plantation coniferous woodland (partially present within the Quadrat) while to east of the minor road habitats are typified by mixed and semi-natural broad-leaved woodland with improved fields and a small area of amenity grassland.

Section NL3 (A96 to Nether Kirkton)

3.4.8 Section NL3 includes extensive areas of farmland with large fields of arable, improved and semi-improved grassland, scattered scrub and species-rich hay meadows with species-rich verges with

extensive areas of commercial forest plantation that include: mature coniferous species, blocks of young spruce and larch and mixed woodland plantation.

3.4.9 The remainder of Section NL3 comprises a diverse range of habitats, including: semi-natural and planted broad-leaved woodland, mature semi-natural pinewood of long-established plantation origin, semi-natural broad-leaved riparian woodland, localised areas of scrub, wet heath, unimproved acid grassland, marshy grassland and small areas of parkland with woodland and ornamental gardens.

3.4.10 Table 14 presents a detailed description and value of habitats present within each SOV and Quadrat.

Table 14 – Habitat Descriptions: Section 3 (Kirkhill – Monument Wood)

SOV / Quadrat	Has	Value	Habitat Description
Standingstones Wood SOV	N35	Low	The SOV comprises a mosaic of woodland, scrub and heathland habitats including; semi-natural broad-leaved woodland (mature), deciduous plantation woodland (mature and immature), coniferous plantation woodland (immature), deciduous parkland/scattered trees (mature), scattered/dense scrub, acid dry dwarf scrub heath, unimproved acid grassland, continuous bracken, tall ruderal and running water.
Kirkhill Forest SOV	N37 N38 N39 N40	Medium	Kirkhill Forest SOV comprises a mosaic of woodland, scrub and grassland habitats including; semi-natural broad-leaved woodland (mature), coniferous plantation woodland (mature and semi-mature), mixed woodland (mature and semi-mature), deciduous parkland/scattered trees (mature), scattered/dense scrub, marsh/marshy grassland, unimproved acid grassland, tall ruderal, continuous bracken and running water.
Bogenjoss Burn and Monument Woods SOV	N42 N43 N44 N47	High	Bogenjoss Burn and Monument Woods SOV comprises a mosaic of woodland, scrub and grassland habitats including; semi-natural broad-leaved woodland, deciduous plantation woodland (mature), coniferous plantation woodland (mature and immature), coniferous semi-natural woodland (mature), recently felled coniferous woodland, deciduous parkland/scattered trees (mature), semi-improved acid grassland, scattered/dense scrub, acid dry dwarf scrub heath, scattered bracken, tall ruderal and running water.
Quadrat Bb03	W50 W51 W52	Medium	Habitats within the Quadrat are typified by arable and poor semi-improved fields (the majority of which are bounded by stone walls) with scattered scrub and occasional parkland / scattered trees located along field boundaries. A small area of plantation broad-leaved woodland is located partially within the south-east of the Quadrat.
Quadrat Bb04	N37 N38 N39	Medium	Habitats within the Quadrat are typified by improved and arable fields bounded by stone walls to the south-east. The remainder of the Quadrat is dominated by plantation coniferous woodland habitats (Kirkhill Forest) with discrete areas of unimproved acid grassland, marsh/marshy grassland and broad-leaved woodland with occasional parkland/scattered trees.
Quadrat Bb05	N46 N47 N48 N50	Low	Habitats within the Quadrat are typified by improved grassland fields (bounded by stone walls) with a large area of coniferous plantation/semi-natural woodland with a dense bracken fringe on the northern side of the woodland.

Section NL4 (Nether Kirkton to Corsehill)

3.4.11 Section NL4 includes extensive areas of arable and improved grassland fields and an extensive area of marshy grassland at the edge of the River Don flood plain together with riparian habitats on both banks of the River Don and additional freshwater habitats in the river channel. Both banks of the Don support species-rich grassland, scattered scrub and tall herb habitats. Goval Burn and reservoir with marginal habitats and wayside trees, support a diverse mosaic of habitats such as tall herb, grassland, scrub, woodland and semi-improved pasture. Woodland areas comprise small areas of semi-natural broad-leaved woodland, mature broad-leaved woodland of long established plantation origin, wet woodland, and mixed and coniferous commercial plantation.

3.4.12 The remainder of Section NL4 comprises parkland and wood pasture, species-rich grassland, tall herb, scrub, semi-improved pasture, unimproved acid grassland and wet heath.

3.4.13 Table 15 presents a detailed description and value of habitats present within each SOV and Quadrat.

Table 15 – Habitat Descriptions: Section NL4 (Nether Kirkton to Corsehill)

SOV / Quadrat	Has	Value	Habitat Description
Quadrat Bb06	N51 N52 N54 N55	High	Habitats within the Quadrat are dominated by the River Don it's adjacent unimproved grassland habitats. Habitats to the east and west of the river are typified by improved grassland fields (some bounded by stone walls) with areas of dense and scattered scrub and dense bracken with a small area of plantation mixed and coniferous plantation woodland to the east of the River Don.
Quadrat Bb07	N58 N59 N60 N61 N64 N66 N69	High	To the east of Formartine and Buchan Way (a corridor of semi-improved neutral grassland and scattered scrub) habitats within the Quadrat are typified by arable, improved and poor semi-improved grassland fields with parkland/scattered broad-leaved/coniferous trees along field boundaries while in comparison habitats to the west of the Formartine and Buchan Way comprise a mosaic of tall ruderal/semi-improved acid grassland, standing water (Goval Lade), parkland/scattered broad-leaved trees and plantation broad-leaved woodland with improved and arable fields.

Section NL5 (Corsehill to Blackdog)

3.4.14 Section NL5 includes extensive areas of farmland with fields of arable, improved and semi-improved grassland together with a relatively extensive area of conifer plantation at Littlejohn's Wood with naturally regenerating birch woodland bounded by mature beech trees connected to Red Moss: a lowland raised bog habitat comprised of wet modified bog with a central dome supporting drier peat bog vegetation; surrounded by mature semi-natural broad-leaved woodland with localised areas of wet woodland, wet heath and acid grassland, scattered and dense gorse scrub habitat.

3.4.15 Approximately 50% of the Corby / Lily Loch SSSI (of Corby, Lily and Bishop Lochs [composite] SSSI) is located within Section NL5. The SSSI supports a diverse range of habitats that include open water, swamp, basin mire (poor-fen vegetation), wet heath, wet woodland, scrub and drainage channels.

3.4.16 Other habitats include: recently-planted semi-mature conifer, broad-leaved and mixed plantation woodland; occasional mature trees; scattered ruderal and tall herb vegetation; marshy grassland and; a small waterbody supporting swamp and marginal vegetation.

3.4.17 Table 16 presents a detailed description and value of habitats present within each SOV and Quadrat.

Table 16 – Habitat Descriptions: Section NL5 (Corsehill – Blackdog)

SOV / Quadrat	HA	Value	Habitat Description
Red Moss (West) SOV	N74 N75	Medium	Red Moss (West) SOV comprises a mosaic of woodland, grassland, bog and heathland habitats including; semi-natural broad-leaved woodland (mature and semi-mature), deciduous parkland/scattered trees (mature), unimproved acid grassland, marsh/marshy grassland, wet modified bog, wet heath/acid grassland mosaic, scattered scrub and running water.
Lily / Corby Loch SOV	N85	High	Lily/Corby Loch SOV comprises a mosaic of woodland, grassland, bog, heathland, swamp and aquatic habitats including; semi-natural broad-leaved woodland (mature), coniferous plantation woodland (mature), deciduous parkland/scattered trees (mature), scattered/dense scrub, semi-unimproved acid grassland, marsh/marshy grassland, improved grassland, wet heath/acid grassland mosaic, fen/dry modified bog, swamp and standing water (Corby Loch).

SOV / Quadrat	HA	Value	Habitat Description
Gourdieburn SOV	N89	Medium	Gourdieburn SOV comprises a mosaic of woodland, grassland, agricultural and aquatic habitats including; coniferous plantation woodland (immature), deciduous parkland/scattered trees (mature), marsh/marshy grassland, arable and standing water.
Cranfield SOV	N91	Low	Cranfield SOV scrub and agricultural habitats including; dense/scattered, arable and improved grassland running water.
Quadrat Bb08	N80 N81	Low	Habitats within the Quadrat are typified by arable and improved grassland fields bounded by stone walls with amenity grassland forming the grounds of residential housing and businesses. An area of standing water (Lochgreens Pond) and bare ground is present in the south-east with a small area of standing water and marsh in the east.
Quadrat Bb09	N87 N86 N84 N85	High	Habitats within the Quadrat are typified by improved and semi-improved grassland fields with marsh/marshy and semi-improved acid grassland and areas of dense and scattered scrub.
Quadrat Bb10	N490 N91	Low	Habitats within the Quadrat are typified by improved/arable grassland fields with parkland/scattered trees located along field boundaries.
Quadrat Bb11	N93 N94 N95	Medium	Habitats within the Quadrat are typified by improved/poor semi-improved grassland fields bounded by stone walls with discrete areas of dense and scattered scrub and marsh/marshy grassland.

3.5 Habitat Area (HA) Descriptions

3.5.1 A description of habitats present within each HA for Sections NL1–NL5 is presented in the Terrestrial Habitats report (Appendix A10.1).

3.6 Summary

Consultation

3.6.1 Consultation with the RSPB identified the presence of ospreys foraging on the River Don in the vicinity of Fintray (Ian Francis, pers.comm.).

3.6.2 Consultation with NESBReC identified the presence of breeding barn owl in the grounds of SAC Craibstone (although an exact nesting location could not be provided).

3.6.3 Records of breeding bird species were not obtained from the RSPB/SOC as the data were not considered to be sufficient in terms of location detail, and the methods used to collect the data differed from the methods used by Jacobs as outlined in Section 2.6.

Incidental Observations

3.6.4 Nine bird species were recorded incidentally in the route section, of which:

- woodcock (JNCC Amber List);
- whooper swan (WCA1i, JNCC Amber List);
- short-eared owl (JNCC Amber List);
- barn owl (WCA1i, JNCC Amber List, LBAP);
- dunlin (JNCC Amber List);
- dipper (LBAP);
- scaup (WCA1i, JNCC Red List);
- red-backed shrike (WCA1i, JNCC Red List, UK BAP); and
- common sandpiper (no status).

Breeding Bird Survey (BBS)

3.6.5 A BBS was undertaken on eight SOV within or adjacent to the study corridor and 11 Quadrats established along the along the original consultation route.

3.6.6 A total of 55 bird species (48 breeding or possible breeding and seven non-breeding) were recorded throughout the eight SOV, of which:

- one was a WCA1i species (red-throated diver);
- nine were JNCC Red List species (skylark, song thrush, grasshopper warbler, starling, tree sparrow, linnet, bullfinch, yellowhammer and reed bunting); and
- 16 were JNCC Amber List species (red-throated diver, kestrel, oystercatcher, dunlin, curlew, black-headed gull, common gull, herring gull, sand martin, swallow, meadow pipit, grey wagtail, dunnock, mistle thrush, willow warbler and goldcrest).

3.6.7 A total of 64 bird species (57 breeding or possible breeding and seven non-breeding) were recorded throughout the 11 Quadrats, of which:

- none were WCA1i species.
- ten were JNCC Red List species (grey partridge, skylark, song thrush, grasshopper warbler, starling, house sparrow, tree sparrow, linnet, yellowhammer and reed bunting); and
- 21 were JNCC Amber List species (mute swan, kestrel, oystercatcher, lapwing, snipe, curlew, black-headed gull, common gull, lesser black-backed gull, great black-backed gull, herring gull, green woodpecker, sand martin, swallow house, martin meadow pipit, grey wagtail, dunnock, mistle thrush, willow warbler and goldcrest).

Habitat Description

3.6.8 The majority of the study area consists of agricultural land dominated by arable and grazed improved/semi-improved grassland fields, typically bounded by wire fences or occasionally man-made walls of natural stone. The remainder of the study area is interspersed by a mosaic of inter-connected semi-natural woodland, scrub, parkland, grassland/marsh, tall herb, heathland and mire/marginal/aquatic habitats. A number of watercourses/waterbodies are present within the study area, of note: River Don, Goval Burn and Lily / Corby Loch.

4 Evaluation

4.1 Rationale

4.1.1 The ecological value of each SOV, Quadrat and HA for breeding birds was determined by professional judgment by considering the evaluation of the habitat potential for breeding birds (derived from information in Appendix A10.1 Terrestrial Habitats) combined with the value of the breeding bird assemblage present.

4.1.2 An assessment was then made of the representativeness of the habitats found in each Quadrat or SOV in relation to the non surveyed areas adjacent. The ecological value of the remaining HAs in each route section was then determined by an initial evaluation of their habitat potential for breeding birds combined with the knowledge of the breeding bird assemblages found in adjacent representative Quadrats or SOVs.

4.2 Evaluation of Bird Assemblages and Habitats: SOVs / Quadrats

4.2.1 Species recorded in each of the Sections (within SOVs and Quadrats) are presented in the baseline section of this report (Table 9 and Table 11).

Section NL1 (Derbeth – Tulloch Road)

4.2.2 One Quadrat (Bb01) is located within Section NL1 and includes all or parts of HAs N1, N3, N7, N8, N10, N11 and N13. The bird assemblage recorded in this Quadrat is considered to be of medium diversity, comprising 29 species (27 breeding/possible breeding, one non-breeding and two incidentals) of which five were JNCC Red List, eight were JNCC Amber List, three were UK BAP and four were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising improved grassland and arable fields bounded by stone walls, with dense/scattered scrub and parkland and scattered trees located along field boundaries with one shelterbelt of mixed woodland. The bird assemblage found in Quadrat Bb01 is considered to enrich the biodiversity resource within the local context and is therefore considered to be of **local** ecological value.

Section NL2 (SAC Craibstone)

4.2.3 One SOV (Craibstone) and one Quadrat (Bb02) are located within Section NL2 and are evaluated below.

4.2.4 Craibstone SOV includes all or parts of HAs N21, N25 and N26. The bird assemblage recorded in this SOV is considered to be of high diversity, comprising 33 species (26 breeding/possible breeding, one non-breeding and six consultation records) of which one was WCA1i, seven were JNCC Red List, eight were JNCC Amber List, five were UK BAP, nine were LBAP and one was of locally uncommon/rare status. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising semi-natural broad-leaved woodland (mature), deciduous plantation woodland (mature and immature), coniferous plantation woodland (mature and semi-mature), mixed woodland (mature), scattered/dense scrub, continuous bracken and running/standing water). The bird assemblage is considered to enrich the biodiversity resource within the local context and therefore is assessed to be of **county** ecological value.

4.2.5 Quadrat Bb02 includes all or parts of HAs N18, N19, N20, N21, N24, N25 and N28. The bird assemblage recorded in this Quadrat is considered to be of medium diversity, comprising 29 species (28 breeding/possible breeding and one non-breeding) of which five are JNCC Red List, five are JNCC Amber List, three are UK BAP and four are LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising amenity and improved grassland, plantation mixed/coniferous woodland, semi-natural broad-leaved woodland and parkland/scattered trees). The bird assemblage found in Quadrat Bb02 is considered to enrich the biodiversity resource within the local context and therefore is considered to be of **local** ecological value.

Section NL3 (A96 – Nether Kirkton)

4.2.6 Three SOVs (Standingstones Wood, Kirkhill Forest and Bogenjoss Burn/Monument Wood) and three Quadrats (Bb03, Bb04 and Bb05) and are located within Section NL3 and are evaluated below.

4.2.7 Standingstones Wood SOV includes all of HA N35. The bird assemblage recorded in this SOV is considered to be of medium diversity, comprising 20 species (all recorded breeding/possible breeding) of which three were JNCC Red List, five were JNCC Amber List, one was UK BAP, two were LBAP and one was of locally uncommon/rare status. The habitats that comprise the HAs within the Quadrat are assessed as being of **low** value for birds, comprising a mosaic of semi-natural broad-leaved woodland), deciduous plantation woodland, coniferous plantation woodland,

deciduous parkland/scattered trees, scattered/dense scrub, acid dry dwarf scrub heath, unimproved acid grassland, continuous bracken, tall ruderal and running water . The bird assemblage found in this SOV is not considered to enrich the biodiversity resource within the local context and therefore is assessed to be of **less than local** ecological value.

4.2.8 Kirkhill Forest SOV includes all or parts of HAs N37, N38, N39 and N40. The bird assemblage recorded in this SOV is considered to be of medium diversity, comprising 29 species (26 breeding/possible breeding and three non-breeding) of which four were JNCC Red List, nine were JNCC Amber List, three were UK BAP and four were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising a large mosaic of semi-natural broad-leaved woodland, coniferous plantation woodland, mixed woodland, deciduous parkland/scattered trees, scattered/dense scrub, marsh/marshy grassland, unimproved acid grassland, tall ruderal, continuous bracken and running water. The bird assemblage found in this SOV is considered to enrich the biodiversity resource within the county context and therefore is assessed to be of **county** ecological value.

4.2.9 Bogenjoss Burn/Monument Wood SOV includes all or parts of HAs N41, N42, N43 and N47. The bird assemblage recorded in this SOV is considered to be of medium diversity, comprising 30 bird species (all recorded breeding/non-breeding) of which five were JNCC Red List, seven were JNCC Amber List, three were UK BAP and four were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising mosaic of semi-natural broad-leaved woodland, deciduous plantation woodland, coniferous plantation woodland, coniferous semi-natural woodland, recently felled coniferous woodland, deciduous parkland/scattered trees, semi-improved acid grassland, scattered/dense scrub, acid dry dwarf scrub heath, scattered bracken, tall ruderal and running water. The bird assemblage found in this SOV is considered to enrich the biodiversity resource within the county context and therefore is assessed to be of **county** ecological value.

4.2.10 Quadrat Bb03 includes all or parts of HAs N31, N32 and N33. The bird assemblage recorded in the Quadrat is considered to be of high diversity, comprising 33 bird species (28 breeding/possible breeding, four non-breeding and one incidental) of which six were JNCC Red List, 11 were JNCC Amber List, four were UK BAP, four were LBAP and one was of local status. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising arable and poor semi-improved fields (the majority of which are bounded by stone walls) with scattered scrub and occasional parkland/scattered trees (located along field boundaries) together with a small area of plantation broad-leaved woodland located partially within the south-east of the Quadrat. The bird assemblage found in Quadrat Bb03 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of **county** ecological value.

4.2.11 Quadrat Bb04 includes all or parts of HAs N37, N38 and N39. The bird assemblage recorded in the Quadrat is considered to be of low diversity, comprising 13 bird species (all recorded breeding/possible breeding) of which two were JNCC Red List, four were JNCC Amber List, one was UK BAP and two were LBAP. The habitats that comprise the HAs within the Quadrat are of **medium** value for birds, comprising improved and arable fields (bounded by stone walls) and plantation coniferous woodland (Kirkhill Forest) with discrete areas of unimproved acid grassland, marsh/marshy grassland and broad-leaved woodland with occasional parkland/scattered trees. The bird assemblage found in Quadrat Bb04 is considered not to enrich the biodiversity resource within the local context and therefore is considered to be of **less than local** ecological value.

4.2.12 Quadrat Bb05 includes all or parts of HAs N46, N47, N48 and N50. The bird assemblage recorded in the Quadrat is considered to be of medium diversity, comprising 24 bird species (22 breeding/possible breeding and two non-breeding) of which five were JNCC Red List, seven were JNCC Amber List, three were UK BAP and four were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **low** value for birds, comprising improved grassland fields (bounded by stone walls), coniferous plantation/semi-natural woodland with dense bracken (on the northern side of the woodland). The bird assemblage found in Quadrat Bb05 is considered to enrich the biodiversity resource within the local context and therefore is considered to be of **local** ecological value.

Section NL4 (Nether Kirkton to Corsehill)

4.2.13 Two Quadrats (Bb06 and Bb07) are located within Section NL4 and are evaluated below.

4.2.14 Quadrat Bb06 includes all or parts of HAs N51, N52, N54 and N55. The bird assemblage recorded in the Quadrat is considered to be of high diversity, comprising 35 species (28 breeding/possible breeding, four non-breeding and three incidentals) of which one was WCA1i, seven were JNCC Red List, 12 were JNCC Amber List, four were UK BAP and seven were LBAP and one was local status. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising unimproved grassland adjacent to the River Don with adjacent improved grassland fields (some bounded by stone walls) and discrete areas of dense and scattered scrub and dense bracken with a small area of plantation mixed and coniferous plantation woodland to the east of the River Don. The bird assemblage found in Quadrat Bb06 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of **county** ecological value.

4.2.15 Quadrat Bb07 includes all or parts of HAs N58, N59, N60, N61, N64, N66 and N69. The bird assemblage recorded in the Quadrat is considered to be of high diversity, comprising 34 species (all recorded breeding/possible breeding) of which five were JNCC Red List, nine were JNCC Amber List, three were UK BAP and five were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising a corridor of semi-improved neutral grassland and scattered scrub (Formartine & Buchan Way) with arable, improved and poor semi-improved grassland fields with parkland/scattered broad-leaved/coniferous trees along field boundaries to the east, and a mosaic of tall ruderal/semi-improved acid grassland, standing water (Goval Lade), parkland/scattered broad-leaved trees and plantation broad-leaved woodland with improved and arable fields to the west of the Formartine and Buchan Way. The bird assemblage found in Quadrat Bb07 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of **county** ecological value.

Section NL5 (Corsehill to Blackdog)

4.2.16 Four SOVs (Red Moss (West), Lily/Corby Loch, Gourdieburn and Cranfield) and three Quadrats (Bb08, Bb09, Bb10 and Bb11) and are located within Section NL5 and are evaluated below.

4.2.17 Red Moss (West) SOV includes all or parts of HAs N74 and N75. The bird assemblage recorded in this SOV is considered to be of low diversity, comprising 15 bird species (all recorded breeding/possible breeding) of which two were JNCC Red List, four were JNCC Amber List, one was UK BAP and two were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising semi-natural broad-leaved woodland, deciduous parkland/scattered trees, unimproved acid grassland, marsh/marshy grassland, wet modified bog, wet heath/acid grassland mosaic, scattered scrub and running water. The bird assemblage found in this SOV is not considered to enrich the biodiversity resource within the local context and therefore is assessed to be of **less than local** ecological value.

4.2.18 Lily/Corby Loch SOV includes all of HA N85 and N87. The bird assemblage recorded in this SOV is considered to be of high diversity, comprising 34 bird species (31 breeding/possible breeding, two non-breeding and one incidental) of which one was ECB, two were WCA1i, five were JNCC Red List, 12 were JNCC Amber List, four were UK BAP, seven were LBAP and three were local status. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising a mosaic of semi-natural broad-leaved woodland, coniferous plantation woodland, deciduous parkland/scattered trees, scattered/dense scrub, semi-unimproved acid grassland, marsh/marshy grassland, improved grassland, wet heath/acid grassland mosaic, fen/dry modified bog, swamp and standing water (Corby Loch). The bird assemblage found in this SOV is considered to enrich the biodiversity resource within the regional context and therefore is assessed to be of **regional** ecological value.

4.2.19 Gourdieburn SOV includes all of HA N89. The bird assemblage recorded in this SOV is considered to be of medium diversity, comprising 30 bird species (27 breeding/possible breeding, one non-

breeding and two incidentals) of which two were WCA1i, eight were JNCC Red List, eight were JNCC Amber List, six were UK BAP, eight were LBAP and two were of local status. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising coniferous plantation woodland, deciduous parkland/scattered trees, marsh/marshy grassland, arable and standing water. The bird assemblage found in this SOV is considered to enrich the biodiversity resource within the county context and therefore is assessed to be of **county** ecological value.

4.2.20 Cranfield SOV includes all of HA N91. The bird assemblage recorded in this SOV is considered to be of low diversity, comprising 13 species (12 breeding/possible breeding and one non-breeding) of which two were JNCC Red List, three were JNCC Amber List, one was UK BAP and two were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **low** value for birds, comprising dense/scattered, arable, improved grassland and running water. The bird assemblage found in this SOV is not considered to enrich the biodiversity resource within the local context and therefore is assessed to be of **less than local** ecological value.

4.2.21 Quadrat Bb08 includes all or parts of HAs N80 and N81. The bird assemblage recorded in the Quadrat is considered to be of medium diversity, comprising 26 species (23 breeding/possible breeding and three non-breeding) of which one was WCA1i, five were JNCC Red List, eight were JNCC Amber List, two were UK BAP and four were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **low** value for birds, comprising arable and improved grassland fields bounded by stone walls with amenity grassland forming the grounds of residential housing and businesses together with standing water and bare ground and standing water and marsh. The bird assemblage found in Quadrat Bb08 is considered to enrich the biodiversity resource within the local context and therefore is considered to be of **local** ecological value.

4.2.22 Quadrat Bb09 includes all or parts of HAs N84, N85, N86 and N87. The bird assemblage recorded in the Quadrat is considered to be of medium diversity, comprising 26 species (all recorded breeding/possible breeding) of which five were JNCC Red List, 11 were JNCC Amber List, three were UK BAP and six were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **high** value for birds, comprising improved and semi-improved grassland fields with marsh/marshy and semi-improved acid grassland and areas of dense and scattered scrub. The bird assemblage found in Quadrat Bb09 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of **county** ecological value.

4.2.23 Quadrat Bb010 includes all or parts of HAs N90 and N91. The bird assemblage recorded in the Quadrat is considered to be of low diversity, comprising 13 species (all recorded breeding/possible breeding) of which four were JNCC Red List, two were JNCC Amber List, two were UK BAP and three were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **low** value for birds, comprising improved/arable grassland fields with parkland/scattered trees located along field boundaries. The bird assemblage found in Quadrat Bb010 is not considered to enrich the biodiversity resource within the local context and therefore is considered to be of **less than local** ecological value.

4.2.24 Quadrat Bb011 includes all or parts of HAs N93, N94 and N95. The bird assemblage recorded in the Quadrat is considered to be of high diversity, comprising 30 species (28 breeding/possible breeding and two were non-breeding) of which seven were JNCC Red List, ten were JNCC Amber List, four were UK BAP and five were LBAP. The habitats that comprise the HAs within the Quadrat are assessed as being of **medium** value for birds, comprising improved/poor semi-improved grassland fields bounded by stone walls with discrete areas of dense and scattered scrub and marsh/marshy grassland. The bird assemblage found in Quadrat Bb010 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of **county** ecological value.

Summary of Evaluation of NL1-NL5

4.2.25 Table 17 presents a summary evaluation of SOVs and Quadrats.

Table 17 – Evaluation of Bird Assemblages and Habitats: SOVs and Quadrats

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
Section NL1 Derbeth – Tulloch Road ch314800 - 316000	Quadrat Bb01 North Kingswells	N1 N3 N7 N8 N10 N11 N13	Low	Brimmond Hill DWS to west of Quadrat 1	29	-	-	skylark song thrush starling linnet yellowhammer	lapwing swallow meadow pipit willow warbler goldcrest dunnock woodcock* short-eared owl*	skylark song thrush linnet	skylark song thrush linnet yellowhammer	-	Local
Section NL2 SAC Craibstone ch316000 - 317400	Craibstone SOV ch316590 – 317200	N21 N25 N26	High		33	-	barn owl#	song thrush (also C.R.) starling bullfinch (also C.R.) yellowhammer (also C.R.) linnet* skylark* tree sparrow*	oystercatcher black-headed gull dunnock mistle thrush willow warbler goldcrest kestrel* lapwing *	song thrush bullfinch linnet skylark tree sparrow	barn owl song thrush yellowhammer bullfinch kestrel lapwing linnet skylark tree sparrow	barn owl	County
	Quadrat Bb02 Craibstone Golf Centre	N18 N19 N20 N21 N24 N25 N28	Medium		29	-	-	skylark starling tree sparrow linnet yellowhammer	oystercatcher black-headed gull meadow pipit goldcrest dunnock	skylark tree sparrow linnet	skylark tree sparrow linnet yellowhammer	-	Local

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
Section NL3 Kirkhill - Monument Wood ch317400 - 322600	Standingstones Wood SOV ch319120 – 319420	N35	Low	Farburn Wood DWS immediately adjacent to the SOV	20	-	-	grasshopper warbler linnet yellowhammer	swallow meadow pipit dunnock willow warbler goldcrest	linnet	linnet yellowhammer	grasshopper warbler	Less than local
	Kirkhill Forest SOV ch319610 – 320610	N37 N38 N39 N40	Medium		29	-	-	song thrush linnet bullfinch yellowhammer	oystercatcher woodcock common gull herring gull swallow dunnock mistle thrush willow warbler goldcrest	song thrush linnet bullfinch	song thrush linnet yellowhammer bullfinch	-	County
	Bogenjoss Burn and Monument Wood SOV ch320600 – 321820	N41 N42 N43 N47	High	Aberdeen – Inverness and Kittybrester Railway Line DWS north and east of SOV and Quadrat 5	30	-	-	skylark song thrush starling linnet yellowhammer	short eared owl* swallow meadow pipit dunnock mistle thrush willow warbler goldcrest	skylark song thrush linnet	skylark song thrush linnet yellowhammer	-	County

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
	Quadrat Bb03 Newton	N31 N32 N33	Medium		33	-	-	grey partridge skylark starling linnet yellowhammer house sparrow	oystercatcher curlew lapwing common gull lesser black-backed gull herring gull swallow willow warbler meadow pipit dunnock woodcock*	golden plover skylark linnet grey partridge	skylark linnet lapwing yellowhammer	golden plover	County
	Quadrat Bb04 Kirkhill / Bogenjoss	N37 N38 N39	Medium		13	-	-	linnet yellowhammer	oystercatcher swallow meadow pipit dunnock	linnet	linnet yellowhammer	-	Less than local
	Quadrat Bb05 Monument Wood	N46 N47 N48 N50	Low		24	-	-	grey partridge skylark starling linnet yellowhammer	oystercatcher herring gull swallow meadow pipit dunnock lesser black-backed gull willow warbler	skylark linnet grey partridge	skylark linnet yellowhammer grey partridge	-	Local

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
Section NL4 River Don - Goval Burn ch322600 – 325370	Quadrat Bb06 River Don	N51 N52 N54 N55	High	River Don DWS	35	-	whooper swan*	grey partridge skylark grasshopper warbler starling linnet yellowhammer reed bunting	mute swan oystercatcher black-headed gull herring gull lapwing common gull swallow house martin meadow pipit grey wagtail whooper swan* dunlin*	linnet skylark grey partridge reed bunting	grey partridge linnet yellowhammer skylark lapwing reed bunting dipper*	whooper swan	County
	Quadrat Bb07 Goval Reservoir / Meadowhead	N58 N59 N60 N61 N64 N66 N69	High		34	-	-	skylark starling linnet yellowhammer reed bunting	oystercatcher swallow house martin meadow pipit willow warbler grey wagtail lapwing dunnock mistle thrush	skylark linnet reed bunting	skylark linnet yellowhammer reed bunting lapwing	-	County

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
Section NL5 Corsehill - Blackdog ch325370 – 331000	Red Moss (West) SOV ch325900 – 326500	N74 N75	Low		15	-	-	yellowhammer reed bunting	swallow meadow pipit dunnock willow warbler	reed bunting	yellowhammer reed bunting	-	Less than local
	Lily / Corby Loch SOV ch327000 – 3283000	N85 N87	High	Corby Loch SSSI, DWS and SINS citation states that '…is important for roosting wildfowl and breeding birds.'	34	red throated diver	red throated diver scaup*	skylark song thrush linnet yellowhammer reed bunting	red throated diver scaup* kestrel oystercatcher dunlin curlew sand martin swallow meadow pipit dunnock willow warbler goldcrest	skylark song thrush linnet reed bunting	kestrel curlew skylark song thrush linnet yellowhammer reed bunting	red throated diver scaup dunlin	Regional
	Gourdieburn SOV ch328330 – 329000	N89	Medium		30	-	barn owl* red-backed shrike*	skylark song thrush starling tree sparrow linnet yellowhammer reed bunting red-backed shrike*	oystercatcher curlew black-headed gull sand martin swallow meadow pipit willow warbler barn owl*	skylark song thrush tree sparrow linnet reed bunting red-backed shrike*	curlew skylark song thrush tree sparrow linnet yellowhammer reed bunting barn owl*	barn owl red-backed shrike*	County

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
	Cranfield SOV ch329600 – 329910	N91	Low		13	-	-	song thrush yellowhammer	herring gull meadow pipit willow warbler	song thrush	song thrush yellowhammer	-	Less than local
	Quadrat Bb08 North of Loch Hills Farm	N80 N81	Low		26	-	little ringed plover	starling house sparrow linnet yellowhammer reed bunting	oystercatcher lapwing black-headed gull herring gull sand martin swallow meadow pipit dunnock	linnet reed bunting	linnet yellowhammer reed bunting lapwing	-	Local
	Quadrat Bb09 Red Moss Burn / Corby Loch	N84 N85 N86 N87	High		26	-	-	skylark starling linnet yellowhammer reed bunting	kestrel lapwing linnet snipe black-headed gull herring gull sand martin swallow meadow pipit willow warbler goldcrest	skylark linnet reed bunting	skylark linnet yellowhammer reed bunting kestrel lapwing	-	County
	Quadrat Bb10 North of Cranfield Farm	N90 N91	Low		13	-	-	skylark house sparrow tree sparrow yellowhammer	oystercatcher swallow	skylark tree sparrow	skylark tree sparrow yellowhammer	-	Less than local

Route Section	SOV / Quadrat	Contributing HAs	Habitat Value	Designated Sites Within Or Adjacent To SOV / Quadrat	Total Bird Species (inc non-breeding and incidental (I.R) / consultation records (C.R)	Legal / Conservation Status of Breeding Bird Species							Value of Breeding Population
						EC Birds Directive Annex I	WCA1I	JNCC Red List	JNCC Amber List	UK BAP	LBAP	Local Status (Uncommon / Rare)	
	Quadrat Bb11 Blackdog Burn	N93 N94 N95	Medium		30	-	-	skylark song thrush grasshopper warbler house sparrow linnet yellowhammer reed bunting	oystercatcher lapwing snipe herring gull green woodpecker sand martin swallow house martin meadow pipit dunnock	song thrush skylark linnet reed bunting	song thrush yellowhammer skylark reed bunting lapwing	-	County

* indicates incidental recording.
# indicates consultation record.

4.3 Evaluation of Bird Assemblages and Habitats: HAs

Sections NL1 – NL5 (Derbeth – Blackdog)

4.3.1 An evaluation of HAs within Sections NL1 – NL5 (Derbeth – Blackdog) is presented in Table 18.

4.3.2 A full description of habitats represented by HAs is presented in the Terrestrial Habitats report (Appendix A10.1).

Table 18 – Evaluation of HAs: Section NL1 – NL5 (Derbeth – Blackdog)

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
Section NL1 (Derbeth – Tulloch Road)			
N1	Medium	Habitats within the HA were partially sampled by Quadrat Bb01. However, the Quadrat is not considered to be representative of the majority of the habitats within the HA nor is the HA considered to be representative of any area sampled within the Section SL1. Therefore a value has been assigned based on values derived from similar area in the Southern Leg.	Local
N2	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 which is considered to be representative of the HA and therefore the HA is likely to support a similar assemblage.	Local
N3	Medium	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and therefore the HA is likely to support a similar bird assemblage.	Local
N4	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 which is considered to be representative of the HA and therefore the HA is likely to support a similar assemblage.	Local
N5	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 with the exception of marsh grassland and therefore the HA is considered to be representative of the Quadrat and as such the HA is likely to support a similar assemblage.	Local
N6	High	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 and therefore the Quadrat is considered to be representative of the HA and as such the HA is likely to support a similar assemblage.	Local
N7	Low	Habitats within the HA were partially sampled by Quadrat Bb01 which is considered to be representative of the HA although more diverse in terms of habitats and therefore the HA is likely to support a less diverse bird assemblage.	Less than local
N8	Medium	Habitats within the HA were partially sampled by Quadrat Bb01 which is considered to be representative of the HA and therefore the HA is likely to support a similar bird assemblage.	Local
N9	High	The HA is located outside the route corridor. Habitats within the HA were not therefore sampled by either a SOV or Quadrat. The habitats within the HA are similar to habitats occurring within Quadrat Bb01 and therefore the Quadrat is considered to be representative of the HA although the HA is greater in extent and therefore the HA is likely to support a more diverse assemblage.	County
N10	Low	Habitats within the HA were partially sampled by Quadrat Bb01 which is considered to be representative of the HA although the HA is less diverse in terms of habitats and therefore is likely to support a similarly less diverse bird assemblage.	Less than local
N11	Medium	Habitats within the HA were partially sampled by Quadrat Bb01 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N12	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 although are less diverse and therefore the HA is likely to support a less diverse breeding assemblage compared to the Quadrat.	Less than local
N13	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 although are less diverse and therefore the HA is likely to support a less diverse bird assemblage compared to the Quadrat.	Less than local
N14	High	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL1. Therefore a value has been assigned based on an evaluation of similar habitats represented by Red Moss (West) SOV located in Section NL5. However, the habitat represented by the HA is more diverse which is reflected in the evaluation.	County
N15	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 although are less diverse and therefore the HA is likely to support a less diverse breeding assemblage compared to the Quadrat.	Less than local

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
N16	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb02 although are less diverse and therefore the HA is likely to support a less diverse bird assemblage compared to the Quadrat.	Less than Local
N17	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within Quadrat Bb01 and therefore the HA is likely to support a similar bird assemblage.	Local
Section NL2 (SAC Craibstone)			
N18	Medium	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N19	Low	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N20	Low	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N21	Low	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and Craibstone SOV. The HA is likely to support a similarly bird assemblage.	Less than local
N22	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within part of Quadrat Bb02 and therefore the HA is likely to support a similar bird assemblage.	Local
N23	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats occurring within part of Quadrat Bb02 and therefore the HA is likely to support a similar bird assemblage.	Local
N24	High	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N25	High	Habitats within the HA were partially sampled by Quadrat Bb02 which is considered to be representative of the HA and part of Craibstone SOV. The HA is therefore likely to support a similarly bird assemblage (primarily compared to Craibstone SOV).	County
N26	High	Habitats within the HA were sampled by Craibstone SOV. The HA is therefore likely to support a similarly bird assemblage.	County
N27	High	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb02 and Craibstone SOV therefore the HA is likely to support a similar bird assemblage.	County
N28	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb02 although are less diverse. Therefore the HA is likely to support a less diverse bird assemblage.	Local
Section NL3 (A96 – Nether Kirkton)			
N29	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb02 although are less diverse. Therefore the HA is likely to support a less diverse bird assemblage.	Local
N30	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb03 although less diverse and more disturbed and therefore the HA is likely to support a less diverse bird assemblage.	Local
N31	Low	Habitats within the HA were partially sampled by Quadrat Bb03 which is considered to be representative of part of the HA. However, the habitats within HA represent The HA is therefore likely to support a similarly bird assemblage.	Local
N32	Medium	Habitats within the HA were partially sampled by Quadrat Bb03 which is considered to be representative of the HA. The HA is therefore likely to support a similarly bird assemblage.	County
N33	Medium	Habitats within the HA were partially sampled by Quadrat Bb03 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	County

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
N34	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb03 and Bb04 and therefore the HA is likely to support a similar bird assemblage**.**	Local
N35	Low	Habitats within the HA were sampled by Standingstones Wood SOV and therefore the HA is likely to support a similar bird assemblage.	Less than local
N36	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb03 and therefore the HA is likely to support a similar bird assemblage.	Local
N37	Medium	Habitats within the HA were sampled by Kirkhill Forest SOV and therefore the HA is likely to support a similar bird assemblage.	County
N38	High	Habitats within the HA were partially sampled by Quadrat Bb04 which is considered to be representative of the HA and Kirkhill SOV. The HA is therefore likely to support a similarly bird assemblage.	Local
N39	Low	Habitats within the HA were partially sampled by Quadrat Bb04 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Less than local
N40	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb03 and Bb04 and therefore the HA is likely to support a similar bird assemblage.	Local
N41	Low	Habitats within the HA were partially sampled by Bogenjoss Burn / Monument Wood SOV and therefore the HA is likely to support a similar bird assemblage.	County
N42	High	Habitats within the HA were partially sampled by Bogenjoss Burn / Monument Wood SOV and therefore the HA is likely to support a similar bird assemblage.	County
N43	Medium	Habitats within the HA were partially sampled by Bogenjoss Burn / Monument Wood SOV and therefore the HA is likely to support a similar bird assemblage.	County
N44	Low	Habitats within the HA were partially sampled by Quadrat Bb05 which is considered to be representative of the HA although the habitats within the HA are less diverse and therefore the HA is likely to support a less diverse bird assemblage.	Less than local
N45	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Bogenjoss Burn / Monument Wood SOV and therefore the HA is likely to support a similar bird assemblage.	County
N46	Low	Habitats within the HA were partially sampled by Quadrat Bb05 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N47	Medium	Habitats within the HA were sampled by part of Bogenjoss Burn / Monument Wood SOV and therefore the HA is likely to support a similar bird assemblage.	Local
N48	Low	Habitats within the HA were partially sampled by Quadrat Bb05 which is considered to be representative of the HA and therefore the HA is likely to support a similarly bird assemblage.	Local
N49	Low	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb05 and therefore the HA is likely to support a similar bird assemblage.	Local
Section Nl4 (Nether Kirkton - Corsehill)			
N50	Medium	Habitats within the HA were not sampled by either a SOV or Quadrat. However, the habitats within the HA are similar to habitats represented by part of Quadrat Bb04 and Bb05 and therefore the HA is likely to support a similar bird assemblage**.**	Local
N51	Medium	Habitats within the HA were partially sampled by Quadrat Bb06 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N52	High	Habitats within the HA were sampled by Quadrat Bb06 which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	County
N53	Medium	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Craibstone SOV located in Section NL2.	County

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
N54	Low	Habitats within the HA were partially sampled by Quadrat Bb06 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N55	Low	Habitats within the HA were partially sampled by Quadrat Bb06 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N56	High	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Bogenjoss Burn / monument Wood SOV located in Section NL3.	County
N57	Low	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Kirkhill Forest SOV located in Section NL3.	County
N58	Medium	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N59	Low	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Less than local
N60	Medium	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N61	High	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA and as such, the HA is likely to support a similar bird assemblage.	County
N62	Medium	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N63	Medium	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Craibstone SOV located in Section NL2.	County
N64	Low	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Less than local
N65	Medium	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Craibstone and Red Moss (West) SOVs located in Section NL3 and 5.	Local
N66	Low	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N67	Low	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL4. Therefore a value has been assigned based on an evaluation of similar habitats represented by Kirkhill Forest SOV located in Section NL3.	Local
N68	Low	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N69	Low	Habitats within the HA were partially sampled by Quadrat Bb07 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local
N70	Low	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Quadrat Bb07 although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Local

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
Section NL5 (Corsehill - Blackdog)			
N71	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Red Moss (West) SOV although the habitats within the HA are more diverse than the SOV and as such, the HA is likely to support a more diverse bird assemblage.	Local
N72	Medium	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative. Therefore a value has been assigned based on an evaluation of similar habitats represented by Kirkhill Wood SOV located in Section NL3.	County
N73	Low	Habitats within the HA were partially sampled by Quadrat Bb06 and Bb07 which are considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Less than local
N74	Low	Habitats within the HA were sampled by Red Moss (West) SOV and as such, is likely to support a similar breeding bird assemblage.	Less than local
N75	Low	Habitats within the HA were sampled by Red Moss (West) SOV and as such, is likely to support a similar bird assemblage.	Less than local
N76	Low	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Quadrat Bb08 although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Less than local
N77	Low	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL5. Therefore a value has been assigned based on an evaluation of similar habitats represented by Kirkhill Wood SOV located in Section NL3.	Local
N78	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Red Moss (West) SOV although the habitats within the HA are more diverse than the SOV and as such, the HA is likely to support a more diverse bird assemblage.	Local
N79	Low	Habitats within the HA were not sampled by any SOV and Quadrat nor are they considered to be representative of any area sampled within the Section SL5. Therefore a value has been assigned based on an evaluation of similar habitats represented by Quadrat Bb07 located in Section NL3.	Local
N80	Medium	Habitats within the HA were sampled by Quadrat Bb08 which is considered tto be representative of the HA and as such, the HA is likely to support a similar bird assemblage.	Local
N81	Low	Habitats within the HA were sampled by Quadrat Bb08. However, the Quadrat is not considered to be representative of the HA nor is the HA considered to be representative of any area sampled within the Section SL5. Therefore a value has been assigned based on professional judgement.	County
N82	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Red Moss (West) SOV although the habitats within the HA are more diverse than the SOV and as such, the HA is likely to support a more diverse bird assemblage.	Local
N83	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Red Moss (West) SOV as such the HA is likely to support a similar bird assemblage.	Local
N84	Medium	Habitats within the HA were partially sampled by Quadrat Bb09 which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	County
N85	High	Habitats within the HA were sampled by Lily / Corby Loch SOV and therefore the HA is likely to support a similar bird assemblage.	Regional
N86	Low	Habitats within the HA were partially sampled by Quadrat Bb09 which is considered to be representative of the HA although the habitats within the HA are less diverse than the Quadrat and as such, the HA is likely to support a less diverse bird assemblage.	Less than local
N87	Low	Habitats within the HA were partially sampled by Quadrat Bb09 and Lily / Corby Loch SOV which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	County
N88	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Lily / Corby Loch SOV although smaller in extent and less diverse in terms of the habitats and as such the HA is likely to support a less diverse bird assemblage.	County
N89	Low	Habitats within the HA were sampled by Goudieburn SOV which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	County
N90	Low	Habitats within the HA were partially sampled by Quadrat Bb10 which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	Less than local

HA	Habitat Value	Description of Representation /	Value of Bird Assemblage
N91	Low	Habitats within the HA were sampled by Cranfield SOV which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	Less than local
N92	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Quadrat Bb10 and as such the HA is likely to support a less diverse bird assemblage.	Local
N93	Medium	Habitats within the HA were partially sampled by Quadrat Bb11 which is considered to be representative of the HA and as such the HA is likely to support a similar bird assemblage.	County
N94	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of Quadrat Bb10 and Bb11 and as such the HA is likely to support a less diverse bird assemblage.	Local
N95	Low	Habitats within the HA were partially sampled by Quadrat Bb11 which is considered to be representative of the HA and as such the HA is likely to support a similar breeding bird assemblage.	Local
N96	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of parts of Quadrat Bb10 and Bb11 and as such the HA is likely to support a less diverse bird assemblage.	Local
N97	Medium	Habitats within the HA were not sampled by either SOV or Quadrat. However, the HA is considered to be representative of parts of Quadrat Bb10 and Bb11 and as such the HA is likely to support a less diverse bird assemblage.	Local

5 Potential Impacts

5.1 Introduction

5.1.1 Potential Impacts (both short- and long-term) can either be positive or negative and are identified and described for both construction and operation of the proposed scheme.

5.1.2 The following key issues associated with road construction and operation of the proposed scheme are set out following the DMRB guidelines and recommendations (Highways Agency, 2001). It should be noted that the impacts associated with the operational phase of the scheme are considered to be permanent, whereas temporary impacts, which are only apparent while the road is being built, are discussed in association with the construction phase.

5.1.3 Potential impacts associated with construction and operation of the proposed scheme on breeding bird populations are likely to include: direct mortality, habitat loss, habitat fragmentation/isolation, disturbance (in particular during the bird breeding season) and pollution/other indirect impacts.

5.1.4 The potential impacts outlined above frequently interact (i.e. habitat loss during construction can potentially result in disturbance and habitat fragmentation) and the resulting combination of impacts may through synergistic effects significantly increase the negative impact of the proposed scheme (Luell et al., 2003).

5.2 Generic Impacts: Habitat Areas

5.2.1 The following comprises a description of the general potential impacts that are likely to occur during construction and operation of the proposed scheme.

Direct Mortality

Construction

5.2.2 Direct mortality of adult birds, their eggs and un-fledged/fledged young during road construction is directly linked to pre-construction habitat loss and disturbance.

5.2.3 Habitat loss resulting from clearance of vegetation prior to construction is unlikely to result in direct mortality of adults and/or sufficiently fledged young since they are able to escape by moving into unaffected adjacent habitats. However, birds' eggs and un-fledged young are vulnerable to direct mortality impacts associated with habitat loss with species located in denser habitats, such as dense scrub, grassland or woodland being the most effected as the nests cannot be easily detected by contractors.

5.2.4 Disturbance could result in direct mortality due to the presence of workers/construction activities that may cause a lack of breeding success if adult birds are not able to spend sufficient time incubating eggs to tending dependant young.

5.2.5 Direct mortality of bird eggs and young (from habitat loss and disturbance) is most likely to occur during the breeding season, typically March to July inclusive, and would constitute a prosecutable offence under the WCA (in particular for those species listed within Schedule 1 of the Act).

Operation

5.2.6 Many bird species will attempt to cross active roads to move between habitat fragments that arise as a direct result of operational habitat fragmentation and isolation and the barrier effects that road development imposes on species movement (Salter, 1994).

5.2.7 High mortality rates associated with operational roads reduces the exchange of bird populations between habitats and thus increases isolation effects, demonstrating the link between mortality and barrier effects caused by fragmentation (Van Apeldoorn, 1995). While there is no data available for the numbers of birds killed on roads in Scotland, a review undertaken by Slater (1994) estimated that a total of 653,000 and 7,000,000 birds per annum were killed on Dutch and Bulgarian roads.

5.2.8 An increase in direct mortality resulting from habitat fragmentation associated with an increase in number of roads and road traffic within the UK has been highlighted as a major component in the decline of some bird species such as the barn owl (a WCA Schedule 1 species). It has been observed that twice as many barn owls are now killed by road traffic (an estimated 5,000 individuals per annum) on UK roads as compared with the 1950's and in some areas suitable habitat no longer supports barn owl populations (English Nature, 1996).

5.2.9 Roads can also create unexpected sources of mortality, for example, there have been several documented cases of bird mortality from road salt. Finches, in particular, are attracted to salt, probably to satisfy a dietary need. This can cause mortality through vehicle collision and also through the toxic effects of the ingested salt (Mineau & Brownlee, 2005).

5.2.10 In contrast, some bird species actively benefit from living near roads such as certain members of the corvid family, for example magpie and carrion crow, which regularly scavenge on road kills (Slater, 1994) and common kestrel, which hunts for small rodents along suitable roadside verges. However, none of these species are considered to be species of conservation concern.

5.2.11 The proposed scheme would constitute a new off-line road through a range of habitats where no comparable road exists and is likely to result in an increase in mortality (in addition to fragmentation and isolation of both adult and juvenile birds (with the greatest hazard presented to juvenile birds) through road traffic accidents (RTAs) and is most likely to occur where birds do not have time to avoid road traffic travelling at speed. RTAs typically occur where woodland or scrub habitats are located immediately adjacent to busy roads and it likely that low flying bird species (e.g. members of the thrush family, owls and game birds) would be the greatest affected.

Habitat Loss

Construction and Operation

5.2.12 The direct impact of road construction is the physical loss of breeding and foraging habitats along a route corridor, which are replaced or altered by transport infrastructure. The impacts associated with direct habitat loss are additionally increased by the interaction of disturbance and fragmentation/isolation impacts, which if combined can lead to a change in the distribution of species within a route corridor or wider study area (Luell et al., 2003).

5.2.13 Pre-construction habitat clearance would result in the destruction of potential breeding habitat for bird species. Cumulative impacts are also likely to arise as a consequence of the destruction of birds' eggs and direct mortality of un-fledged young and the displacement of adults and fledglings by means of disturbance into adjacent, un-affected habitat.

5.2.14 Habitat clearance would additionally result in the direct loss of foraging habitat through the loss of plant food groups such as buds or berries and the indirect loss of invertebrate communities (which form a major dietary constituent for the majority of small to medium sized bird species, e.g. blue tit or song thrush).

5.2.15 Removal/clearance of surrounding vegetation and/or buildings (which may or may not provide nesting sites) may possibly alter the available shelter for breeding birds increasing vulnerability to a range of external factors such as adverse conditions and/or predators.

5.2.16 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 19 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 19 – 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*

5.2.17 Although occurring during the construction phase, this habitat loss is regarded as an operational impact because the loss would be permanent. Further permanent habitat loss may occur through the occasional operational management of roadside habitats (comprising mowing of verges or trimming of scrub/trees). Operation of the proposed scheme could result in a reduction in the abundance of invertebrate communities within the immediate vicinity of the proposed scheme and thus indirectly impact bird populations through a reduction in food availability.

5.2.18 In addition, indirect habitat loss can occur in areas adjacent to the proposed road, where an increase in noise and pollution from the traffic using the road can lead to birds moving out of the area and thus rendering potentially suitable habitat as unsuitable for breeding bird populations.

5.2.19 Temporary habitat loss associated with the construction and use of site compounds and other temporary structures, for example, access tracks, bridges or storage areas would result in the temporary destruction of potential breeding bird habitat, the effects of which are described above. However, it should be noted that the level of permanence (in terms of loss) would vary and is dependant on location/s that are currently unknown.

5.2.20 Operation of the proposed scheme could result in a reduction in the abundance of invertebrate communities within the immediate vicinity of the proposed scheme in particular as a result of pollution, which may include road salting, oil and fuel spillage resulting in an indirect impact to bird populations through a reduction in food availability.

5.2.21 In addition, indirect habitat loss (i.e. habitat degradation) can occur in areas adjacent to the proposed road, where an increase in noise and pollution from the traffic using the road can lead to birds moving out of the area and thus rendering potentially suitable habitat as unsuitable for breeding bird populations. Studies undertaken in the Netherlands demonstrated that approximately 60% of species exhibited reduced breeding densities close to roads with the distance over which the effect was measurable varying depending on how busy the roads were (Reijnen & Foppen, 1994; 1995b). The research observed that very busy roads (up to 60,000 vehicles per day) affected breeding birds up to 2.9km away with less busy roads (up to 10,000 vehicles per day) affecting birds up to 1.5km from the road. Current estimates for the AWPR estimate that it would carry up to 43,000 vehicles per day at its busiest time, which is likely to result in significant disturbance to breeding birds in adjacent unaffected habitats. Breeding bird species affected could potentially include; buzzard, woodcock, cuckoo, woodpeckers, tree pipit, goldcrest, chaffinch and warblers (wood and willow warbler) with significantly lower breeding success (or complete absence) near to the road.

Habitat Fragmentation and Isolation

Construction and Operation

5.2.22 Habitat fragmentation occurs when a road development imposes a barrier to the natural dispersal of animals resulting in disrupted movement across a site (English Nature, 2001). Research undertaken by English Nature (1994) suggests that habitat fragmentation may have a greater impact than isolation (defined as ‘a state of separation that exists between individuals or groups of a particular species’) but that the isolation effect incurred by species imposed by fragmentation is increased by the barrier effects of roads in conjunction with disturbance and mortality.

5.2.23 The loss of contiguous habitat due to fragmentation is now considered to be one of the most important factors in accelerating the reduction in worldwide biodiversity (Wilson, 1992 in English Nature, 2001).

5.2.24 Previous studies of breeding birds in highly fragmented woodland has shown that greater number of species were recorded in larger areas of woodland, but that factors such as available hedgerows within 0.5km of the woodland and species composition of the woodland were significant contributors to the variation in the number of breeding birds. The research also found that local species extinctions were more pronounced in smaller woods than in larger areas of woodland (Hinsley et al., 1992 in English Nature, 2001).

5.2.25 English Nature (1994) reports that the habitats most likely to be affected by fragmentation are woodland, heathland and species-rich grassland and bird species that move between habitats in order to maintain genetic diversity and avoid inter-breeding are the most impacted. However, some bird species such as the great spotted woodpecker are not significantly affected by fragmentation and easily cross gaps between pockets of woodland to meet their area requirements. The ability to utilise fragmented habitats varies according to species with greater impacts on those species less able to cross gaps. Some species will not live within several hundred meters of a road, for example, cuckoo. While the barrier effect imposed by the proposed scheme to birds is difficult to assess due to it being variable between species, as a general rule, the busier and wider the road the more effective barrier it is to dispersion (English Nature, 2001).

5.2.26 With respect to the above research, the proposed scheme is likely to constitute a significant dispersion barrier between habitats that could have the ability to adversely impact a range breeding bird species, some of which may not normally be significantly impacted by habitats gaps.

5.2.27 Construction of the proposed scheme is likely to have significant fragmentation and isolation impacts on bird populations within the survey corridor through the severing and subsequent isolation of bird populations within pre-existing habitats, as dispersal of species between habitats is one of the key factors that enable species to maintain their population viability. Although occurring during the construction phase of the scheme, permanent habitat fragmentation is regarded as an operational impact. Habitat fragmentation and isolation would have a negative impact on local bird populations through a reduction in dispersal and subsequent isolation of species, which could potentially result in a reduction in population sizes. The extent of these impacts is likely to be dependent on the size of the isolated area of habitat and the species affected, as the ability to avoid genetic isolation and localised extinctions by moving between fragmented habitats varies between bird species. However, the continued fragmentation and isolation of bird species within severed habitats could have a detrimental effect on species population dynamics and ultimately viability.

Disturbance

Construction

5.2.28 Disturbance resulting from noise and vibration associated with construction of the proposed scheme would occur in two stages. The first stage would comprise disturbance resulting from pre-construction habitat clearance. The second stage would comprise both direct disturbance (for example, from rock chipping) and indirect disturbance (for example, human activity associated with construction of the proposed scheme). Both direct and indirect disturbance are likely to contribute to an increase in the effects of fragmentation and isolation. Should either form of disturbance reach a level considered to be significant, it may lead to some species of bird failing to nest during the breeding season (March – July inclusive).

5.2.29 The location of temporary site compounds/offices near sensitive habitats, for example areas of woodland or wetlands, could result in significant disturbance to breeding birds resulting from noise, vibration and light pollution in additional to physical disturbance from the presence of construction workers and heavy plant.

5.2.30 Disturbance resulting from light pollution associated with construction during low light levels in winter/autumn and/or 24-hour construction could result in disturbance to both breeding and non-breeding bird species located within habitats adjacent to the proposed scheme, potentially leading to some species of bird failing to breed or completely abandoning their habitats at a local level if the disturbance reaches a significant level. The severity of the impact would vary according to the frequency and magnitude of the disturbance and the species involved.

5.2.31 It should be noted that it is illegal to disturb breeding birds under the WCA (1981), in particular, for those species listed within Schedule 1 of the Act.

Operation

5.2.32 Research undertaken by Reijnen et al. (1997) and Reijnen & Foppen (1994) has shown that operational noise is a primary factor in altering the density of bird populations adjacent to roads and highways.

5.2.33 A detailed study on the effects of road traffic noise on breeding bird populations in the Netherlands by Reijnen et al. (1995a) observed that roads used for high speed travel reduced the density of breeding birds within adjacent woodland and grassland habitats. Their research additionally noted that the distances at which species were affected varied between species. For example, the

greatest sensitivity to disturbance was observed in black-tailed godwits and cuckoo, located 1130m and 990m, respectively from the study highway.

5.2.34 Further research undertaken by Reijnen et al. (1995b) has shown that road traffic noise accounted for lower densities of 43 songbird species in habitats adjacent to operational roads and that the distance from a motorway at which breeding bird densities were affected was influenced by the intensity and speed of traffic (Reijnen et al., 1995a).

5.2.35 Other studies have shown that road traffic noise exceeding 50dBA can reduced bird density (40 dBA for some woodland species) in adjacent habitats, while in comparison, some bird species appeared unaffected by disturbance, but had lower breeding success (Luell et al., 2003).

5.2.36 Light pollution can have adverse impacts on bird species and can affect both breeding and foraging behaviour in a number of species of bird. This impact was first observed by Rawson (1923) who demonstrated the correlation between critical light levels at dawn and singing in thrushes and suggested that artificial lighting could modify the timing of natural behavioural patterns.

5.2.37 Farner (1964) demonstrated photoperiodic control of reproduction in birds and observed that increasing artificial day length induced hormonal, physiological and behavioural changes initialling breeding. Lofts & Merton (1968) demonstrated photoperiodic control of reproduction in birds, showing that 50 species of wild bird could be brought into breeding condition prematurely by exposure to artificially long days in winter.

5.2.38 Hill (1992) observed that seabirds were disorientated by street lights on cloudy nights and observed that redshank and oystercatchers were observed feeding within 50m of artificial lighting at night, while flocks of dunlin were observed roosting near to a large roundabout lit by flood lighting.

5.2.39 Outen (undated) and Hill (1992) found that nocturnal bird species such as barn owl are sensitive to the presence of bright illumination and that artificial lighting has the potential to provide more feeding time for birds, but could have a negative impact on prey abundance leading to food shortages.

5.2.40 Disturbance resulting from noise and vibration associated with operation of the proposed scheme would be mainly influenced by traffic type, traffic intensity, road surface properties, topography and structure/type of adjacent vegetation, the magnitude and spread of which is in turn influenced by underlying geology and soil characteristics (Luell et al., 2003).

5.2.41 Disturbance during operation of the proposed scheme would result from noise and vibration associated with road traffic, artificial lighting at major junctions and occasional operational maintenance of the proposed scheme. As with disturbance associated with construction, an increase in traffic noise and lighting could result in sensitive bird species failing to breed or abandoning habitats adjacent to the scheme. This impact may be more pronounced given that the majority of habitats within the route corridor are currently subject to either low or no artificial lighting.

Pollution and Other Indirect Impacts

Construction

5.2.42 Accidental spills of chemicals and other potentially toxic substances during construction of the proposed scheme may occur and are of particular concern if they happen within proximity of ecological sensitive communities or rivers and/or streams (especially if they are designated or form a tributary to a site designated at a national or European level, for example, SSSI or cSAC (refer to ES Chapter 9: Water Environment). The severity and magnitude of the pollution impact would depend on the constituents, toxicity to biodiversity and discharge/spill volume of the pollutant in question.

Operation

5.2.43 Pollutants and toxins are derived from road traffic and road surfaces. The exhaust produced by road vehicles contains a number of pollutants ranging from carbon monoxide, nitrogen oxide and sulphur dioxide to hydrocarbons and dioxins, while cars themselves produce a number of heavy metals ranging from lead to cadmium. These chemicals and gases can potentially pollute surface and groundwater, soil and vegetation (Luell et al., 2003).

5.2.44 Research conducted by Ballard and Hacker (1996) has shown that de-icing salt used in the winter to keep roads ice-free can potentially result in the death of seed eating birds such as finches, which consume seeds contaminated by salt. The application of de-icing salt to the proposed scheme during the winter and the indirect pollution of adjacent habitats via vehicle spray could potentially result in the death of seed eating bird species foraging in habitats located adjacent to the proposed scheme. It is not possible to estimate the average amount of salt spread because this is dependant on the rate of salt spread and speed of the spreader.

5.2.45 Accidental spills of chemicals and other potentially toxic substances during operation of the proposed scheme may occur as a consequence of inadvertent discharge or indirectly as a result of road traffic accidents and as with construction, are of particular concern if they happen within proximity of ecological sensitive communities or rivers and/or streams identified above (refer to ES Chapter 9: Water Environment).

5.2.46 It is not possible to state the impact that atmospheric pollution, such as lead contamination derived from vehicle exhaust, is likely to have on bird populations without first undertaking further research regarding predicted traffic flows along the proposed scheme and analysis of emissions. It is likely that pollution derived from road traffic at a local level would decrease as a result of a reduction in local congestion associated with a movement of traffic onto the AWPR, for example, within the City of Aberdeen. However, a reduction in local traffic congestion would result in an increase in road traffic pollution at district to regional level as more road traffic uses the AWPR to avoid local congestion. Furthermore, current road traffic pollution effects habitats and species within a built up environment, the proposed scheme and the road traffic using it would introduce pollution into greenspace habitats and associated species.

5.2.47 Insufficient research has been undertaken to date regarding the direct impacts that operational roads have on the abundance of invertebrate communities and the indirect impacts on bird species through a reduction in food availability. The only survey conducted to date in the UK was undertaken by the RSPB in 2004 (www.rspb.org.uk/bugcount). The study observed that in total one invertebrate was killed for every five miles travelled.

5.2.48 Spills and/or accidental discharge within or in close proximity to watercourses and/or waterbodies during construction and operation could constitute a potentially negative impact, as assessed and described in Chapter 9 of the ES (Water Environment).

5.3 Generic Impacts: Key Bird Species

5.3.1 A description of potential generic impacts on key birds species as identified in the evaluation is presented in Table 20.

Table 20 – Description of Generic Impacts on Key Bird Species

Bird Species	Habitat/s of value	Impacts
barn owl	Uncommon resident. Breeds in farm buildings, foraging over open farmland and rough grassland habitats.	Loss and fragmentation of breeding habitat (buildings, in particular, farm out buildings and open fields) during operation. Disturbance during construction and operation. Possible risk of RTAs due to low flight patterns.
black-headed gull	Common resident and passage migrant. Breeds on coastal and inland marshes, moorland and gravel pits. Winters on estuaries, lakes, reservoirs, coasts and rubbish tips.	Possible direct mortality from ingestion of pollutants. Unlikely to be impacted by loss of breeding habitat or disturbance.
bullfinch	Common resident and rare passage migrant. Breeds and winters in orchards, parks, woodlands and scrub.	Loss of breeding habitat (woodland and scrub) during operation of the scheme. Disturbance during construction and operation.
common gull	Common resident and passage migrant. Breeds on bare ground, or rocky grassy slope less often on coastal edges and more recently, buildings.	Possible direct mortality from ingestion of pollutants. Unlikely to be impacted by loss of breeding habitat or disturbance.
curlew	Common resident. Breeds on areas of damp moorland and pasture.	Loss of breeding habitat (heathland, pasture and marshy grassland) during operation. Disturbance during construction. Species in the long term is unlikely to be disturbed during operation due to habituated of road traffic.
dunlin	Common winter visitor and passage migrant, uncommon breeder. Breeds on grassy moorland and peat bogs.	Loss of breeding habitat and disturbance during construction. Species in the long term is unlikely to be disturbed during operation due to habituation of road traffic.
dunnock	Common resident and uncommon passage migrant. Breeds and winters in gardens, parks, woodland, waste ground and hedges.	Loss of breeding habitat (woodland, hedgerow and scrub) during operation. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact.
goldcrest	Common resident and passage migrant. Breeds and winters in coniferous woodlands, occurring in deciduous woodland, scrub and even gardens in winter.	Loss of breeding habitat (conifer woodlands) during operation Disturbance during construction. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact.
golden plover	Uncommon breeder, common passage migrant species. Breeds on moorland peat bogs.	Loss of breeding habitat and disturbance during construction. Species in the long term is unlikely to be disturbed during operation due to habituated of road traffic.
grasshopper warbler	Uncommon summer visitor and scarse passage migrant. Breeds in habitats with low thick vegetation, marshland, beside lakes or watercourses, in young conifer plantations or clear felled areas, among tall grass and herbage with scattered bushes.	Loss and fragmentation of breeding riparian habitats (marsh / marshy grassland and areas of wet woodland / scrub) during operation. Disturbance and pollution to wet areas during construction and operation.
greater black-backed gull	Common resident. Breeds on rocky islands and headlands, occasionally on inland moors.	Possible direct mortality from ingestion of pollutants. Unlikely to be impacted by loss of breeding habitat or disturbance.
green woodpecker	Common resident. Breeds in mature woodland, parkland and heaths, feeding on nearby short grassland.	Loss and fragmentation of breeding habitat during operation. Disturbance during both construction and operation. Possible risk of RTAs due to low flight pattern.
grey partridge	Common resident. Breeds and winters on farmland, grassland and arable fields.	Loss and fragmentation of breeding habitat (arable farmland and fields) during operation. Disturbance during both construction and operation. Possible risk of RTAs due to low flight pattern.
grey wagtail	Common resident and passage migrant. Breeds in sheltering trees, shrubs, or dense herbage, holes, ledges, or hollows for nesting. Usually but not exclusively associated with water, such as river or streams.	Loss and fragmentation of breeding habitat during operation. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact. Possible direct mortality from ingestion of pollutants.
herring gull	Common resident and passage migrant. Breeds on rocky coastal edges and more recently, buildings.	Possible direct mortality from ingestion of pollutants. Unlikely to be impacted by loss of breeding habitat or disturbance.

Bird Species	Habitat/s of value	Impacts
house martin	Common summer visitor and passage migrant. Breeds on the sides or buildings or other structure with vertical sides. Feeds on insects over fields and other areas.	Loss and fragmentation of breeding habitat (buildings and open fields) during operation. Unlikely to be subject to disturbance. Possible risk of RTAs due to low flight patterns.
kestrel	Common resident and passage migrant. Breeds in open woodland, parks, farmland, moorland and towns. Regularly feeds over roadside verges.	Loss and fragmentation of breeding habitat during operation. Unlikely to be subject to disturbance. Possible risk of RTAs due to low flight patterns.
lapwing	Common resident and passage migrant. Breeds from the coast to the uplands on marshy areas and farmland. Winters on estuaries and farmland.	Loss and fragmentation of breeding habitat (farmland) during operation. Disturbance, in particular during construction, as species is sensitive to human presence.
lesser black-back gull	Common summer visitor and passage migrant. Breeds on coastal cliffs, buildings, moorland and dunes.	Possible direct mortality from ingestion of pollutants. Unlikely to be impacted by loss of breeding habitat or disturbance.
linnet	Common resident and scarce passage migrant. Breeds in scrub on moorland, heaths and farmland. Winters in stubble and weedy fields.	Loss of breeding and wintering habitat (farmland and grassland) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact.
meadow pipit	Common resident and passage migrant. Breeds in open country, moors and heaths, coastal meadows, pastures and bogs.	Loss and fragmentation of breeding habitat (grassland, heathland and bog). Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact.
mistle thrush	Common resident and scarce passage migrant. Breeds in woods, parks, gardens and orchards. Also found in winter in fields and moorland edges.	Loss and fragmentation of breeding habitat (woodland, scrub, gardens, agricultural fields). Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. Possible risk of RTAs due to low flight patterns.
mute swan	Common resident. Breeds on lakes, streams, rivers, estuaries, and marshes.	Possible direct mortality from ingestion of pollutants. Loss and fragmentation of breeding habitat during operation. Disturbance during construction and operation.
osprey	Uncommon summer visitor and passage migrant. Breeds in trees, favouring Scots pine woodland but dependent on large fresh-wwaterbodies (rivers or lochs) for feeding.	Possible direct mortality from ingestion of pollutants. Loss and fragmentation of the River Dee during operation. Disturbance during both construction and operation at the River Dee and Loirston Loch.
oystercatcher	Common resident. Breeds on grass fields and shingle beside lakes, rivers and seashores. Winters on estuaries, sandy beaches and open fields.	Loss of breeding habitat (farmland and grassland) during operation. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact.
red-backed shrike	Rare vagrant. Breeds on heaths and commons with thorn bushes and gorse.	Loss of breeding habitat (heathland and scrub) during operation. Disturbance during construction and operation.
red-throated diver	Common at coastal locations, uncommon inland. Breeds on lochs and pools.	Possible direct mortality from ingestion of pollutants. Loss of breeding habitat during operation. Disturbance during construction and operation.
reed bunting	Common resident and passage migrant. Breeds and winters in reedbeds, upland and lowland marshes and farmland. Visits gardens in winter.	Possible direct mortality from ingestion of pollutants. Loss, fragmentation and possible pollution of breeding habitat (riparian corridors, marshland and scrub/hedgerows operation) during operation. Disturbance during construction and operation.
sand martin	Common summer visitor and passage migrant. Breeds in riverbanks, lakesides and sandpits. Usually seen over water.	Loss of breeding habitat during operation. Unlikely to be subject to disturbance other then in proximity of breeding areas. Possible risk of RTAs due to low flight patterns.
scaup	Uncommon winter visitor and passage migrant. Breeds by moorland pools and lakes.	Possible direct mortality from ingestion of pollutants. Loss and fragmentation of non-breeding habitat during operation. Disturbance during construction and operation.
short-eared owl	Common resident and passage migrant. Breeds on boggy moorland, upland pasture, young conifer plantations and marshes.	Loss and fragmentation of breeding habitat during operation. Disturbance during construction and operation. Possible direct mortality during operation from RTAs.
skylark	Common resident and partial migrant. Breeds on moorland, farmland, dunes and grassland. Winters on rough grassland, stubble and saltmarsh.	Loss of breeding habitat (arable and grassland) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact.

Bird Species	Habitat/s of value	Impacts
snipe	Common resident and passage migrant. Breeds in marshes and boggy areas. Winters on salt marshes, coastal lagoons and other marshy areas.	Possible direct mortality from ingestion of pollutants. Loss and fragmentation of breeding habitat (marshland and boggy areas) during operation. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact. Possible risk of RTAs due to low flight patterns.
song thrush	Common resident and passage migrant. Breeds and winters in gardens, farmland, woodland and hedges.	Loss and fragmentation of breeding habitat (woodland, scrub, gardens, agricultural fields). Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. Possible risk of RTAs due to low flight patterns.
starling	Resident species. Breeds in towns, woods, parks, and on farms. Winters in cities, gardens and farmland.	Loss of breeding habitat (woodland, agricultural land, parks and gardens). Disturbance during construction and operation is unlikely to constitute a significant impact.
swallow	Common summer visitor and passage migrant. Breeds mostly in farm buildings. Feeds in the air usually over open country.	Loss and fragmentation of breeding habitat (buildings, in particular, farm out buildings and open fields) during operation. Unlikely to be subject to disturbance. Possible risk of RTAs due to low flight patterns.
tree sparrow	Resident species. Breeds and winters in woodland, farmland and scrub, nesting in holes in trees or buildings.	Loss and fragmentation of breeding habitat (scrub / hedgerows) during operation. Disturbance during construction and operation.
whooper swan	Common winter visitor, rare in summer. Winters on lakes, estuaries, marshes and flooded fields.	Loss and fragmentation of non-breeding habitat during operation. Disturbance during construction and operation.
willow warbler	Common summer visitor and passage migrant Breeds in thick ground cover in woodland, farmland and scrub.	Loss and fragmentation of breeding habitat (woodland and areas dense scrub) during operation. Disturbance during construction. Disturbance during operation in unlikely to constitute a significant impact.
woodcock	Common resident and passage migrant. Breeds in extensive woodland, whether broad-leaved, mixed, or coniferous, for cool shade, humidity and soft humus apt to retain moisture.	Loss and fragmentation of breeding habitat (mature woodland) during operation. Disturbance during construction and operation
yellowhammer	Common resident. Breeds and winters in hedgerows and scrub, especially gorse and hawthorn thickets.	Loss and fragmentation of breeding habitat (farmland and grassland) during operation. Disturbance during construction and operation.

5.4 Specific Impacts: Habitat Areas

5.4.1 Potential impacts to bird populations throughout Sections NL1-NL5 during construction and operation of the proposed scheme (as outlined in Section 5.2: Generic Impacts) are likely to include:

- direct mortality;
- direct and in-direct habitat loss;
- habitat severance, fragmentation and isolation;
- disturbance; and
- pollution.

5.4.2 HAs that are unlikely to be impacted either during construction or operation of the proposed scheme have not been considered as part of this assessment.

5.4.3 With respect to construction and operation and unless otherwise stated in Table 21, the risk of direct mortality (including operational RTAs), fragmentation and disturbance resulting from clearance and loss of low value habitats (arable or improved/amenity grassland) is assessed as being a low negative impact. In comparison, the above impacts resulting from clearance and loss of high value habitats (such as woodland, scrub, unimproved/semi-improved/marshy grassland, heath and bog) is assessed as being a medium negative impact. Pollution to aquatic habitats resulting from accidental spills or surface runoff is assessed as being a medium negative impact. Whereas, pollution to solely terrestrial habitats is assessed as being a low negative impact.

5.4.4 Impacts associated with the location of temporary work compounds cannot be assessed at this stage until their location is determined.

5.4.5 Estimates of habitat loss are quoted in hectares (ha) and expressed in increments of 25%.

5.4.6 Key bird species outlined in Table 20 (JNCC Red List, JNCC Amber List, UK BAP and LBAP) likely to be effected by the impacts described above have been inferred through an assessment of the baseline information based on professional judgement.

5.4.7 A description and assessment of specific impacts within Sections NL1-NL5 is provided below and in Table 21.

Section NL1 (Derbeth to Tulloch Road)

5.4.8 Eleven HAs and the bird assemblages they support would be impacted during construction and operation of the proposed scheme, including; N1, N3, N7, N8, N10, N11, N12, N13, N14, N15 and N16. There would be no potential impacts of Moderate or above significance to breeding birds in this Section.

Section NL2 (SAC Craibstone)

5.4.9 Nine HAs and the bird assemblages they support would be impacted during construction and operation of the proposed scheme, including; N18, N19, N20, N23, N24, N25, N26, N27 and N28.

5.4.10 The area of Craibstone SAC is the most important for breeding birds in this Section. Potential impact significance for breeding birds in this area due to construction would be Moderate due to direct mortality from pre-construction habitat clearance and associated temporary fragmentation (not applicable to Green Burn as approximately 70% of the habitat area will be lost), disturbance and potential pollution of aquifers, in particular Parkhead Burn, Craibstone Burn / Pond and Green Burn.

5.4.11 Potential impact significance for breeding birds in Craibstone SAC during operation would be moderate due to risk of direct mortality from RTAs (particularly ch316200-317400) as a result of permanent habitat loss and fragmentation (although these impacts not applicable to Green Burn with respect to fragmentation), disturbance and potential pollution of aquifers due to run off, in particular, Craibstone Burn / Pond and Green Burn.

Section NL3 (A96 to Nether Kirkton)

5.4.12 Sixteen HAs and the bird assemblages they support would be impacted during construction and operation of the proposed scheme, including; N30, N31, N32, N33, N34, N35, N37, N38, N39, N41, N42, N43, N44, N45, N46 and N47.

5.4.13 The areas surrounding Howemoss, Kirkhill Forest, Bogenjoss Burn, East Woodlands and Monument Wood have been assessed as being the most important for breeding birds in this Section. Potential impact significance for breeding birds in these areas due to construction (with the exception of Howemoss) would be Moderate due to risk of direct mortality resulting from pre-construction habitat clearance and associated temporary fragmentation, disturbance and potential pollution of Bogenjoss Burn due to accidental spills. A Moderate impact significance for potential pollution impacts to Howemoss burn would also be predicted.

5.4.14 Potential impact significance for breeding birds due to operation in Kirkhill Forest, Bogenjoss Burn, East Woodlands and Monument Wood would be moderate due to direct mortality from RTAs (particularly ch319700-321600) as a result of permanent habitat loss and fragmentation, disturbance and potential pollution of Bogenjoss Burn due to run off. A Moderate impact significance for potential pollution impacts to Howemoss burn would also be predicted

Section NL4 (Nether Kirkton toCorsehill)

5.4.15 Sixteen HAs and the bird assemblages they support would be impacted during construction and operation of the proposed scheme, including; N50, N51, N52, N54, N55, N58, N60, N61, N62, N63, N64, N65, N66, N68, N69 and N70.

5.4.16 The areas surrounding the River Don and Goval Burn / Mill Lade have been assessed as being the most important for breeding birds in this Section. Potential impact significance for breeding birds in the River Don area due to construction would be Moderate due to direct mortality resulting from pre-construction habitat clearance and associated temporary fragmentation, disturbance and the potential pollution from accidental spills. A Moderate impact significance for potential pollution impacts to Goval Burn/Mill Lade would also be predicted.

5.4.17 Potential impact significance for breeding birds due to operation in Goval Burn and Mill Lade would be Moderate due to direct mortality from RTAs (particularly ch323000-324800) as a result of permanent habitat loss, disturbance and potential pollution from run off. A Moderate impact significance for potential pollution impacts to breeding birds in the River Don would also be predicted

Section NL5 (Corsehill to Blackdog)

5.4.18 Sixteen HAs and the bird assemblages they support would be impacted during construction and operation of the proposed scheme, including; N71, N72, N74, N78, N80, N84, N85, N87, N89, N90, N91, N92, N94, N95, N96 and N97.

5.4.19 Areas surrounding Lochgreens Farm and Corby / Lily Loch SSSI have been assessed as being the most important for breeding birds in this Section. Predicted impact significance to breeding birds due to construction in agricultural fields south of Lochgreens Farm and between Lochgreens Road and Gravel Pits would be Moderate for potential pollution from accidental spills. A Moderate and Major impact significance for potential disturbance and pollution impacts respectively to breeding birds in Corby / Lily Loch SSSI would also be predicted.

5.4.20 Potential impact significance due to operation in this Section (agricultural fields south of Lochgreens Farm and between Lochgreens Road and Gravel Pits) would be moderate for direct mortality from RTAs due to permanent habitat loss and fragmentation (particularly ch327000-328300), disturbance and potential pollution impacts from run off. A Moderate and Major impact significance for potential pollution impacts to breeding birds at Corby / Lily Loch SSSI and agricultural fields south of Lochgreens Farm respectively would also be predicted

Table 21 – Description and Assessment of Potential Impacts: Sections NL1 – NL5

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
Section NL1 (Derbeth – Tulloch Road)					
N1 / N3	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss of arable / improved fields and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss).		
N7	Less than local	Construction	Direct mortality due to clearance, temporarily fragmentation and disturbance.	Medium negative	Negligible
			Potential pollution due to accidental spills.	Low negative	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of plantation mixed woodland and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Negligible
			Potential pollution.	Low negative	Negligible
N8	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss of dense and scattered scrub (refer to Appendix A10.1 for information regarding specific habitat loss).		
N10	Less than local	Construction	Disturbance.	Negligible	Negligible
		Operation			
N11	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative	Minor Adverse
			Potential pollution to Kepplestone Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of dense/scattered scrub, arable fields and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Kepplestone Burn due to run off.	Medium negative	Minor Adverse
N12	Less than local	Construction	Direct mortality due to clearance, and disturbance.	Low negative	Negligible
			Potential pollution to Kepplestone Burn due to accidental spills.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of improved fields and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution of Kepplestone Burn due to run off.	Medium negative	Negligible
N13	Less than local	Construction	Direct mortality due to clearance and disturbance.	Low negative	Negligible
			Potential pollution to Kepplestone Burn due to accidental spills.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of improved fields and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution to Kepplestone Burn due to run off.	Medium negative	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
N14	County	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss of improved fields and scattered scrub (refer to Appendix A10.1 for information regarding specific habitat loss).		
N15	Less than local	Construction	Direct mortality due to clearance, temporarily fragmentation, disturbance (in particular N14 – Gough Burn DWS) and potential pollution.	Low negative	Negligible
		Operation	Direct mortality, permanent fragmentation, disturbance and potential pollution. Habitat loss of arable fields (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Negligible
N16	Less than local	Construction	Disturbance.	Negligible	Negligible
		Operation			
Section NL2 (SAC Craibstone)					
N18	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss of improved fields with stonewalls (refer to Appendix A10.1 for information regarding specific habitat loss).		
N19	Local	Construction	Direct mortality due to clearance and disturbance (in particular N24 and N25).	Low negative	Minor Adverse
			Potential pollution to Gough Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAsand disturbance. Habitat loss of immature mixed plantation woodland (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Gough Burn due to run off.	Medium negative	Minor Adverse
N20	Local	Construction	Direct mortality due to clearance, disturbance (in particular N16 and N24) and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance (in particular N16 and N24) and potential pollution. Habitat loss of improved and arable fields (refer to Appendix A10.1 for information regarding specific habitat loss).		
N23	Local	Construction	Disturbance.	Negligible	Negligible
		Operation			
N24	Local	Construction	Direct mortality due to clearance and disturbance (in particular N19 and N25). Potential pollution to Gough Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance (in particular N19 and N25). Habitat loss of semi-natural broad-leaved woodland (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Gough Burn due to run off.		

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
N25	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance. Potential pollution to Parkhead and Craibstone Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation, and disturbance. Habitat loss of mature plantation mixed and broad-leaved woodland (refer to Appendix A10.1 for information regarding specific habitat loss).		
N26	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance. Potential pollution to Craibstone Burn and Pond (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of mature plantation mixed and broad-leaved woodland and drystone walls (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Craibstone Burn and Pond due to run off (refer to Amphibian Report, Appendix A10.9).		
N27	County	Construction	Direct mortality due to clearance and disturbance (in particular N26).	Medium negative	Moderate Adverse
			Potential pollution to Green Burn due to accidental spills.		
		Operation	Direct mortality due to RTAs and disturbance (in particular N26). Habitat loss of mature mixed woodland and riparian habitats (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Moderate Adverse
			Potential pollution of Green Burn due to run off.		
N28	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Parkhead, Craibstone and Green Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance. Habitat loss of improved and arable fields (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Parkhead, Craibstone and Green Burn due to run off.	Medium negative	Minor Adverse
Section NL3 (A96 – Nether Kirkton)					
N30	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative	Minor Adverse
			Potential pollution to Green Burn and Walton Field Ditch due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of of improved and poor semi-improved grassland with areas of parkland/scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Green Burn and Walton Field Ditch due to run off.	Medium negative	Minor Adverse
N31	Local	Construction	Disturbance.	Negligible	Negligible
		Operation			
N32	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Howemoss Burn due to accidental spills.	Medium negative	Moderate Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
		Operation	Direct mortality due to RTAs, per fragmentation, disturbance. Habitat loss of poor semi-improved grassland and arable fields with scattered scrub and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Howemoss Burn due to run off.	Medium negative	Moderate Adverse
N33	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturb (in particular N34 and N35).	Low negative	Minor Adverse
			Potential pollution to Howemoss Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, temporary fragmentation and disturb (in particular N34 and N35). Habitat loss of arable fields with scattered scrub and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Howemoss Burn due to run off.	Medium negative	Moderate Adverse
N34	Local	Construction	Disturbance.	Negligible	Negligible
		Operation			
N35	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance (in particular N34 and N37) and potential pollution.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance (in particular N34 and N37) and potential pollution. Habitat loss of immature coniferous woodland, dry dwarf scrub heath, dense scrub, semi-improved grassland habitats and parkland/scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Negligible Adverse
N37	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N38, N39 and N41).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N38, N39 and N41). Habitat loss of a mosaic of coniferous plantation woodland, mixed woodland, deciduous parkland/scattered trees, unimproved acid grassland (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Bogenjoss Burn due to run off.	Medium negative	Moderate Adverse
N38	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N37, N40 and N41).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37, N40 and N41). Habitat loss of a mosaic of riparian habitats (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Bogenjoss Burn due to run off.	Medium negative	Minor Adverse
N39	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N37 and N35).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37 and N35). Habitat loss of arable and improved fields with scattered scrub and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution of Bogenjoss Burn due to run off.	Medium negative	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
N41	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N37, N43, and N45). Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37, N43, and N45). Habitat loss of improved fields with stone walls, riparian woodland and semi-improved acid grassland (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution of Bogenjoss Burn due to run off.	Medium negative	Moderate Adverse
N42	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (particularly N37, N41 and N43). Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, temporary fragmentation and disturbance (particularly N37, N41 and N43). Habitat loss of a mosaic of riparian habitats (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Bogenjoss Burn due to run off.		
N43	County	Construction	Direct mortality due to clearance and disturbance (in particular N37, N41, N42).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Moderate Adverse
		Operation	Direct mortality due to RTAs and disturbance (in particular N37, N41, N42). Habitat loss of a mosaic of woodland and riparian habitats (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Bogenjoss Burn due to run off.	Medium negative	Moderate Adverse
N44 / N45	Less than local / county	Construction	Disturbance.	Negligible	Negligible
		Operation			
N46	Local	Construction	Direct mortality due to clearance and disturbance (in N41, N45, and N47).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance (in N41, N45, and N47). Habitat loss of improved fields with stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Bogenjoss Burn due to run off.	Medium negative	Minor Adverse
N47	Local	Construction	Direct mortality due to clearance, disturbance (in N41, N43 and N45) and potential pollution.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance (in N41, N43 and N45) and potential pollution. Habitat loss of mature semi-natural and coniferous woodland habitats with continuous bracken (refer to Appendix A10.1 for information regarding specific habitat loss).		
Section NL4 (Nether Kirkton - Corsehill)					
N50	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance (in N47 and N46) and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance (in N47 and N46) and potential pollution. Habitat loss of improved fields with areas of deciduous plantation woodland (refer to Appendix A10.1 for information regarding specific habitat loss).		
N51	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in N52).	Low negative	Minor Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
			Potential pollution to the River Don due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in N52). Habitat loss of improved grassland fields with a small area of marsh/marshy grassland (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to the River Don due to run off.	Medium negative	Minor Adverse
N52	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Medium negative	Moderate Adverse
			Potential pollution to the River Don due to accidental spills.	High negative	Moderate Adverse
		Operation	Disturbance.	Negligible	Negligible
			Potential pollution to the River Don due to run off.	High negative	Moderate Adverse
N54	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N52).	Low negative	Minor Adverse
			Potential pollution to the River Don due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular to N52). Habitat loss of arable and improved grassland fields and a small area of mature mixed plantation (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to the River Don due to run off.	Medium negative	Minor Adverse
N55	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Goval Burn and Mill Lade due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of arable and poor semi-improved fields (with stone walls) and riverine habitats represented by Goval Burn (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Goval Burn and Mill Lade due to run off.	Medium negative	Minor Adverse
N58	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative	Minor Adverse
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss of mature broad-leaved woodland and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).		
N60	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N61).	Low negative	Minor Adverse
			Potential pollution to Goval Burn and Goval Mill Lade due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of arable and improved grassland fields (with stone walls) (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Goval Burn and Goval Mill Lade due to run off.	Medium negative	Minor Adverse
N61	County	Construction	Direct mortality due to clearance and disturbance.	Low negative	Minor Adverse
			Potential pollution to Goval Burn due to accidental spills.	Medium negative	Moderate Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss poor semi-improved grassland field, parkland/scattered trees and riverine habitats represented by Goval Burn and Mill Lade together with a small area of mature mixed woodland (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Goval Burn due to run off.	Medium negative	Moderate Adverse
N62	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution. Permanent fragmentation, disturbance and potential pollution. Habitat loss of unimproved grassland, with areas of scattered and dense scrub and parkland / scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
N63	Local	Construction	Direct mortality due to clearance and disturbance (in particular N52).	Low negative	Minor Adverse
			Potential pollution to the River Don due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of arable and improved grassland fields (with stone walls) and small areas of semi-natural broad-leaved woodland (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to the River Don due to run off.	Medium negative	Minor Adverse
N64	Less than local	Construction	Disturbance.	Negligible	Negligible
			Potential pollution to Goval and Corsehill Burn due to accidental spills	Medium negative	Negligible
		Operation	Habitat loss of improved fields with stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution to Goval and Corsehill Burn due to run off.	Medium negative	Negligible
N65	Local	Construction	Disturbance.	Negligible	Negligible
		Operation			
N66	Local	Construction	Direct mortality due to clearance and disturbance.	High negative	Minor Adverse
			Potential Pollution to Corsehill Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Habitat loss of broad-leaved and coniferous mature parkland/scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	High negative	Minor Adverse
			Potential pollution to Corsehill Burn due to run off.	Medium negative	Minor Adverse
N68	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of arable and improved fields with stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to run off.	Medium negative	Minor Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
N69	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative	Minor Adverse
			Potential pollution to Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss of arable fields with parkland and scattered trees and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential runoff pollution to Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn.	Medium negative	Minor Adverse
N70	Local	Construction / Operation	Direct mortality due to clearance/RTAs, disturbance (in particular in N74 and N72) and potential pollution in particular within the vicinity of the area of marsh/marshy grassland where contamination of the water table is seen as a risk. Habitat loss of marsh/marshy grassland and semi-natural broad-leaved woodland (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Minor Adverse
Section NL5 (Corsehill – Blackdog)					
N71	Local	Construction / Operation	Direct mortality due to clearance/RTAs, fragmentation, disturbance (in particular N72) and potential pollution. Habitat loss of improved grassland and a small area of broad-leaved plantation woodland (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
N72	County	Construction / operation	Direct mortality due to clearance/RTAs, disturbance (in particular N70) and potential pollution. Habitat loss of broad-leaved plantation (refer to Appendix A10.1 for information regarding specific habitat loss). Coniferous plantation woodland (shown in Figure 10.2f) was felled in winter 2004/5. No additional habitat loss is predicted.	Medium negative	Minor Adverse
N74	Less than local	Construction	Direct mortality due to clearance and disturbance (in particular N70 and N72).	Low negative	Negligible
			Potential pollution within the vicinity of a ditch located on the western boundary due to accidental spills.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs and disturbance (in particular N70 and N72). Habitat loss of mature semi-natural broad-leaved woodland (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution of a ditch located on the western boundary due to run off.	Medium negative	Negligible
N78	Local	Construction	Disturbance and potential pollution.	Negligible	Negligible
		Operation	Disturbance.		
N80	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution of Lochgreens Pond (refer to Amphibian Report, Appendix A10.9) due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of improved/poor semi-improved grassland and arable fields, marsh/marshy grassland, open water, stone walls, scattered scrub, parkland/scattered trees and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Lochgreens Pond and Loch Hills Farm Pond due to run off (refer to Amphibian Report, Appendix A10.9).	Medium negative	Minor Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
N84	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Red Moss Burn and Corby/Lily Loch due to accidental spills.	High negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of dry stone walls, improved fields and areas of scattered scrub (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to run off.	High negative	Moderate Adverse
N85	Regional	Construction	Disturbance.	Medium negative	Moderate Adverse
			Potential pollution resulting from accidental spills which are of concern within the vicinity of the area of Red Moss Burn and Corby/Lily Loch.	High negative	Moderate Adverse
		Operation	Disturbance.	Low negative	Minor Adverse
			Potential pollution to Red Moss Burn and Corby/Lily Loch due to run off.	High negative	Moderate Adverse
N87	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to Red Moss Burn and Corby/Lily Loch due to accidental spills.	High negative	Moderate Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of a mosaic of arable, improved grassland, marsh/marshy grassland, dense and scattered scrub, parkland/scattered trees and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss). Potential pollution to Red Moss Burn and Corby/Lily Loch due to run off.	Medium negative	Moderate Adverse
N89	County	Construction / Operation	Disturbance.	Low negative	Minor Adverse
N90	Less than local	Construction / Operation	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution. Habitat loss of improved grassland and arable fields with stone walls and parkland/scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
N91	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Negligible
			Potential pollution to a tributary to Blackdog Burn due to accidental spills.	Medium negative	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of improved grassland fields (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Negligible
			Potential pollution to a tributary to Blackdog Burn due to run off.	Medium negative	Negligible
N92	Local	Construction / Operation	Disturbance.	negligible	Negligible
N93	County	Operation	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse
			Potential pollution to North Tarbothill Ditch due to accidental spills.	Medium negative	Moderate Adverse
		Construction	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of marsh/marshy grassland, improved grassland and stone walls (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to North Tarbothill Ditch due to run off.	Medium negative	Moderate Adverse
N94	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative	Minor Adverse

HA	Evaluation	Phase	Description of Impacts	Potential Impact	
				Magnitude	Significance
			Potential pollution to Blackdog Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss of improved/poor semi-improved grassland and arable fields with dense and scattered scrub (refer to Appendix A10.1 for information regarding specific habitat loss).	Low negative	Minor Adverse
			Potential pollution to Blackdog Burn due to run off.	Medium negative	Minor Adverse
N95	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative	Minor Adverse
			Potential pollution to Blackdog Burn due to accidental spills.	Medium negative	Minor Adverse
		Operation	Disturbance. Habitat loss of improved, poor semi-improved and marsh/marshy grassland (refer to Appendix A10.1 for information regarding specific habitat loss).	Negligible	Negligible
			Potential pollution to Blackdog Burn due to run off.	Medium negative	Minor Adverse
N96	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution (of particular concern within the vicinity of Blackdog Burn).	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance and potential pollution (of particular concern within the vicinity of Blackdog Burn). Habitat loss of improved and semi-improved (acid) grassland and arable fields with dense and scattered parkland and scattered trees (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Minor Adverse
N97	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution (of particular concern within the vicinity of Middlefield Burn).	Medium negative	Minor Adverse
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance and potential pollution (of particular concern within the vicinity of Middlefield Burn). Habitat loss of arable fields, improved grassland, semi-improved acid grassland, immature coniferous plantation woodland and areas of scattered/parkland trees and scattered bracken (refer to Appendix A10.1 for information regarding specific habitat loss).	Medium negative	Minor Adverse

6 Mitigation and Residual Impacts

6.1 Generic Mitigation

6.1.1 A habitat management plan (refer to Appendice A10.1: Terrestrial Habitats Report) will be written and approved by SNH prior to construction of the proposed scheme. The purpose of the management plan will be to specify where and when the generic / specific mitigation proposed below must be implemented.

6.1.2 Table 22 presents a suite of mitigation measures to address generic impacts (as identified and described in Section 5.4 (Potential Impacts) within each of HAs during construction and operation of the proposed scheme.

6.1.3 The measures outlined below comprise prevention/avoidance, reduction and offset/compensation measures, which form a hierarchy of measures.

6.1.4 It should be noted that offset measures to offset adverse impacts that cannot be prevented or reduced by specific mitigation.

6.1.5 Specific measures for WCA1i bird species are highlighted in bold italics.

Table 22 – Generic Mitigation Measures: Construction and Operation

Mitigation Type	Generic Impact	Description of Generic Mitigation
Construction		
Prevent	Direct Mortality Disturbance	All habitat clearance and building demolition must take place outside the main bird breeding season (March – July inclusive) and must be maintained in such a condition as to ensure that it is not used for breeding purposes. The potential presence of bat roosts must be taken into consideration when planning the demolition of buildings or clear felling of trees.
	Direct Mortality Disturbance	All cleared material must be either be chipped or moved and stored off-site to ensure that birds do not use the cleared material for nesting during the breeding season.
	Direct Mortality Disturbance	Barn Owl (WCA1i species) All buildings (in particular farm or other vacant structure with open access) that need to be demolished prior to construction must be checked one year in advance of construction to ensure that they are not in use by barn owl and must be destroyed immediately after survey provided barn owl is not present or must be secured to prevent access must demolition is not feasible before construction.
	Direct Mortality Disturbance	Kingfisher (WCA1i species) A pre-construction survey of all suitable watercourses must be undertaken at least one breeding season in advance of construction following methods outlined by Gilbert et al. (1998) to confirm the potential presence of kingfisher. Should the presence of kingfisher be confirmed, any river or stream bank that is likely to be directly impacted by the proposed scheme that exhibits potential nesting habitat for kingfisher must be destroyed (only if strictly necessary and under supervision of the ecological clerk of works) or securely covered (which ever is applicable) outside the main breeding season at least one year in advance of construction in order to prevent access by potentially breeding kingfishers. Once construction of the proposed scheme is completed all protective covering must be removed. Any river or stream bank that is not directly impacted (but is likely to be disturbed) by construction of the proposed scheme that exhibits potential nesting habitat for kingfisher must be securely covered under the supervision of the ecological clerk of works out with the main breeding season at least one season in advance of construction in order to prevent access by potentially breeding kingfishers. Once construction of the proposed scheme is completed all protective covering must be removed. It must be noted that the above mitigation measure cannot be undertaken without taking into consideration indirect impacts (disturbance and pollution) to other ecology, for example, protected mammal species such as otter and freshwater ecology, for example, fish.

Mitigation Type	Generic Impact	Description of Generic Mitigation
	Direct Mortality Habitat Loss Disturbance	Plant and personnel must be restricted to a prescribed working corridor through the use of temporary barriers thereby minimising damage to habitats and potential direct mortality and disturbance to breeding/non-breeding birds located within and adjacent to the proposed scheme working corridor.
	Habitat Loss Disturbance	Works compounds, storage sites and access roads must not be located within 30m of areas of woodland, wetland and scrub to prevent damage of habitats and disturbance of breeding birds.
	Disturbance Pollution	Ensure that any lighting associated with construction during low light levels and/or night is minimised as far as practical by the adoption of best working practices associated with the use of artificial light.
	Pollution	Strict adherence to SEPA pollution prevention guidelines PPG1, PPG2 and PPG6.
	Pollution	Minimise the amount of dust and other airborne debris produced during construction by the adoption of best working practices.
	Pollution	The use of approved pollution prevention schemes (e.g. oil separators) must be installed to prevent potentially polluted surface water from flowing into wetlands and/or other waterbodies.
Reduce	Direct Mortality Disturbance	Construction activities such as blasting, piling, grouting or any other activity likely to result in significant disturbance to breeding birds must (as far as practical) be undertaken outside the main bird breeding season (March – July inclusive). Where it is not possible to time works outside the breeding season, consideration must be given to avoiding works near habitats identified (by the Ecological Clerk of Works) as being of high value / sensitivity for breeding birds.
Operation		
Prevent	Direct Morality	Where the alignment passes through existing areas of established woodland, potential RTAs must be prevented by removing or significantly thinning all trees to within 5m of the road unless considered to be of significant ecological value (i.e. mature oak, wych elm or ash).
	Direct Morality	A bird hazard management plan (BHMP) must be produced in consultation with Aberdeen Airport and the British Aviation Authority (BAA) to ensure that ecological and landscape mitigation is compatible with the operation of Aberdeen Airport in terms of aircraft and passenger safety. The management plan will ensure that there is no increase in the hazard posed by birds as a result of ecological and landscape mitigation planting. It must be noted that as part of this BHMP, berried shrubs or trees may be avoided within 2km of Aberdeen Airport and/or along the alignment of aircraft flight paths.
	Direct Mortality Disturbance	Habitat management of areas of woodland, scrub and/or grassland must occur out with the main bird breeding season (March – July inclusive) to ensure that breeding birds, their eggs and/or nestlings not subject to direct mortality / disturbance impacts during operational habitat management.
	Disturbance Pollution	Roadside lighting throughout the proposed scheme will be strategically sited only where strictly necessary (e.g. major junctions) and will ensure that it complies with guidelines / guidance produced by the Environment Agency (http://www.environment-agency.gov.uk/yourenv/eff/pollution/) and Institute of Lighting Engineers (http://www.ile.org.uk/lighting_technical.htm) concerning the reduction of unnecessary light pollution within urban and rural areas (in particular the requirement for fitting all lights with shades and ensuring that lighting only illuminates chosen areas).
	Direct Mortality Habitat Loss Disturbance	Kingfisher (WCA1i species) Any sand and/or gravel bank/s within 500m of the proposed scheme must be surveyed for potential nesting kingfisher one breeding season in advance of any operational habitat management and/or maintenance following methods outlined by Gilbert et al. (1998). Works cannot be undertaken if breeding is confirmed. If suitable nesting habitat is identified, the banks must be securely covered out with the main breeding season (March – July inclusive) in order to prevent access by potentially breeding kingfishers one breeding season in advance of any works.
	Direct Mortality Habitat Loss Disturbance	Operational maintenance of areas of woodland, scrub and/or grassland is minimised as far as practical.
	Direct Mortality Pollution	The use of de-icing salt during winter periods must be kept to an absolute minimum.
Reduce	Direct Mortality	A grassland verge (approximately 5m in width) must be maintained between the edge of the hard muster and any areas of scrub or woodland thereby ensuring that bird species can easily see any on-coming vehicles before they attempt to cross the proposed scheme.

Mitigation Type	Generic Impact	Description of Generic Mitigation
	Direct Mortality	Landscape planting (including berry / fruit bearing trees and shrubs) at all junctions (regardless of size), embankments or any point of the proposed scheme that is below vehicle height will be not be planted within 5m of the carriageway to ensure that potential RTAs are minimised as far as practical. Use of temporary fencing (prior to the development of the planting) will be considered where appropriate to reduce the risk of RTA for species of particular sensitivity (e.g. barn owl).
Offset	Fragmentation Disturbance	Planting of dense native tree and scrub species (>25m from the carriageway) to screen noise and vibration disturbance associated with operation of the proposed scheme from birds located within adjacent habitats (the screening must ensure that noise levels are maintained less than 40dBA on the side opposite to the carriageway).
	Habitat Loss	Barn owl (WCA1i species) Replacement nest boxes must be provided in suitable adjacent buildings/habitat (subject to consultation and verification with SNH) in the event that they are identified in buildings that need to be demolished prior to construction of the proposed scheme.
	Habitat Loss	Additional planting within and adjacent to existing areas of woodland/scrub using native scrub and tree species thereby creating additional breeding and foraging bird habitat and compensating for habitat clearance, fragmentation and isolation and disturbance impacts. Habitat creation must include areas of core woodland (>30m from woodland edge) and areas located at least 50m from route alignment.
	Habitat Loss	Appropriate management of existing boundary habitats such as hedgerows or rough edges for the benefit of key farmland species of conservation concern such as yellowhammer, skylark, linnet, tree sparrow, meadow pipit and grey partridge.
	Habitat Loss	Appropriate habitat management of existing woodland/scrub habitats by selective thinning to create open glades and additional planting of native broad-leaved species to enhance existing woodland/scrub habitat and compensate for habitat lost to the scheme thereby creating a habitat structure of greater value to breeding and non-breeding birds.
	Habitat Loss	Bird boxes (suitable for a range of species) must be considered (at a density of 20 boxes for every 0.5ha of woodland lost) in severed areas of woodland in order to compensate for the loss of suitable breeding habitat.
	Habitat Loss	Off-line compensatory habitat creation will be undertaken at a location still to be determined. The area of habitat creation will be managed to create a mosaic of habitats of value to a range of key priority breeding bird species.
	Habitat Loss Fragmentation Disturbance	Kingfisher (WCA1i species) Where a pre-construction survey of all suitable watercourses (undertaken at least one breeding season in advance of construction following methods outlined by Gilbert et al. (1998) confirms the presence of kingfisher, replacement breeding habitat in the form of sand and/or gravel banks must be created in order to compensate for any nesting habitat loss during construction and must be sited as close to the location where the original habitat was lost (taking into account disturbance impacts associated with operation of the proposed scheme). Habitat loss will be identified and quantified in the course of a pre-construction survey.
	Habitat Loss Fragmentation	Vegetated strips, wildlife overbridges or similar must be created to offset the loss of wildlife corridors (e.g. woodland, scrub, rivers, streams or disused railways etc) severed by the proposed scheme and must be planted with native shrub and/or tree species to facilitate the movement of bird species along the these severed corridors either above or below the alignment.
	-	An environmental management plan (EMP) will be prepared in consultation with SNH and must be followed throughout operation of the proposed scheme.

6.2 Specific Mitigation and Residual Impacts

Specific Mitigation

Sections NL1 – NL5 (Derbeth to Blackdog)

6.2.1 A description of generic and specific mitigation measures to prevent, reduce and/or off-set potential impacts are presented in Table 22 and Table 23. Specific measures for WCA1i bird species are highlighted in bold italics.

6.2.2 A record of barn owl was provided by NESBReC for Craibstone Agricultural College. Generic mitigation for barn owl (a WCA1i species) as outlined in Section 6.1 (Mitigation and Residual Impact: Generic Mitigation) must therefore be implemented throughout Section NL2.

6.2.3 The current mitigation proposals do not include any scope for the loss of ecologically valuable farmland (arable, improved, poor semi-improved and semi-improved grassland fields), which determined from professional knowledge, are likely to provide foraging and/or nesting opportunities (to a greater or lesser degree) for populations of the following key bird species: barn owl, curlew, golden plover, grey partridge, kestrel, lapwing, linnet, meadow pipit, oystercatcher, skylark and yellowhammer. Habitat creation (which is still to be confirmed in terms of location and extent) intended to mitigate for cumulative impacts as per Part E of the ES is anticipated to provide sufficient mitigation to offset impacts to the above farmland bird species, although not taken into account in this assessment of residual impacts.

Residual Impacts

6.2.4 A description of residual impacts is presented in Table 23 and summarised below.

Section NL - (Derbeth to Tulloch Road)

6.2.5 All residual impacts in Section NL1 on breeding birds are reduced to of Negligible significance through the application of generic mitigation proposed in Table 22.

Section NL2 - (SAC Craibstone)

6.2.6 Residual impacts of Minor significance in Section NL2 on breeding birds remain in areas surrounding Craibstone Campus including Craibstone Burn and Pond and Green Burn (HAs N24, N25, N26, N27, and N28). Residual impacts are predicted due to temporary fragmentation and disturbance during construction and from the risk of potential direct mortality from RTAs, fragmentation and disturbance during operation.

Section NL3 - (A96 to Nether Kirkton)

6.2.7 Residual impacts of Minor significance in Section NL3 on breeding birds remain in areas surrounding Bogenjoss Burn including Howemoss and Kirkhill Forest and surrounding woodlands (HAs N37, N38, N41, N42, N43 and N47). These impacts would result from temporary fragmentation and disturbance during construction and from the risk of potential direct mortality due to RTAs, fragmentation and disturbance during operation.

Section NL4 - (Nether Kirkton to Corsehill)

6.2.8 Residual impacts of Minor significance in Section NL4 remain at the River Don and Goval Burn and the Mill Lade (HAs N52 and N61) due to temporary fragmentation and disturbance during construction and the risk of direct mortality from RTAs and disturbance during operation.

Section NL5 - (Corsehill to Blackdog)

6.2.9 Residual impacts Minor significance in Section NL5 on breeding birds would result from short-term construction disturbance to Corby and Lily Lochs and surrounding agricultural fields HAs (N85 and N87) with potential direct mortality due to RTAs, and fragmentation and disturbance of adjacent habitats during operation.

Further Work

6.2.10 It will be the responsibility of the contractor to appoint an Ecological Clerk of Works, whose primary role will be to ensure the implementation of all proposed mitigation measures during construction of the proposed scheme.

Table 23 – Mitigation and Residual Impacts: Sections NL1 – NL5

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
Section NL1 (Derbeth – Tulloch Road)						
N1 / N3	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss.		Generic mitigation (Table 22) apart from the loss of arable habitat.	Negligible
N7	Less than local	Construction	Direct mortality due to clearance, temporarily fragmentation and disturbance.	Medium negative / Negligible	Generic mitigation (Table 22).	Negligible
			Potential pollution due to accidental spills.	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Medium negative / Negligible	Habitat creation Scrub to the east of the proposed scheme HA N11 from ch314900 (Figure 11.5a), and scrub to the west of the proposed scheme in HA N11 from ch314800 (Figure 11.5a) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution.	Low negative / Negligible	Generic mitigation (Table 22)	Negligible
N8	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22)	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss.		Generic mitigation (Table 22) Habitat creation Scrub to the east of the proposed scheme in HA N11 from ch314900 (Figure 11.5a), and scrub to the west of the proposed scheme in HA N11 from ch314800 (Figure 11.5a (refer to Appendix A10.1: Terrestrial Habitats).	
N10	Less than local	Construction	Disturbance.	Negligible / negligible	Generic mitigation (Table 22)	Negligible
		Operation				
N11	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22)	Negligible
			Potential pollution of Kepplestone Burn resulting from accidental spills.	Medium negative / Minor Adverse		

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Scrub to the east of the proposed scheme in HA N11 from ch314900 (Figure 11.5a), and scrub to the west of the proposed scheme in HA N11 from ch314800 (Figure 11.5a) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution of Kepplestone Burn due to accidental spills.	Medium negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
N12	Less than local	Construction	Direct mortality and disturbance.	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
			Potential pollution of Kepplestone Burn due to accidental spills.	Medium negative / Negligible		
		Operation	Direct mortality and disturbance. Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22) apart from loss of improved fields and stonewalls (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution of Kepplestone Burn resulting from accidental spills	Medium negative / Negligible		Negligible
N13	Less than local	Construction	Direct mortality due to clearance and disturbance.	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
			Potential pollution of Kepplestone Burn resulting from accidental spills	Medium negative / Negligible		Negligible
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22) Habitat creation Scrub to the east of the proposed scheme in HA N11 from ch314900 (Figure 11.5a), and scrub to the west of the proposed scheme in HA N11 from ch314800 (Figure 11.5a) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution of Kepplestone Burn resulting from accidental spills.	Medium negative / Negligible	Generic mitigation (Table 22).	Negligible
N14	County	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss.		Generic mitigation (Table 22) apart from loss of improved fields and stonewalls (refer to Appendix A10.1: Terrestrial Habitats).	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
N15	Less than local	Construction	Direct mortality due to clearance, temporarily fragmentation, disturbance (in particular N14 – Gough Burn DWS) and potential pollution.	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance and potential pollution. Habitat loss.	Medium negative / Negligible	Generic mitigation (Table 22) apart from loss of improved fields is proposed (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
N16	Less than local	Construction	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
		Operation				
Section NL2 (SAC Craibstone)						
N18	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
N19	Local	Construction	Direct mortality due to clearance and disturbance (in particular N24 and N25).	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Gough Burn due to accidental spills.	Medium negative / Minor Adverse		Negligible
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Gough Burn due to accidental spills.	Medium negative / Minor Adverse		Negligible
N20	Local	Construction	Direct mortality due to clearance, disturbance (in particular N16 and N24) and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
		Operation	Direct mortality due to RTAs, disturbance (in particular N16 and N24) and potential pollution. Habitat loss.			
N23	Local	Construction	Disturbance.	Negligible/ Negligible	Generic mitigation (Table 22).	Negligible
		Operation				
N24	Local	Construction	Direct mortality due to clearance	Medium negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Disturbance (in particular N19 and N25).			Minor
			Potential pollution of Gough Burn due to accidental spills.			Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs and disturbance (in particular N19 and N25). Habitat loss.		Generic mitigation (Table 22). Habitat creation (refer to Appendix A10.1: Terrestrial Habitats). Two blocks of coniferous woodland to the west of the proposed scheme in HAs N25 and N28 from ch316470 - 316800 (Figure 11.5c). Narrow linear corridor of mixed plantation to the east of the proposed scheme, surrounding the attenuation ponds, in HA N26 and N28 from ch317100 – 317370 (Figure 11.5c). Two blocks of coniferous plantation woodland to the west of the proposed scheme either side of the A96 junction in HA N28 at ch317000 - 317500 (Figure 11.5c) (refer to Appendix A10.1: Terrestrial Habitats). Two ecological ponds to be created within HA N28 and N30 (outlined for amphibian habitat loss).	Negligible
			Potential pollution of Gough Burn due to accidental spills.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
N25	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance.			Minor
			Potential pollution of Parkhead and Craibstone Burn due to accidental spills.			Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation, and disturbance. Habitat loss.		Generic mitigation (Table 22). Habitat creation Two blocks of coniferous woodland to the west of the proposed scheme in HAs N25 and N28 from ch316470 - 316800 (Figure 11.5c) (refer to Appendix A10.1: Terrestrial Habitats). Narrow linear corridor of mixed plantation to the east of the proposed scheme, surrounding the attenuation ponds, in HA N26 and N28 from ch317100 – 317370 (Figure 11.5c). Two blocks of coniferous plantation woodland to the west of the proposed scheme either side of the A96 junction in HA N28 at ch317000 - 317500 (Figure 11.5c) (refer to Appendix A10.1: Terrestrial Habitats). Two ecological ponds to be created within HA N28 and N30 (outlined for amphibian habitat loss).	Minor
			Potential pollution of Parkhead and Craibstone Burn due to accidental spills.			Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
N26	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance.			Minor
			Potential pollution of Craibstone Burn and Pond due to accidental spills (refer to Amphibian Report, Appendix A10.9).			Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.		Generic mitigation (Table 22). Habitat creation two blocks of coniferous woodland to the west of the proposed scheme in HAs N25 and N28 from ch316570 - 316800 (Figure 11.5c) (refer to Appendix A10.1: Terrestrial Habitats). Narrow linear corridor of mixed plantation to the east of the proposed scheme, surrounding the attenuation ponds, in HA N26 and N28 from ch317100 – 317370 (Figure 11.5c). Two blocks of coniferous plantation woodland to the west of the proposed scheme either side of the A96 junction in HA N28 at ch317000 - 317500 (Figure 11.5c) (refer to Appendix A10.1: Terrestrial Habitats). Landscape planting comprising scrub and mixed woodland between ch317300 – 317550 north and south of the A96 Junction Two ecological ponds to be created within HA N28 and N30 (outlined for amphibian habitat loss).	Minor
			Potential pollution of Craibstone Burn and Pond due to accidental spills (refer to Amphibian Report, Appendix A10.9).			Negligible
N27	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Disturbance (in particular N26).			Minor
			Potential pollution of Green Burn due to accidental spills.			Negligible
		Operation	Direct mortality due to RTAs and disturbance (in particular N26). Habitat loss.	Medium negative / Moderate Adverse	Generic mitigation (Table 22) and specific mitigation outlined for HA N26.	Minor
			Potential pollution of Green Burn due to run off.		Generic mitigation (Table 22).	Negligible
N28	Local	Construction	Direct mortality due to clearance.	Low negligible/Minor Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance.		Generic mitigation (Table 22).	Minor
			Potential pollution of Parkhead, Craibstone and Green Burn due to accidental spills.	Medium negative / Minor Adverse		Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance. Habitat loss.	Low negligible/Minor Adverse	Generic mitigation (Table 22).	Minor
			Potential pollution of Parkhead, Craibstone and Green Burn due to run off.	Medium negative / Minor Adverse		Negligible
Section NL3 (A96 – Nether Kirkton)						
N30	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Green Burn and Walton Field Ditch due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss .	Low negative / Minor Adverse		
			Potential pollution of Green Burn and Walton Field Ditch due to run off.	Medium negative / Minor Adverse		
N31	Local	Construction	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
		Operation				
N32	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturb.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Howemoss Burn due to accidental spills.	Medium negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs, fragmentation, and disturbance. Habitat loss .	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	
			Potential pollution of Howemoss Burn due to run off.	Medium negative / Moderate Adverse		Negligible
N33	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturb (in particular N34 and N35).	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Howemoss Burn due to accidental spills.	Medium negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs, temporary fragmentation and disturb (in particular N34 and N35). Habitat loss.	Low negative / Minor Adverse		

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
			Potential pollution of Howemoss Burn due to run off.	Medium negative / Moderate Adverse		
N34	Local	Construction Operation	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
N35	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance (in particular N34 and N37) and potential pollution.	Medium negative / Negligible	Generic mitigation must be applied to account for direct mortality, fragmentation, disturbance and pollution impacts.	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance (in particular N34 and N37) and potential pollution. Habitat loss.	Medium negative / Negligible Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland to the west of the proposed scheme in HA N33 from at ch318900 (Figure 11.5e) (refer to Appendix A10.1: Terrestrial Habitats).	
N37	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N38, N39 and N41).	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Bogenjoss Burn due to accidental spills.	Medium negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N38, N39 and N41). Habitat loss.	Medium negative / Moderate Adverse	Generic mitigation (Table 22). Habitat creation Coniferous woodland to the west of the proposed scheme in HA N35 from ch319430 - 31970 (Figure 11.5f).	Minor
			Potential pollution of Bogenjoss Burn due to run off.		Generic mitigation (Table 22).	Negligible
N38	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N37, N40 and N41).	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Bogenjoss Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37, N40 and N41). Habitat loss.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation a linear strip of ecological / landscape scrub woodland to the	Minor

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
			Potential pollution of Bogenjoss Burn due to run off.		west of the proposed scheme located in HA N37 from ch319970 - 320400 combined with riparian woodland to the west of the proposed scheme located in HA N37 and N41 from ch320000 – 320500 (Figures 11.5f-g) (refer to Appendix A10.1: Terrestrial Habitats). a Kirkhill wildlife over-bridge at ch319950 in N38.	Negligible
N39	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N37 and N35).	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Bogenjoss Burn due to accidental spills.	Medium negative / Negligible	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37 and N35). Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22). Habitat creation Scrub to the east of the proposed scheme located in HA N41 and N42 from ch320450 - 320950 (Figure 11.5g) (refer to Appendix A10.1: Terrestrial Habitats).	
			Potential pollution of Bogenjoss Burn due to run off.	Medium negative / Negligible	Generic mitigation (Table 22).	
N41	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance (in particular N37, N43, and N45).		Generic mitigation (Table 22). Habitat creation Mixed woodland to the west of the proposed scheme from ch320400 - 320870 located in HA N41 (Figure 11.5g) (refer to Table 11 in the Terrestrial Habitats report (Appendix A10.1) for information regarding specific habitat loss).	Minor
			Potential pollution of Bogenjoss Burn due to accidental spills.			Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular N37, N43, and N45). Habitat loss.			Minor
			Potential pollution of Bogenjoss Burn run off.			Negligible
N42	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance (particularly N37, N41 and N43).			Minor
			Potential pollution of Bogenjoss Burn due to accidental spills.			Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs, temporary fragmentation and disturbance (particularly N37, N41 and N43). Habitat loss.	Medium negative / Moderate Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland to the west of the proposed scheme from ch320400 - 320870 located in HA N41 (Figure 11.5g) (refer to Appendix A10.1: Terrestrial Habitats).	Minor
N43	County	Construction	Direct mortality due to clearance and disturbance (in particular N37, N41, N42).	Low negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland to the west of the proposed scheme from ch320400 - 320870 located in HA N41 (Figure 11.5g) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution resulting of Bogenjoss Burn due to accidental spills.	Medium negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs and disturbance (in particular N37, N41, N42). Habitat loss.			Minor
			Potential pollution of Bogenjoss Burn due to run off.			Negligible
N44 / N45	Less than local / county	Construction	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
		Operation				
N46	Local	Construction	Direct mortality due to clearance and disturbance (in N41, N45, and N47).	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Bogenjoss Burn due to accidental spills	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs and disturbance (in N41, N45, and N47). Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of Bogenjoss Burn due to run off.	Medium negative / Minor Adverse		
N47	Local	Construction	Direct mortality due to clearance, disturbance (in N41, N43 and N45) and potential pollution.	Medium negative / Minor Adverse	Generic mitigation (Table 22).	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs, disturbance (in N41, N43 and N45) and potential pollution. Habitat loss.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Coniferous woodland to the north of the proposed scheme in HA N46 and N47 from ch319430 - 319700 (Figure 11.5h). Three blocks of ecological/landscape mixed woodland north of the proposed scheme in HA N50 at ch321630 (Figure 11.5h) (refer to Appendix A10.1: Terrestrial Habitats).	Minor
Section NL4 (Nether Kirkton - Corsehill)						
N50	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance (in N47 and N46) and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Coniferous woodland to the north of the proposed scheme in HA N46 and N47 from ch319430 - 319700 (Figure 11.5h). Three blocks of ecological/landscape mixed woodland north of the proposed scheme in HA N50 at ch321630 (Figure 11.5h) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
		Operation	Direct mortality due to RTAs, permanent fragmentation, disturbance (in N47 and N46) and potential pollution. Habitat loss.			
N51	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in N52).	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of the River Don due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in N52). Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of the River Don due to run off.	Medium negative / Minor Adverse		
N52	County	Construction	Direct mortality due to clearance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
			Temporary fragmentation and disturbance.		Generic mitigation (Table 22).	Minor
			Potential pollution of the River Don due to accidental spills.	High negative / Moderate Adverse	The River Don is considered, based on professional judgement, to offer suitable nesting and foraging habitat for kingfisher (a WCA1i species). Despite not being recorded by the surveys, all pertinent generic mitigation for kingfisher (as outlined in Section 6.1) will be implemented.	Negligible
		Operation	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
			Potential pollution of the River Don due to run off.	High negative / Moderate Adverse	The River Don is considered, based on professional judgement, to offer suitable nesting and foraging habitat for kingfisher (a WCA1i species). Despite not being recorded by the surveys, all pertinent generic mitigation for kingfisher (as outlined in Section 6.1) will be implemented.	
N54	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N52).	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of the River Don due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance (in particular to N52). Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of the River Don due to run off.	Medium negative / Minor Adverse		
N55	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Goval Burn and Mill Lade due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of Goval Burn and Mill Lade due to run off.	Medium negative / Minor Adverse		
N58	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution. Habitat loss.	Low negative / Minor Adverse		
N60	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance (in particular N61).	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Goval Burn and Goval Mill Lade due to accidental spills.	Medium negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Goval Burn and Goval Mill Lade due to run off.	Medium negative / Minor Adverse		Negligible
N61	County	Construction	Direct mortality due to clearance and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Goval Burn due to accidental spills.	Medium negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Medium negative / Moderate Adverse	Generic mitigation (Table 22). Habitat creation (refer to Appendix A10.1: Terrestrial Habitats). Mixed woodland north of the road, east of the A947 in HA N61, including a 100m long, 10m wide strip of riparian woodland along the Mill Lade at ch324400 (Figure 11.5j). Mixed woodland south of the road, east of the A947 in HA N61, at ch324400 including a 150m long, 10m wide strip of riparian woodland north of Goval Burn (Figure 11.5j). Mixed woodland south of the road, east of the A947 in HA N61,) including a 10m wide, 50m long strip of riparian woodland at ch324400 (Figure 11.5j). mosaics of scrub and mixed woodland planting in flood plain field fragments adjacent to Goval Burn, HA N61, N68 and N69 (Figure 11.5j) (outlined for landscape impacts).	Minor
			Potential pollution of Goval Burn due to run off.		Generic mitigation must be applied for potential pollution impacts.	Negligible
N62	Local	Construction	Direct mortality due to clearance, temporary fragmentation, disturbance and potential pollution.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Permanent fragmentation, disturbance and potential pollution. Habitat loss.			
N63	Local	Construction	Direct mortality due to clearance and disturbance (in particular N52).	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of the River Don due to accidental spills.	Medium negative / Minor Adverse		

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of the River Don due to run off.	Medium negative / Minor Adverse		
N64	Less than local	Construction	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Goval and Corsehill Burn due to accidental spills.	Medium negative / Negligible		
		Operation	Habitat loss.	Low negative / Negligible	No specific mitigation for habitat loss is proposed.	Negligible
			Potential pollution of Goval and Corsehill Burn due to run off.	Medium negative / Negligible	Generic mitigation (Table 22).	
N65	Local	Construction Operation	Disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
N66	Local	Construction	Direct mortality due to clearance and disturbance.	High negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Corsehill Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Habitat loss.	High negative / Minor Adverse	Habitat creation (refer to Appendix A10.1: Terrestrial Habitats). Mixed woodland north of the road, east of the A947 in HA N61, including a 100m long, 10m wide strip of riparian woodland along the Mill Lade at ch324400 (Figure 11.5j). Mixed woodland south of the road, east of the A947 in HA N61, at ch324400 including a 150m long, 10m wide strip of riparian woodland north of Goval Burn (Figure 11.5j). Mixed woodland south of the road, east of the A947 in HA N61,) including a 10m wide, 50m long strip of riparian woodland at ch324400 (Figure 11.5j). mosaics of scrub and mixed woodland planting in flood plain field fragments adjacent to Goval Burn, HA N61, N68 and N69 (Figure 11.5j) (outlined for landscape impacts).	Negligible
			Potential pollution of Corsehill Burn due to run off.	Medium negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
N68	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
			Potential pollution of Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse		
			Potential pollution of Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to run off.	Medium negative / Minor Adverse		
N69	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Potential pollution of Gorsehill Pond (refer to Amphibian Report, Appendix A10.9) and Gorsehill Burn due to run off.	Medium negative / Minor Adverse		
N70	Local	Construction Operation /	Direct mortality due to clearance/RTAs, and disturbance (in particular in N74 and N72) Habitat loss.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland south of the proposed scheme in HA N72 from ch325700 - 325900 (Figure 11.5k) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
			Potential pollution of the area of marsh/marshy grassland due to accidental spills/run off..			
Section NL5 (Corsehill – Blackdog)						
N71	Local	Construction / Operation	Direct mortality due to clearance/RTAs, fragmentation, disturbance (in particular N72) and potential pollution. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland south of the proposed scheme in HA N72 from ch325700 - 325900 (Figure 11.5k) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible
N72	County	construction / operation	Direct mortality due to clearance/RTAs, disturbance (in particular N70) and potential pollution. Habitat loss. Coniferous plantation woodland (shown in Figure 10.2) was felled in winter 2004/5.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Mixed woodland south of the proposed scheme in HA N72 from ch325700 - 325900 (Figure 11.5k) (refer to Appendix A10.1: Terrestrial Habitats).	Negligible

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
N74	Less than local	Construction	Direct mortality due to clearance and disturbance (in particular N70 and N72).	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
			Potential pollution of a ditch located on the western boundary of the HA due to accidental spills.	Medium negative / Negligible		
		Operation	Direct mortality due to RTAs and disturbance (in particular N70 and N72). Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22). Habitat creation Mixed woodland south of the proposed scheme in HA N72 from ch325700 - 325900 (Figure 11.5k). For details on specific habitat creation refer to section 6 in the Terrestrial Habitats report in Appendix A10.1.	Negligible
			Potential pollution of a ditch located on the western boundary of the HA due to run off.	Medium negative / Negligible	Generic mitigation (Table 22).	Negligible
N78	Local	Construction	Potential disturbance and potential pollution.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
		Operation	Potential disturbance.			
N80	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Lochgreens Pond (refer to Amphibian Report, Appendix A10.9) due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	Negligible
			Pollution of Lochgreens Pond and Loch Hills Farm Pond (refer to Amphibian Report, Appendix A10.9) due to run off.	Medium negative / Minor Adverse		
N84	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to accidental spills.	High negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22) apart from habitat loss.	
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to run off.	High negative / Moderate Adverse		

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
N85	Regional	Construction	Disturbance.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Minor
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to accidental spills.	High negative / Moderate Adverse		Negligible
		Operation	Disturbance.	Low negative / Minor Adverse		
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to run off.	High negative / Moderate Adverse		
N87	County	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to accidental spills.	High negative / Moderate Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Medium negative / Moderate Adverse	Generic mitigation (Table 22) apart from habitat loss.	Minor
			Potential pollution of Red Moss Burn and Corby/Lily Loch due to run off.			Negligible
N89	County	Construction / Operation	Potential disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
N90	Less than local	Construction / Operation	Direct mortality due to clearance/RTAs, temporary fragmentation, disturbance and potential pollution. Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22). Habitat creation. For details on specific habitat creation refer to section 6 in the Terrestrial Habitats report in Appendix A10.1. Riparian habitat south of the proposed scheme and east of Blackdog Burn, in HA N91 from ch330000 (Figure 11.5n), and scrub and riparian mosaic north of road and either side of the Blackdog Burn at ch329900 – 329950 in HA N91 (Figure 11.5n).	Negligible
N91	Less than local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Negligible	Generic mitigation (Table 22).	Negligible
			Potential pollution of a tributary to Blackdog Burn due to accidental spills.	Medium negative / Negligible		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Negligible	Generic mitigation (Table 22) apart from habitat loss.	

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
			Potential pollution of a tributary to Blackdog Burn due to run off.	Medium negative / Negligible		
N92	Local	Construction / Operation	Potential disturbance.	Negligible / Negligible	Generic mitigation (Table 22).	Negligible
N93	County	Operation	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution to North Tarbothill Ditch due to accidental spills.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
		Construction	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss..	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution to North Tarbothill Ditch due to run off.	Medium negative / Moderate Adverse	Generic mitigation (Table 22).	Negligible
N94	Local	Construction	Direct mortality due to clearance, temporary fragmentation and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Blackdog Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Direct mortality due to RTAs, permanent fragmentation and disturbance. Habitat loss.	Low negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation Scrub and riparian mosaic north of road and either side of the Blackdog Burn at ch329900 – 329950 in HA N91 (Figure 11.5). For details on specific habitat creation refer to section 6 in the Terrestrial Habitats report in Appendix A10.1.	
			Potential pollution of Blackdog Burn due to run off.	Medium negative / Minor Adverse	Generic mitigation (Table 22).	
N95	Local	Construction	Direct mortality due to clearance and disturbance.	Low negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
			Potential pollution of Blackdog Burn due to accidental spills.	Medium negative / Minor Adverse		
		Operation	Disturbance and habitat loss.	Negligible / Negligible	Generic mitigation (Table 22) apart from specifically for loss of poor semi-improved and marsh/marshy grassland habitats is proposed.	
			Potential pollution of Blackdog Burn due to run off.	Medium negative / Minor Adverse	Generic mitigation (Table 22).	

HA	Evaluation	Phase	Description of Impacts	Potential Impact Magnitude / Significance	Mitigation	Residual Impact
N96	Local	Construction	Direct mortality due to clearance, disturbance and potential pollution (of particular concern within the vicinity of Blackdog Burn).	Medium negative / Minor Adverse	Generic mitigation (Table 22).	Negligible
		Operation	Direct mortality due to RTAs, disturbance and potential pollution (of particular concern within the vicinity of Blackdog Burn). Habitat loss.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation South-east of Blackdog Junction and east of the A90 at Blackdog Croft, landscape scrub woodland planting. Above Fife Hill (HA N97) east of the road and east of the A90 Junction there will be a strip of scrub woodland surrounding a detention basin.	
N97	Local	Construction / Operation	Direct mortality due to clearance/RTAs, temporary and permanent fragmentation, disturbance and potential pollution. Habitat loss.	Medium negative / Minor Adverse	Generic mitigation (Table 22). Habitat creation South-east of Blackdog Junction and east of the A90 at Blackdog Croft, landscape scrub woodland planting. Above Fife Hill (HA N97) east of the road and east of the A90 Junction there will be a strip of scrub woodland surrounding a detention basin.	Negligible

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ANNEX 1

Common Name	Scientific Name
barn owl	*Tyto alba*
blackbird	*Turdus merula*
Blackcap	*Sylvia atricapilla*
black-headed gull	*Larus ridibundus*
blue tit	*Parus caeruleus*
bullfinch	*Pyrrhula pyrrhula*
buzzard	*Buteo buteo*
carrion crow	*Corvus corone*
chaffinch	*Fringilla coelebs*
chiffchaff	*Phylloscopus collybita*
coal tit	*Parus ater*
common gull	*Larus canus*
common sandpiper	*Actitis hypoleucos*
common tern	*Sterna hirundo*
Coot	*Fulica atra*
curlew	*Numenius arquata*
Dipper	*Cinclus cinclus*
dunlin	*Calidris alpine*
dunnock	*Prunella modularis*
garden warbler	*Sylvia borin*
goldcrest	*Regulus regulus*
goldfinch	*Carduelis carduelis*
Goosander	*Mergus merganser*
grasshopper warbler	*Locustella naevia*
great black-backed gull	*Larus marinus*
great spotted woodpecker	*Dendrocopos major*
great tit	*Parus major*
green woodpecker	*Picus viridis*
Greenfinch	*Carduelis chloris*
grey heron	*Ardea cinerea*
grey partridge	*Perdix perdix*
grey wagtail	*Moctacilla cinerea*
herring gull	*Larus argentatus*
house martin	*Delichon urbica*
house sparrow	*Passer domesticus*
jackdaw	*Corvus monedula*
kestrel	*Falco tinnunculus*
lapwing	*Vanellus vanellus*
lesser black-backed gull	*Larus fuscus*
lesser whitethroat	*Sylvia curruca*
linnet	*Carduelis cannabina*
little ringed plover	*Charadrius dubius*

Common Name	Scientific Name
long-tailed tit	*Aegithalos caudatus*
magpie	*Pica pica*
mallard	*Anas platyrhynchos*
meadow pipit	*Anthus pratensis*
mistle thrush	*Turdus viscivorus*
Moorhen	*Gallinula chloropus*
mute swan	*Cygnus olor*
Osprey	*Pandion haliaetus*
oystercatcher	*Haematopus ostralegus*
Pheasant	*Phasianus colchicus*
pied wagtail	*Motacilla alba*
red-backed shrike	*Lanius collurio*
Red-throated diver	*Gavia stellata*
robin	*Erithacus rubecula*
rook	*Corvus frugilegus*
sand martin	*Riparia riparia*
Scaup	*Aythya marila*
sedge warbler	*Acrocephalus schoenobaenus*
short-eared owl	*Asio flammeus*
sky lark	*Alauda arvensis*
Snipe	*Gallinago gallinago*
snow bunting	*Plectrophenax nivalis*
song thrush	*Turdus philomelos*
sparrowhawk	*Acipiter nisus*
starling	*Sturnus vulgaris*
swallow	*Hirundo rustica*
Swift	*Apus apus*
tree sparrow	*Passer montanus*
treecreeper	*Certhia familiaris*
tufted duck	*Aythya fuligula*
Wheatear	*Oenanthe oenanthe*
whitethroat	*Sylvia communis*
willow warbler	*Phylloscopus trochilus*
Woodcock	*Scolopax rusticola*
woodpigeon	*Columba palumbus*
wooper swan	*Cygnus Cygnus*
wren	*Troglodytes troglodytes*
yellowhammer	*Emberiza citrinella*