



Appendix A40.4 – Breeding Bird Survey

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1 Introduction

1.1 General Background

- 1.1.1 This report is one of the appendices supporting Chapter 40 (Ecology and Nature Conservation) of the AWPR Environmental Statement. This appendix reports on the impacts on breeding bird assemblages associated with the Fastlink section of the proposed scheme. The results of the surveys carried out for the purposes of this assessment are also presented and are shown on Figures A40.6a-f.
- 1.1.2 To aid the interpretation of the assessment, the Fastlink has been sub-divided into three component route sections as follows:
- Section FL1: Stonehaven to Howieshill (ch0-3200);
 - Section FL2: Howieshill to Cookney (ch3200-6300); and
 - Section FL3: Cookney to Cleanhill Junction (ch6300-10200).
- 1.1.3 All tables and figures are structured in this manner.
- 1.1.4 The Ecological Impact Assessment (EclA) was undertaken in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 10 and 11 (Highways Agency 2001) and the Environmental Impact Assessment (Scotland) Regulations 1999, along with cognisance of draft Institute of Ecology and Environmental Management (IEEM) guidelines.
- 1.1.5 These studies included desk-based consultation to collate existing information about breeding bird assemblages in the area affected by the scheme and field surveys to provide current data about the status of breeding bird assemblages and the habitats that support them within the study area.

Aims

- 1.1.6 This report provides an assessment of the current status of breeding birds in the vicinity of the proposed scheme, an assessment of the potential impacts associated with the construction and operation of the scheme, provides appropriate mitigation measures and determines any residual impacts.

Study Area

- 1.1.7 For the purposes of this assessment, the study area is defined as comprising all areas 500m either side of the centreline of the road alignment.

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1.2 Legislation and Conservation Status of Birds

National Legislative Protection

Wildlife and Countryside Act 1981 (as amended) & 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, the 'Birds Directive') and Natural Habitats and Wild Fauna and Flora (92/43/FFC, the 'Habitat Directive') 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 improve the legal protection and enhance the conservation of the natural features of Scotland (natural features, in this context, refer to flora, fauna, geological or geomorphological features).
- 1.2.4 The NCSA 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); and Part 3 strengthens and extends the protection of birds, animals and plants by updating Part I of the WCA (1981).
- 1.2.5 Taken together, the WCA (1981) and NCSA (2004) ensure that all wild birds, their nests and eggs are protected, and make 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 Sites of Special Scientific Interest (SSSI) in particular those that are designated for the presence of wild bird populations.

UK Conservation Status of Birds

Biodiversity Action Plans

- 1.2.8 The UK Biodiversity Action Plan (UK BAP) is 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.

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- 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 (LBAP) outlines action for 12 national and 22 local bird species and can be viewed at <http://www.nesbiodiversity.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 Biodiversity Action Plan.

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) Act 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 93 species of bird and can be viewed at <http://www.biodiversityscotland.gov.uk>.

UK 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 species¹ that are regularly found within the United Kingdom 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, these being:
- Red - red list species are those that are 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 - amber listed species have had an historical population decline from 1800-1995, 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); and
 - Green - green listed species have no identified threat to their population status.
- 1.2.15 Of the 247 species assessed, 40 species were red-listed, 121 were amber-listed and the remaining 86 were green-listed. With respect to this report, key species of conservation concern include CWA (1981) Schedule 1i, JNCC Red List, JNCC Amber List, UK BAP, LBAP and local status species.

¹ This figure takes into account both breeding and non-breeding bird species within the UK and thus differs from the total given in section 2.2.1 which only pertains to the approximate number of breeding bird species within the UK (an approximation can only be obtained as a result of the variability in the annual total number of breeding bird species recorded within the UK).

2 Approach and 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

2.2.1 Survey methods were developed by Jacobs ecologists, in consultation with SNH, from 2004 to 2006. The following survey method section has been divided into two parts. The first part details the methods used to select and survey sites within the study area for breeding bird assemblages. The second part details the methods used to assess and evaluate habitats within the study area for breeding bird assemblages.

2.2.2 Field surveys were directed and undertaken by experienced ornithological surveyors with extensive background in identifying birds from observations and from bird song.

Development of Survey Strategy

2.2.3 A requirement to survey the route corridor of the proposed scheme for breeding bird assemblages to inform the assessment was identified through an initial scoping exercise with SNH in late 2004.

2.2.4 A preliminary walkover survey of the study area was undertaken in early 2006 to assist in the development of an appropriate survey strategy to sample the route corridor for breeding birds.

2.2.5 When developing the survey strategy, it was determined 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 that 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.

2.2.6 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). All methods were agreed through consultation with SNH in the form of an Ecology Scoping Report (Jacobs, 2006), prior to survey.

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 study area, referred to as Sites of Ornithological Value (SOV). Potential SOVs located within and/or adjacent to the study area were identified based on the initial walkover survey (as outlined in Section 2.2.4) together with an assessment of data supplied by NESBReC and analysis of aerial photographs and Ordnance Survey maps. Selected SOVs were then subject to a breeding bird survey (BBS).

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Selection of Survey Areas – Remaining Habitats

- 2.2.8 The second stage in the selection of survey areas involved the use of a Line Transect and Quadrat sampling system to sample habitats (outside of the SOVs) throughout the remainder of the study area for breeding bird species. The Quadrat data was used to infer the importance of all remaining non-surveyed areas throughout the route corridor for breeding birds.
- 2.2.9 A single transect was established centered over the Stage 1 Options route corridor (based on route option plans dated 23 January 2006) along which 500m square Quadrats were established. A sampling ratio of 1:3 was used resulting in eight 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.
- 2.2.10 Approximately 40% (200ha) of the study area was surveyed for breeding birds using the Line Transect and Quadrat sampling system. The selected eight Quadrats were subject to a breeding bird survey. The following habitats within each selected Quadrat were not surveyed:
- if the Quadrat overlapped the whole or part of any SOV (since these areas would be surveyed in any case); and
 - urbanised zones including areas of existing road and/or hard standing.
- 2.2.11 Limitations to the surveys and the assessment are described in Section 2.6.

Breeding Bird Survey

- 2.2.12 An adapted breeding bird survey (based on the Common Bird Census (CBC) standard mapping technique as developed by the British Trust for Ornithology (Bibby et al 2000) method 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 10 days.
- 2.2.13 Definitions of the criteria used to classify observed birds as either confirmed breeding, potentially breeding and non-breeding are presented in Table 1.

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Table 1 – 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 to suitable for nesting. |

Incidental Observations

- 2.2.14 Observations of WCA1i, JNCC Red/Amber List and UK BAP / LBAP bird species present within or adjacent to each of the SOV and Quadrat, in addition to the wider study area, were noted during other ecological surveys that were undertaken for this ES.

Dates of Survey

- 2.2.15 The reconnaissance surveys were undertaken from 23 to 26 January 2006. The surveys were undertaken from 10 to 14 April 2006, 8 May to 3 June 2006 and 12 to 28 June 2006.

2.3 Habitat Assessment

- 2.3.1 Information obtained from the Phase 1 Habitat Survey was used to inform a description of the habitats represented within each SOV and Quadrat and assess their value for breeding birds. A habitat value (expressed as high, medium or low) was assigned to each SOV, Quadrat and Habitat Area (HA) (as described in the Terrestrial Habitat Report, Appendix A25.1) based on the habitat descriptions derived from the Phase 1 Habitat Survey, following the criteria shown in Table 2.

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Table 2 – Habitat Assessment Criteria

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

2.4 Evaluation of Ecology and Nature Conservation Value

- 2.4.1 The method for assessing the value of an ecological receptor uses all information collated in determining the baseline status of the resource. The ecological evaluation of a receptor is 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 incorporates a geographical framework where ecological receptors are assessed according to a series of criteria presented in Table 3, 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 includes 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 3 – Evaluation of Ecological Receptor

| Ecological Importance | Attributes of Ecological Receptor |
|---------------------------------|---|
| International (European) | <p>Habitats</p> <p>An internationally designated site or candidate site i.e. Special Protection Area (SPA), provisional SPA (pSPA), Special Areas of Conservation (SAC), candidate SAC (cSAC), Ramsar site, Biogenetic/Biosphere Reserve, World Heritage Site or an area which meets the published selection criteria for such designation. A viable area of a habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat that are essential to maintain the viability of a larger whole. Any river classified as excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> <p>Species</p> <p>Any regularly occurring population of an internationally important species, which is threatened or rare in the UK, i.e. a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of any internationally important species.</p> |
| National (Scottish) | <p>Habitats</p> <p>A nationally designated site i.e. Site of Special Scientific Interest (SSSI), Areas of Special Scientific Interest (ASSI), National Nature Reserve (NNR), Marine Nature Reserve, or a discrete area, which meets the published selection criteria for national designation (e.g. SSSI selection guidelines) A viable area of a priority habitat identified in the UK Biodiversity Action Plan (UK BAP), or of smaller areas of such habitat that are essential to maintain the viability of a larger whole. Any river classified as excellent A1 and likely to support a substantial salmonid population. Any river with a Habitat Modification Score indicating that it is Pristine or Semi-Natural or Obviously Modified.</p> |

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| Ecological Importance | Attributes of Ecological Receptor |
|---|---|
| | <p>Species</p> <p>A regularly occurring, regionally or county significant population/number of an internationally/nationally important species. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A feature identified as of critical importance in the UK BAP.</p> |
| <p>Regional (North East Scotland)</p> | <p>Habitats</p> <p>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 such habitat that are essential to maintain the viability of a larger whole. Viable areas of key habitat identified as being of regional value in the appropriate SNH Natural Heritage Future area profile. Any river classified as excellent A1 or good A2 and capable of supporting salmonid population. Any river with a Habitat Modification Score indicating that it is significantly modified or above.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant SNH Natural Heritage Future area on account of its regional rarity or localisation. A regularly occurring, locally significant population/number of a regionally important species. Sites maintaining populations of internationally/nationally important species that are not threatened or rare in the region or county.</p> |
| <p>Authority Area (e.g. County or District) (Aberdeenshire / City of Aberdeen)</p> | <p>Habitats</p> <p>Sites that are recognised by local authorities e.g. Sites of Interest for Nature Conservation (SINCS) and District Wildlife Sites (DWS). 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.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species that is listed in a County/District BAP on account of its regional rarity or localisation. A regularly occurring, locally significant population of a county/district important species (particularly during a critical phase of its life cycle). Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations. Sites/features that are scarce within the county/district or which appreciably enrich the county/district habitat resource.</p> |
| <p>Local (Immediate local area or village importance)</p> | <p>Habitats</p> <p>Areas of habitat considered to appreciably enrich the 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 of such habitats within the local area are not considered for the above classifications. Semi-natural ancient woodland smaller than 0.25ha. Any river classified as fair B or poor C and unlikely to support coarse fishery. Rivers with a Habitat Modification Score indicating that it is severely modified or above.</p> <p>Species</p> <p>Populations/assemblages of species that appreciably enrich the biodiversity resource within the local context. Sites supporting populations of county/district important species that are not threatened or rare in the region or county, and are not integral to maintaining those populations.</p> |
| <p>Less than Local (Limited ecological value)</p> | <p>Sites that retain habitats and/or species that are of limited ecological importance due to their size, species composition or other factors. Any river classified as impoverished D and/or and with a Habitat Modification Score indicating that it is severely modified.</p> |

Evaluation of SOVs, Quadrats and Habitat Areas

2.4.3 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 A40.1 Terrestrial Habitats) combined with the value of the breeding bird assemblage present.

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- 2.4.4 The habitats found in each SOV or Quadrat surveyed, was compared with adjacent non surveyed areas in order to assess the ecological value of any remaining Habitat Areas.

2.5 Impact Assessment

- 2.5.1 The approach to the assessment of impacts in terms of magnitude and significance is presented in Chapter 40 (Ecology and Nature Conservation), paragraphs 40.2.81 – 4.2.84 and Tables 40.6 and 40.7.

2.6 Limitations to Assessment

Weather

- 2.6.1 All surveys were carried out in suitable weather, although it was not practical to limit surveys to optimal weather conditions only. 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).
- 2.6.2 Weather conditions during surveys were generally good with a limited number of days affected by rain and heavy cloud. Surveys were suspended if weather conditions were poor (e.g. high winds and persistent rain). Wind speed was relatively high on some days (approximately 12% of survey days), which is likely to have reduced records of singing birds. However, visiting the site several times during the optimal survey period helps to reduce the significance of such effects.

Survey Methodology

- 2.6.3 A full Common Bird Census (CBC) comprises ten survey visits made between March and June, with a minimum of 10 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 10 days between each repetition. There were two 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.
- 2.6.4 The above 'scaled down' survey methodology which was included in the scoping report (Jacobs, 2006) and which is supported by SNH in their current guidance (SNH, 2005; section 6.9) was approved prior to the start of the surveys by SNH.

Changes to the Route Alignment

- 2.6.5 Four Quadrats currently lie outside the route corridor as a result of changes to the preferred route following the DMRB Stage 1 Assessment. Using the Quadrat and Line Transect method, it was possible to infer the potential value of remaining non-sampled areas within the route corridor for breeding bird assemblages.

Access Limitations

- 2.6.6 Complications in gaining land access to the route corridor were encountered from February to June 2006. In total, two SOVs and four Quadrats received three survey visits as per the methods section. In comparison, four SOVs and four Quadrats were surveyed either once or twice (Table 4).

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2.6.7 Survey limitations and thus restricted baseline data may result in protected/key species of conservation concern potentially present within SOVs and Quadrats going unrecorded. It is not possible therefore to provide a robust assessment of SOV, Quadrat and habitat area value for those sites surveyed less than three times. Difficulties in gaining land access did not affect the selection of SOVs.

Table 4 – 2006 Survey Breakdown: Sites of Ornithological Value (SOVs) and Quadrats

| SOV/Quadrat | Section | Survey Month/Surveyed | | |
|------------------|---------|-----------------------|-----|------|
| | | April | May | June |
| Limpet Burn | FL1 | ✓ | ✗ | ✓ |
| Kempstone Hill | FL1 | ✓ | ✗ | ✓ |
| South Fishermyre | FL1 | ✓ | ✗ | ✓ |
| North Fishermyre | FL2 | ✓ | ✗ | ✓ |
| Harecraig | FL3 | ✓ | ✓ | ✓ |
| Cookney | FL3 | ✓ | ✓ | ✓ |
| FL-Bb01 | FL1 | ✓ | ✓ | ✓ |
| FL-Bb02 | FL1 | ✗ | ✗ | ✗ |
| FL-Bb03 | FL2 | ✓ | ✗ | ✗ |
| FL-Bb04 | FL2 | ✓ | ✓ | ✓ |
| FL-Bb05 | FL3 | ✓ | ✗ | ✓ |
| FL-Bb06 | FL3 | ✓ | ✓ | ✓ |
| FL-Bb07 | FL3 | ✓ | ✓ | ✓ |
| FL-Bb08 | FL3 | ✓ | ✓ | ✓ |

2.6.8 Seasonal constraints and delays in agreeing access led to some areas not being completed for the breeding bird surveys. Surveys are ongoing at the time of writing this report and the full results will be published in an Environmental Report later in 2007. Pending completion of these surveys, a provisional assessment on breeding birds has been undertaken.

Evaluation Limitations

2.6.9 No limitations associated with the evaluation of SOVs, Quadrats and habitat areas (represented within each SOV/Quadrat) that were subject to three full surveys as per the methods were identified. SOVs and Quadrats that were surveyed less than three times are being re-surveyed in spring/summer 2007.

2.6.10 As it was not possible to undertake three surveys on all SOVs and Quadrats in 2006, some of the SOVs, Quadrats and their represented habitat areas were under surveyed thus leading to an incomplete breeding bird baseline on which to base an accurate evaluation. However, preliminary analysis of 2007 survey data suggests that there are unlikely to be significant changes to the evaluations in this report and it is envisaged that the further data will re-confirm the initial assessment.

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3 Baseline

3.1 Consultation Information

- 3.1.1 SNH did not provide any records of key breeding bird species for the proposed scheme in their consultation correspondence.
- 3.1.2 Consultation with the RSPB did not identify the presence of any RSPB nature reserves or provide any previous records of breeding bird species within or adjacent to the proposed scheme study area.
- 3.1.3 The Scottish Ornithologists' Club (SOC) and the RSPB are jointly involved in a 5-year project to produce a Breeding Bird Atlas for Aberdeenshire (which was due for completion in 2006 but has yet has not been published). 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 by 2km (tetrad) grid sampling system.
- 3.1.4 Existing survey data was not obtained from SOC and the RSPB for the following reasons:
- the data was not of sufficient detail in terms of the specific 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 while the CBC methodology was used for this assessment.

3.2 Incidental Observations

- 3.2.1 Records of key bird species that were made incidentally during other surveys that were carried out for this EIA during spring and summer 2006 are shown in Table 5.

Table 5 – Incidental Records of Key Bird Species

| Month / Year | Species | Status | Location (NGR) | Comment |
|---------------------|-----------------------------|--------------------------|--------------------------|--|
| April 2006 | tree sparrow (flock of six) | JNCC Red List and UK BAP | NO 865 938 | Recorded on the edge of Red Moss (by Quadrat FL-Bb05). |
| May 2006 | reed bunting | JNCC Red List and UK BAP | NO 868 907 | Recorded singing near Fishermyre. |
| May 2006 | song thrushes | JNCC Red List and UK BAP | NO 869 905 | Recorded singing Near Howieshill. |
| May 2006 | linnet | JNCC Red List and UK BAP | NO 869 900 | Recorded near Fishermyre. |
| - | skylark | NBAP, JNCC Red List | - | Recorded throughout the route section. |
| May 2006 | grasshopper warblers | LBAP, JNCC Red List | NO 868 894 | Recorded singing near Coneyhatch. |
| April 2006 May 2006 | yellowhammer | LBAP, JNCC Red List | NO 870 875 NO 869 900 | Recorded at Mains of Ury and at Fishermyre. |
| May 2006 | house sparrow | JNCC Red List | NO 869 900 | Recorded at Fishermyre. |
| May 2006 | curlew | LBAP, JNCC Amber | NO 867 902 | Recorded in song near Fishermyre. |
| April 2006 | lapwing | LBAP, JNCC | NO 873 923 | Recorded north of Elrick. |

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| Month / Year | Species | Status | Location (NGR) | Comment |
|--------------|---------------------------|-----------------|----------------|---|
| | | Amber | | |
| May 2006 | cuckoo | JNCC Amber List | NO 870 906 | Heard singing near Howieshill. |
| - | herring gulls | JNCC Amber List | - | Recorded foraging in much of the section throughout the season. |
| - | lesser black-backed gulls | JNCC Amber List | - | Recorded foraging in much of the section throughout the season. |
| - | meadow pipits | JNCC Amber List | - | Recorded throughout the section all season. |
| April 2006 | oystercatchers | JNCC Amber List | NO 873 934 | Pair recorded east of Cookney. |
| April 2006 | stock dove | JNCC Amber List | - | Recorded about fields near Mains of Ury. |
| - | swallow | JNCC Amber List | - | Recorded along much of the route section throughout the season. |

3.3 Survey of Breeding Bird Assemblages

Sites of Ornithological Value (SOVs)

- 3.3.1 A total of six SOVs were identified in the Fastlink study area, within or adjacent to the proposed route corridor (Figures 10.5a-g) and account for approximately 19% of the total survey corridor area. A description of each SOV in terms of location and size, is presented in Table 6. The scientific names of bird species are presented in Annex 1.

Table 6 – Description of SOVs

| SOV Name | Section | Grid Reference | Size (ha) |
|-------------------|---------|----------------|-----------|
| Limpet Burn* | FL1 | NO 874 888 | 16.6 |
| Kempstone Hill* | FL1 | NO 876 894 | 14.5 |
| South Fishermyre* | FL1 | NO 869 899 | 18.1 |
| North Fishermyre* | FL2 | NO 866 907 | 28 |
| Harecraig | FL3 | NO 875 937 | 9 |
| Cookney | FL3 | NO 870 936 | 9.5 |

- 3.3.2 * denotes SOVs surveyed on less than 3 occasions
- 3.3.3 Table 7 presents the results of the breeding bird surveys 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).

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Table 7 – Bird Species Recorded Breeding (B), Possible Breeding (P) and Non-breeding (N) Birds within each Site of Ornithological Value (SOV)

| Common Name | Status | SOV | | | | | |
|----------------------------|--------|-------------|----------------|------------------|------------------|-----------|---------|
| | | Limpet Burn | Kempstone Hill | South Fishermyre | North Fishermyre | Harecraig | Cookney |
| blackbird | | P | B | P | P | B | B |
| blackcap | | P | P | | | | |
| blue tit | | P | P | P | P | B | P |
| bullfinch | x & Ψ | P | N | | | | |
| buzzard | | P | N | | N | | |
| carrion crow | | N | | N | N | | N |
| chaffinch | | B | B | B | B | B | B |
| chiffchaff | | P | | | | | |
| coal tit | | P | | | | P | P |
| cuckoo | + | | | P | | | |
| curlew | + Ψ | | | N | | | |
| dunnock | + | P | P | P | | P | B |
| goldcrest | + | P | | | | P | |
| goldfinch | | | P | N | | | |
| grasshopper warbler | x Ψ | | | P | | | |
| greater spotted woodpecker | | | | | P | | |
| great tit | | B | | | P | P | P |
| greenfinch | | P | | P | P | B | P |
| house sparrow | x | | | B | | | |
| jackdaw | | | | | | | N |
| lesser redpoll | + | N | | | P | P | P |
| linnet | x & Ψ | P | P | | P | P | B |
| magpie | | | | | | P | |
| meadow pipit | + | P | B | B | B | P | B |
| mistle thrush | + | | N | | | | |
| oystercatcher | + | | | | N | | |
| pheasant | | | | B | | | |
| reed bunting | x & Ψ | | | P | B | P | P |
| redstart | + | P | | | | | |
| robin | # | | P | P | P | N | P |
| sand martin | + | N | | | | | |
| sedge warbler | | | | | | P | |

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| Common Name | Status | SOV | | | | | |
|----------------|--------|-------------|----------------|------------------|------------------|-----------|---------|
| | | Limpet Burn | Kempstone Hill | South Fishermyre | North Fishermyre | Harecraig | Cookney |
| siskin | | | | P | P | | |
| skylark | x & Ψ | | | P | P | P | P |
| song thrush | x & Ψ | P | P | B | P | B | B |
| starling | x | | N | N | | P | B |
| swallow | + | | N | N | N | N | |
| tawny owl | | | | | | N | |
| whitethroat | | P | P | P | P | P | |
| woodpigeon | | B | | N | P | B | N |
| wren | | B | P | B | | B | B |
| willow warbler | + | P | P | P | P | B | |
| yellowhammer | x Ψ | P | P | B | B | P | B |

Key: x = JNCC Red List; + = JNCC Amber List; & = UKBAP; Ψ = LBAP.

Quadrats

- 3.3.4 A total of eight Quadrats were established within the Fastlink study area (Figures 10.5a-g) and account for approximately 17% of the total survey corridor area. A description of each Quadrat, in terms of location, is shown in Table 8.

Table 8 – Description of Quadrats

| Quadrat | Section | Grid Reference |
|----------|---------|----------------|
| FL-Bb01 | FL1 | NO 873 875 |
| FL-Bb02* | FL1 | NO 874 890 |
| FL-Bb03* | FL2 | NO 875 904 |
| FL-Bb04 | FL2 | NO 872 920 |
| FL-Bb05* | FL3 | NO 863 935 |
| FL-Bb06 | FL3 | NO 862 950 |
| FL-Bb07 | FL3 | NO 862 965 |
| FL-Bb08 | FL3 | NO 861 980 |

* denotes Quadrats surveyed on less than 3 occasions

- 3.3.5 Table 9 presents the results of the surveys 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). The scientific names of bird species are presented in Annex 1.

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Table 9 – 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 |
| blackbird | | | P | P | B | P | P | P | B |
| blackcap | | | | | P | | | P | |
| blue tit | | P | P | | P | B | P | P | P |
| bullfinch | x & Ψ | | | | | | | N | |
| buzzard | | N | P | | | | | | N |
| carrion crow | | | | N | N | | | B | P |
| chaffinch | | B | B | P | B | B | B | B | B |
| chiffchaff | | | | | | | | | P |
| coal tit | | | | | P | | P | B | B |
| curlew | + Ψ | | | P | | P | | P | |
| dunnock | + | | | | P | | P | | P |
| garden warbler | | | | | P | | | P | |
| goldcrest | + | | | | P | | | | P |
| goldfinch | | | | | | | P | | P |
| greater spotted woodpecker | | | | | | P | | | |
| great tit | | P | | | P | B | B | | B |
| greenfinch | | P | | | P | P | P | P | |
| grey heron | | | | | | | | | N |
| grey partridge | x & Ψ | | | P | | | | | |
| herring gull | + | | | | N | | | | |
| house martin | + | | | | N | | | | |
| house sparrow | x | P | | | P | B | | | |
| jackdaw | | | | | P | | | N | |
| lapwing | + Ψ | | | | B | | | | |
| lesser redpoll | + | | | | | P | P | | B |
| linnet | x & Ψ | | | | | P | P | B | B |
| magpie | | | | | P | P | | N | P |
| mallard | | | | | P | | | | |
| meadow pipit | + | | | P | | B | B | P | B |
| mistle thrush | + | | | | | | | | P |
| moorhen | | | | | P | | | | |
| mute swan | + | | | | N | | | | |
| oystercatcher | + | P | | | B | | B | | |
| pie wagtail | | | | P | P | B | B | | |
| reed bunting | x & Ψ | | | | | P | | P | B |

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| Common Name | Status | Quadrat ID | | | | | | | |
|----------------|--------|------------|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| robin | | P | | | B | B | | B | B |
| rook | | | | | | N | B | | |
| sand martin | + | | | | N | | | | |
| sedge warbler | | | | | B | | | P | |
| siskin | | | | | | | P | | |
| skylark | x & | B | | P | B | B | P | B | B |
| snipe | + Ψ | | | | | | | P | |
| snow bunting | | | | | | | | N | |
| song thrush | x & Ψ | P | | | P | B | P | P | P |
| starling | x | | | N | N | P | B | | |
| stock dove | + | | | | | | P | | N |
| swallow | + | | | | P | | B | | |
| whitethroat | | P | | | P | | P | | B |
| willow warbler | + | | P | | B | | B | B | B |
| woodpigeon | | P | P | | P | P | | B | B |
| wood warbler | + | | | | | | | N | |
| wren | | P | | P | B | B | B | B | B |
| yellowhammer | x Ψ | | P | P | B | P | B | B | P |

Key: x = JNCC Red List; + = JNCC Amber List; & = UKBAP; Ψ = LBAP.

3.4 Habitat Descriptions: SOVs and Quadrats

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

Section FL1

3.4.2 The habitats within Section FL1 are comprised predominantly of arable farmland with some improved grassland fields and areas of scattered scrub and hedgerows (species rich) along the field margins.

3.4.3 Table 10 presents a detailed description of habitats present within each SOV and Quadrat, together with their associated Habitat Areas.

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Table 10 – Habitat Descriptions for Section FL1

| SOV / Quadrat | Represented Habitat Area | Value | Habitat Description |
|----------------------|--------------------------|--------|---|
| Limpet Burn SOV | F7 | High | Mosaic of semi-natural communities lining the heavily vegetated Limpet Burn. Communities include a dense marsh with scattered willow, birch woodland, dense bracken and continuous gorse scrub. |
| Kempstone Hill SOV | F9 | Medium | A large area of gorse scrub-acid grassland mosaic with some dry heath vegetation. |
| South Fishermyle SOV | F10 | Medium | A large area of gorse scrub-acid grassland mosaic with some dry heath vegetation. |
| FL-Bb01 | F1 F2 F3 F4 | Low | Quadrat comprised of fields of arable (with areas of scattered scrub and parkland/scattered trees) and improved grassland (the later associated with the existing Stonehaven bypass and junction). Megray Burn bisects the Quadrat south of H Ram Wood. Areas of broad-leaved woodland (Ury Shelter Belt) constitute the remainder of the habitats. |
| FL-Bb02 | F6 F7 F8 | Low | Approximately half of the Quadrat is comprised by Limpet Burn SOV (see above for habitat description and habitat value). The remaining areas within the Quadrat comprise immature coniferous plantation woodland and arable fields boarded by native species-rich hedgerows with pockets of scattered and dense scrub. |

Section FL2

3.4.4 Habitats within Section FL2 are entirely comprised of arable farmland with some improved and semi-improved grassland fields with occasional hedgerows. Table 11 presents a detailed description of habitats present within each SOV and Quadrat, together with their associated Habitat Areas.

Table 11 – Habitat Descriptions for Section FL2

| SOV / Quadrat | Represented Habitat Area | Value | Habitat Description |
|----------------------|--|--------|--|
| North Fishermyle SOV | F12 | High | The majority of this area is dominated by dry heath. The north and north west is lined with dense gorse scrub. Mixed semi-natural woodland is present towards the south west with scattered pockets of willow dominated wet woodland ranging across the south. Marsh is present in the environs of the wet woods. This habitat mosaic extends well beyond the survey corridor to form a large area of good quality habitat. |
| FL-Bb03 | F8 F13 Quadrat is located partially outside of the study area. | Low | Habitats within the Quadrat are entirely comprised of a small area of bare ground and arable fields the east and acid grassland mosaic with patches of dense scrub and improved grassland to the west. |
| FL-Bb04 | F13 F15 F16 | Medium | Habitats within the Quadrat are comprised of arable fields bounded by native species-rich hedgerows and stone walls. The Burn of Muchalls bisects the Quadrat from west to east and is dominated by semi-natural wet woodland in the east and young mixed plantation woodland in the west. The burn also contains fishing ponds and supports a broad strip of partially naturalised planted mixed woodland, species rich hedgerow and marshy grassland vegetation. An avenue of broadleaf trees runs along an access road. |

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Section FL3

3.4.5 The majority of Section FL3 is comprised of improved grassland with some arable fields, hedgerows and scattered stands of scrub and woodland. There are a number of minor burns and stands of marshy grassland. Table 12 presents a detailed description of habitats present within each SOV and Quadrat, together with their associated Habitat Areas.

Table 12 – Habitat Descriptions for Section FL3

| SOV / Quadrat | Represented Habitat Area | Value | Habitat Description |
|---------------|--|--------|---|
| Cookney SOV | F17 | Medium | A large area of marsh/marshy grassland with areas of patchy gorse scrub together with three large stands of willow carr woodland. |
| Harecraig SOV | F19 | High | Patchy alder, willow and birch scrub/ woodland on an area of marsh/marshy grassland. There are patches of wet heath vegetation and gorse scrub. |
| FL-Bb05 | Quadrat is located entirely outside of the study area | High | Habitats within the Quadrat are comprised of improved grassland fields with the exception of approximately a quarter, which includes part of the Red moss of Netherly SAC. The farmland includes areas of gorse scrub and a strip of conifer plantation (along the back of private gardens). The habitat in Red Moss of Netherly SAC is a mosaic of wet and dry heath, with birch and willow scrub. |
| FL-Bb06 | Quadrat is located entirely outside of the study area. | Medium | Habitats within the Quadrat are comprised predominantly of arable and improved grassland bisected by a belt of broad-leaved woodland and areas of gorse scrub. Stands of scrub and mature parkland/scattered trees are located around some of the residential properties and farm buildings. |
| FL-Bb07 | F22 Quadrat is located partially outside of study area. | Medium | Habitats within the Quadrat are comprised of fields of arable and improved fields with a mosaic of semi-improved and marshy grassland/gorse scrub. |
| FL-Bb08 | F27 | Medium | Habitats within the Quadrat are comprised of semi-improved grassland (much of which is rank or wet and not intensively grazed) with areas of gorse/willow scrub and heath vegetation. Approximately one quarter of the Quadrat is comprised of coniferous plantation woodland that supports mixed scrub and rough grassland along the edge of the plantation. |

3.5 Survey Results

Consultation

- 3.5.1 Consultation with SNH and the RSPB did not identify the presence of any bird nature reserves or provide any previous records of breeding bird species within or adjacent to the proposed scheme study area.
- 3.5.2 Records of breeding bird species were not obtained from the RSPB/SOC as the data was not of considered to be sufficient in terms of location detail and the methods used to collect the data differed from the methods used by Jacobs outlined in Section 3.1.

Incidental Observations

- 3.5.3 Seventeen key bird species were recorded throughout the route section during the other ecological surveys, of which:

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- none were WCA1i;
- eight were JNCC Red List Species (grasshopper warbler, house sparrow, linnet, reed bunting, skylark, song thrush, tree sparrow and yellowhammer); and
- nine were JNCC Amber List Species (cuckoo, curlew, lapwing, herring gull, lesser black-backed gull, oystercatcher, meadow pipit, stock dove and swallow).

Breeding Bird Surveys

- 3.5.4 A total of 44 bird species (28 recorded breeding or possibly breeding) were recorded throughout the six SOVs, of which:
- none were WCA1i species;
 - eight were JNCC Red List species (bullfinch, grasshopper warbler, linnet, reed bunting, skylark, starling, song thrush, and yellowhammer); and
 - 20 were JNCC Amber List species (cuckoo, curlew, dunnoek, goldcrest, mistle thrush, meadow pipit, oystercatcher, redstart, swallow, sand martin, willow warbler).
- 3.5.5 A total of 53 bird species (38 recorded as breeding or possibly breeding) were recorded throughout the eight Quadrats, of which:
- one was WCA1i species (snow bunting) was recorded (non-breeding);
 - eight were JNCC Red List Species (house sparrow, linnet, grey partridge, reed bunting, skylark, starling, yellowhammer and song thrush); and
 - 11 were JNCC Amber List Species (curlew, dunnoek, goldcrest, lapwing, mistle thrush, meadow pipit, oystercatcher, stock dove, swallow, common snipe and willow warbler).

Habitat Description

- 3.5.6 The majority of the study area consists of arable farmland and improved or semi-improved grassland. This farmland also supports species-rich hedgerows and stands of scrub. Identified SOVs represented the majority of semi-natural habitats within the route corridor, which were dominated by heath, scrub, woodland, marshy and riparian habitats.
- 3.5.7 A number of watercourses are present within the route corridor, including the Burn of Muchalls.

4 Evaluation

4.1 Introduction

- 4.1.1 The ecological value of SOVs, Quadrats and habitat areas for breeding birds was determined by considering the habitat evaluation of each area combined with the value of the breeding bird assemblage present. The ecological value of remaining ecological Habitat Areas in each route section was determined by an initial evaluation of habitat potential for breeding birds combined with the knowledge of the breeding bird assemblages found in adjacent representative Quadrats or SOVs (refer to sections 2.4.4 and 2.4.5).

4.2 Evaluation of SOVs / Quadrats

- 4.2.1 Species recorded in the study area are presented in the baseline section of this report (Table 7 and Table 9).

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4.2.2 Table 13 provides a list of key bird species recorded within each Quadrat or SOV. Where a key bird species were recorded as an incidental sighting only (noted in Table 13 and following text with an asterisk), it has been assigned to the appropriate Quadrat or SOV. Incidental sightings without grid references which have not been included in the evaluation below, as the information could not be identified with a particular SOV or Quadrat.

Section FL1

4.2.3 Three SOVs (Limpet Burn, Kempstone Hill and South Fishermyre) and two Quadrats (FL-Bb01 and FL-Bb02) are located within Section FL1 and are evaluated below.

4.2.4 Limpet Burn SOV was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F7.

4.2.5 The breeding bird assemblage recorded in this SOV is considered to be of medium diversity, with 21 breeding bird species of which none were WCA1i species, four were JNCC Red List species (bullfinch, linnet, song thrush, yellowhammer), five were JNCC Amber List species (dunnock, goldcrest, meadow pipit, redstart, willow warbler), three were UK BAP species (bullfinch, linnet, song thrush), four were LBAP species (bullfinch, linnet, song thrush, yellowhammer) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of high value for birds, comprising a mosaic of semi-natural habitats dominated by dense marsh with scattered willow, birch woodland, dense bracken and continuous gorse scrub (Table 10). The breeding 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.

4.2.6 Kempstone Hill SOV was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F9.

4.2.7 The breeding bird assemblage recorded in this SOV is considered to be of low diversity, with 14 breeding bird species of which none were WCA1i species, three were JNCC Red List species (linnet, song thrush, yellowhammer), three were JNCC Amber List species (dunnock, meadow pipit, willow warbler), two were UK BAP species (linnet, song thrush), four were LBAP species (linnet, song thrush, yellowhammer, bullfinch) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising a large mosaic of gorse scrub-acid grassland with some dry heath vegetation. (Table 10). The breeding assemblage found in this SOV is considered to enrich the biodiversity resource within the local context and therefore is assessed to be of local ecological value.

4.2.8 South Fishermyre SOV was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F9.

4.2.9 The breeding bird assemblage recorded in this SOV is considered to be of medium diversity, with 20 breeding bird species of which none were WCA1i species, six were JNCC Red List species (grasshopper warbler, reed bunting, song thrush, yellowhammer, skylark, house sparrow), five were JNCC Amber List species (cuckoo, dunnock, mistle thrush, meadow pipit, willow warbler), three were UK BAP species (reed bunting, song thrush, skylark), six were LBAP species (reed bunting, song thrush, yellowhammer, grasshopper warbler, skylark, curlew) and one (grasshopper warbler) was a locally uncommon species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising a large mosaic of gorse scrub-acid grassland with some dry heath vegetation (Table 10). The breeding assemblage found in this SOV is considered

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to enrich the biodiversity resource within the county context and therefore is assessed to be of county ecological value.

- 4.2.10 Quadrat FL-Bb01 was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The Quadrat includes all or parts of Habitat Areas F1 – 3.
- 4.2.11 The breeding bird assemblage recorded in this Quadrat is considered to be of relatively low diversity, with 14 breeding bird species of which none were WCA1i species, four were JNCC Red List species (house sparrow, skylark, song thrush, yellowhammer*), two were JNCC Amber List species (oystercatcher, stock dove*), two were UK BAP species (skylark, song thrush), four were LBAP species (reed bunting, song thrush, yellowhammer*, curlew) and none were local status. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of low value for birds, comprising arable fields (with areas of scattered scrub and parkland/scattered trees), improved grassland (the latter associated with the existing Stonehaven bypass and junction) with Megray Burn bisecting the Quadrat south of H Ram Wood and areas of broad-leaved woodland (Ury Shelter Belt) constituting the remainder of the habitats (Table 10). The breeding assemblage found in Quadrat FL-Bb01 is considered to enrich the biodiversity resource within the less than local context and therefore is considered to be of less than local ecological value.
- 4.2.12 Quadrat FL-Bb02 was subject to only two partial breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The Quadrat includes all or parts of Habitat Areas F6 – 8.
- 4.2.13 The breeding bird assemblage recorded in this Quadrat is considered to be of relatively low diversity, with seven breeding bird species of which none were WCA1i species, one was a JNCC Red List species (yellowhammer, also LBAP), one was a JNCC Amber List species (willow warbler). The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of low value for birds, comprising immature coniferous plantation woodland and arable fields boarded by native species-rich hedgerows with pockets of scattered and dense scrub (Table 10). The breeding assemblage found in Quadrat FL-Bb02 is considered to enrich the biodiversity resource within the less than local context and therefore is considered to be of less than local ecological value.

Section FL2

- 4.2.14 One SOV (North Fishermyme) and two Quadrats (FL-Bb03 and FL-Bb04) are located within Section FL2 and are evaluated below.
- 4.2.15 North Fishermyme SOV was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F12.
- 4.2.16 The breeding bird assemblage recorded in this SOV is considered to be of medium diversity, with 22 breeding bird species of which none were WCA1i species, five were JNCC Red List species (linnet, skylark, yellowhammer, reed bunting, song thrush), five were JNCC Amber List species (meadow pipit, willow warbler, lesser redpoll, curlew*, cuckoo*), four were UK BAP species (linnet, skylark, reed bunting, song thrush), six were LBAP species (linnet, skylark, yellowhammer, reed bunting*, song thrush*, curlew*) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of high value for birds, the majority comprising dry heath, with dense gorse scrub in the north and north west and mixed semi-natural woodland in the south west with scattered pockets of willow dominated wet woodland ranging across the south (Table 11). The breeding 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.

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- 4.2.17 Quadrat FL-Bb03 was subject to only one breeding bird survey and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The Quadrat includes all or parts of Habitat Areas F8 and F13.
- 4.2.18 The breeding bird assemblage recorded in this Quadrat is considered to be of relatively low diversity, with nine breeding bird species of which none were WCA1i species, three were JNCC Red List species (grey partridge, skylark, yellowhammer), two were JNCC Amber List species (curlew, meadow pipit), two were UK BAP species (grey partridge, skylark), four were LBAP species (grey partridge, skylark, yellowhammer, curlew) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of low value for birds, comprising arable and improved grassland with native species-rich hedgerows and scrub (Table 11). The breeding assemblage found in Quadrat FL-Bb03 is considered to enrich the biodiversity resource within the less than local context and therefore is considered to be of less than local ecological value.
- 4.2.19 Quadrat FL-Bb04 was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The Quadrat includes all or parts of Habitat Areas F13, F15 and F16.
- 4.2.20 The breeding bird assemblage recorded in this Quadrat is considered to be of relatively low diversity, with 28 breeding bird species of which none were WCA1i species, four were JNCC Red List species (house sparrow, song thrush, skylark, yellowhammer), six were JNCC Amber List species (dunnock, goldcrest, lapwing, oystercatcher, swallow, willow warbler), two were UK BAP species (song thrush, skylark), three were LBAP species (song thrush, lapwing, yellowhammer) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising arable fields boarded by native species-rich hedgerows and stonewalls with the Burn of Muchalls (dominated by semi-natural wet woodland in the east, young mixed plantation woodland in the west and naturalised planted mixed woodland, species rich hedgerow and marshy grassland vegetation) bisecting the Quadrat from west to east (Table 11). The breeding assemblage found in Quadrat F-Bb04 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of county ecological value.

Section FL3

- 4.2.21 Two SOVs (Cookney and Harecraig) and four Quadrats (FL-Bb05 - FL-Bb08) are located within Section FL3 and are evaluated below.
- 4.2.22 Cookney SOV was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F17.
- 4.2.23 The breeding bird assemblage recorded in this SOV is considered to be of medium diversity, with 18 breeding bird species of which none were WCA1i species, six were JNCC Red List species (linnet, reed bunting, starling, skylark, song thrush, yellowhammer), four were JNCC Amber List species (dunnock, meadow pipit, lesser redpoll, oystercatcher*), four were UK BAP species (linnet, reed bunting, skylark, song thrush), five were LBAP species (linnet, reed bunting, skylark, song thrush, yellowhammer) and none were local status species. One of the species (oystercatcher*) was recorded as an incidental and thus the total number of species presented here differs from the total given in the baseline. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising a large mosaic of marsh / marshy grassland with areas of patchy gorse scrub together with three large stands of willow carr woodland (Table 12). The breeding 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.

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- 4.2.24 Harecraig SOV was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The SOV includes all or parts of Habitat Area F19.
- 4.2.25 The breeding bird assemblage recorded in this SOV is considered to be of medium diversity, with 22 breeding bird species of which none were WCA1i species, six were JNCC Red List species (linnet, reed bunting, skylark, starling, yellowhammer, song thrush), five were JNCC Amber List species (dunnock, goldcrest, meadow pipit, willow warbler, lesser redpoll), four were UK BAP species (linnet, reed bunting, skylark, song thrush), five were LBAP species (linnet, reed bunting, skylark, yellowhammer, song thrush) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of high value for birds, comprising patchy alder, willow and birch scrub / woodland on an area of marsh / marshy grassland with patches of wet heath vegetation and gorse scrub (Table 12). The breeding 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.
- 4.2.26 Quadrat FL-Bb05 was subject to only two breeding bird surveys and therefore the evaluation outlined below is considered a provisional assessment of the site's ecological value for breeding birds. The Quadrat is located entirely outside of the study area and therefore is not comprised from any Habitat Area.
- 4.2.27 The breeding bird assemblage recorded in this Quadrat is considered to be of medium diversity, with 22 breeding bird species of which none were WCA1i species, eight were JNCC Red List species (house sparrow, linnet, reed bunting, starling, song thrush, yellowhammer, skylark, tree sparrow*), three were JNCC Amber List species (curlew, meadow pipit, lesser redpoll), five were UK BAP species (linnet, reed bunting, skylark, song thrush, tree sparrow*), five were LBAP species (linnet, reed bunting, curlew, yellowhammer, tree sparrow*) and none were local status species. One of the species (tree sparrow) was recorded as an incidental and thus the total number of species presented here differs from the total given in the baseline. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of high value for birds, comprising improved grassland fields and gorse scrub with the exception of approximately a quarter, which includes part of the Red moss of Netherly SAC comprising a mosaic of wet and dry heath, with birch and willow scrub (Table 12). The breeding assemblage found in Quadrat FL-Bb05 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of county ecological value.
- 4.2.28 Quadrat FL-Bb06 was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The Quadrat is located entirely outside of the study area and therefore is not comprised from any Habitat Area.
- 4.2.29 The breeding bird assemblage recorded in this Quadrat is considered to be of medium diversity, with 24 breeding bird species of which one were WCA1i species, five were JNCC Red List species (linnet, starling, song thrush, yellowhammer, skylark), seven were JNCC Amber List species (dunnock, oystercatcher, stock dove, swallow, willow warbler, lesser redpoll, meadow pipit), three was a UK BAP species (linnet, skylark, song thrush), two were LBAP species (linnet, yellowhammer) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising arable and improved grassland bisected by a belt of broad-leaved woodland and areas of gorse scrub with stands of scrub and mature parkland / scattered trees located around some residential properties and farm buildings (Table 12). The breeding assemblage found in Quadrat FL-Bb06 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of county ecological value.

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- 4.2.30 Quadrat FL-Bb07 was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The Quadrat is located partially outside of the study area but comprises part of Habitat Area F6.
- 4.2.31 The breeding bird assemblage recorded in this Quadrat is considered to be of medium diversity, with 21 breeding bird species of which none were WCA1i species, five were JNCC Red List species (linnet, reed bunting, song thrush, yellowhammer, skylark), four were JNCC Amber List species (curlew, snipe, meadow pipit, willow warbler), four were UK BAP species (linnet, reed bunting, skylark, song thrush), five were LBAP species (linnet, reed bunting, curlew, snipe, yellowhammer) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising fields of arable and improved fields with a mosaic of semi-improved and marshy grassland / gorse scrub (Table 12). The breeding assemblage found in Quadrat FL-Bb07 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of county ecological value.
- 4.2.32 Quadrat FL-Bb08 was subject to three breeding bird surveys and therefore the evaluation outlined below is considered an accurate assessment of the site's ecological value for breeding birds. The Quadrat is located partially outside of the study area but comprises part of Habitat Area F27.
- 4.2.33 The breeding bird assemblage recorded in this Quadrat is considered to be of medium diversity, with 24 breeding bird species of which none were WCa1i species, five were JNCC Red List species (linnet, reed bunting, skylark, song thrush, yellowhammer), six were JNCC Amber List (dunnock, goldcrest, mistle thrush, meadow pipit, willow warbler, lesser redpoll), four were UK BAP species (linnet, reed bunting, skylark, song thrush), five were LBAP species (linnet, reed bunting, skylark, song thrush, yellowhammer) and none were local status species. The habitats that comprise the Habitat Areas within the Quadrat are assessed as being of medium value for birds, comprising semi-improved grassland (much of which is rank or wet and not intensively grazed), areas of gorse / willow scrub and heath vegetation and coniferous plantation woodland that supports mixed scrub and rough grassland along the edge of the plantation (Table 12). The breeding assemblage found in Quadrat FL-Bb08 is considered to enrich the biodiversity resource within the county context and therefore is considered to be of county ecological value.

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Table 13 – Summary Evaluation of Breeding Bird Assemblages and Habitats: SOVs and Quadrats

| SOV / Quadrat | Habitat Area Contributing to the Value of the Quadrat / SOV | Value of Habitats for Breeding Birds | Total Number of Breeding Bird Species Recorded in SOV / Quadrat | Legal / Conservation Status of key bird species (Breeding, Possibly Breeding, Non Breeding and Incidentals) | | | | | | | Value of Breeding Bird Assemblage |
|----------------------|---|--------------------------------------|---|---|-------|--|---|--|---|--------------------------------|-----------------------------------|
| | | | | EU Birds Directive Annex I | WCA1i | JNCC Red List | JNCC Amber List | UK BAP | LBAP | Local Status (Uncommon / Rare) | |
| Section FL1 | | | | | | | | | | | |
| Limpet Burn SOV | F7 | High | 21 | - | - | bullfinch linnet song thrush yellowhammer | duncock goldcrest meadow pipit redstart willow warbler lesser redpoll sand martin | bullfinch linnet song thrush | bullfinch linnet song thrush yellowhammer | - | County |
| Kempstone Hill SOV | F9 | Medium | 14 | - | - | linnet song thrush yellowhammer bullfinch starling | duncock meadow pipit willow warbler mistle thrush swallow | linnet song thrush bullfinch | linnet song thrush yellowhammer bullfinch | - | Local |
| South Fishermyre SOV | F7 | Medium | 20 | - | - | grasshopper warbler reed bunting song thrush yellowhammer skylark house sparrow | cuckoo duncock mistle thrush meadow pipit willow warbler curlew swallow | reed bunting song thrush skylark | reed bunting song thrush yellowhammer grasshopper warbler curlew skylark | grasshopper warbler | County |
| Quadrat FL-Bb01 | F1 F2 F3 | Low | 14 | - | - | house sparrow skylark song thrush yellowhammer* | oystercatcher stock dove* | skylark song thrush | skylark song thrush yellowhammer* | - | Less than local |

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| SOV / Quadrat | Habitat Area Contributing to the Value of the Quadrat / SOV | Value of Habitats for Breeding Birds | Total Number of Breeding Bird Species Recorded in SOV / Quadrat | Legal / Conservation Status of key bird species (Breeding, Possibly Breeding, Non Breeding and Incidentals) | | | | | | | Value of Breeding Bird Assemblage |
|----------------------|---|--------------------------------------|---|---|-------|---|---|--|---|--------------------------------|-----------------------------------|
| | | | | EU Birds Directive Annex I | WCA1i | JNCC Red List | JNCC Amber List | UK BAP | LBAP | Local Status (Uncommon / Rare) | |
| Quadrat FL-Bb02 | F6 F7 F8 | Low | 7 | - | - | yellowhammer | willow warbler | - | yellowhammer | - | Less than local |
| Section FL2 | | | | | | | | | | | |
| North Fishermyre SOV | F12 | High | 22 | - | - | linnet skylark yellowhammer reed bunting song thrush | meadow pipit willow warbler lesser redpoll oystercatcher swallow curlew* cuckoo* | linnet skylark reed bunting song thrush | linnet skylark yellowhammer reed bunting song thrush curlew* | - | County |
| Quadrat FL-Bb03 | F8 F13 | Low | 9 | - | - | grey partridge skylark yellowhammer starling | curlew meadow pipit | grey partridge skylark | grey partridge skylark yellowhammer curlew | - | Less than local |
| Quadrat FL-Bb04 | F13 F15 F16 | Medium | 28 | - | - | house sparrow song thrush skylark yellowhammer starling | duncock goldcrest lapwing oystercatcher swallow willow warbler herring gull house martin mute swan sand martin | song thrush skylark | song thrush lapwing yellowhammer | - | County |

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| SOV / Quadrat | Habitat Area Contributing to the Value of the Quadrat / SOV | Value of Habitats for Breeding Birds | Total Number of Breeding Bird Species Recorded in SOV / Quadrat | Legal / Conservation Status of key bird species (Breeding, Possibly Breeding, Non Breeding and Incidentals) | | | | | | | Value of Breeding Bird Assemblage |
|--------------------|---|--------------------------------------|---|---|-------|--|--|---|---|--------------------------------|-----------------------------------|
| | | | | EU Birds Directive Annex I | WCA1i | JNCC Red List | JNCC Amber List | UK BAP | LBAP | Local Status (Uncommon / Rare) | |
| Section FL3 | | | | | | | | | | | |
| Cookney SOV | F17 | Medium | 18 | - | - | linnet reed bunting starling skylark song thrush yellowhammer | dunnock meadow pipit lesser redpoll oystercatcher | linnet reed bunting skylark song thrush | linnet reed bunting skylark song thrush yellowhammer | - | County |
| Harecraig SOV | F19 | High | 22 | - | - | linnet reed bunting skylark starling yellowhammer song thrush | dunnock goldcrest meadow pipit willow warbler lesser redpoll | linnet reed bunting skylark song thrush | linnet reed bunting skylark yellowhammer song thrush | - | County |
| Quadrat FL-Bb05 | - | High | 22 | - | - | house sparrow linnet reed bunting starling song thrush yellowhammer skylark tree sparrow* | curlew meadow pipit lesser redpoll swallow | linnet reed bunting skylark song thrush tree sparrow* | linnet reed bunting curlew yellowhammer tree sparrow* | - | County |

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| SOV / Quadrat | Habitat Area Contributing to the Value of the Quadrat / SOV | Value of Habitats for Breeding Birds | Total Number of Breeding Bird Species Recorded in SOV / Quadrat | Legal / Conservation Status of key bird species (Breeding, Possibly Breeding, Non Breeding and Incidentals) | | | | | | | Value of Breeding Bird Assemblage |
|-----------------|---|--------------------------------------|---|---|-------|---|---|---|--|--------------------------------|-----------------------------------|
| | | | | EU Birds Directive Annex I | WCA1i | JNCC Red List | JNCC Amber List | UK BAP | LBAP | Local Status (Uncommon / Rare) | |
| Quadrat FL-Bb06 | - | Medium | 24 | - | - | linnet starling song thrush yellowhammer skylark | duncock oystercatcher stove dove swallow willow warbler lesser redpoll meadow pipit | Linnet skylark Song thrush | Linnet yellowhammer | - | County |
| Quadrat FL-Bb07 | F6 | Medium | 21 | - | - | linnet reed bunting song thrush yellowhammer skylark bullfinch | curlew snipe meadow pipit willow warbler wood warbler | linnet reed bunting skylark song thrush bullfinch | linnet reed bunting curlew snipe yellowhammer | - | County |
| Quadrat FL-Bb08 | F27 | Medium | 24 | - | - | linnet reed bunting skylark song thrush yellowhammer | duncock goldcrest mistle thrush meadow pipit willow warbler lesser redpoll stock dove | linnet reed bunting skylark song thrush | linnet reed bunting skylark song thrush yellowhammer | - | County |

Note: Species names highlighted in bold italics were recorded as incidentals only and have been included with the relevant SOV / Quadrat.

4.3 Evaluation of Habitat Areas

Section FL1

4.3.1 An evaluation of Habitat Areas within Section FL1 is provided in Table 14.

Table 14 – Evaluation of Habitat Areas for Section FL1

| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|---|---|
| F1 | Low | Series of agricultural fields with scattered scrub. A railway line runs through the area, however this is characterised by scattered scrub, rank grassland and tall ruderals. | Habitats within the area were partially sampled by Quadrat FQ1, which is considered to be representative of F1 and therefore likely to support a similar breeding bird assemblage. Less than local |
| F2 | Low | Large expanse of south sloping agricultural fields. Broadleaved shelter belts between fields and the road can be relatively species rich and, in some cases, of semi-natural status (though derived from plantation). | Habitats within the area were partially sampled by Quadrat SQ1, which is considered to be representative of F2 and therefore likely to support a similar breeding bird assemblage. Less than local |
| F3 | Medium | Very large arable fields with a small occasional scattered scrub. A species rich arable border is present around some of the fields. Dwelling houses with tree surrounds are present to the south. | Habitats within the area were partially sampled by Quadrat FL-Bb01, which is considered to be representative of F3 and therefore likely to support a similar breeding bird assemblage. Less than local |
| F4 | Medium | Small pocket of reasonably mature plantation woodland. | Habitats within the area were partially sampled by Quadrat SQ1, which is considered to be representative of F4 and therefore likely to support a similar breeding bird assemblage. Less than local |
| F5 | Medium | Semi-natural broad-leaved woodland co-dominated by rowan and birch. The woodland near to Coneyhatch Farm is comprised of similar species, but goat willow is co-dominant with birch in that area. | Composed of a similar habitat mosaic to Limpet Burn SOV but is less diverse in terms of habitats and therefore is likely to support less diverse breeding assemblage. Local |
| F6 | Low | Mature conifer plantation dominated by Sitka spruce. A small burn runs through the upper portion, which connects to the richer HA F7. | Habitats within the area were sampled by Quadrat FL-Bb02, which is considered to be representative of the surrounding area and therefore it is likely to support a similar breeding bird assemblage. Less than local |
| F7 | High | Mosaic of semi-natural communities lining the heavily vegetated Limpet Burn. Communities include a dense marsh with scattered willow, birch woodland, dense bracken and continuous gorse scrub. | The majority of habitats within the area are composed from Limpet Burn SOV and therefore it is likely to support a similar breeding bird assemblage. County |
| F8 | Low | Series of arable and improved fields, with occasional marshy grassland and scattered scrub. | Habitats within the area were partially sampled by Quadrat FL-Bb02 and F3, which are both considered to be representative of F8. Therefore, likely to support a similar breeding bird assemblage. Less than local |
| F9 | Medium | A large area of gorse scrub-acid grassland mosaic with some dry heath vegetation. | The majority of habitats within the area are composed from Kempstone Hill SOV and therefore it is likely to support a similar breeding bird assemblage. Local |

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| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|---|---|
| F10 | Medium | A large area of gorse scrub-acid grassland mosaic with some dry heath vegetation. | The majority of habitats within the area are composed from South Fishermyme SOV and therefore it is likely to support a similar breeding bird assemblage. County |
| F11 | Medium | A mix of semi-natural broadleaved birch wood towards the edge with road, combined with dense continuous gorse scrub. Behind the birch wood is a Scots pine conifer plantation, with acid grassland underneath and beyond. The hill to the north is composed of semi-improved neutral grassland. | Composed of a similar habitat mosaic to South Fishermyme and Limpet Burn SOV and therefore is less likely to support a similar breeding assemblage. County |

4.3.2 An evaluation of Habitat Areas within Section FL2 is provided in Table 15.

Table 15 – Evaluation of Habitat Areas for Section FL2

| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|--|---|
| F12 | High | The majority of this area is dominated by dry heath. The north and north west is lined with dense gorse scrub. Mixed semi-natural woodland is present towards the south west with scattered pockets of willow dominated wet woodland ranging across the south. Marsh is present in the environs of the wet woods. | The majority of habitats within the area are composed of North Fishermyme SOV and therefore it is likely to support a similar breeding bird assemblage. County |
| F13 | Low | This area is comprised of agricultural land that is predominantly improved grassland or grasses cropped for silage. There are small areas of mature mixed plantation woodland and shelter belts throughout that are co-dominated by beech and Scots pine and occasional patches of dense gorse scrub. | Habitats within the area were partially sampled by Quadrat FL-Bb03 and FL-Bb04, which are both considered to be representative of F13. Therefore, likely to support a similar breeding bird assemblage. Local |
| F14 | Low | A small area comprised of bare ground and arable fields the east and acid grassland mosaic with patches of dense scrub and improved grassland to the west. | Habitats within F14 were not sampled by either a SOV or Quadrat. However, the habitats within F13 are similar to habitats occurring within part of Quadrat FL-Bb04, which is considered to be representative of the surrounding area. The habitats within F14 are less diverse and therefore the breeding assemblage is likely to be correspondingly less diverse. Local |
| F15 | High | Riparian habitat surrounding the Burn of Muchalls. This varied riparian zone includes semi-natural wet woodland consisting of rowan, alder and willow in the eastern section with young mixed plantation woodland in the western section that consists of Scots pine, birch, rowan, hazel, whitebeam, a number of willow species, bird cherry and wild cherry. | Habitats within the area were partially sampled by Quadrat FL-Bb04, which is considered to be representative of F15. Therefore, it is likely to support a similar breeding bird assemblage. County |
| F16 | Medium | This Habitat Area is predominantly agricultural land consisting of improved pasture and cropped silage. The management of the area has however been sympathetic and there are many newly planted hedgerows and rows and groups of standards trees. Mature Scots pine and beech line many of the | Habitats within the area were partially sampled by Quadrat FL-Bb05, which is considered to be representative of F15. Similar in composition to habitats represented by Quadrat FL-Bb05, which is located outside the route corridor. Therefore, F16 is likely to support a similar breeding bird |

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| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|---|-------------------------------------|
| | | lanes in the area and shelter belts comprised of these species are frequent throughout the landscape. | assemblage to both Quadrats. County |

Section FL3

4.3.3 An evaluation of Habitat Areas within Section FL3 is provided in Table 16.

Table 16 – Evaluation of Habitat Areas for Section FL3

| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|---|--|
| F17 | Medium | This is an area with patches of bog and heath, characterised by hare's tail cotton grass humps with abundant heather and common cotton grass dominant in the bog pools. The moss species in this area are predominantly <i>Sphagnum</i> . There are also areas of wet and dry heath throughout this habitat consisting of heather, cross leaved heath, crowberry, bilberry and occasional purple moor grass. Here <i>Sphagnum</i> is not a major constituent. | Habitats within the area were partially sampled by Cookney SOV and therefore F17 is likely to support a similar or more diverse breeding bird assemblage. County |
| F18 | Medium | Large area of predominantly improved grassland but also occasional arable farms. Marshy grassland is present though rare. Scrub is present throughout the habitat, usually scattered around field edges and boundaries, however dense pockets of continuous gorse scrub are also present. | Habitats within the area were not sampled by either a SOV or Quadrat. However, Quadrats FL-Bb05 and FL-Bb06 are both considered to be representative, but are located outside the route corridor are similar in composition in terms of habitats. Therefore, F16 is likely to support a similar breeding bird assemblage. County |
| F19 | High | Patchy alder, willow and birch scrub/ woodland on an area of marsh/marshy grassland. There are patches of wet heath vegetation and gorse scrub. | Habitats within the area were partially sampled by Harecraig SOV which is similar in composition in terms of habitats. Therefore, likely to support a similar breeding bird assemblage. County |
| F20 | Medium | Series of improved agricultural fields with occasional pockets of scattered scrub, notably within the vicinity of both new and established dwelling houses. | Habitats within the area were not sampled by either a SOV or Quadrat and were not considered to be representative of Quadrat FL-Bb07. Local |
| F21 | Medium | The habitats grade from soft rush dominated improved fields in the north to a dry heath/acid grassland mosaic dominated by wavy-hair grass and ericoids, plus cotton grasses in the south. Scrub is frequent and is particularly invasive within the dry heath habitat. | Habitats within the area were not sampled by either a SOV or Quadrat but are similar in composition to habitats represented by Quadrat FL-Bb07 and FL-Bb08 (not representative). Therefore, F21 is likely to support a similar breeding bird assemblage. County |
| F22 | Medium | A series of improved fields. Soft rush is prominent in the mid-section, whilst scattered and dense gorse scrub is the distinguishing feature in the north. | Habitats within the area were not sampled by either a SOV or Quadrat, but are similar in composition to habitats represented by Quadrat FL-Bb07. Therefore, F22 is likely to support a similar breeding bird assemblage. County |
| F23 | Medium | Dry heath/acid grassland mosaic on level area of ground. Grassland dominates overall with scattered shrub occasional. Patches of wet heath | Habitats within the area were not sampled by either a SOV or Quadrat. Similar in composition to habitats represented by Quadrat FL-Bb08, |

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| Habitat Area | Habitat Value | Habitat Description | Value of Breeding Bird Assemblage |
|--------------|---------------|--|--|
| | | leading onto bog are also present. | which is considered to be representative of F23 and therefore it is likely to support a similar breeding bird assemblage. County |
| F24 | High | Wet modified bog is the dominant habitat, this being of a higher value in the western section. The eastern section of this area is more modified, containing areas of dry heath, wet birch woods and scattered broadleaves and conifers. A small vegetated burn is present with a pool of standing water. Synthetic tracks are present within this area. | Habitats within the area were not sampled by either a SOV or Quadrat but are similar in composition to habitats represented by FL-Bb05 which is considered to be representative. Therefore F24 is likely to support a similar breeding bird assemblage. County |
| F25 | Medium | An area of young mixed plantation woodland underlain by dry heath / acid grassland mosaic similar to that of F24. | Habitats within the area were not sampled by either a SOV or Quadrat. Similar in composition to habitats represented by FL-Bb08, which is considered to be representative. Therefore, F25 is likely to support a similar breeding bird assemblage. County |
| F26 | Medium | Dominated by improved fields, scrub is rare but marshy grassland is present to the west of Burnhead. | Habitats within the area were not sampled by either a SOV or Quadrat. Similar in composition, although less diverse to habitats represented by FL-Bb07. Therefore, F26 is likely to support a similar but less diverse breeding bird assemblage. Local |
| F27 | Medium | Mesotrophic semi-improved grassland is dominant to the south, giving way to improved fields with abundant gorse scrub. | Habitats within the area were not sampled by either a SOV or Quadrat. Similar in composition, although less diverse to habitats represented by Quadrat FL-Bb08, which are considered representative. Therefore, F26 is likely to support a similar but less diverse breeding bird assemblage. Local |

5 Potential Impacts

5.1 Introduction

5.1.1 The following assessment addresses the potential impacts (in the absence of mitigation) on breeding birds. Potential impacts associated with construction and operation of the proposed scheme on breeding bird assemblages are likely to include: direct mortality, habitat loss, habitat fragmentation/isolation, disturbance (in particular during the bird breeding season) and pollution/other indirect impacts.

5.1.2 It should be noted that 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 adverse impact of the proposed scheme (Luell et al., 2003). Furthermore, 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.

5.2 General

5.2.1 The following comprises a description of the types of potential impacts that would 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. Birds' eggs and un-fledged young however 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 which 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, 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 and Brownlee, 2005).

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- 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 hunt 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 – refer to paragraph 5.2.21) 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 (refer to paragraphs 5.2.21 and 5.2.26) 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 (refer to paragraph 5.2.2) and the displacement of adults and fledglings by means of disturbance (refer to paragraph 5.2.26) 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 landtake required in order to construct the Fastlink of the proposed scheme is estimated at approximately 1.20km² / 120ha. Table 17 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.

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Table 40.18 – Phase 1 Habitat Areas Pre and Post Construction

| Phase 1 Habitat Description | Phase 1 Habitat Categories within proposed scheme land-take | |
|--|---|------------------------|
| | Pre-construction (ha) | Post-construction (ha) |
| Woodland mixed plantation | 2.46 | 13.23 |
| Woodland broadleaved plantation (including standard trees) | 0.10 | 0.78 |
| Woodland broadleaved semi-natural | 2.11 | 0.55 |
| Woodland coniferous plantation | 1.28 | 0.31 |
| Scattered scrub | 0.59 | 1.20 |
| Dense continuous scrub | 3.58 | 7.17 |
| Riparian woodland | 0 | 3.37 |
| Acid grassland semi-improved | 0.15 | 0.13 |
| Acid grassland unimproved | 0.40 | 0.19 |
| Improved grassland | 46.29 | 26.39 |
| Marshy grassland | 5.21 | 2.87 |
| Neutral grassland semi-improved | 0.26 | 0.21 |
| Poor semi-improved grassland | 2.96 | 1.51 |
| Disturbed amenity grassland | 0.83 | 0.37 |
| Arable | 49.21 | 19.64* |
| Built up areas (buildings) | 0.49 | 0.49 |
| Fen | 3.87 | 1.41 |
| Heath - acid grassland dry mosaic | 1.88 | 1.67 |
| Total | 121.67 | 81.49 |

*Figure assumes all potential return to agriculture is achieved.

- 5.2.17 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 loss of potential breeding bird habitat, the effects of which are described above. It should be noted however that the level of permanence (in term of loss) would vary and is dependant on location/s, which are currently unknown at this stage.
- 5.2.18 Aside from the permanent habitat loss described above, no significant additional habitat loss within the route corridor associated with operation of the proposed scheme is envisaged, with the possible exception of occasional routine operational management of roadside habitats (comprising mowing of verges or trimming of scrub/trees).
- 5.2.19 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. Pollution may include road salting, oil and fuel spillage, resulting in an indirect impact to bird populations through a reduction in food availability.
- 5.2.20 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 rendering potentially suitable habitat as unsuitable for breeding bird populations (refer to paragraph 5.2.28). Studies undertaken in the Netherlands demonstrated that around 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 and Foppen, 1994; and 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. It is likely that the proposed scheme would result in significant disturbance to breeding birds in adjacent unaffected habitats during periods of peak traffic flow. 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

- 5.2.21 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).
- 5.2.22 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).
- 5.2.23 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).
- 5.2.24 English Nature (1994) reports that the habitats most likely to be affected by fragmentation are woodland, heathland and species-rich grassland and bird species which move between habitats in order to maintain genetic diversity and avoid inter-breeding are the most affected. The ability to use fragmented habitats varies according to species with greater impacts on those species less able to cross gaps. Some bird species such as the great spotted woodpecker are not significantly affected by fragmentation and easily cross gaps between pockets of woodland. However, other species (e.g. cuckoo) will not live within several hundred meters of a road. 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).
- 5.2.25 With respect to the above research, the proposed scheme is likely to constitute a significant dispersion barrier between habitats which could have the ability to adversely impact a range breeding bird species, some of which may not normally be significantly impacted by habitats gaps.
- 5.2.26 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 habitats². This fragmentation and isolation would have an adverse 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.
- 5.2.27 Operation of the proposed scheme is also likely to have significant fragmentation and isolation impacts on bird populations through a restriction in dispersal and movement of species between

² Dispersal of species between habitats is one of the key factors that enables species to maintain their population viability.

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habitats (fragmented by construction) resulting from direct mortality, habitat loss associated with minimal operational maintenance and noise and vibration disturbance. The continued fragmentation and isolation of bird species within severed habitats could have a detrimental effect on species population dynamics and ultimately population 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 or possible blasting) 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 nest³ during the breeding season.
- 5.2.29 The location of temporary site compounds/offices (which may be operational 24 hours a day) 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 addition 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. This could potentially lead 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. 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

- 5.2.31 Research undertaken by Reijnen et al (1997) and Reijnen and Foppen (1994) has shown that operational noise is a primary factor in altering the density of bird populations adjacent to roads and highways.
- 5.2.32 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 1.13km and 0.9km respectively from the study highway.
- 5.2.33 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).
- 5.2.34 Other studies have shown that road traffic noise exceeding 50dBA can reduced bird density (40dBA 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).

³ The number of failed nesting attempts will depend on the frequency and magnitude of the disturbance and the species involved.

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- 5.2.35 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 (1932) 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 behaviour patterns.
- 5.2.36 Farner (1964) demonstrated photoperiodic control of reproduction in birds and observed that increasing artificial day length induced hormonal, physiological and behavioural changes initialising breeding. Lofts and 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.
- 5.2.37 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.
- 5.2.38 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 an adverse impact on prey abundance leading to food shortages.
- 5.2.39 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).
- 5.2.40 Disturbance during operation of the proposed scheme would result from noise and vibration associated with road traffic, artificial lighting (that will be installed at all major junctions along the proposed scheme) 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

- 5.2.41 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 SAC (refer to Chapter 39: Water Environment). The severity and magnitude of the pollution impact would depend on the on the constituents, toxicity to biodiversity and discharge/spill volume of the pollutant in question.

Operation

- 5.2.42 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).
- 5.2.43 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

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during the winter and the indirect pollution of adjacent habitats via vehicle spray could potential 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 and hence potential impact to bird populations as since this is dependant on the rate of salt spread and speed of the spreader. However, wide verges with varied nut or berry bearing planting are likely to be most impacted.

- 5.2.44 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. As with the construction phase, these pollution incidents are of particular concern if they happen within proximity of ecological sensitive communities or rivers and/or streams identified above (refer to ES Chapter 39: Water Environment).
- 5.2.45 Impacts on bird populations from vehicle-derived atmospheric pollution are not envisaged. An air quality assessment has been undertaken for the route corridor and also for the wider area including the city of Aberdeen (refer to Chapters 44 and 55). Findings indicate air quality within the vicinity of the proposed scheme would remain good.
- 5.2.46 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. The study observed that in total one invertebrate was killed for every five miles travelled.

Impacts on Key Bird Species

- 5.2.47 A summary description of impacts on key bird species (WCA1i, JNCC Red List, JNCC Amber List, UK BAP, LBAP and local status species) is shown in Table 18.

Table 17 – Summary Description of Impacts on Bird Species of Conservation Concern

| Bird Species | Habitat/s of Value | Impacts |
|---------------------|--|--|
| bullfinch | Resident species. 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. |
| cuckoo | Summer visitor. Parasitic breeding species. | Loss of breeding habitat (woodland, hedgerow and scrub) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. |
| curlew | Resident species. Breeds on areas of damp moorland and pasture. Winters on estuaries and damp grassland. | 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. |
| dunnock | 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 is unlikely to constitute a significant impact. |
| goldcrest | 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 is unlikely to constitute a significant impact. |
| grasshopper warbler | Summer visitor. 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. |
| grey partridge | Breeds and winters on farmland, grassland and arable fields. | Loss and fragmentation of breeding habitat (arable farmland and fields) during operation. Disturbance during |

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| Bird Species | Habitat/s of Value | Impacts |
|--------------------------|---|--|
| | | both construction and operation. Possible risk of RTAs due to low flight pattern. |
| herring gull | Resident species. Breeds on rocky coastal edges and more recently, building. | Unlikely to be impacted by loss of breeding habitat or disturbance. Direct mortality from ingestion of pollutants due to savaging behaviour could occur. |
| house sparrow | Resident species. Breeds in urban environment, in rood tiles, air ducts, recesses and occasionally trees. | Loss of breeding habitat (buildings and hedgerows). Unlikely to be impacted by disturbance. Direct mortality from ingestion of pollutants due to savaging behaviour could occur. |
| lapwing | Resident species. 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-backed gull | Resident species. Breeds on rocky coastal edges and more recently, building. | Unlikely to be significantly impacted by loss of breeding habitat, fragmentation or disturbance. Direct mortality from ingestion of pollutants due to savaging behaviour could occur. |
| linnet | Resident species. 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 | Resident species. 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 | 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. |
| oystercatcher | 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 is unlikely to constitute a significant impact. |
| redstart | Summer visitor. Breeds in woodland, gardens and parks. | 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. |
| reed bunting | Resident species. Breeds and winters in reedbeds, upland and lowland marshes and farmland. Visits gardens in winter. | Loss, fragmentation and possible pollution of breeding habitat (riparian corridors, marshland and scrub/hedgerows operation) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. |
| sand martin | Breeds in riverbanks, lakesides and sandpits. Usually seen over water. | Loss of breeding habitat during operation. Unlikely to be subject to disturbance other than in proximity of breeding areas. Possible risk of RTAs due to low flight patterns. |
| skylark | Resident species. 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. |
| snipe | Breeds in marshes and boggy areas. Winters on salt marshes, coastal lagoons and other marshy areas. | Loss and fragmentation of breeding habitat (marshland and boggy areas) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. Possible risk of RTAs due to low flight patterns. |
| snow bunting | Resident species. Breeds in high alpine habitat, in boulder zone of bare mountains. | Unlikely to breed within the route corridor and therefore only subject to disturbance during both construction and operation. |
| song thrush | Breeds and winters in gardens, farmland, woodland and hedges. | Loss and fragmentation of breeding habitat (woodland, scrub, gardens, agricultural fields). Disturbance during |

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| Bird Species | Habitat/s of Value | Impacts |
|----------------|---|--|
| | | 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. |
| stock dove | Resident species. Breeds in wooded areas, forest edges and larger undisturbed parks. | Loss and fragmentation of breeding habitat (woodland and parkland). Disturbance during construction and operation. Possible risk of RTAs due to low flight patterns. |
| swallow | Summer visitor. 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. |
| willow warbler | Breeds in thick ground cover in woodland, farmland and scrub. | Loss of breeding habitat (woodland and areas dense scrub) during operation. Disturbance during construction. Disturbance during operation is unlikely to constitute a significant impact. |
| yellowhammer | Resident species. 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. |

5.3 Specific Impacts

Section FL1

5.3.1 Potential construction impacts would include fragmentation/isolation, disturbance and pollution due to accidental spills at Limpet Burn (F7), South Fishermyme (F10) and North Fishermyme (F12). These areas are all assessed as being of county importance for breeding birds. Potential risks are anticipated to be greater at North and South Fishermyme and these impacts have been assessed as medium magnitude and Moderate significance. All other impacts within FL1 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

5.3.2 During the operation of the road, there is the potential risk of direct mortality, fragmentation/isolation, disturbance, habitat loss and pollution due to runoff. Limpet Burn, South Fishermyme and North Fishermyme are assessed as having a county ecological value for breeding birds. Operational impacts within these areas have been assessed as medium negative magnitude and Moderate significance. The exception is the potential impacts that have been identified at Limpet Burn, which have been assessed at low negative magnitude (medium magnitude for pollution) and Minor significance. All other impacts within FL1 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

Section FL2

5.3.3 Potential construction impacts would include fragmentation/isolation, disturbance and pollution due to accidental spills at the Burn of Muchalls (F15) and the area surrounding Cookney (F16). These areas are all assessed as being of county importance for breeding birds. Potential impacts from construction activities have been assessed as low negative magnitude and Minor significance. However, the impacts that would result from risk of pollution of watercourses within these areas has been assessed as being of medium negative magnitude and Moderate significance. All other impacts within FL2 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

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5.3.4 During the operation of the road, impacts from direct mortality, fragmentation/isolation, disturbance, habitat loss and pollution due to runoff have been identified. The Burn of Muchalls and the area surrounding Cookney are assessed as county ecological value for breeding birds. The potential for operational pollution in both of these areas, as well as direct mortality, fragmentation/isolation, disturbance and habitat loss at the area surrounding Cookney is predicted to be of medium negative magnitude and Moderate significance. All other impacts within FL2 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

Section FL3

5.3.5 Potential construction impacts would include fragmentation/isolation, disturbance and pollution due to accidental spills at Harecraig (F18 and F19) and Strannog Hill (F23 and F25). These areas are all assessed as being of county importance for breeding birds. The potential impacts have been assessed as low magnitude and Minor significance. The exception is the risk from pollution which has been assessed as being of medium negative magnitude and Moderate significance. All other impacts within FL3 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

5.3.6 During the operation of the road, impacts from direct mortality, fragmentation/ isolation, disturbance, habitat loss and pollution due to runoff have been identified , particularly at Harecraig and Strannog Hill (both of county importance). These impacts have been assessed as low negative magnitude and Minor significance. The exception is the risk of pollution which has been assessed as medium negative magnitude and Moderate significance. All other impacts within FL1 are predicted to be between negligible to low negative magnitude and between Negligible and Minor significance.

6 Mitigation

6.1 Generic Mitigation

6.1.1 This section of the report outlines measures to prevent, reduce or offset the adverse effects of the proposed scheme on breeding birds and the habitat features of importance to them.

6.1.2 Table 19 presents a suite of generic mitigation measures that are applicable during both construction and operation of the proposed scheme. The mitigation measures outlined below comprise prevention/avoidance, reduction and offset/compensation measures, which form a hierarchy of measures that should be adopted preferably in this order. Further details of habitat creation are provided in the Terrestrial Habitats Report in Appendix A40.1.

Table 18 – Generic Mitigation Measures: Construction and Operation

| Mitigation Type | 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 bird nests should be taken into consideration when planning the demolition of buildings or clear felling of trees. |
| Prevent | 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. |
| Prevent | Direct Mortality Disturbance | Barn Owl (WCA1i species) All buildings (in particular farm buildings 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. All buildings will be destroyed immediately after survey provided evidence of barn owl is not recorded. Alternatively, if demolition is not feasible, all entrances into the structure |

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| Mitigation Type | Impact | Description of Generic Mitigation |
|------------------|---|--|
| | | should be secured covered to prevent access by barn owl. |
| Prevent | Direct Mortality Disturbance | Kingfisher (WCA1i species) A pre-construction survey of all suitable watercourses should 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 (whichever is applicable) outside the main breeding season (March – October) 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 should be securely covered under the supervision of the Ecological Clerk of Works out with the main breeding season (March – October) 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 should 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. |
| Prevent | Direct Mortality Habitat Loss Disturbance | Plant and personnel should 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. |
| Prevent | 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. |
| Prevent | 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. |
| Prevent | Pollution | Strict adherence to SEPA pollution prevention guidelines PPG1, PPG2 and PPG6. |
| Prevent | Pollution | Minimise the amount of dust and other airborne debris produced during construction by the adoption of best working practices. |
| Prevent | Pollution | The use of approved pollution prevention schemes (e.g. oil separators) should 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 should 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 Mortality | Where the proposed alignment passes through existing areas of established woodland, potential RTAs should 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). |
| Prevent | Direct Mortality Disturbance | Habitat management of areas of woodland, scrub and/or grassland should 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. |
| Prevent | 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 |

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| Mitigation Type | Impact | Description of Generic Mitigation |
|-----------------|---|---|
| | | chosen areas). |
| Prevent | Direct Mortality Habitat Loss Disturbance | Kingfisher (WCA1i species) Any sand and/or gravel bank/s within 500m of the proposed scheme should 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 should be securely covered out with the main breeding season (March – October) in order to prevent access by potentially breeding kingfishers one breeding season in advance of any works. |
| Prevent | Direct Mortality Habitat Loss Disturbance | Operational maintenance of areas of woodland, scrub and/or grassland is minimised as far as practical. |
| Prevent | Direct Mortality Pollution | The use of de-icing salt during winter periods should be kept to an absolute minimum. |
| Reduce | Direct Mortality | A grassland verge (approximately 5m in width) should be maintained between the edge of the hard shoulder 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. |
| Reduce | 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). |
| Offset | Habitat Loss | Barn owl (WCA1i species) Replacement nest boxes should 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. |
| Offset | 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 should include areas of core woodland (> 30m from woodland edge) and areas located at least 50m from route alignment. |
| Offset | 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, linnets, tree sparrow, meadow pipit and grey partridge. |
| Offset | 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. |
| Offset | Habitat Loss | Bird boxes (suitable for a range of species) should 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. |
| Offset | 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. |
| Offset | 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 should be created in order to compensate for |

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| Mitigation Type | Impact | Description of Generic Mitigation |
|-----------------|-------------------------------|---|
| | | any nesting habitat loss during construction and should 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. |
| Offset | Habitat Loss Fragmentation | Vegetated strips, wildlife overbridges or similar should be created to offset the loss of wildlife corridors (e.g. woodland, scrub, rivers, streams or disused railways) severed by the proposed scheme and should 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. |
| Offset | - | An environmental management plan (EMP) will be prepared in consultation with SNH and should be followed throughout operation of the proposed scheme. |

6.2 Specific Mitigation

6.2.1 The approach to breeding bird mitigation includes the following key elements:

- construction activities including the felling of trees and clearing of scrub will be timed to avoid periods when birds are nesting (i.e. March-July) where possible, preventing disturbance to breeding birds. Areas may be pre-felled or cleared in winter to make habitat undesirable for nesting;
- areas of habitat will be created to offset habitat loss, although these areas will be situated away from the scheme to prevent RTAs. This will include the provision of a grassland buffer either side of the road before any scrub or woodland planting therefore allowing a clear sightline of the traffic;
- planting of dense native tree and scrub species (taking into account direct mortality impacts) to screen noise and vibration disturbance associated with operation of the proposed scheme from birds located within adjacent habitats; and
- sympathetic planting of second (and subsequent) stage detention basins, where appropriate, to allow use by wintering birds.

6.3 Further Surveys

6.3.1 SOVs and Quadrats that were not subject to three full BBS will be re-surveyed during the 2007 survey period to complete the baseline, update the evaluations and hence inform a full specific impact assessment.

6.3.2 The following SOVs and Quadrats require a re-survey for breeding birds from April – June 2007:

- Limpet Burn, Kempstone Hill, South Fishermyme and North Fishermyme SOVs; and
- Quadrats FL-Bb01, FL-Bb02, FL-Bb03 and FL-Bb05.

6.3.3 In addition to the re-survey of SOVs and Quadrats, the following additional areas (which were not originally included within the original route corridor during the selection of SOVs) should be surveyed:

6.3.4 Stranog / Berry Top Hill (NO 864 963) - comprising a mosaic of wet heath, marshy grassland and mixed plantation woodland habitats that potentially offer good foraging and roosting opportunities for breeding birds.

7 Residual Impacts

7.1.1 Residual impacts on breeding birds throughout Sections FL1-FL3 would remain due to the risk of direct mortality from RTAs, fragmentation/isolation and habitat loss during operation despite

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application of appropriate mitigation. The residual impacts on breeding birds in the study area have been assessed as being of Negligible to Minor residual significance.

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Annex 1

Species list for birds recorded in the Fastlink

| Common Name | Scientific Name |
|--------------------------|----------------------------------|
| blackbird | <i>Turdus merula</i> |
| blackcap | <i>Sylvia atricapilla</i> |
| blue tit | <i>Parus caeruleus</i> |
| bullfinch | <i>Pyrrhula pyrrhula</i> |
| buzzard | <i>Buteo buteo</i> |
| carrion crow | <i>Corvus corone</i> |
| chaffinch | <i>Fringilla coelebs</i> |
| chiffchaff | <i>Phylloscopus collybita</i> |
| coal tit | <i>Parus ater</i> |
| collared dove | <i>Streptopelia decaocto</i> |
| cuckoo | <i>Cuculus canorus</i> |
| curlew | <i>Numenius arquata</i> |
| dunnock | <i>Prunella modularis</i> |
| garden warbler | <i>Sylvia borin</i> |
| goldcrest | <i>Regulus regulus</i> |
| goldfinch | <i>Carduelis carduelis</i> |
| grasshopper warbler | <i>Locustella naevia</i> |
| great spotted woodpecker | <i>Dendrocopos major</i> |
| great tit | <i>Parus major</i> |
| greenfinch | <i>Carduelis chloris</i> |
| grey heron | <i>Ardea cinerea</i> |
| grey partridge | <i>Perdix perdix</i> |
| herring gull | <i>Larus argentatus</i> |
| house martin | <i>Delichon urbica</i> |
| house sparrow | <i>Passer domesticus</i> |
| jackdaw | <i>Corvus monedula</i> |
| lapwing | <i>Vanellus vanellus</i> |
| lesser black-backed gull | <i>Larus fuscus</i> |
| lesser redpoll | <i>Carduelis flammea cabaret</i> |
| linnet | <i>Carduelis cannabina</i> |
| magpie | <i>Pica pica</i> |
| mallard | <i>Anas platyrhynchos</i> |
| meadow pipit | <i>Anthus pratensis</i> |
| mistle thrush | <i>Turdus viscivorus</i> |
| moorhen | <i>Gallinula chloropus</i> |
| mute swan | <i>Cygnus olor</i> |
| oystercatcher | <i>Haematopus ostralegus</i> |
| pheasant | <i>Phasianus colchicus</i> |
| pied wagtail | <i>Motacilla alba</i> |
| redstart | <i>Phoenicurus phoenicurus</i> |

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| Common Name | Scientific Name |
|--------------------|-----------------------------------|
| reed bunting | <i>Emberiza schoeniclus</i> |
| robin | <i>Erithacus rubecula</i> |
| rook | <i>Corvus frugilegus</i> |
| sand martin | <i>Riparia riparia</i> |
| sedge warbler | <i>Acrocephalus schoenobaenus</i> |
| siskin | <i>Carduelis spinus</i> |
| skylark | <i>Alauda arvensis</i> |
| snipe | <i>Gallinago gallinago</i> |
| snow bunting | <i>Plectrophenax nivalis</i> |
| song thrush | <i>Turdus philomelos</i> |
| starling | <i>Sturnus vulgaris</i> |
| stock dove | <i>Columba oenas</i> |
| swallow | <i>Hirundo rustica</i> |
| tawny owl | <i>Strix aluco</i> |
| tree sparrow | <i>Passer montanus</i> |
| whitethroat | <i>Sylvia communis</i> |
| willow warbler | <i>Phylloscopus trochilus</i> |
| woodpigeon | <i>Columba palumbus</i> |
| wood warbler | <i>Phylloscopus sibilatrix</i> |
| wren | <i>Troglodytes troglodytes</i> |
| yellowhammer | <i>Emberiza citrinella</i> |