Appendix 12.4

Breeding Bird Survey

Contents

Tables

1 Introduction

1.1.1 CH2M Hill Fairhurst Joint Venture (CFJV) is the Lead Design Consultant for the A9 Dualling Central Section (Glen Garry to Dalraddy). MacArthur Green has been commissioned to assist CFJV with risk-based ornithology elements relating to the Design Manual for Roads and Bridges (DMRB) Stage 2 options appraisal and DMRB Stage 3 environmental assessment process.

1.1.2 This document provides a summary of the results of field surveys carried out in Project 8 (Dalwhinnie to Crubenmore) during the 2015 and 2016 breeding seasons.

2 Methods

2.1.1 Field surveys took place from May to July 2015, and March to May 2016, with the aims of mapping the distribution of breeding birds, estimating the approximate size of breeding bird populations, and identifying the areas of relatively high ornithological sensitivity to feed into the design process. This comprised a programme of:

- Four separate breeding bird survey visits (May to July 2015)
- A series of targeted scarce breeding bird surveys to record breeding species categorised as high conservation concern (May to July 2015 and March to May 2016)
- A series of woodland grouse surveys to record lekking (or breeding), and associated maximum numbers (April and May 2016)

2.1.2 The ornithology surveys were undertaken and reported in line with sections applied to undertake the DMRB stage 2 options appraisal. The study area was split for the stage 2 assessment into the following 4 sections from south to north: Section 1 (ch. 20,000 to 21,750); Section 2 (ch. 21,750 to 24,300); Section 3 (ch. 24,300 to 28,750); Section 4 (ch. 28,750 to 31,050). A short length of tie-in is present at both the north and south end of the scheme which is referred to in the report.

2.2 Species under Consideration

2015 Breeding Bird Survey Target Species

2.2.1 The scope of the 2015 desk-based study and field surveys was restricted to “target species” (thereby excluding common species of low conservation concern) in order to more efficiently record and determine the location of higher sensitivity areas (i.e. containing populations of species of higher conservation concern). Target species are those listed in one or more of the following:

- EU Birds Directive Annex I and regularly occurring migratory species[1]
- Schedule 1 of the Wildlife and Countryside Act[2]
- A qualifying interest of a nearby SPA or SSSI
- The Cairngorms National Park Priority Species List[3]
- Red-listed in the Birds of Conservation Concern 3[4]
- Any other species identified as an integral part of the local bird assemblages which is of wider conservation importance, e.g. Amber-listed wader species[4]

Scarce Breeding Birds Surveys 2015 and 2016

Scarce breeding birds were defined as those listed in one or more of the following:

- EU Birds Directive (Annex I and regularly occurring migratory species)5
- Schedule 1 of the Wildlife and Countryside Act[6]
- A qualifying interest of a nearby Special Protection Area (SPA) or Site of Special Scientific Interest (SSSI)
- A rare national breeder (<300 pairs) not included within the above categories

2.2.2 The Drumochter Hills Special Protection Area (SPA) and Site of Special Scientific Interest (SSSI) partially overlap within Sections 1 and 2 in the eastern 500m survey area. The qualifying interests of the SPA are breeding merlin and dotterel, whereas the breeding bird assemblage is considered as a qualifying interest of the SSSI (includes dotterel, ptarmigan, snow bunting, golden eagle, merlin, peregrine, wigeon, golden plover, dunlin, and ring ouzel).

Woodland Grouse Surveys 2016

2.2.3 Black grouse and capercaillie are considered as woodland grouse species. Both species are known to breed in the Cairngorms and Speyside areas.

[1] http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

[2] http://jncc.defra.gov.uk/pdf/waca1981_schedule1.pdf

[3] http://cairngorms.co.uk/look-after/conservation-projects/biodiversity-action-plan/priority-species-information1

[4] http://www.bto.org/sites/default/files/u12/bocc3.pdf

[5] http://ec.europa.eu/environment/nature/legislation/birdsdirective/index_en.htm

[6] http://jncc.defra.gov.uk/pdf/waca1981_schedule1.pdf

2.3 Breeding Bird Surveys

2.3.1 Methods deployed for "generic" breeding bird surveys were based on a combination of Brown and Shepherd (1993[7]) upland bird surveys developed for surveying extensive upland areas, and Common Bird Census (CBC) surveys[8], developed for more enclosed farmland and woodland areas. Both methods use a territory-mapping approach with species' point records combined across survey visits to define breeding territories.

2.3.2 The key methodological aspects of the breeding bird surveys were:

- The survey area was surveyed four times in 2015 (during May, June and July) as per Calladine et al. (2009[9]) guidance
- Walk-routes which optimised ground visibility were used. Where possible, two surveyors followed an approximately parallel route walking through a 500 m wide strip extending out from the A9 corridor (hereafter 500m buffer) such that all parts are approached to within at least 150 m. This was undertaken on both the sides of the existing A9 road
- Existing infrastructure which runs roughly parallel with the A9 road within the 500m buffer (e.g. the old A9 road and cycle path along the northbound carriageway, the Beauly-Denny Overhead Power Line along the southbound carriageway, as well as other minor roads and farm tracks) were used to maximise the time spent scanning an area for birds, so long as the route did not significantly deviate from the "ideal" survey route
- Fieldwork was undertaken between 0730 and 1800hrs, thus avoiding the main periods of rapidly changing bird activity (Brown and Shepherd, 1993)
- Isolated trees, copses and patches of scrub and woodland which could offer suitable breeding habitat were approached and examined
- At regular intervals (approximately every 100 m) the observers scanned the surrounding area with binoculars and listened for calls or song
- Contacts with birds by sight or sound were recorded on large-scale maps
- Standard BTO activity codes were used to note species, sex and age where possible, and to record activity such as singing or nest-building
- When individuals or pairs were observed the observer made efforts to establish whether, in their opinion, these birds were new observations or the same individuals previously encountered within the survey area

[7] Brown, A. F. & Shepherd, K. B. (1993) A method for censusing upland breeding waders. Bird Study, 40: 189-195.

[8] Marchant, J.H. (1983). Common Birds Census instructions. BTO, Tring. 12pp.

[9] Calladine, J., Garner, G., Wernham, C. & Thiel, A. 2009. The influence of survey frequency on population estimates of moorland breeding birds. Bird Study 56: 381-388.

- Fieldwork was not undertaken in conditions considered likely to affect bird detection rates, for example in winds greater than Beaufort Scale Force 4, persistent precipitation, poor visibility (less than 300 m), or in unusually hot weather . All meta data relating to weather conditions was recorded at regular intervals and has been stored on the CFJV sharepoint
- After survey visits were completed the data were digitised and overview maps produced using GIS showing all records of each target species. These were analysed to produce composite breeding territory maps, using the methodology described by Bibby et al. (2000[10])

2.4 Scarce Breeding Bird Surveys

Desk Studies

2.4.1 In 2015 and 2016, habitat and species data obtained from desk-based studies and 2015 breeding bird surveys were used to focus survey effort within areas most likely to host breeding target species. This was based on the process of sensitivity characterisation of the survey areas carried out in the DMRB2 stage, as described in MacArthur Green (2015) *A9 Dualling, Central Scheme: Ornithological Survey Methods Report*. Historic data were obtained from various sources, as presented in the *2016 Ornithology Summary Note*.

Field Surveys

2.4.2 Scarce breeding bird surveys followed species-specific survey guidelines such as those outlined in Hardy et al. (2009[11]) and Gilbert *et al.* (1998[12]), depending on habitat and likely species assemblage. The aims were to determine the distribution of occupied nests/territories for target species (particularly Schedule 1 listed species) and record breeding success.

2.4.3 Access was restricted to 500m from the A9 corridor. The main impact on breeding species such as raptors is likely to be disturbance during construction, and based on SNH guidance on species-specific disturbance distances (Ruddock and Whitfield, 2007[13]), this is likely to be confined to within 1 km of construction activity at most. The actual scarce breeding bird survey area was therefore a buffer of up to 1 km either side of the A9 corridor, depending on habitat type and

[10] Colin J. Bibby, Neil D. Burgess, David A. Hill and Simon H. Mustoe (2000) Bird Census Techniques, 2nd Edition, London, Academic Press

[11] Hardy, J. Crick, H. Wernham, C. Riley, H. Etheridge, B and Thompson, D. (2009) Raptors: A Field Guide for Surveys and Monitoring. The Stationary Office, Edinburgh.

[12] Gilbert, G., Gibbons, D. W. & Evans, J. (1998) Bird Monitoring Methods. RSPB, Sandy.

[13] Ruddock, M. & Whitfield, D. P. (2007). A Review of Disturbance Distances in Selected Bird Species, A report from Natural Research (Projects) Ltd to Scottish Natural Heritage.

topography. Because of access restrictions it was necessary to scan areas of land beyond 500m from the edge of the corridor.

2.4.4 Areas with potential for scarce breeding birds, as identified in the desk studies, were characterised as being of high sensitivity and therefore prioritised during surveys.

2.4.5 Areas of suitable habitat were visited to:

- Check for territory occupancy (1st and 2nd visits) – this consisted of watching over suitable habitat from a good vantage point for displaying males (and females)
- Locate incubating birds (2nd and 3rd visits) e.g. by listening for begging calls or watching for food provision by the other member of a pair
- Check for young or breeding evidence (3rd visit in 2015) by listening for begging calls, watching for food passes or watching for adults provisioning the nest with food
- Check for fledged young (4th visit in 2015)

2.4.6 Surveys were undertaken by experienced and licensed field ornithologists. Extreme care was taken to avoid unnecessary disturbance to breeding birds.

2.5 Woodland Grouse Surveys

2.5.1 Prior to 2016 field surveys to record lekking woodland grouse, a sensitivity map showing priority areas of suitable habitat for surveying woodland grouse was created, with the rationale behind the map production described in Appendix A.

2.5.2 The desk-based study used two categories for capercaillie and black grouse to determine likelihood of presence, and corresponding survey effort. These were:

- **Suitable habitat**: habitat is suitable for presence of leks, and/or historic records are present. Areas identified will be surveyed at least twice.
- **Suitable habitat not present**: habitat is not generally suitable for woodland grouse, and there are no historic records. Areas will not be specifically surveyed, but will be covered as part of ongoing scarce breeding bird surveys. If evidence of woodland grouse is found, then further specific surveys will take place.

2.5.3 Following the survey rationale in Appendix A, it was concluded that, due to a combination of a lack of historic data within Project 8, and lack of extensive and contiguous suitable habitat, capercaillie was scoped out of the field surveys. , this approach followed consultation with RSPB regarding the scope of surveys.

2.5.4 The preferred habitats identified for black grouse leks included mosaics of moorland or heathland, woodland, plantations, rough grazing, in-bye land and meadows. The following areas were considered unsuitable for black grouse leks: ground above 550 m; built-up areas; enclosed arable farmland; the interiors of unbroken post-thicket stage forest blocks and dense native woodland.

2.5.5 The survey methodology used is detailed in Gilbert *et al.* (1998). A summary is provided below.

- Black grouse were surveyed within the 500m A9 corridor, and scanned out to 1km, by counting total numbers of males and females at leks
- Most lekking activity takes place at or soon after dawn in spring, and so known lek sites and other areas of suitable habitat which can host leks were visited during April and May within two hours of dawn, on calm dry days with good visibility where possible

- Visits involved listening and scanning for lekking black grouse from strategic locations (avoiding disturbance of leks) and during walks between these locations ensuring that all potential habitat was covered
- The maximum count of males in the two hours around dawn gives the standard count estimate but the maximum number of females seen was also presented
- Leks that were at least 200m apart within the same year were treated as separate leks.

3 Results

3.1 Survey Limitations

3.1.1 Survey guidelines were followed as closely as practicably possible. However, the following should be noted:

- Wherever possible a constant walking search effort was maintained, particularly in more open moorland areas. However, in practice, access restrictions meant that it was necessary to adopt a stop-and-scan approach in some areas. It was not possible to access certain areas, including private properties and public amenities. Where possible, these areas were scanned externally, but even where this was not possible, the habitat type suggests that bird sensitivity is likely to be low and few target species are likely to be present.
- The mainline railway track lies to the west of the A9 corridor within the survey area, and there was no access within the Network Rail boundary and across the tracks for Health and Safety reasons. There are a few road crossing points within the survey area that allowed movement from one side of the railway line to the other (e.g. bridges and underpasses). Consequently, for a number of locations where the railway line runs close to the road, access to areas on the non-A9 side of the railway line was obtained on follow up visits by way of these minor roads.
- The Brown and Shepherd (1993) survey guidelines suggest the first visit should be completed by mid-May. However, May 2015 was a relatively cold and windy month in comparison with the long term averages[14], and this could possibly have delayed the onset of breeding for a number of species. Therefore, a later start date was considered to be appropriate, with the first survey conducted between the 25th and 27th May.
- The first scarce breeding bird surveys in 2015 were conducted in early June, and so it is possible that some early season breeding activity, including any breeding failures, may have been missed. However, the cold spring weather could possibly have delayed the onset of breeding by target species. Early season surveys were undertaken in 2016 eliminating data gaps with respect to this part of the season. Ongoing breeding was picked up by the continuing survey

[14] http://www.metoffice.gov.uk/climate/uk/summaries/datasets

programme. Scarce breeding bird surveys in 2016 took place between March and May, and so any late breeding attempts may have been missed. The 2016 surveys were however intended to compliment the 2015 surveys, to build up a complete picture of the breeding season (i.e. the surveys have covered the full breeding period from March to July).

3.2 Survey Results

2015 Breeding Bird and Scarce Breeding Bird Surveys

3.2.1 A total of 38 target species were recorded during the 2015 breeding bird and scarce breeding bird surveys. Their highest conservation status, level of breeding status (possible, probable or confirmed) and number of territories recorded within each section of Project 8 are presented in Table 3.2.1. Locations of territories are shown in Figures 1.1 to 4.5 (note that one point does not necessary mean one territory – on occasion a number of pairs were recorded within a small area and this has been represented as a single entry).

Table 3.2.1: Highest conservation status and number of pairs for species recorded during 2015 Breeding Bird Surveys in Project 8

Highest Conservation Status	Species	Latin name	Tie-in (S)	Section 1	Section 2	Section 3	Section 4	Tie-in (N)
SPA breeding feature	Merlin*	*Falco columbarius*	Location of possible merlin breeding is presented in confidential appendix 12.13.					
SSSI breeding feature	Golden eagle*	*Aquila chrysaetos*	-	✓	✓	-	-	-
	Wigeon	*Anas penelope*	-	-	P	-	-	-
	Golden plover*	*Pluvialis apricaria*	-	-	1	1	-	-
	Dunlin*	*Calidris alpina*	-	-	✓	-	-	-
	Ring ouzel*	*Turdus torquatus*	-	-	-	1	-	-
Schedule 1 & Annex I	White-tailed eagle*	*Haliaeetus albicilla*	-	✓	✓	-	-	✓
Schedule 1	Common crossbill	*Loxia curvirostra*	-	-	P	P	-	-
	Garganey*	*Anas querquedula*	-	-	-	✓	-	-
	Greenshank	*Tringa nebularia*	-	-	✓	-	-	-
CNPPS	Lapwing*	*Vanellus*	-	P	6	27	4	-
BoCC Red	Black grouse*	*Tetrao tetrix*	-	-	-	-	-	5¥
	Curlew*	*Numenius arquata*	-	-	1	14	3	1
	Ringed plover	*Charadrius hiaticula*	-	-	P	-	-	-
	House sparrow*	*Passer domesticus*	-	-	P	P	-	-
	Lesser redpoll*	*Carduelis cabaret*	1	3	5	6	4	-
	Skylark	*Alauda arvensis*	-	-	-	13	-	-
	Song thrush*	*Turdus philomelos*	1	3	2	1	-	-
	Mistle thrush	*Turdus viscivorus*	-	✓	-	-	P	-
	Spotted flycatcher*	*Muscicapa striata*	-	-	P	-	2	-
	Starling*	*Sturnus vulgaris*	-	-	P	P	-	-
	Tree pipit*	*Anthus trivialis*	-	1	-	-	-	-

Highest Conservation Status	Species	Latin name	Tie-in (S)	Section 1	Section 2	Section 3	Section 4	Tie-in (N)
	Tree sparrow*	*Passer montanus*	-	-	-	1	-	-
	Grey wagtail	*Motacilla cinerea*	P	-	-	P	P	-
BoCC Amber†	Kestrel*	*Falco tinnunculus*	P	✓	✓	1	1	-
	Greylag goose€	*Anser*	-	-	-	10	4	-
	Teal€	*Anas crecca*	-	-	✓	✓	-	-
	Mallard	*Anas platyrhynchos*	-	-	P	P	P	-
	Goldeneye	*Bucephala clangula*	-	-	✓	-	-	-
	Tawny owl	*Strix aluco*	-	1	-	-	-	-
	Red grouse*	*Lagopus*	-	-	3	7	3	-
	Black-headed gull*€	*Chroicocephalus ridibundus*	✓	2	-	✓	✓	-
	Common gull	*Larus canus*	P	C.50	1	C.40	P	-
	Lesser black-backed gull	*Larus fuscus*	-	-	✓	-	-	-
	Common sandpiper	*Actitis hypoleucos*	3	6	6	11	1	1
	Redshank	*Tringa totanus*	-	-	1	-	-	-
	Oystercatcher	*Haematopus ostralegus*	1	1	6	9	1	2
	Snipe	*Gallinago*	-	1	6	13	1	-

BoCC = listed in Red or Amber Birds of Conservation Concern 4 (Eaton et al. 2015)
CNPPS = Cairngorms National Park Priority Species
* = Scottish Biodiversity List Priority Species
✓ = present but no signs of breeding
P = possible or probable breeder, in suitable habitat, but no confirmation
C = colony, with total number of adults
¥ = 5 males attended lek within 500m of Section 4 northern boundary
† = Target Amber-listed species only (i.e. excludes common passerines which were not systematically recorded)
€ = Amber listed for its wintering population only

2016 Scarce Breeding Bird Surveys

3.2.2 A total of nine scarce breeding bird species were recorded during the 2016 surveys. Their highest conservation status, level of breeding status and location within each section of Project 8 are presented in Table 3.2.2. Locations of all observations and any territories / nest sites are shown in Figures 6.1 to 6.3. SPA and SSSI references relates to the qualifying interests of the Drumochter Hills SPA and SSSI which is partially located within the Project 8 study area.

Table 3.2.2: Highest conservation status and number of pairs for species recorded during 2016 Breeding Bird Surveys in Project 8

Highest Conservation Status	Species	Latin name	Breeding Status	Tie-in (S)	Section 1	Section 2	Section 3	Section 4	Tie-in (N)
SPA feature	Merlin	*Falco columbarius*	Probable breeding	Location of possible merlin breeding is presented in confidential appendix 12.13.					
SSSI feature	Golden eagle	*Aquila chrysaetos*	Non-breeding	-	✓	✓	✓	✓	✓

Highest Conservation Status	Species	Latin name	Breeding Status	Tie-in (S)	Section 1	Section 2	Section 3	Section 4	Tie-in (N)
	Ring ouzel	*Turdus torquatus*	Probable breeding	-	-	-	P	P	-
Schedule 1 & Annex I	White-tailed eagle	*Haliaeetus albicilla*	Non-breeding	-	-	✓	✓	✓	-
	Osprey	*Pandion haliaetus*	Non-breeding	-	-	-	-	-	✓
	Black-throated diver	*Gavia arctica*	Non-breeding	-	-	✓	-	-	-
Schedule 1	Greenshank	*Tringa nebularia*	Possible breeding	-	-	P*	-	✓	-
	Common crossbill	*Loxia curvirostra*	Possible breeding	-	-	P	P*	-	-
BoCC Amber	Kestrel	*Falco tinnunculus*	Non-breeding	-	-	-	✓	P*	-

✓ = present but no signs of breeding
P = possible or probable breeder, in suitable habitat, but no confirmation
* = located outside of 500m corridor
BoCC = listed in Red or Amber Birds of Conservation Concern (Eaton et al. 2015[15])

Woodland Grouse

3.2.3 In 2015 a black grouse lek was recorded within the 500 m buffer, the location of the Lek is included within confidential **Appendix 12.13**. with five males present on one occasion, and two males on another (Figure 2.5).

3.2.4 Surveys in 2016 recorded one black grouse lek within a 1km buffer of the Project 8 corridor. The location of the Lek is included within confidential **Appendix 12.13** . A summary of findings is presented in Table 3.2.3. No evidence of breeding was recorded within the survey area in 2015 or 2016.

Table 3.2.3: Black grouse leks within Project 8

Location	Distance from current A9 corridor	Max. no. males	Max. no. females
See Appendix 12.13	350m	5	0
See Appendix 12.13	730m	3	3

[15] Eaton MA, Aebischer NJ, Brown AF, Hearn RD, Lock L, Musgrove AJ, Noble DG, Stroud DA and Gregory RD (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746.

SPA Species

3.2.5 Merlin was the only species recorded that is listed as a qualifying interest of the Drumochter Hills SPA, and in 2015 was present in the southern part of Project 8 in section 1, within the SPA although no breeding within 1km of the A9 corridor was recorded. At the northern part of the scheme merlin was recorded carrying food to an unknown location. Although no further breeding evidence was recorded it is likely that breeding took place in the wider area in 2015.

3.2.6 In 2016, a possible merlin territory was recorded within 500m of the A9 corridor (see Confidential **Appendix 12.13**). A pair was present and copulation was noted, suggesting a breeding attempt was likely. The territory is over 5km north of the SPA boundary, which means that this pair is unlikely to be directly connected to the SPA population.

SSSI Species

3.2.7 Five species, listed within the Drumochter Hills SSSI citation as key features of the breeding bird assemblage, were recorded in 2015 and/or 2016. These were golden eagle, wigeon, golden plover, dunlin and ring ouzel.

3.2.8 Golden eagle observations during 2015 breeding bird surveys (including flights over section 1, within the SSSI) appeared to be of wandering individuals (adults and juveniles) and no breeding evidence was recorded. Up to three golden eagles were recorded simultaneously in flight during 2016 surveys (an immature and two adults), with most activity occurring over high slopes around 1km from the A9 corridor. It is likely that golden eagle breeds within the wider area, but there was no evidence to suggest this occurs within 1km.

3.2.9 Two wigeon were recorded on one occasion on Loch Ericht in 2015 (over 500m from the A9 corridor and beyond the railway line), but no breeding evidence was observed.

3.2.10 Golden plovers were recorded in low numbers within moorland habitats. It is estimated that there were at least two pairs breeding within Project 8 in 2015 (one just north of the SSSI in section 2), although most of the habitat was considered to be sub-optimal or unsuitable for breeding for this species.

3.2.11 Dunlin was recorded beside Loch Ericht in 2015 (beyond 500m from the A9 corridor), although breeding was not confirmed.

3.2.12 At least one ring ouzel pair considered likely to have bred in moorland in section 2 in 2015. Two or three territories were recorded within Sections 3 and 4 of Project 8 in 2016. One of these territories is centred within 500m of the A9 corridor.

Schedule 1 and Annex 1 Species

3.2.13 Six Schedule 1 and/or Annex I species (apart from golden eagle and merlin) were recorded during surveys: white-tailed eagle, osprey, black-throated diver, garganey, greenshank and crossbill.

3.2.14 Observations of white-tailed eagle in 2015 and 2016 appeared to be of wandering individuals and no breeding evidence was recorded within 1km of the A9 corridor.

3.2.15 Osprey was recorded in flight north of Project 8 in 2016, but there were no records of birds utilising the survey area. It is likely that the bird recorded is from a pair located during Project 9 surveys.

3.2.16 A black-throated diver was recorded on one occasion in April 2016 near the Loch Ericht dam at Dalwhinnie. This bird may have paused on migration northwards, or may be present through the summer in the wider area, using the loch to feed. No breeding evidence was recorded.

3.2.17 Garganey was recorded at a waterbody in 2015, but there was no evidence that the species was breeding. The observed individual was therefore most likely to have been on passage or a non-breeder.

3.2.18 Greenshanks were recorded at Loch Ericht (three individuals calling/displaying in April 2016) and a single individual was feeding along the River Truim in Section 4. No breeding was confirmed but it is possible that this species bred within the wider area in 2015 and 2016.

3.2.19 Crossbills (considered most likely to be common crossbill) were recorded within areas of plantation in the middle of Project 8 (around Loch Ericht and the Lechden plantation). It is likely that breeding took place earlier in the season, but this could not be confirmed during the breeding bird surveys.

Cairngorms National Park Priority Species

3.2.20 One Priority Species (in addition to golden eagle) was recorded during 2015 breeding bird surveys: lapwing.

3.2.21 Lapwings were recorded in high concentrations along the River Truim floodplain in particular, where it was estimated that 37 pairs were present. Lapwing chicks fledge in June, which resulted in larger aggregations of adults and juveniles being recorded after this time.

Birds of Conservation Concern: Red-listed Species

3.2.22 A total of eleven Red-listed species were recorded during 2015 surveys, all of which have been listed due to national declines rather than being inherently rare.

3.2.23 Curlew territories were numerous along the River Truim floodplain and enclosed fields, particularly in section 3. Ringed plover was recorded beside Loch Ericht, although breeding was not confirmed.

3.2.24 Records of Red-listed passerine species are mapped, rather than territories, since the majority of single registrations in suitable habitat are likely to related to a territorial individual.

Birds of Conservation Concern: Amber-listed Species

3.2.25 Many of the amber listed species encountered during the surveys were passerines. These species are generally included on the Amber list due to national declines and were locally abundant along the A9 corridor. Furthermore, these species are not regarded as particularly sensitive to disturbance and attempting to record all observations could potentially lead to more sensitive species being missed. Consequently, only non-passerine Amber listed species were recorded.

3.2.26 Greylag geese were recorded breeding along the River Truim and floodplain, with some larger crèches of combined offspring noted later in the season. Around 14 pairs were present in 2015. Other wildfowl in 2015 was limited to the presence of teal and goldeneye, but no breeding evidence was observed.

3.2.27 A tawny owl adult with young was recorded within a juniper bush during an ecological survey in June 2015.

3.2.28 Waders were numerous along the River Truim floodplain and enclosed fields in 2015, with oystercatcher, snipe and common sandpiper abundant, particularly in sections 2 and 3. One redshank breeding territory was recorded in section 2. Common gull and black-headed gull were also a common sight along the floodplain, with two notable common gull colonies present in sections 1 and 3.

3.2.29 In 2015, kestrel were thought to have bred in the Drumochter Hills at the southernmost part of Project 8, as well as to the north of section 4 at the Falls of Truim. In 2016, a probable kestrel breeding attempt took place to the west of Section 4, outside of the 500m survey area. A pair was recorded mobbing a buzzard in suitable nesting habitat, and birds were recorded flying nearby on other occasions.

3.2.30 Red grouse were widespread across Project 8, but largely confined to managed moorland on the southbound side of the A9 in particular.

3.2.31 Breeding bird distribution is presented in **Volume 3 Drawings 12.31- 12.35**. Confidential Data are presented in **Appendix 12.13 (Volume 2)**.

4 Discussion

4.1.1 This report summarises the ornithological survey results from the 2015 and 2016 breeding seasons. In general, data obtained suggest that the survey area was host to a typical upland breeding bird assemblage, and in particular a healthy breeding wader population along the River Truim. Not only does the site appear important for nesting waders, but also for post-breeding aggregations of adults and juveniles (e.g. lapwing, a Cairngorms National Park Priority Species, with flocks of up to 30 individuals recorded from late May) which may need to be safeguarded from construction disturbance by avoiding key areas or key breeding periods.

4.1.2 Direct habitat loss is unlikely to be a significant issue for waders since much nesting has taken place adjacent to the River Truim, and at to the west of the railway line, outside the area in which dualling options are being considered. Some territories may be lost however, either permanently, or until habitat reinstatement occurs after the construction phase.

4.1.3 Depending on the nature, location, timing and duration of construction works, there is a possibility that breeding may be interrupted for species due to disturbance, potentially out to 300m from source (e.g. Summers *et al.* 2011[16]). Conducting this work during the non-breeding season (August to March) in particularly sensitive areas would avoid this issue. Once operational, densities may be suppressed up to at least 500m from the road (e.g. Reijnen *et al.* 1995[17]).

4.1.4 It is likely that merlin, ring ouzel and crossbill attempted to breed within 500m of the A9 corridor. There is therefore potential for these species to be disturbed by construction activities during the breeding season. It should be noted that merlin and crossbill are Schedule 1 listed species and are therefore afforded increased legal protection from disturbance at nest sites. Conducting

[16] Summers, P.D., Cunnington, G.M. and Fahrig, L. 2011. Are the negative effects of roads on breeding birds caused by traffic noise? Journal of Applied Ecology, 48, 1527-1534.

[17] Reijnen, R., Foppen, R., Terbraak, C. and Thissen, J. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. Journal of Applied Ecology, 32, 187-202.

construction work during the non-breeding season (August to March) in particularly sensitive areas would avoid disturbance to scarce breeding birds.

4.1.5 Based on evidence presented in a review of disturbance distances by Ruddock and Whitfield (2007), merlin may be affected at ranges of up to 300-500m, with exact distances likely to be based on baseline human activity levels and any natural screening from disturbance source.

4.1.6 For crossbills, Forestry Commission Guidance (2006[18]) suggests that for forestry operations, a buffer of 50-150m around nest sites should be deployed, with the main period being mid-February to mid-May. If tree-felling is required then buffer distances towards the upper buffer range are likely to be more applicable, whereas if other forms of construction work close by the existing A9 corridor are taking place, a 50m buffer may be sufficient.

4.1.7 A black grouse lek was present within 500m of Project 8 in 2015, and another was located to the west of this in 2016. It is not clear whether the same birds were present at both of these lek sites. The lek sites will need to be taken into account when planning construction activities in order to minimise disturbance. Avoiding work within 750m from April to July, or temporal restrictions during this period (avoiding early morning lekking activity) may be required.

4.1.8 Woodland patches held a range of passerines of conservation concern (e.g. Red-listed species). These species may be subject to direct habitat loss if dualling requires any tree felling. Densities may also be suppressed up to at least 500m from the road. In this case however as there is an existing road in place such displacement is likely to be more limited if detected.

[18] Forestry Commission Scotland (2006). FCS Guidance Note 32: Forest operations and birds in Scottish forests: November 2006.

Annex A

WOODLAND GROUSE SURVEY RATIONALE

Annex A - Woodland grouse survey rationale

The Woodland Grouse sensitivity map was formulated using the following information:

- Ordnance survey 1:25,000 scale basemaps to determine habitat types and study area (500m buffer from A9 corridor). [GIS Ref – OS_25k).
- A combination of aerial imagery of route provided by CFJV [GIS ref – A9_10cm_Ortho and Google Imagery (Accessed March 2016), to determine habitat types;
- Phase 1 habitat survey results from 2015 provided by CFJV, to confirm habitat types [GIS ref – Annex 1 and GWDTE (Phase_1_Habitats_A9_Polygon). Note that survey coverage did not extend to 500m buffer, but does provide an indication of habitat type within the local area;
- National Vegetation Classification (NVC) survey results carried out in 2015 [GIS ref – NVC_Poly_Project_7, NVC_Poly_Project_8, NVC_Poly_Project_9], and associated Project 8 to Project 9 National Vegetation Classification Survey Reports to confirm habitat types and quality (e.g. understory of plantation woodland);
- Historic ornithological data provided by RSPB and the Scottish Ornithologists Club [GIS ref - Derived from data received from CH2M, RSPB: RSPB_Black_Grouse_C_1km, SOC: Moy Filter Data Combined]. Data were filtered by species and clipped to a 2km buffer of the A9 corridor, to establish distribution within the A9 corridor and wider area;
- Results from 2015 breeding bird surveys along the P7-P9 route with 500m buffer, including all observations and field signs of woodland grouse [SBBS_2015_L, SBBS_2015_P, BBS_2015_L, BBS_2015_P].
- Discussions with field surveyors that conducted the 2015 breeding bird surveys, to confirm habitat suitability in particular areas, gain information on their local knowledge of species distribution, and outcomes of informal discussions with gamekeepers/estate workers/farmers during previous site visits;
- Survey methodologies for capercaillie (SNH, 2013) and black grouse (Gilbert et al. 1998) which identify key habitat types to search (see below); and
- Literature review (e.g. Forrester et al. 2007 (Birds of Scotland), http://www.blackgrouse.info/ and www.capercaillie-life.info). These sources provide further information on species' distribution, preferred habitat types and food sources.

There are two categories for capercaillie and black grouse that have been used to determine likelihood of presence, and corresponding survey effort. These are:

- **Suitable habitat:** habitat is suitable for presence of leks, and/or historic records are present. Areas identified will be surveyed at least twice.
- **Suitable habitat not present:** habitat is not generally suitable for woodland grouse, and there are no historic records. Areas will not be specifically surveyed, but will be covered as part of ongoing scarce breeding bird surveys. If evidence of woodland grouse is found, then further specific surveys will take place.

The following habitat types have been considered to be suitable for capercaillie and black grouse leks:

Capercaillie:

Capercaillie can utilise almost any type of forest at certain times of the year. Males generally need at least 50 hectares of woodland to range within, and so suitable lek habitat is considered to be areas of woodland comprising at least this size. Focussed searching should be carried out in key areas of suitable habitat:

a. Wooded knolls and ridges, particularly where tree growth has been stunted;

b. Wooded hill tops;

c. Rocky outcrops which are surrounded by trees;

d. Mature plantations (especially pine and larch with heather and blaeberry ground cover);

e. Areas with granny (mature old growth) pine trees;

f. Bogs and open rides in forests;

g. Exposed root plates from fallen trees;

h. Tracks where capercaillie have been gritting.

Black grouse:

The preferred habitats for black grouse leks include mosaics of moorland or heathland, woodland, plantations, rough grazing, in-bye land and meadows. They are transitional or marginal between the enclosed fields on valley slopes and the lower edges of heather moorland. These habitats correspond to a distinct altitudinal range of 200-550 m.

Moorland

Within northern Britain, heather moorland, often managed for red grouse, is the main habitat for black grouse. They tend to be found on the edges of moorland from which they have access to other habitats such as scrub or woods, rough grazing and herb-rich in-bye pastures.

Native woodland

Black grouse favour two types of native woodland in the uplands: birch and birch/scots pine mixes. They prefer either small woods, woodland edges or even rows of shelterbelt trees. Open canopied woods are preferred as these allow sufficient light to reach the forest floor and create a field rich in herbs and dwarf scrubs. They avoid closed-canopy woods.

Forestry

Afforestation may result in short-term benefits for black grouse. Under relaxation from grazing and heather burning in the early stages of afforestation, heather, bilberry and scrub can provide increased food and nesting cover. However, the benefits are short-lived, and conditions rapidly deteriorate on canopy closure 10-15 years after planting.

Unsuitable areas

The following areas are generally unsuitable for black grouse leks and may not be occupied: ground above 550 m; built-up areas; enclosed arable farmland; the interiors of unbroken post-thicket stage forest blocks and dense native woodland.