Roxhill Developments Ltd

Northampton Gateway, Northamptonshire

BREEDING BIRD SURVEY REPORT

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1.0 EXECUTIVE SUMMARY

1.1 FPCR were commissioned by Roxhill Developments to conduct breeding bird surveys at a site that comprises two main site areas including an area of land adjacent to J15 of the M1 motorway and a site to the west of the village of Roade, Northamptonshire Proposals for the site include the construction of a bypass road around the village.

1.2 Desktop study results indicated that there was a single statutorily designated site within 10km of the site identified for its ornithological value. The Upper Nene Valley Gravel Pits SPA/Ramsar was present approximately 5.5 west of the site and there were a number of records for notable bird species in the local area as detailed in Appendix B.

1.3 A total of 48 bird species were recorded during the breeding bird surveys within the Junction 15 site, of which 20 were considered 'notable' species. Of the species recorded, 12 were confirmed as breeding on site, 12 were considered probable breeders and the remaining 24 species were considered possible or non-breeders.

1.4 A total of 46 bird species were recorded during the breeding bird surveys within the Bypass Corridor site, of which 14 were considered 'notable' species. Of the species recorded, three were confirmed as breeding on site, 14 were considered probable breeders and the remaining 29 species were considered possible or non-breeders.

1.5 The habitats on site were considered to be of Local nature conservation value for 14 of the notable species recorded.

1.6 The sites were assessed against published criteria for Local Wildlife Site selection (Northamptonshire Biodiversity Partnership 2014*)* and were not found to meet the criteria for its breeding bird assemblage.

1.7 The potential effects of the proposed development were considered against the unique ecological requirements of each species considered to be the most vulnerable. Effects could be expected for a range of farmland species including skylark, yellow wagtail, linnet and yellowhammer with negligible or beneficial impacts expected for all other species.

1.8 Mitigation measures are recommended to minimise disturbance impacts to birds during any clearance in the bird nesting season (March – August, inclusive).

1.9 A range of enhancement opportunities have been suggested based on the habitats and bird species recorded in order to achieve biodiversity gains. These include sensitive planting and habitat creation schemes and the provision of a range of nest boxes.

2.0 INTRODUCTION

2.1 This report has been prepared by FPCR Environment and Design Ltd. on behalf of Roxhill Development Limited and provides details of a series of breeding bird surveys undertaken during 2016 at two sites to the west of junction 15 of the M1, Northamptonshire. The first site is known as Main site whilst the other is named Bypass Corridor.

2.2 The report has been produced to accompany Environmental Statements of the respective development proposals and should be read in conjunction with those documents.

Site Location and Context

Main Site

2.3 The site is located to the west of Junction 15 of the M1 motorway (central grid reference SP 74749 54728), in Northamptonshire. It is bound by Collingtree Road to the north, the M1 and A508 to the east, a rail line to the west and agricultural land to the south. The site comprises agricultural fields bisected by hedgerows, with woodland blocks, tree lines and ditches also present. An area used for recreational shooting is located roughly at the centre of the site and this comprises a mosaic of habitats, including woodland, dense and scattered scrub, closely mown grassland, a pond and several shooting features such as a shed and a shooting lodge. Several other buildings are also present across the site, some of which are now disused.

2.4 The surrounding landscape consists of farmland with further wooded areas, hedgerows, and waterbodies. The villages of Collingtree and Milton Malsor are located close to the north-east and north-west of the site respectively.

Bypass Corridor

2.5 The site includes a strip of land that crosses arable fields to the north and west of the village of Roade, Northamptonshire (centred on grid reference SP 748 516) as shown on Figure 2. The site was dominated by cereal crop stubble at the time of survey with a series of boundary hedgerows and two small woodland blocks in the south and north of the site. The central part of the site was dominated by improved grassland pasture fields with associated boundary hedgerows. Surrounding land use included the residential environs within the village of Roade to the east and further arable farmland with associated hedgerows and woodland blocks to the north, west and south. The northern part of the site was bisected by an active railway that ran through the centre of Roade.

Development Proposals

2.6 Full details of the Proposed Development are provided separately in Chapter 2: Application Site and Proposed Development. In brief, the Proposed Development consists of the following:

- An intermodal freight terminal including container storage and HGV parking, rail sidings to serve individual warehouses, and the provision of an aggregates facility as part of the intermodal freight terminal, with the capability to also provide a ‘rapid rail freight’ facility;
- Up to 468,000 sq m (approximately 5 million sq ft) (gross internal area) of warehousing and ancillary buildings, with additional floorspace provided in the form of mezzanines;

- A secure, dedicated, HGV parking area of approximately 120 spaces including driver welfare facilities to meet the needs of HGVs visiting the site or intermodal terminal;
- New road infrastructure and works to the existing road network, including the provision of a new access and associated works to the A508, a new bypass to the village of Roade, improvements to Junction 15 and to J15A of the M1 motorway, the A45, other highway improvements at junctions on the local highway network and related traffic management measures;
- Strategic landscaping and tree planting, including diverted public rights of way;
- Earthworks and demolition of existing structures on the SRFI site.

Survey Objectives

2.7 The objectives of the breeding bird surveys of each site were to:

- Identify the presence and distribution of breeding birds on the site;
- Evaluate the importance of local bird populations and their habitat requirements;
- Evaluate the conservation importance of the site; and
- Identify areas of ornithological interest and make recommendations to minimise the potential impact of the scheme.

3.0 LEGISLATION & STATUS

Legislation

3.1 The Wildlife and Countryside Act 1981 (as amended) is the principal legislation affording protection to UK wild birds. Under this legislation all birds, their nests and eggs are protected by law and it is an offence, with certain exceptions to recklessly or intentionally:

- Kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while in use or being built; and/or
- Take or destroy the egg of any wild bird.

3.2 Species listed on Schedule 1 of the *Wildlife and Countryside Act 1981* (as amended) are specially protected at all times. This extends their protection, beyond that normally provided by the act for all species during the breeding season, to guard them against intentional disturbance whilst building or occupying a nest. The disturbance of dependent young of Schedule 1 species is also an offence.

3.3 A number of birds are listed as species of principle importance for nature conservation under Section 41 of the Natural Environment and Rural Communities Act 2006 (NERC S.41), as Species of Principal Importance for the conservation of biodiversity in England. The NERC S.41 list is used to guide decision-makers such as public bodies, including local and regional authorities, in implementing their duty under section 40 of the act, as they are required have regard to the conservation of biodiversity in England when carrying out their normal functions.

Status

3.4 In addition to statutory protection, some bird species are classified according to their conservation status, such as their inclusion on the Red and Amber lists of Birds of Conservation Concern (BoCC) in the UK[1].

3.5 Red list (high conservation concern) species are those that are Globally Threatened according to IUCN criteria; those whose population has declined rapidly (50% or more) in recent years; and those that have declined historically and not shown a substantial recent recovery.

3.6 Amber list (medium conservation concern) species are those with an unfavourable conservation status in Europe; whose population or range has declined moderately (between 25% and 49%) in recent years; those whose population has declined historically but made a substantial recent recovery; rare breeders; and those with internationally important or localised populations.

3.7 Green list (low conservation concern) species fulfil none of the above criteria.

4.0 METHODOLOGY

Desk Study

4.1 In order to compile existing baseline information, a desktop survey was undertaken. The desk study comprised a search for existing ecological data regarding statutorily and non-statutorily designated habitats/sites of interest to nature conservation and protected bird species. The following organisations were contacted as part of this exercise:

- Northamptonshire Biological Records Centre; and
- Additional records were also requested from the former county recorder[2].

4.1 The Multi-Agency Government Information for the Countryside (MAGIC) website (www.magic.gov.uk) was also consulted for information on the presence of statutorily protected sites including Special Protection Areas (SPA) within 5km and Sites of Special Scientific Interest (SSSIs) within 2km.

4.2 To provide background information, the results of previous breeding bird surveys undertaken at the site by FPCR in 2014 have been referred to within this report where considered relevant/appropriate to the assessment.

Breeding Bird Survey

4.3 For both sites, the survey methodology employed was broadly based on that of territory mapping[3] as used for the British Trust for Ornithology (BTO) Common Bird Census (CBC). Standard BTO species codes and symbols for bird activities were used to identify birds and denote activity, sex and age where appropriate. The criteria used in the assessment of

[1] 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.
[2] Data includes records of bird species recorded during the winter period (November – February) between 2007 + 2011, and bird species recorded during the breeding season (April – July) between 2008 + 2011
[3] Bibby, C.J., N.D. Burgess & D.A. Hill, 2000: Bird Census Techniques: 2nd Edition. London: Academic Press

breeding birds has been adapted from the standard criteria proposed by the European Ornithological Atlas Committee[4] and are grouped into three categories:

- Possible breeder;
- Probable breeder; and
- Confirmed breeder

4.4 Breeding evidence used in this report follows the EOAC guidelines, as detailed within Appendix A and B.

4.5 Birds that were not considered to be using the site for breeding purposes were categorised as 'non-breeders'. This included birds that were recorded flying over the site, were considered to be on migration or the habitats within the site were not suitable.

4.6 To provide a reasonable level of accuracy for determining the population status of the breeding birds on the site and update the survey completed in 2014, three surveys were undertaken between 05.00 and 11.00 during the period June to August 2016. A route was mapped out prior to the surveys being undertaken, paying particular attention to any linear features, such as hedgerows and tree lines, and natural features such as ponds, areas of scrub and woodland. The site was surveyed by two ornithologists on each of the survey occasions, covering approximately half of the site each, and were not undertaken in unfavourable conditions such as heavy rain or strong wind, which may negatively affect the results. Table 1 provides details of the survey dates and weather conditions.

Table 1: Breeding Bird Survey Dates and Weather Conditions for the Main Site and Bypass Corridor

Site	Date	Cloud Cover	Rain	Wind	Visibility
Junction 15	29/06/2016	30%	None	Light Air	Good
	20/07/2016	20%	None	Light Air	Excellent
	10/08/2016	70%	None	Moderate Breeze	Excellent
Bypass Corridor	21/04/16	60-80%	None	Light breeze	Very good
	19/05/16	60%	None	Light air	Excellent
	30/06/16	90%	None	Light air	Very good

Main Site Barn Owl Roost Vantage Point Survey

4.7 The buildings on site were subject to survey for evidence of breeding/roosting barn owl *Tyto alba*, which was undertaken in 2013 at the same time as the Bat Roost Inspection Survey. In addition, as barn owl *Tyto alba* are known to breed within the local area, the Main Site contained habitats potentially suitable for breeding barn owl (i.e. derelict buildings) and barn owl had been observed on site during the 2016 bat surveys, it was considered necessary to undertake a targeted barn owl survey to establish if and how the species may be using the

[4] EOAC, 1979. Categories of Breeding Bird Evidence. European Ornithological Atlas Committee.

buildings on site. The survey was undertaken on 20th July 2016 and commenced at 21.40. Two surveyors were positioned at the north and south of the group of three barns at the east of the site to record barn owl activity 30mins before dusk, and stayed on site until after dark.

Bypass Corridor Barn Owl Activity Survey

4.8 As barn owl are known to have bred within the locality and given the bird strike risk associated with the proposed road construction, it was considered necessary to make an assessment of the barn owl activity within the vicinity of this site. Two vantage point surveys were undertaken on the 9th August 2017 and on the 4th December 2017 during which four surveyors observed all activity from four different locations (see figure 1) that aimed to cover all suitable foraging habitat on site and within the surrounding area. All activity was recorded including behaviour, direction of flight and any evidence of using features of interest (i.e. tree/building roosts and foraging posts). Surveys begin 30mins before dusk and surveyors stayed in position until one hour after sunset. Surveys were not undertaken in unsuitable weather and each survey was completed following a previous night of rainfall to improve the likelihood of observing foraging barn owl within the area.

4.9 During the initial August survey, a walkover of all suitable trees within 200m of the site was also conducted to assess their potential to harbour suitable roosting features for barn owl.

Survey Limitations

4.10 Access to the 3 field compartments at the west of the site, adjacent to the rail line, was not granted during any of the three 2016 breeding bird surveys. However, these could be viewed from the field boundaries of the adjacent fields and it is considered that this lack of access did not pose a significant constraint to the results of the surveys.

4.11 Access was denied for land covering the central part of the site boundary during the first and second survey occasion and these surveys were therefore unable to cover this area. It was therefore deemed appropriate to cover a wider survey area to assess the species composition present within the local area to in turn determine the likely assemblage that would be present on site. This approach was considered suitable to make an accurate assessment of the potential impacts of the development on the local breeding bird assemblage. Access to these fields was granted for the barn owl activity surveys conducted in 2017.

Species & Assemblage Assessment

4.12 The conservation value of bird populations has been measured using two separate approaches: nature conservation value and conservation status. The CIEEM guidance on ecological impact assessment assesses nature conservation value within a geographical context. To attain each level of value, an ornithological resource or one of the features (species population or assemblage of species) should meet the criteria set out for each respective level in Table 2 below. In some cases, professional judgement may be required to increase or decrease the allocation of specific value, based upon local knowledge.

4.13 The site has also been assessed against the Local Wildlife Site (LWS) criteria for the identification of avian sites in Northamptonshire[5] based a number of criteria set out for

[5] Northamptonshire Biodiversity Partnership 2007 (updated 2010)

breeding birds. Local Wildlife Sites are recognised by central government as an important tool in promoting sustainable development and protecting biodiversity. It should be noted that only those species noted as probable and confirmed breeding species were considered against the LWS criteria.

4.14 The most recent county annual bird report, *The Northants Bird Report 2015,* as published by The Northamptonshire Bird Club, was consulted to inform the assessment.

Table 2: Nature Conservation Value Categories and Evaluation Criteria

Nature Conservation Value	Examples of Selection Criteria
International	A species which is part of the cited interest of an SPA and which regularly occurs in internationally or nationally important numbers. A species present in internationally important numbers (>1% of international population).
National	A species which is part of the cited interest of a SSSI and which regularly occurs in nationally or regionally important numbers. A nationally important assemblage of breeding or over-wintering species. A species present in nationally important numbers (>1% UK population). Rare breeding species (<300 breeding pairs in the UK).
Regional	Species listed as being of principal importance under NERC S.41 which are not covered above, and which regularly occurs in regionally important numbers. Species present in regionally important numbers (>1% of regional population). Sustainable populations of species that are rare or scarce within a region. Species on the BoCC Red List and which regularly occurs in regionally important numbers.
County	Species listed as being of principal importance under NERC S.41 which are not covered above and which regularly occurs in county important numbers Species present in county important numbers (>1% of county population). Sustainable populations of species that are rare or scarce within a county, or are listed as being of principle importance under S41 of the NERC Act. A site designated for its county important assemblage of birds (e.g. a SINC Site). Species on the BoCC Red List and which regularly occur in county important numbers.
Local	Other species of conservation interest (e.g. all other species on the BoCC Red and Amber List or species listed as being of principal importance under NERC S.41 which are not covered above) regularly occurring in locally sustainable populations. Sustainable populations of species which are rare or scarce within the locality.
Site	Species that are common and widespread

5.0 RESULTS AND EVALUATION

Desk Study

Main Site

Designated Sites

5.1 The details of designated sites of nature conservation interest within the local area are provided within the ES Ecology Chapter 5 and accompanying Appendix 5.1.

Upper Nene valley Gravel Pits SPA / Ramsar

5.2 The Upper Nene Valley Gravel Pits SPA/Ramsar lies c. 5.5km to the east boundary of the Junction 15 Site at its closest point. The Upper Nene Valley Gravel Pits SPA/Ramsar is a discontinuous series of water bodies stretching over 35km from Clifford Hill on the edge of Northampton to the north of Thrapston. The habitats support internationally important populations of two Annex I bird species and a high proportion of the total European population of Gadwall *Anas strepera* and a nationally important numbers of breeding birds. Integrity of the site is dependent upon maintenance of the structure and function of wet woodland in the floodplain, the varied wetland habitats, water quality and supply and suitable breeding, foraging and roosting areas for birds. Further information is provided within the Report on European Sites: Habitat Regulations Assessment Pursuant to Regulation 5(2)(g) (FPCR 2018).

Species Records

5.3 Numerous records for birds within 1km of the site were provided by NBRC and the County Recorder as part of the desk study undertaken in 2014. The majority of records occurred to the north of the site in association with the fringe of Northampton, particularly along Wootton Brook, and to the south-west around the village of Blisworth.

5.4 Lapwing *Vanellus vanellus* have been recorded on site previously and there were also records for a number of Schedule1 bird species in the vicinity of the site; barn owl, common kingfisher *Alcedo athis*, hobby *Falco subbuteo*, merlin *Falco colombarius*, fieldfare *Turdus pilaris* and redwing *Turdus iliacus.* Fieldfare and redwing are very rare breeders in the UK and breeding activity is restricted to the north so would not form part of the breeding bird assemblage on or near to the site.

5.5 Table 3 below contains details of bird records returned from within 1km of the site.

Table 3: 2014 Records of Protected and Notable Birds from Local Area around Junction 15 Site

Name		WCA Sch.1	NERC S.41
BoCC Red List			
Common starling	*Sturnus vulgaris*		+
Curlew	*Numenius arquata*		+
Fieldfare	*Turdus pilaris*	+	
Grey partridge	*Perdix perdix*		+
Grey wagtail	*Motocilla cinerea*		

Herring gull	*Larus argentatus*		+
House sparrow	*Passer domesticus*		+
Lesser redpoll	*Carduelis cabaret*		+
Linnet	*Carduelis cannabina*		+
Marsh tit	*Poecile palustris*		+
Merlin	*Falco columbarius*	+	
Mistle thrush	*Turdus viscivorus*		
Lapwing	*Vanellus vanellus*		+
Redwing	*Turdus iliacus*	+	+
Skylark	*Alauda arvensis*		+
Song thrush	*Turdus philomelos*		+
Spotted flycatcher	*Muscicapa striata*		+
Yellow wagtail	*Motacilla flava flavissima*		+
Yellowhammer	*Emberiza citrinella*		+
BoCC Amber List			
Black-headed gull	*Chroicocephalus ridibundus*		
Bullfinch	*Pyrrhula pyrrhula*		+
Goldeneye	*Bucephala clangula*		
Gull	*Larus canus*		
Kestrel	*Falco tinnunculus*		
Kingfisher	*Alcedo atthis*	+	
Snipe	*Gallingo gallingo*		
Swift	*Apus apus*		
Tern	*Sterna hirundo*		
BoCC Green List			
Hobby	*Falco subbuteo*	+	
Barn Owl	*Tyto alba*	+	

Summary of 2014 Breeding Bird Survey Results

5.6 During 2014, a total of 41 species were recorded within the site boundary, of which 14 are considered notable species. Breeding was confirmed by six species including dunnock *Prunella modularis* (NERC S.41, BoCC amber list) and breeding was considered probable by a further 13 species including stock dove *Columba oenas* (BoCC amber list), skylark *Alauda arvensis*, yellow wagtail *Motacilla flava* and yellowhammer *Emberiza citrinella*. Barn owl was also recorded roosting within a barn in the centre of the site, however no evidence of breeding was observed.

5.7 While the habitats present on site in 2014 supported a number of notable breeding species, none were recorded in numbers of county importance. Further to this, the site was assessed against published criterion for the selection of Local Wildlife Sites in Northamptonshire and failed to qualify for any of the habitats the site supports. The 2014 breeding bird assemblage was therefore considered to be of no more than Local nature conservation value. The site was also considered to be of local nature conservation value for all 14 notable species recorded in 2014, while the remaining individual species recorded were considered to be of site nature conservation value.

Bypass Corridor

Species Records

5.8 Records returned by NBRC identified the presence of a number of barn owl, red kite *Milvus milvus* and ring-necked parakeet *Psittacula krameri* records all of which were located within the Stoke Bruerne Brickpits LWS c.1.2km south west of the survey area.

5.9 There were a number of records for bird species within the local area recorded within the breeding bird season including a number of protected or 'notable' species as listed in Table 4. It was highlighted that a number of notable species were recorded within the same tetrad as the site boundary between 2008 and 2011. However, it should be noted that the tetrad covers a larger area of land surrounding the site boundary and the precise location of records could therefore not be determined.

Table 4: 2016 Records of Protected and Notable Birds from Local Area around Bypass Corridor Site

Name		WCA Sch.1	NERC S.41
BoCC Red List			
Grey Partridge*	*Perdix perdix*		+
Lapwing*	*Vanellus vanellus*		+
Herring Gull*	*Larus argentatus*		+
Cuckoo*	*Cuculus canorus*		+
Lesser Spotted Woodpecker	*Dendrocopos minor*		+
Willow Tit*	*Poecile montana*		+
Marsh Tit*	*Poecile palustris*		+
Skylark*	*Alauda arvensis*		+
Grasshopper Warbler	*Locustella naevia*		+
Starling*	*Sturnus vulgaris*		+
Fieldfare	*Turdus Pilaris*		+
Song Thrush*	*Turdus philomelos*		+
Mistle Thrush	*Turdus viscivorus*		
House Sparrow*	*Passer domesticus*		+
Tree Sparrow	*Passer montanus*		+
Yellow Wagtail	*Motacilla flava*		+
Grey Wagtail*	*Motacilla cinerea*		
Linnet*	*Linaria cannabina*		+
Yellowhammer*	*Emberiza citrinella*		+
BoCC Amber List			
Mute Swan*	*Cygnus olor*		
Mallard*	*Anas platyrhynchos*		
Kestrel*	*Falco tinnunculus*		
Stock Dove*	*Columba oenas*		
Swift*	*Apus apus*		
House Martin	*Delichon urbicum*		
Dunnock*	*Prunella modularis*		+
Bullfinch*	*Pyrrhula pyrrhula*		+
Reed Bunting*	*Emberiza schoeniclus*		+
BoCC Green List			
Barn Owl	*Tyto alba*	+	+

*Species recorded within the same tetrad squares as the site boundary

Field Survey

Main Site

Summary

5.10 A total of 48 species were recorded during the breeding bird surveys (see Appendix A). Of these, 20 appear on one or more of the following:

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- BoCC Red or Amber lists;
- Section 41 of the NERC Act 2006; and/or
- Northamptonshire Local Biodiversity Action Plan

5.11 Of the 48 species recorded, 12 were confirmed as breeding on site, including the linnet *Linaria cannabina* (NERC S.41, BoCC Red listed), dunnock *Prunella modularis* (NERC S.41, BoCC Amber list) and stock dove *Columba oenas* (BoCC Amber list). All remaining confirmed breeding species are BoCC green listed (low conservation concern).

5.12 Twelve species were considered probable breeders including skylark, starling *Sturnus vulgaris*, yellowhammer (all NERC S.41, BoCC Red list) and reed bunting *Emberiza schoeniclus* and bullfinch *Pyrrhula pyrrhula* (both NERC S.41, BoCC Amber list).

5.13 The remaining 24 species were considered possible breeders (15) or non-breeders (10).

5.14 The recorded locations of the 20 notable species can be found on Figure 2 and detailed in Table 3 below.

Table 5: Protected Bird Species, Species of Principal Importance, and BoCC Red and Amber Listed Bird Species Recorded on site during Breeding Bird Surveys in 2016 and their Recent Status within Northamptonshire.

Species	Legal/ Conservation status	Maximum Count / Number Survey Occasions Recorded	Breeding Status†	Recent Status in Northamptonshire
Mallard *Anas platyrhynchos*	Amber list	1/1	Non-Breeder	Common resident and winter visitor with large numbers released for shooting
Grey Partridge *Perdix perdix*	NERC S.41 Red list	2/1	Possible	Scarce resident
Black-headed Gull *Chroicocephalus ridibundus*	Amber list	1/1	Non-breeder	Very common passage migrant and winter visitor, breeding in increasing numbers
Stock dove *Columba oenas*	Amber list	5/3	Confirmed	Widespread resident

Species	Legal/ Conservation status	Maximum Count / Number Survey Occasions Recorded	Breeding Status†	Recent Status in Northamptonshire
Barn owl *Tyto alba*	WCA Sch.1 Green list LBAP	1/2	Non-breeder	Thinly distributed resident
Swift *Apus apus*	Amber list	2/1	Non-Breeder	Common summer visitor
Kestrel *Falco tinnunculus*	Amber list	6/3	Possible	Widespread resident
Hobby *Falco subbuteo*	WCA Sch.1 Green list	1/1	Non-breeder	Passage migrant and scarce breeder
Skylark *Alauda arvensis*	NERC S.41 Red list	6/2	Probable	Declining common resident and winter visitor
House martin *Delichon urbica*	Amber list	5/1	Non-breeder	Declining common summer visitor
Starling *Sturnus vulgaris*	NERC S.41 Red list	24/3	Probable	Common resident and winter visitor
Song thrush *Turdus philomelos*	NERC S.41 Red list	6/3	Probable	Widespread resident and passage migrant
Mistle thrush *Turdus viscivorus*	Red list	7/2	Possible	Fairly common resident
Dunnock *Prunella modularis*	NERC S.41 Amber list	16/3	Confirmed	Common resident
House sparrow *Passer domesticus*	NERC S.41 Red list	1/1	Possible	Common resident but declining
Yellow wagtail *Motacilla flava*	NERC S.41 Red list	3/2	Possible	Passage migrant and declining summer visitor
Bullfinch *Pyrrhula pyrrhula*	NERC S.41 Amber list	16/3	Probable	Widespread but scarce resident
Linnet *Carduelis cannabina*	NERC S.41 Red list	50/3	Confirmed	Declining resident
Yellowhammer *Emberiza citrinella*	NERC S.41 Red list	21/3	Probable	Fairly common, but declining resident

Species	Legal/ Conservation status	Maximum Count / Number Survey Occasions Recorded	Breeding Status†	Recent Status in Northamptonshire
Reed bunting *Emberiza schoeniclus*	NERC S.41 Amber list	10/2	Probable	Declining resident and passage migrant

Barn Owl Vantage Point Survey

5.15 A single barn owl was noted during the barn owl vantage point survey. This bird emerged from a hole at the northern gable end of the most northerly barn at 21.49 and flew north. This individual was not seen again during the course of the survey and no other barn owls were observed.

5.16 A single barn owl was also flushed from the barn at the north of the group during the first breeding bird survey, which was carried out on 29th June 2016. This bird flew south away from the surveyor and did not return during the course of the survey.

5.17 Barn owl activity was also noted on site during the suite of bat activity (transect) surveys that were undertaken during spring and summer 2016. This included a bird roosting within the northernmost stone barn, and foraging activity across the site. Sightings were made in July, August and September.

5.18 No evidence of breeding barn owl was recorded during the building inspection, and no cavities suitable for breeding were noted within any of the buildings.

5.19 Given the evidence above, it is considered that the small barn at the north of the group of buildings is currently used by the species for roosting purposes. It is not considered that the species bred on site within the buildings during 2016 and unlikely that birds would breed in future years given the sub-optimal suitability of the buildings. However, future breeding cannot be completely ruled out and therefore provision for breeding barn owl should be included within scheme design.

Bypass Corridor

Summary

5.20 A total of 46 bird species were recorded within the survey area (Appendix B). Of these, 14 appear on one or more of the following:

- Schedule 1 of the Wildlife & Countryside Act 1981 (as amended);
- BoCC Red or Amber lists;
- Section 41 of the NERC Act 2006;

5.21 Of the 46 species recorded, 3 were confirmed as breeding, including the green listed species great tit, blackbird and chaffinch *Fringilla coelebs*.

5.22 14 species were considered probable breeders, including skylark, song thrush, linnet, yellowhammer (NERC S.41, BoCC red list), dunnock and bullfinch (NERC S.41, BoCC amber list). The remaining 8 probable breeding species all BoCC Green-listed species (low conservation concern).

5.23 The remaining 29 species recorded were considered possible breeders (24) or non-breeders (5).

5.24 Table 6 provides a summary of the notable bird species and their breeding status on site and Figure 3 shows the locations where they were recorded.

Table 6: Protected, Species of Principal Importance and BoCC Red and Amber Listed Bird Species Recorded during Breeding Bird Surveys 2016, and their Recent Status within Northamptonshire

Species	Legal/ Conservation status	Maximum Count / Number of Survey Occasions Recorded	Breeding Status	Recent Status in Northamptonshire
Black-headed gull *Chroicocephalus ridibundus*	Amber list	1 / 1	Non-breeder	Very common passage migrant and winter visitor, breeding in increasing numbers
Stock dove *Columba oenas*	Amber list	1 / 1	Possible	Widespread resident
Swift *Apus apus*	Amber list	2 / 1	Non-breeder	Common summer visitor
Marsh tit *Poecile palustris*	Red list NERC S.41	1 / 1	Possible	Declining widespread resident
Skylark *Alauda arvensis*	Red list NERC S.41	23 / 3	Probable	Declining common resident and winter visitor
Starling *Sturnus vulgaris*	Red list NERC S.41	12 / 3	Possible	Common resident and winter visitor
Song thrush *Turdus philomelos*	Red list NERC S.41	4 / 3	Probable	Widespread resident and passage migrant
Mistle thrush *Turdus viscivorus*	Red list	1 / 1	Possible	Fairly common resident
Dunnock *Prunella modularis*	Amber list NERC S.41	25 / 3	Probable	Common resident
House sparrow *Passer domesticus*	Red list NERC S.41	1 colony / 1	Possible	Common resident but declining
Bullfinch *Pyrrhula pyrrhula*	Amber list NERC S.41	5 / 2	Probable	Widespread but scarce resident

Species	Legal/ Conservation status	Maximum Count / Number of Survey Occasions Recorded	Breeding Status	Recent Status in Northamptonshire
Linnet *Carduelis cannabina*	Red list NERC S.41	6 / 3	Probable	Declining resident
Yellowhammer *Emberiza citrinella*	Red list NERC S.41	11 / 3	Probable	Fairly common, but declining resident
Reed bunting *Emberiza schoeniclus*	Amber list NERC S.41	2 / 2	Possible	Declining resident and passage migrant

Barn Owl Activity Survey

5.25 During the September survey occasion a single barn owl was observed overflying a pasture field to the west of Hyde Farm before flying westwards off site. In addition, a single barn owl pellet was observed under a feeding perch on a mature tree along the hedgerow also to the west of Hyde Farm (TN1 on figure 1). While the tree supported a large cavity in its main trunk as a result of storm damage, this appeared to be full of detritus, was fully open to weather and was considered to be unsuitable for roosting/nesting barn owl. No other observations of barn owl were made during surveys.

6.0 DISCUSSION AND EVALUATION

Main Site

Local Wildlife Site Assessment

6.1 The site was assessed against published criteria for Local Wildlife Site selection (Northamptonshire Biodiversity Partnership 2014) to assess the site against the thresholds for county value.

6.2 The relevant habitats within the survey area that are tabulated in criterion b) are *ii) Farmland, including margins, hedgerows and neutral grassland* and *v) Woodland*. The total scores for these habitats within the survey area have been calculated using the data from the three breeding bird surveys and are shown alongside the *"threshold site index values"* in Table 7. It should be noted that only the 24 species considered to be probable or confirmed breeders have been included during this assessment as sufficient breeding evidence was not obtained for the remaining 25 species.

Table 7: An assessment of the breeding bird assemblage against the habitat thresholds provided in Criterion b) of the *Wildlife Site Selection Guidelines 2007 (2010 Update)* for Northamptonshire – Junction 15 Site

Farmland, including margins, hedgerows and neutral grassland	
Blackcap	2
Linnet	3
Reed bunting	2
Skylark	2
Whitethroat	2
Yellowhammer	2.5
Total score	**13.5**
Threshold site index value	**25**
Woodland	
Blackcap	2
Bullfinch	2.5
Goldcrest	2
Jay	2
Long-tailed tit	2
Total score	**10.5**
Threshold site index value	**34**

6.3 The total score does not meet the *threshold site index value* for the farmland or woodland habitats found within the site. It is therefore considered that the site would not meet the criteria for an LWS based on its breeding bird assemblage alone.

Breeding Bird Assemblage Value

6.4 Arable fields and their associated field margins and hedgerows provide suitable breeding and foraging habitat for several species closely associated with farmland, comprising linnet, grey partridge, reed bunting, skylark, yellowhammer, kestrel *Falco tinnunclus* and yellow wagtail *Motacilla flava*. Additional species making use of these habitats, but not necessarily so closely associated with agricultural habitats included bullfinch, a widespread but scarce resident in Northamptonshire. Linnet was a confirmed breeding species, while reed bunting, skylark, yellowhammer and bullfinch were classed as probable breeders. Grey partridge, kestrel and yellow wagtail were categorised as possible breeders. Given the low numbers of confirmed and probable breeders and the abundance of arable habitats (comprising arable fields, margins, hedgerows and grassland) within the surrounding landscape, the site was considered to be of no more than Local significance for its breeding farmland bird assemblage.

6.5 The breeding bird assemblage within the woodland habitats on site comprised common and widespread species including a number of notable species including song thrush, mistle thrush, bullfinch and dunnock, however these were present in low numbers. Given the assemblage of common species and that woodland blocks and plantations are a common

feature of the surrounding arable landscape, the site is considered to be of no more than Local significance for its breeding woodland bird assemblage.

Individual Species

6.6 Table 9 provides details of bird species recorded within the site that are of at least Local significance.

6.7 While not observed during surveys, barn owl were flushed from the farm buildings in the east of the Main site on several occasions. During a vantage point survey of these buildings, the barn owl was observed leaving the roost and flying westwards off site at sunset. Despite this, no evidence of nesting was observed during surveys of the buildings and they were therefore considered to be a regularly used barn owl roosting site. Furthermore, while arable habitats provided foraging habitat of limited suitability for barn owl, a compartment of rough grassland adjacent to the east of the abandoned farm buildings likely provided an optimal resource for this species. The habitats on site were therefore considered to be of Local nature conservation value for barn owl.

6.8 Kestrel was considered a possible breeder as suitable nesting habitat exists within the site or on its boundaries (abandoned farm buildings and trees) and a family group was observed during the second survey occasion in association with derelict buildings. Despite this, no further nesting evidence was observed on site on site breeding could therefore not be confirmed. It is considered that if the site does support breeding kestrel, this would comprise 1 or 2 pairs maximum. As with barn owl, arable habitats likely provided sub-optimal foraging habitat while areas of grassland likely provided good resource for this species within the locality. The site was therefore considered to be of Local nature conservation value for this species.

6.9 Skylark, a declining resident species in Northamptonshire, was recorded within arable field compartments within the survey area, particularly towards the east of the site. The species was classed as a probable breeder when singing males were noted defending territories over several survey visits and pairs were observed in suitable nesting habitat. It is considered that there were several probable territories within the site, all within arable habitats. Given the species' status as a BoCC red listed and species of principle importance (NERC S.41) and its breeding status within the county, along with its categorisation as a probable breeder with several territories, its presence is of Local importance.

6.10 Starling populations on site were of Local importance, with a peak count of 24 during the first survey. Comprising several probable territories. This BoCC red listed and species of principle importance (NERC S.41) was primarily associated with arable and hedgerow habitats, and was often recorded foraging.

6.11 Song thrush was noted within several habitats across the site, primarily woodland and woodland edge. A peak count of 6 was noted during the first survey, and singing males were recorded in the same locations on subsequent surveys. This species was therefore classed as a probable breeder and is considered a widespread resident and passage migrant. Given the species' status, its population on site was considered to be of Local importance.

6.12 Woodland and hedgerow habitats within the site supported small numbers of bullfinch with several pairs recorded as probable breeders. While widespread in Northamptonshire, this

species is considered to be a scarce resident and the population recorded within the survey area is therefore considered to be of Local importance.

6.13 A peak count of 16 yellow wagtail territories was recorded during the 2014 breeding bird surveys. This species is frequently associated with bean crops, such as those found across the site during 2014. Therefore, it is considered that this abundance of yellow wagtail is likely to have occurred as a result of the crop rotation at the time. Yellow wagtail numbers were much lower in 2016 (peak count of 3) when bean crops were not so prevalent. While the site has the potential to support good numbers of this species as demonstrated during previous surveys, this is highly dependent on cropping. Furthermore, given the abundance of arable habitats within the wider the landscape the site is considered to be of no more than Local nature conservation importance for this species.

6.14 Linnet, a confirmed breeder, was recorded in low numbers during the first two surveys, and one family group was recorded during the second survey. Numbers increased to 50 during the final survey, comprising small groups. Given the low numbers of linnet present on site during the main part of the breeding season, the similarity of habitats within the site to those within the wider area and its status as a BoCC red-listed and species of principle importance (NERC S.41), it is considered that the presence of the species is of Local importance.

6.15 A small number of reed bunting considered probable breeders on site were recorded during the surveys, in association with farmland habitats (primarily hedgerows). It was also recorded foraging within arable fields and their margins. The breeding population on site was considered to be of Local importance.

6.16 Buzzard are listed as a rare breeding species in guidelines for Local Wildlife Site selection (Northamptonshire Biodiversity Partnership 2014). However, buzzard populations are well known to have undergone increases in recent times, and the Northamptonshire Bird Report 2014 lists them as a widespread resident. Therefore, the presence of a possible breeding site within the woodland on site is considered to be of Site importance.

6.17 Stock dove, which is a widespread resident within Northamptonshire, was classed as a confirmed breeder when a bird was flushed from an egg during the final survey. Additional sightings of this species were made during all of the surveys, with a peak count of 5 during the second survey. Given this species' status within the county, its presence on the amber list and the presence of similar breeding habitat within the wider area, it is considered that the presence of breeding stock dove is of Site Importance.

6.18 The majority of the other breeding bird species were either recorded in low numbers, were recorded flying over the site, were noted in unsuitable breeding habitats and/or are considered common and widespread breeding species. These species are considered as being of only Site importance.

Bypass Corridor

Local Wildlife Site Assessment

6.19 The site was assessed against published criteria for Local Wildlife Site selection (Northamptonshire Biodiversity Partnership 2014) to assess the site against the thresholds for county value.

6.20 The relevant habitats within the survey area that are tabulated in criterion b) is *ii) Farmland, including margins, hedgerows and neutral grassland* and *Woodland*. The total scores for these habitats within the survey area site have been calculated using the data from the three breeding bird surveys and are shown alongside the *"threshold site index values"* in Table 8. It should be noted that only the 14 species considered to be probable or confirmed breeders have been included during this assessment as sufficient breeding evidence was not obtained for the remaining 32 species.

Table 8: An assessment of the breeding bird assemblage against the habitat thresholds provided in Criterion b) of the *Wildlife Site Selection Guidelines 2007 (2010 Update)* for Northamptonshire

Farmland, including margins, hedgerows and neutral grassland	
Skylark	2
Blackcap	2
Yellowhammer	2.5
Total score	**6.5**
Threshold site index value	**25**
Woodland	
Long-tailed tit	2
Chiffchaff	1.5
Blackcap	2
Bullfinch	2.5
Total score	**8**
Threshold site index value	**34**

6.21 The total score does not meet the *threshold site index value* for the farmland or woodland habitats that the site supports. It is therefore considered that the site would not meet the criteria for an LWS based on its breeding bird assemblage alone.

Breeding Bird Assemblage Value

6.22 Arable habitats and their associated field margins provided suitable foraging and breeding habitat for several other farmland species, including skylark, bullfinch, linnet, yellowhammer and reed bunting. Breeding was only considered probable by skylark, bullfinch and yellowhammer, however, breeding was considered possible by linnet and reed bunting within suitable habitat. Given the abundance of arable land within the surrounding landscape, the site was considered to be of no more than Local level importance for this breeding farmland bird assemblage.

6.23 Although a number of notable species were recorded, the overall assemblage recorded within woodland and hedgerows was unremarkable and typical of the habitats present within the survey area. Woodland blocks and boundary hedgerows are a common feature of the surrounding arable landscape and the habitats present within the site boundary were therefore considered to be of no more than Local level importance.

Individual Species

6.24 Table 9 provides summarises those birds species recorded from the site that are of at least Local importance.

6.25 Skylark, a declining resident species in Northamptonshire, were regularly recorded within arable field compartments included within the survey area, particularly with cereal crop present to the west of the village of Roade. Breeding was considered probable by up to seven regularly defended skylark territories with an approximate density of 0.187 pairs per hectare surveyed. This is a slightly higher density than expected in cereal crop farmland which research has found is 0.108 territories per hectare (Donald and Vickery 2000), and therefore the number of breeding territories recorded is considered to be of Local importance.

6.26 Yellowhammer, a fairly common but declining species in Northamptonshire, were widely recorded across the site with a peak count of 11 birds and breeding considered probable by two pairs and within three territories. This is considered to represent a breeding population of Local importance.

6.27 Linnet, while only recorded in small numbers with breeding considered probable within a single territory identified in the north of the site, were considered to form part of a farmland bird assemblage that included a range of declining species. Similarly, the small number of reed bunting considered possible breeders on site also form part of this assemblage. The breeding populations of these two species were therefore considered to be of Local importance.

6.28 Woodland and hedgerow habitats in the north of the site were noted to support small numbers of bullfinch with breeding considered probable by a pair along a length of hedgerow bordering playing fields to the north of Roade. While widespread in Northamptonshire, this species is considered to be a scarce resident and the population recorded within the survey area is therefore considered to be of Local importance.

6.29 Other notable species recorded regularly and in reasonable numbers included marsh tit, starling, song thrush, mistle thrush, dunnock and bullfinch. Each of these individual breeding species is considered to be of Local importance.

6.30 Buzzard are listed as a rare breeding species in guidelines for Local Wildlife Site selection (Northamptonshire Biodiversity Partnership 2014). However, buzzard populations are well known to have undergone increases in recent times, and the Northamptonshire Bird Report 2014 lists them as a widespread resident. Therefore, the presence of a possible breeding site within the areas woodlands is therefore considered to be of Site importance.

6.31 The majority of the other breeding bird species were either recorded in smaller numbers, were recorded flying over the site, were noted in unsuitable breeding habitats and / or are considered common and widespread breeding species. These individual species that make use of the available habitats are recognised as being of only Site importance.

Table 9: Birds of Local Importance

Name	Status		Survey Area Recorded	Importance
	WCA Sch.1	NERC S.41		
BoCC Red list				

Grey partridge	*Perdix perdix*		+	Junction 15 only	Local
Marsh tit	*Poecile palustris*		+	Bypass Corridor only	Local
Skylark	*Alauda arvensis*		+	Junction 15 and Bypass Corridor	Local
Starling	*Sturnus vulgaris*		+	Junction 15 and Bypass Corridor	Local
Song thrush	*Turdus philomelos*		+	Junction 15 and Bypass Corridor	Local
Mistle thrush	*Turdus viscivorus*			Junction 15 and Bypass Corridor	Local
Yellow wagtail	*Motacilla flava*		+	Junction 15 only	Local
House sparrow	*Passer domesticus*		+	Junction 15 and Bypass Corridor	Site
Linnet	*Carduelis cannabina*		+	Junction 15 and Bypass Corridor	Local
Yellowhammer	*Emberiza citrinella*		+	Junction 15 and Bypass Corridor	Local
BoCC Amber list					
Mallard	*Anas platyrhynchos*			Junction 15 only	Site
Black-headed gull	*Chroicocephalus ridibundus*			Bypass Corridor only	Site
Stock dove	*Columba oenas*			Junction 15 and Bypass Corridor	Site
Swift	*Apus apus*			Junction 15 and Bypass Corridor	Site
Kestrel	*Falco tinnunculus*			Junction 15 and Bypass Corridor	Local
House martin	*Delichon urbicum*			Junction 15 only	Site
Dunnock	*Prunella modularis*		+	Junction 15 and Bypass Corridor	Local
Bullfinch	*Pyrrhula pyrrhula*		+	Junction 15 and Bypass Corridor	Local
Reed bunting	*Emberiza schoeniclus*		+	Junction 15 and Bypass Corridor	Local
BoCC Green list					
Barn owl	Tyto alba	+		Junction 15 only	Local
Hobby	Falco subbuteo	+		Junction 15 only	Site

7.0 DISCUSSION AND RECOMMENDATIONS

7.1 The following section provides an assessment of the potential impacts of the proposals at both sites. Recommendations are provided for mitigation considered necessary to take account of the predicted ecological effects.

7.2 It is considered likely that the following potential impacts to the recorded breeding bird populations and assemblage may result from the proposals at both the Main site and Bypass Corridor sites:

- Direct loss/change of breeding habitat; and
- Disturbance during construction and/or operation

7.3 The recommendations below have been provided with the aim of informing development proposals on how to best maintain the conservation statuses of bird species present.

7.4 A summary evaluation of species considered potentially sensitive to habitat loss/change is provided in Table 10 below:

Table 10: Evaluation of Species Considered Potentially Sensitive to Habitat Loss/Change

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
Grey Partridge	Breeds in lowland Britain, mostly in central and eastern England and south-east Scotland. Likes open grassland but has adapted to farmland. Prefers open areas of low grass with dense cover. Most numerous in areas of both pasture and cereal with uncultivated edges and thick hedges.	Junction 15: Two individuals recorded, including one singing male. Present in low numbers in arable fields and margins. Possible breeder. Bypass Corridor: None recorded	**Local**	Given the very low numbers of birds recorded, limited evidence of breeding and extent of suitable habitat within surrounding area, it is considered that the effects of the development on this species will be minimal. Enhancements opportunities include the creation of grass margins and areas of wild bird cover around retained woodlands in the south of the Main site to provide a foraging resource. Trees should not be planted in these areas as the species requires relatively open nesting habitat.
Barn owl	Breeds in open country especially farmland, but also marshes and forest edge in buildings, hollow trees or cliffs. Hunts over areas of rank grassland, along field edges, ditches, riverbanks, railway embankments and roadside edges.	Junction 15: Single bird flushed from derelict buildings in the east of the site during several SPA species surveys. Several fresh pellets regularly recorded in the buildings. Possible breeder. Bypass Corridor: None recorded	**Local**	Demolition of derelict buildings at the Main site will lead to the loss of a regularly used roosting site and loss of grassland on both site areas will also reduce the overall availability of foraging habitat. The construction of a new bypass road has potential to lead to increased risk of bird strike mortality, however proposals include woodland/scrub planting along the length of the road wish should be designed to create a vegetation screen that will encourage any barn owl flying across the areas to fly above the height at which they are at risk of being struck by vehicles. Three barn owl nest boxes should be incorporated into the design of proposals. Theses should be affixed to suitable mature trees where they will provide compensatory roosting habitat for this species. Barn owl nest boxes should not be built close to roads or rail lines and should be situated at a sufficient distance from the proposed buildings to prevent disturbance impacts deterring nesting. Barn owl boxes

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
				should not be placed along the length of the proposed Bypass Corridor to reduce the mortality risk associated with the operational phase of the road.
Kestrel	Tolerates a wide range of open and partially forested habitats, including farmland. Locations of nests are variable, with rock ledges, buildings and abandoned corvid nests being commonly reported sites. The species requires suitable perches and roosting sites, usually provided by trees, telegraph poles, buildings or rock faces.	Junction 15: Peak count of 6 birds during third survey. Primarily recorded foraging within arable habitat but suitable breeding habitat within trees and woodland edge and dilapidated farm buildings. Possible breeder. Bypass Corridor: None recorded	**Local**	Proposals include the loss of the majority of arable habitats which will lead to an overall reduction in foraging habitat available to this species. However, given the wide availability of suitable breeding and foraging habitat within the area, impacts are considered to be negligible. Enhancements for this species could include creation of rough grassland margins within the landscaping scheme and provision of two kestrel nesting boxes.
Marsh tit	A species of lowland broad-leaved woodlands, especially open woods containing oak and beech.	Bypass Corridor: Single singing male bird recorded single within woodland habitats present in the southern part of the site. Possible breeder.	**Local**	There will be minor losses in woodland habitat within the southern part of the Bypass Corridor site. To compensate for these losses, additional woodland/scrub planting will be incorporated within the proposed roadside junction where the bypass will join to the A508 (Stratford Road) in the south of the site. This will provide additional foraging and nesting habitat for this species in proximity to suitable habitats present to the east and west of this part of the site. Woodland/scrub planting will also be provided along the length of the proposed road that will provide additional foraging/breeding habitat and improve connectivity across the site.

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
				As an additional enhancement, it is recommended that a number of small hole nest boxes (26mm) are erected within retained woodland in the south of the site. Marsh tit prefer nest boxes that area placed approximately 1m above the ground.
Skylark	Requires open, dry, flat habitat of grassland or arable crops such as cereals. Ground nester in these habitats. Forages on a mixture of plant and insect food types, with insects becoming highly important during the breeding season. Population decline due to agricultural practices and a reduction in suitable habitat.	Junction 15: Recorded throughout arable fields, particularly within cereal crops to the west and south. Several territories noted. Probable breeder. Bypass Corridor: Recorded throughout arable fields, particularly within cereal crops to the west of Roade. Breeding was considered probable within seven regularly defended territories. Probable breeder.	**Local**	Given the extensive loss of the arable farmland habitat at the main site and the fragmentation of arable habitats at the Bypass Corridor site, several pairs of skylark are likely to be displaced with potential for small numbers to continue using areas of retained habitats where suitable conditions are present. Opportunities for enhancement exist along the proposed Bypass road where retained arable field margins could be planted and managed as a conservation headland where possible to encourage suitable foraging and breeding habitat. Any remaining arable land use should aim to be sympathetic to this species.
Starling	During breeding season will concentrate where suitable holes are available, either naturally or in apertures of buildings. Invertebrate food fed to young. Forages mainly on the ground in open areas of short grass or	Junction 15: Several birds recorded within hedgerows and arable fields and on woodland edges. Breeding was considered probable within suitable standard trees and woodland edge and buildings.	**Local**	Losses of hedgerow and arable habitats will reduce the overall availability of onsite habitat for this species. It is recommended that this loss is compensated for by the planting of additional woodland and scrub habitat within the proposed landscaping scheme at the Main Site and the proposed woodland planting along the length of the proposed Bypass Corridor. Consideration should be given to

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
	sparse vegetation, e.g. cereal stubble, farmyards.	Probable breeder. Bypass Corridor: Several birds recorded foraging within hedgerows. Breeding was considered possible within suitable standard trees and within residential environs where birds were recorded to the west and north of Roade. Possible breeder.		the provision of suitable nest boxes within the design of the scheme to provide suitable breeding opportunities. Starling will readily inhabit urban environs and upon completion of the scheme green infrastructure and soft landscaping proposals will continue to support a population of starling.
Song thrush	In winter can be found almost anywhere in mainland Britain especially inland. Birds from Iceland, Scandinavia, northern Europe and Russia join wintering resident birds.	Junction 15: Peak count of 6 birds, with singing males defending territories over several survey visits. Probable breeder. Bypass Corridor: Count of four birds recorded during each survey occasion. Breeding was considered probable within a defended territory within woodland habitat in the north of the site. Probable breeder.	**Local**	Loss of hedgerow habitats will reduce the overall availability of foraging and breeding habitat for this species. The proposed landscaping scheme, should, however, more than compensate for this habitat loss by providing additional cover and habitat structure. Including a mixture of woodland, scrub and hedgerow planting of native and ideally fruit-bearing species would be beneficial to song thrush. Another species that will readily adapt to built up environs, song thrush will utilise retained habitats in close proximity to proposed development and the maturation of planting proposals will provide additional resources for this species in the future.

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
Mistle thrush	Commonly found in woodland, parks and scrub. Forages on worms, slugs, insects and berries.	Junction 15: Peak count of seven noted. Family group of six recorded flying over and singing male noted on one occasion. Possible breeder. Bypass Corridor: Single bird recorded within hedgerow to the west of Woodleys Farmhouse. Possible breeder.	**Local**	This habitat used by this species at the Bypass Corridor site will be retained. The loss of potentially suitable foraging habitat is considered unlikely to result in a significant impact given the wide availability of similar suitable habitat in the surrounding area. Similarly, the majority of habitat used by this species at Junction 15 will be retained. Furthermore, the proposed landscaping scheme should more than compensate for losses in suitable habitats habitat loss by providing additional cover and habitat structure. As with song thrush, including a mixture of woodland, scrub and hedgerow planting of native and ideally fruit-bearing species would be beneficial to this species.
Dunnock	Commonly invades a wide variety of scrub. Has adapted to field hedgerows, farms, railway embankments, parks, gardens and vacant urban land. Feeds mainly on insects but small seeds are an important winter food.	Junction 15: Several families recorded during second and third survey visits, along with lone juveniles and a peak count of 16 adults. Associated with most habitats across the site except arable fields. Confirmed breeder. Bypass Corridor: Peak count of 25 individuals during breeding bird surveys within hedgerows throughout the site. Several	**Local**	As with other scrub and woodland edge species, no adverse impacts are anticipated with dunnock. In the longer term the inclusion of further planting will provide benefits to this species, which will readily inhabit urban environs.

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
		pairs and defended territories were identified. Probable breeder.		
Yellow Wagtail	In breeding season traditionally occupies fringes of wetlands, but will breed on farmland in the UK. Feeds on invertebrates often in association with grazing cattle and sheep.	Junction 15: Very small number of individuals recorded within arable habitats. Present in much lower numbers than during 2014 surveys, highly likely due to presence of different crops. Possible breeder. Bypass Corridor: None recorded.	**Local**	The loss of arable habitats at the Main Site will lead to an overall reduction of breeding and foraging habitat for this species. While these habitats have the potential to support relatively high numbers of this species during years where bean crop is a dominant feature, this is highly dependent on the cropping regime and therefore represents an inconsistent breeding and foraging resource for this species. Therefore, in the long-term it is likely that only a small number of breeding birds may be displaced by the loss of these habitats. The creation of grassland margins around the site would benefit this species, as would the creation of waterbodies within landscaped areas.
Bullfinch	Breeds mainly in broad-leaved woods, but also commonly in dense hedgerows and thickets. Adults are vegetarian, but invertebrates are important in diet of young.	Junction 15: Peak count of 16 birds recorded during the third survey visit, and several pairs noted within hedgerows, woodland and scrub across the site. Probable breeder. Bypass Corridor: Peak count of five birds recorded during the	**Local**	Losses of woodland and hedgerow habitat in the north of the Main site and the loss of small sections of hedgerow at the Bypass Corridor site will reduce the overall availability of breeding and foraging habitat for this species. However, the inclusion of extensive woodland/scrub planting will more compensate for this loss with the maturation of these habitats providing a greater extent of suitable habitat for this species in the long-term when compared to that currently present. Furthermore, the design of planting at both sites will improve connectivity in the wider area. Consideration should be given to the inclusion of fruit-bearing species that will

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
		second survey occasion including a probable breeding pair within hedgerows bordering playing fields in the north of Roade. Probable breeder.		provide a good foraging resource for this species and the inclusion of species rich grassland margins that would provide an additional resource.
Linnet	Holds habitat preferences for scrub, farmland hedgerows, uncultivated fields, young plantations and woodland fringe habitats. Found in foraging flocks in the winter. Breeds in low dense bushes or hedgerows. Forages almost exclusively on seeds, taking few insects.	Junction 15: Peak count of 50 during final survey, with birds recorded across the site. One family group noted and several singing males across site. Confirmed breeder. Bypass Corridor: Small number recorded foraging and / or overflying on site throughout surveys with a breeding considered probable within a territory identified to the north west of Roade. Probable breeder.	**Local**	The loss of arable habitat will reduce the overall availability of foraging habitat for linnet at both sites, while the losses of hedgerows will reduce the availability of breeding habitat. Given the availability of suitable breeding habitat within the locality and the retention/creation of some useful features such as woodland edges and boundary hedgerows, it is considered that impacts to local linnet populations will not be significant. Additional scrub planting, particularly along the length of the Bypass Corridor will provide additional breeding opportunities for this species in proximity to retained arable habitats. Consideration should be given to the provision of wildflower rich grassland margins along the length of woodland/scrub planting that will provide additional opportunities for this and other farmland specialists.

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
Yellowhammer	Traditionally based on edges of open areas of forest and fringing scrub of gorse, broom and hawthorn. Extends widely across cultivated land with hedges, plantations, and paths. Feeds mainly on grass seeds, invertebrates in the breeding season. Feeds wholly on the ground by hedges, tracks and newly sown fields.	Junction 15: Widely recorded within hedgerows bordering arable fields across the site. Several singing males defending territories and pairs seen in suitable breeding habitat. Probable breeder. Bypass Corridor: Widely recorded within hedgerows bordering arable fields across the site with breeding considered probable within three defended territories and by two pairs. Probable breeder.	**Local**	As with Linnet, losses of hedgerow and arable habitats will reduce the overall resources available to these species. Gapping up and additional scrub planting will, however, provide additional resources for these species. Similarly to predicted impacts upon linnet, the loss of arable habitat will reduce the overall availability of onsite foraging habitat for yellowhammer, while the losses of hedgerows will reduce the availability of breeding habitat. Given the availability of suitable breeding habitat within the locality, it is considered that impacts to local yellowhammer populations will not be significant. Retained hedgerows within the site should be enhanced to improve their overall suitability for this species. Additional scrub and hedgerow planting will provide an additional breeding resource. Any remaining arable land use should aim to be sympathetic to this species.
Reed bunting	Traditional habitat is that of prolific fairly low vegetation, mainly associated with intense soil moisture. Increasingly found in cultivated drier habitats.	Junction 15: Small numbers recorded within hedgerows bordering arable fields across the site. Several singing males defending territories and pairs seen in suitable breeding habitat. Possible breeder.	**Local**	The loss of extensive arable habitats at the Main site and the fragmentation of habitats at the Bypass Corridor site will reduce the overall availability of foraging and breeding habitats for this species. However, proposals include the construction of wetland drainage features that will provide suitable wetland habitat for this species. Drainage features should be planted with suitable vegetation including reed bed that will provide and optimal resource for this species. Additional scrub planting in association with retained and

Species	Habitat Requirements[1]	Species Account (Refer to Figure 1)	Nature Conservation Value[2]	Characterisation of Expected Impact and Suggested Mitigation & Compensation
		Bypass Corridor: Small numbers recorded within cereal crop to the west of Roade with breeding considered possible by a single singing male bird. Possible breeder.		offsite grassland/arable habitats will provide additional resource for this species.

[1] Snow & Perrins, 1998
[2] Based upon criteria set out in Table 2 and professional judgement.
[3] Assumes that any suggested or proposed mitigation, compensation or habitat enhancements are undertaken in full.

Appendix A: Junction 15 2016 Breeding Bird Survey Results

Species		Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[6]
Mallard	*Anas platyrhynchos*	-	1	-	Amber list	Non-breeder
Red-legged partridge	*Alectoris rufa*	-	-	3	No status	Possible
Grey Partridge	*Perdix perdix*	2	-	-	NERC S.41 Red list	Confirmed
Pheasant	*Phasianus colchicus*	2	2	5	No status	Probable
Sparrowhawk	*Accipiter nisus*	1	-	-	Green list	Possible
Buzzard	*Buteo buteo*	3	4	4	Green list	Possible
Black-headed full	*Chroicocephalus ridibundus*	1	-	-	Amber list	Non-breeder
Feral pigeon	*Columba livia*	-	-	14	No status	Non-breeder
Stock dove	*Columba oenas*	1	5	3	Amber list	Confirmed
Woodpigeon	*Columba palumbus*	28	50	73	Green list	Probable
Barn owl	*Tyto alba*	1	1	-	WCA Sch.1 Green list LBAP	Non-breeder
Swift	*Apus apus*	-	2	-	Amber list	Non-breeder
Green woodpecker	*Picus viridis*	1	1	2	Green list	Possible
Great spotted woodpecker	*Dendrocopos major*	-	-	1	Green list	Possible
Kestrel	*Falco tinnunculus*	2	1	6	Amber list	Possible
Hobby	*Falco subbuteo*	-	-	1	WCA Sch.1 Green list	Non-breeder
Magpie	*Pica pica*	2	4	3	Green list	Possible
Jay	*Garrulus glandarius*	-	1	7	Green list	Probable
Jackdaw	*Corvus monedula*	16	583	9	Green list	Non-breeder
Rook	*Corvus frugilegus*	-	17	29	Green list	Non-breeder

[6]European Ornithological Atlas Committee, 1979. *Categories of Breeding Bird Evidence*. European Ornithological Atlas Committee.

Species		Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[6]
Carrion crow	*Corvus corone*	9	8	42	Green list	Possible
Goldcrest	*Regulus regulus*	7	-	9	Green list	Probable
Blue tit	*Cyanistes caeruleus*	6	10 (+ 2 families)	22 (+ 1 family)	Green list	Confirmed
Great tit	*Parus major*	13	5	8	Green list	Confirmed
Skylark	*Alauda arvensis*	6	-	2	NERC S.41 Red list	Probable
Swallow	*Hirundo rustica*	2	2	9	Green list	Non-breeder
House martin	*Delichon urbica*	-	-	5	Amber list	Non-breeder
Long-tailed tit	*Aegithalos caudatus*	4 (+ 4 flocks)	5	6 (+ 1 family)	Green list	Confirmed
Chiffchaff	*Phylloscopus collybita*	3	1	1	Green list	Possible
Blackcap	*Sylvia atricapilla*	2	1	2	Green list	Probable
Garden warbler	*Sylvia borin*	1	-	-	Green list	Possible
Lesser whitethroat	*Sylvia curruca*	-	1	-	Green list	Possible
Whitethroat	*Sylvia communis*	5	3	1 (+1 family)	Green list	Confirmed
Wren	*Troglodytes troglodytes*	20	14	21	Green list	Probable
Starling	*Sturnus vulgaris*	24	1	8	NERC S.41 Red list	Probable
Blackbird	*Turdus merula*	34	29	21	Green list	Confirmed
Song thrush	*Turdus philomelos*	6	3	4	NERC S.41 Red list	Probable
Mistle thrush	*Turdus viscivorus*	1	-	7	Red list	Possible
Robin	*Erithacus rubecula*	10	8	26 inc juveniles (+ 2 families)	Green list	Confirmed
Dunnock	*Prunella modularis*	16	16 (+ 1 fam)	7 including juveniles (+3 families)	NERC S.41 Amber list	Confirmed
House sparrow	*Passer domesticus*	-	-	1	NERC S.41 Red list	Possible
Yellow wagtail	*Motacilla flava*	1	3	-	NERC S.41 Red list	Possible

Species		Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[6]
Chaffinch	*Fringilla coelebs*	23	7	18 (+ 2 families)	Green list	Confirmed
Bullfinch	*Pyrrhula pyrrhula*	4	3	16	NERC S.41 Amber list	Probable
Greenfinch	*Carduelis chloris*	-	6	7 (+1 family)	Green list	Confirmed
Linnet	*Carduelis cannabina*	10	11 (+ 1 family)	50	NERC S.41 Red list	Confirmed
Goldfinch	*Carduelis carduelis*	10	14	22	Green list	Probable
Yellowhammer	*Emberiza citrinella*	7	21	9	NERC S.41 Red list	Probable
Reed bunting	*Emberiza schoeniclus*	10	-	1	NERC S.41 Amber list	Probable
Total No. Species		**35**	**36**	**40**		

Breeding Status evidence can be broken down into four sections, each with their own codes, as defined by the European Ornithological Atlas Committee:

Confirmed breeder
DD – distraction display or injury feigning
UN – used nest or eggshells found from this season
FL – recently fledged young or downy young
ON – adults entering or leaving nest-site in circumstances indicating occupied nest
FF – adult carrying faecal sac or food for young
NE – nest containing eggs
NY – nest with young seen or heard

Probable breeder - Evidence accumulated during the survey indicates that the bird species is breeding on site.
P – pair in suitable nesting habitat
T – permanent territory (defended over at least 2 survey occasions)
D – courtship and display
N – visiting probable nest site
A – agitated behaviour
I – brood patch of incubating bird (from bird in hand)
B – nest building or excavating nest-hole

Possible breeder - Evidence accumulated during the survey indicates that the bird species could be breeding on site, but the evidence is less conclusive than that obtained for probable breeders.
H – observed in suitable nesting habitat
S – singing male

Non-breeder
F – flying over
M – migrant
U – summering non-breeder
UH – observed in unsuitable nesting habitat

Appendix B: Bypass Corridor 2016 Breeding Bird Survey Results

Species: British Common Name	Species: Latin name	Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[7]
Pheasant	*Phasianus colchicus*	3	1	0	Not listed	Possible **H**
Buzzard	*Buteo buteo*	1	3	1	Green list	Possible **H**
Moorhen	*Gallinula chloropus*	0	1	0	Green list	Possible **H**
Black-headed gull	*Chroicocephalus ridibundus*	0	0	1	Amber list	Non-breeder **F**
Rock dove/Feral pigeon	*Columba livia*	1	1	5	Green list	Non-breeder **F**
Stock dove	*Columba oenas*	0	0	1	Amber list	Possible **H**
Woodpigeon	*Columba palumbus*	35	18	13	Green list	Probable **P, H**
Collared dove	*Streptopelia decaocto*	0	0	2	Green list	Possible **H**
Swift	*Apus apus*	0	2	0	Amber list	Non-breeder **F**
Green woodpecker	*Picus viridis*	4	1	1	Green list	Possible **H**
Great spotted woodpecker	*Dendrocopos major*	0	2	0	Green list	Possible **H**
Magpie	*Pica pica*	8	6	8	Green list	Possible **H**
Jay	*Garrulus glandarius*	0	0	1	Green list	Possible **H**
Jackdaw	*Corvus monedula*	2	8	1	Green list	Possible **H**
Rook	*Corvus frugilegus*	5	4	0	Green list	Non-breeder **F**
Carrion crow	*Corvus corone*	12	4	6	Green list	Possible **H**
Goldcrest	*Regulus regulus*	0	0	1	Green list	Possible **H**
Blue tit	*Cyanistes caeruleus*	21	19	7	Green list	Probable **P, S, H**
Great tit	*Parus major*	10	9	6	Green list	Confirmed **FF, P, T, S, H**
Coal tit	*Periparus ater*	1	0	0	Green list	Possible **S, H**

[7]European Ornithological Atlas Committee, 1979. *Categories of Breeding Bird Evidence*. European Ornithological Atlas Committee.

Species: British Common Name	Species: Latin name	Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[7]
Marsh tit	*Poecile palustris*	1	0	0	Red list NERC S.41	Possible **S, H**
Skylark	*Alauda arvensis*	23	13	12	Red list WCA Sch.1	Probable **P, T, S, H**
Swallow	*Hirundo rustica*	0	11	10	Green list	Possible **H**
Long-tailed tit	*Aegithalos caudatus*	20	3	2	Green list	Probable **P, H**
Chiffchaff	*Phylloscopus collybita*	5	2	8	Green list	Probable **T, S, H**
Blackcap	*Sylvia atricapilla*	2	6	4	Green list	Probable **T, S, H**
Garden warbler	*Sylvia borin*	0	2	0	Green list	Possible **S, H**
Lesser whitethroat	*Sylvia curruca*	3	4	0	Green list	Possible **S, H**
Whitethroat	*Sylvia communis*	0	4	1	Green list	Possible **S, H**
Treecreeper	*Certhia familiaris*	2	0	0	Green list	Possible **H**
Wren	*Troglodytes troglodytes*	11	16	12	Green list	Probable **T, S, H**
Starling	*Sturnus vulgaris*	2	12	12	Red list NERC S.41	Possible **H**
Blackbird	*Turdus merula*	14	14	26	Green list	Confirmed **FF, P, S, H**
Song thrush	*Turdus philomelos*	4	4	4	Red list NERC S.41	Probable **T, S, H**
Mistle thrush	*Turdus viscivorus*	0	0	1	Red list	Possible **H**
Robin	*Erithacus rubecula*	23	23	11	Green list	Probable **P, T, S, H**
Dunnock	*Prunella modularis*	25	11	6	Amber list NERC S.41	Probable **P, T, S, H**
House sparrow	*Passer domesticus*	1 colony	2	1	Red list NERC S.41	Possible **S, H**
Pied wagtail	*Motacilla alba*	0	0	2	Green list	Non-breeder **F**
Chaffinch	*Fringilla coelebs*	26	18	8	Green list	Confirmed **FF, P, T, S, H**
Bullfinch	*Pyrrhula pyrrhula*	1	5	0	Amber list NERC S.41	Probable **P, S, H**
Greenfinch	*Carduelis chloris*	0	2	2	Green list	Possible **S, H**
Linnet	*Carduelis cannabina*	3	1	6	Red list NERC S.41	Probable **T, S, H**

Species: British Common Name	Species: Latin name	Survey 1	Survey 2	Survey 3	Conservation Status & Protection	Breeding status[7]
Goldfinch	*Carduelis carduelis*	2	22	3	Green list	Probable **P, S, H**
Yellowhammer	*Emberiza citronella*	7	11	8	Red list NERC S.41	Probable **P, T, S, H**
Reed bunting	*Emberiza schoeniclus*	1	2	0	Amber list NERC S.41	Possible **S, H**
Total No. Species	**46**	32	36	34		

Breeding Status evidence can be broken down into four sections, each with their own codes, as defined by the European Ornithological Atlas Committee:

Confirmed breeder
DD – distraction display or injury feigning
UN – used nest or eggshells found from this season
FL – recently fledged young or downy young
ON – adults entering or leaving nest-site in circumstances indicating occupied nest
FF – adult carrying faecal sac or food for young
NE – nest containing eggs
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Probable breeder - Evidence accumulated during the survey indicates that the bird species is breeding on site.
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A – agitated behaviour
I – brood patch of incubating bird (from bird in hand)
B – nest building or excavating nest-hole

Possible breeder - Evidence accumulated during the survey indicates that the bird species could be breeding on site, but the evidence is less conclusive than that obtained for probable breeders.
H – observed in suitable nesting habitat
S – singing male

Non-breeder
F – flying over
M – migrant
U – summering non-breeder
UH – observed in unsuitable nesting habitat