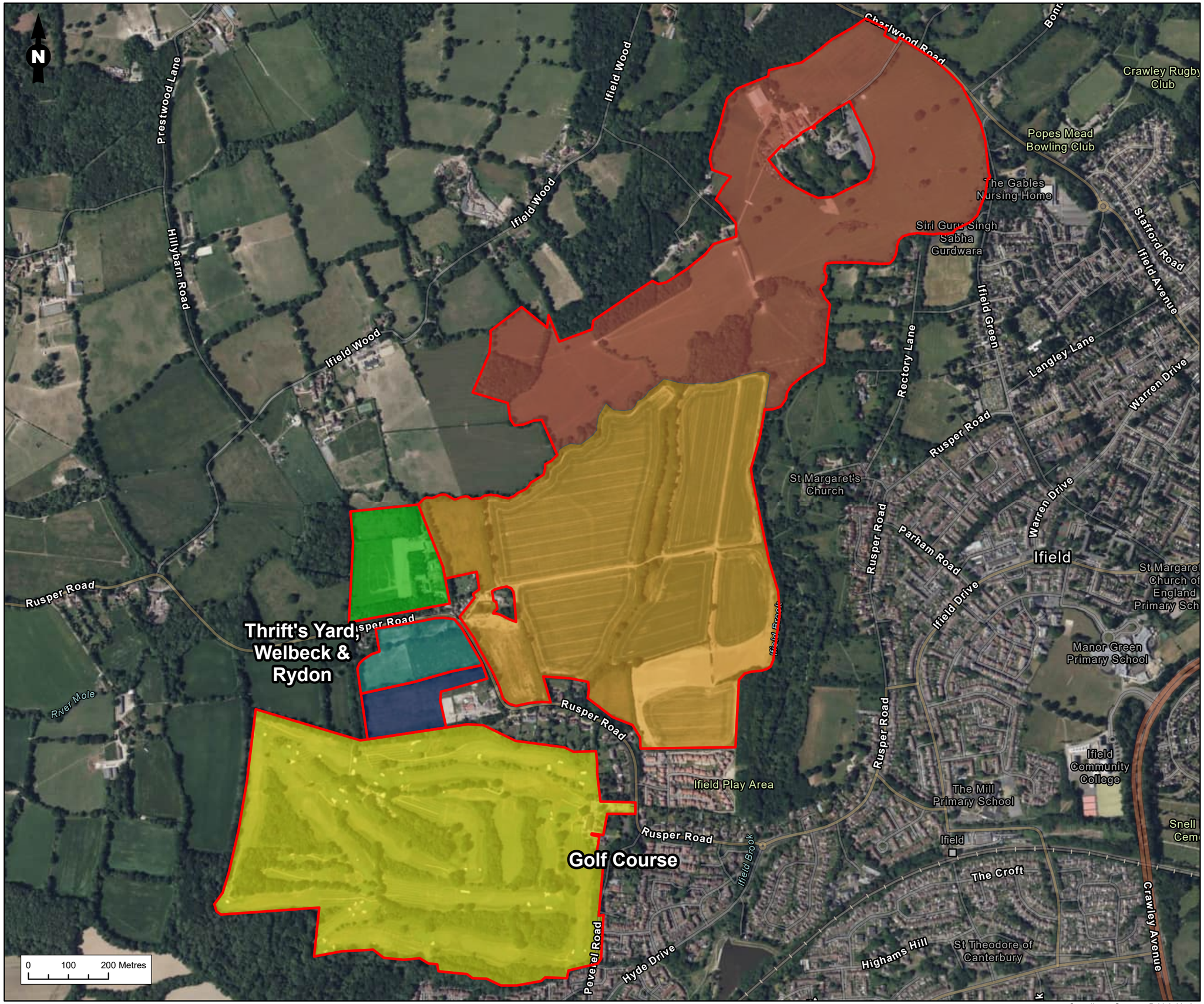


Legend

- Red Line Boundary

Area Name

- Area 1; Pastoral fields
- Area 2; Arable field
- Golf Course
- TWR - Thrift's Yard
- TWR - Welbeck
- TWR - Rydon

Figure Title
Site Area

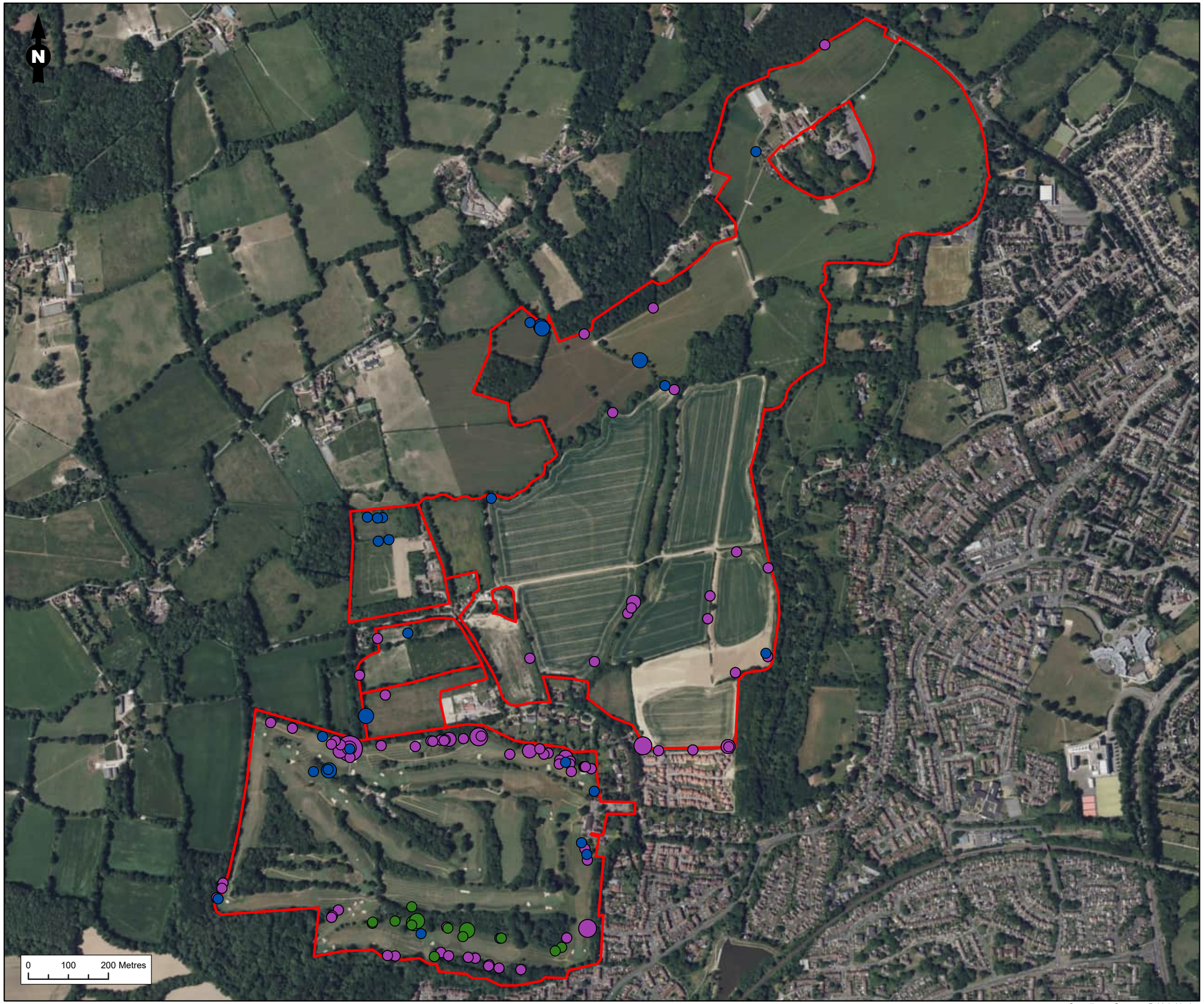
Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	1
Date	**Prepared By**
September 2022	HX
Scale	**Issue**
1:9,000 @A3	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.



Legend

Red Line Boundary

Species

- Common lizard
- Grass snake
- Slow worm

No. of specimens

- 1
- 2
- 3
- 4

Note:
The data presented in this figure is solely based on the results of the 2022 Ramboll ecological surveys conducted between April-September 2022.

Figure Title
Reptile Surveys

Project Name
West of Ifield
2022 Ecology Surveys

Project Number	Figure No.
1620007949	2
Date	Prepared By
October 2022	HX
Scale	Issue
1:9,000 @A3	2

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

APPENDIX 2
RELEVANT LEGISLATION AND POLICY

Ecological features are protected under various United Kingdom (UK) and European legislative instruments. These are described below. European legislation is not included as it is incorporated in UK legislation by domestic provisions.

The Conservation of Habitats and Species Regulations 2017

The Habitats Directive (Council Directive 92/43/EEC)[8] came into force in 1992 and provides for the creation of a network of protected wildlife areas across the European Union (EU), known as 'Natura 2000'. The Natura 2000 network consists of Special Areas of Conservation (SAC) designated under the Habitats Directive and Special Protection Areas (SPA) designated under the Birds Directive (Council Directive 79/409/EEC)[9]. These sites are part of a range of measures aimed at conserving important or threatened habitats and species.

The Conservation of Habitats and Species Regulations 2017[10] (commonly known as the 'Habitats Regulations') transposes the Habitats Directive into national law and set out the provisions for the protection and management of species and habitats of European importance, including Natura 2000 sites. The 2017 bill consolidated all previous versions of the regulations and subsequent amendments since initial transposition, bringing them all under the single heading, and made some minor amendments. It extends to England and Wales, and to a limited extent Scotland and Northern Ireland. Further amendments were made via The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018[11] to ensure they reflect recent European case law (C-323/17 People Over Wind and Sweetman v Coillte Teoranta) in relation to the assessment of plans and projects on sites protected under Council Directive 92/43/EEC on the conservation of natural habitats of wild fauna and flora (the 'Habitats Directive'). In Scotland, the Habitats Directive is transposed through a combination of the Habitats Regulations 2010 (in relation to reserved matters) and the Conservation (Natural Habitats &c.) Regulations 1994. The Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended) transposes the Habitats Directive in relation to Northern Ireland.

In addition to providing for the designation and protection of Natura 2000 sites, the Habitats Regulations provide strict protection for plant and animal species as European Protected Species. Derogations from prohibitions are transposed into the Habitats Regulations by way of a licensing regime that allows an otherwise unlawful act to be carried out lawfully for specified reasons and providing certain conditions are met. Under the Habitats Regulations, competent authorities have a general duty, in the exercise of any of their functions, to have regard to the Habitats Directive and Wild Birds Directive including in the granting of consents or authorisations. They may not authorise a plan or project that may adversely affect the integrity of a European site, with certain exceptions (considerations of overriding public interest).

The Conservation of Habitats and Species Regulations 2017, as amended by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, require the Secretary of State and Welsh Ministers to secure compliance with the requirements of the Nature Directives. Any new powers in the 2019 Regulations must be exercised in line with the Directives and retained EU case law up to 1 January 2021.

[8] European Commission, 1992. Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora.
[9] European Commission, 1979. Council Directive 79/409/EEC on the conservation of wild birds.
[10] Her Majesty's Stationery Officer (HMSO), 2017. The Conservation of Habitats and Species Regulations 2017. HMSO.
[11] Her Majesty's Stationery Officer (HMSO), 2018. The Conservation of Habitats and Species and Planning (Various Amendments) (England and Wales) Regulations 2018. HMSO.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[12]

SACs and Special Protection Areas (SPAs) in the UK no longer form part of the EU's Natura 2000 ecological network. The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 have created a national site network on land and at sea, including both the inshore and offshore marine areas in the UK. The national site network includes:

- existing SACs and SPAs; and
- new SACs and SPAs designated under these Regulations.

Any references to Natura 2000 in The Conservation of Habitats and Species Regulations 2017, as amended and in guidance now refers to the new national site network. Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to:

- fulfil the commitment made by government to maintain environmental protections
- continue to meet our international legal obligations, such as the Bern Convention, the Oslo and Paris Conventions (OSPAR), Bonn and Ramsar Conventions

Designated Wetlands of International Importance (known as Ramsar sites) do not form part of the national site network. Many Ramsar sites overlap with SACs and SPAs and may be designated for the same or different species and habitats. All Ramsar sites remain protected in the same way as SACs and SPAs.

The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 establish management objectives for the national site network. These are called the network objectives.

The UK Government and devolved administrations (in Wales, Northern Ireland and Scotland) will cooperate to manage, and where necessary, adapt the network to contribute towards meeting the network objectives.

Any references in the 2017 Regulations to meeting the 'requirements of the Directives' includes achieving the network objectives.

The appropriate authorities may publish guidance relating to these requirements. The appropriate authorities are the Secretary of State for Environment, Food and Rural Affairs in England and the Welsh Ministers in Wales.

The network objectives are to:

- maintain or, where appropriate, restore habitats and species listed in Annexes I and II of the Habitats Directive to a favourable conservation status (FCS)
- contribute to ensuring, in their area of distribution, the survival and reproduction of wild birds and securing compliance with the overarching aims of the Wild Birds Directive

The appropriate authorities must also have regard to the:

- importance of protected sites
- coherence of the national site network
- threats of degradation or destruction (including deterioration and disturbance of protected features) on SPAs and SACs

The network objectives contribute to the conservation of UK habitats and species that are also of pan-European importance, and to the achievement of their FCS within the UK.

[12] Secretary of State (2019) The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Her Majesty's Stationery Office (HMSO)

The Countryside and Rights of Way Act 2000

The Countryside and Rights of Way Act 2000[13] primarily extends to England and Wales. It provides a new statutory right of access to the countryside and modernises the rights of way system, bringing into force stronger protection for both wildlife and the countryside.

The Act is divided into five distinct sections, Part III is of relevance to ecology:

- Part III – Nature Conservation and Wildlife Protection: The Act details measures to promote and enhance wildlife conservation. These measures include improving protection for Sites of Special Scientific Interest (SSSI) and increasing penalties for deliberate damage to SSSIs. Furthermore, the Act affords statutory protection to Ramsar Sites which are wetlands designated under the International Convention on Wetlands[14].

The Wildlife and Countryside Act 1981 (As Amended)

The Wildlife and Countryside Act 1981 (as amended)[15] forms the basis of much of the statutory wildlife protection in the UK. Part I deals with the protection of plants, birds and other animals and Part II deals with the designation of SSSIs.

This Act covers the following broad areas:

- Wildlife – listing endangered or rare species in need of protection and creating offences for killing, disturbing or injuring such species. Additionally, the disturbance of any nesting bird during breeding season is also noted as an offence, with further protection for species listed on Schedule 1. Measures for preventing the establishment of non-native plant and animal species as listed on Schedule 9 are also provided;
- Nature Conservation – protecting those sites which are National Nature Reserves (NNR) and SSSIs;
- Public Rights of Way – placing a duty on the local authority (to maintain a definitive map of footpaths and rights of way. It also requires that landowners ensure that footpaths and rights of way are continually accessible; and
- Miscellaneous General Provisions.

The Act is enforced by local authorities.

Natural Environment and Rural Communities Act 2006

Under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006[16], public authorities must show regard for conserving biodiversity in all their actions. Public authorities should consider how wildlife or land may be affected in all the decisions that they make. The commitment to the biodiversity duty must be measured by public authorities.

Section 41 also requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England.

[13] Her Majesty's Stationery Officer (HMSO), 2000. The Countryside and Rights of Way Act 2000. HMSO.

[14] United Nations Educational, Scientific and Cultural Organization (UNESCO), 1971. Convention on Wetlands of International Importance especially as Waterfowl Habitat, as amended in 1982 and 1987. Ramsar, Iran Published in Paris, 1994.

[15] Her Majesty's Stationery Office (HMSO), 1981. The Wildlife and Countryside Act 1981 [as amended in Quinquennial Review and by the Countryside and Rights of Way Act 2000 and the Natural Environment and Rural Communities Act 2006]. HMSO.

[16] Her Majesty's Stationery Office (HMSO), Natural Environment and Rural Communities Act 2006. HMSO.

APPENDIX 8.14: LAND WEST OF IFIELD – REPTILE SURVEY REPORT 2020

Intended for
Turner Townsend plc on behalf of Homes England

Document type
Report

Date
July 2020

LAND WEST OF IFIELD
REPTILE SURVEY REPORT 2020

RAMBOLL Bright ideas. Sustainable change.

LAND WEST OF IFIELD
REPTILE SURVEY REPORT 2020

Project number	**1620007949**
Version	**1**
Document type	**Report**
Document number	**R-1620007949_1-Reptile Survey**
Date	**15/07/2020**
Prepared by	**Bianca Hoad and Joanne Barker**
Checked by	**Malcolm Robertson**
Approved by	**Matt Royall**
Description	**Reptile Report**

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CONTENTS

APPENDICES

FIGURES

1. INTRODUCTION

1.1 Scope

1.1.1 Ramboll UK Limited (Ramboll) has been appointed by Turner Townsend plc on behalf of Homes England to undertake a reptile survey at the land West of Ifield (the site). This report presents the findings of the reptile surveys carried out by Ramboll Ecologists in May and June 2020 in the northern portion of the site previously not surveyed (here referred to as 'Area D').

1.1.2 The objectives of the study were to:

i. Establish the presence or absence of reptiles at the site; and
ii. If present, establish the reptile species present.

1.1.3 This report presents factual baseline information based on the findings of the survey; no interpretation of the results is made in the context of implications for development. The report is intended to inform masterplanning and design and will form part of the baseline information used to support the Environmental Impact Assessment of the Land West of Ifield planning application.

1.2 Limitations

1.2.1 This report has been prepared solely for the benefit of Turner Townsend plc on behalf of Homes England. It shall not be relied upon or transferred to any other party without the prior written authorisation of Ramboll. This report has been commissioned to identify reptile presence and distribution or likely absence at the above-mentioned site; it does not address any other potential environmental impacts that may result from development. This report is based on a survey of suitable habitat in the land within the site boundary as shown in (Figure 1). If any additional land take is required, either temporarily during works or permanently, the recommendations of this report may need to be updated.

1.2.2 It must be recognised that ecology is temporally variable and the findings of the report are based on observations made and data available at the time of the survey. This report will remain valid for a period of two years, if the development is delayed or postponed the findings and recommendations of this report should be reconsidered and it may be necessary to re-visit the site to determine if there have been any changes in the ecological status of the site. Ramboll does not accept any liability for the accuracy or otherwise of any information derived from secondary sources, however, reasonable endeavours have been made to verify information obtained this way.

2. SURVEY LOCATION AND DESCRIPTION

2.0.1 The survey was undertaken in the northern portion of the site known as 'Area D' and forms part of the wider Land West of Ifield site. The centre of the survey location is approximately at National Grid Reference (NGR) 524512, 138149. Figure 1 shows the location of the survey and Appendix A shows the extent of Area D. The survey site comprises semi-improved grassland and poor semi improved grassland, with broadleaved woodland on the fringes. Several ponds are present within the local landscape in addition to the River Mole flows along the southern boundary of Area D.

3. PROTECTED SPECIES LEGISLATION

3.0.1 All of the common reptile species Grass snake (*Natrix helvetica*), adder (*Vipera berus*), common lizard (*Zootoca vivipara*) and slow worm (*Anguis fragilis*)) native to Britain are protected under Sections 9(1)

and 9(5) of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it illegal to intentionally kill, injure, sell or advertise for sale a common reptile and also, to sell, barter, exchange or transport for sale these animals or parts of them. However, their habitat is not directly protected.

3.0.2 In addition, sand lizard and smooth snake are fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2017 (as amended) making them European Protected Species. This legislation makes it illegal to carry out the following activities:

i. Deliberately or recklessly disturb, capture or kill these animals;
ii. Deliberately or recklessly take or destroy eggs of these animals;
iii. Damage or destroy a breeding site or resting place of such a wild animal; and
iv. Keep, transport, sell or exchange, or offer for sale or exchange, any live or dead animal, or any part of, or anything derived from such a wild animal.

3.0.3 Sand lizard and smooth snake have extremely limited distributions and specific habitat requirements; neither species is present in the vicinity of Ifield and these species are not discussed further.

3.0.4 Natural England recommends the following, avoidance, mitigation and compensation measures to avoid killing and injury to reptiles on a site where they are present (listed in order of decreasing desirability):

i. Maintaining the reptiles on site, i.e. developing the site or changing the layout of the proposals so that areas used by reptiles are not developed;
ii. Moving reptiles to areas within the site which are to be retained, enhanced and managed for conservation purposes, whilst developing remaining areas; and
iii. Moving (translocating) reptiles away from the development site to another suitably prepared area[1].

4. PREVIOUS SURVEYS

A previous reptile survey report was undertaken by Arcadis Consulting Ltd in October 2019[2]. The reptile survey was undertaken by Arcadis in April, May and June 2019 and included a total of nine visits. Arcadis divided the site into four areas A-D. The location of all areas surveys are shown within the drawing in Appendix A. All areas of the site were surveyed apart from Area D.

4.0.1 The 2019 survey results indicate that the site is capable of supporting 'good' populations of slow worms, with peak counts of slow worm exceeding five individuals in each area of the site. Area A (Ifield Brook Wood and Meadow LWS) was noted to support an 'exceptional' population of slow worm. Grass snake were relatively widely distributed throughout the site, with all areas of the site supporting a maximum population density of 'low', however, the peak count for grass snake did not exceed four adults. It was noted that common lizards were extremely limited across the site, with all records of this species recorded within the area of long sward semi-improved grassland and scrub within the south of Area B (Ifield Golf Club) and therefore the site is considered to support a 'low' population of common lizard. During the 2019 survey no adder were observed with the survey area.

[1] Natural England (2020) Reptileseptiles: surveys and mitigation for development projects: [online] Available from: https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences [Accessed 11/07/2020]
[2] Arcadis (October 2019). Land west of Ifield – Reptile Survey Report. Report reference: WOI-AUK-XX-WS-RP-EC-0006-01-Reptile Survey Report

5. METHODOLOGY

5.0.1 The methodology for this reptile survey followed best practice guidance outlined by Natural England[3], in the Herpetofauna Workers Manual[4] and Froglife Advice Sheet 10[5]. Artificial refuges, each measuring approximately 0.5m^2 were placed within areas of suitable reptile habitat, such as areas of coarse grass habitat that would be in direct sunlight and left to 'bed-in' for one week. A total of 120 refugia were placed across Area D. The location of the refugia is shown in Figure 1, whilst individual refugia are not shown, the survey lines indicate the locations of refugia with the corresponding numbers. The survey was conducted in accordance with the recommended densities for refuges given in Froglife Advice Sheet 10 (Froglife 1999). The refuges were checked for reptiles seven times in suitable weather conditions in accordance with JNCC guidelines (JNCC 2003).

5.0.2 Refuges were approached slowly and carefully in order to minimise disturbance to any reptiles on top, or beneath the refuge and maximise potential observations. In addition, visual searches were made of potential basking locations in other areas of suitable habitat within the site. This ensured that all areas were represented in the survey, and that the survey was not biased towards those reptiles more likely to use refugia. Records of reptile sightings from this method were recorded to the nearest refuge. Potential reptile refuges already present, such as discarded wooden boards and plastic sheets were also lifted to check for the presence of reptiles.

6. RESULTS

6.0.1 The weather conditions during the survey are shown in Table 6.1. Temperatures varied between 13 ºC and 16 ºC and a range of cloud cover meant that the extent of shade on the visits was variable at each refuge. All the visits were undertaken in suitable conditions.

Table 6.1: Survey Conditions

Visit	Date	Time (24hr)	Temperature (ºC)	% Cloud Cover	Wind Speed	Precipitation
1	6 May 2020	11:40 to 13:08	15	0	2 (Light air)	None
2	7 May 2020	10:20 to 11:30	16	0	1 (Light air)	None
3	15 May 2020	11:00 to 13:00	14 to 16	0	0 (Calm)	None
4	22 May 2020	09:40 to 11:00	16	90	1 (Light air)	None
5	27 May 2020	08:00 to 10:00	18	0	1 (Light air)	None
6	3 June 2020	09:00 to 11:00	13 to 15	100	0 (Calm)	None
7	11 June 2020	09:00 to 11:00	14	90	1 (Light air)	None

6.1 Findings

The reptile survey identified the presence of two species of reptiles, slow worm and grass snake. A peak count of three adult slow worms and two juvenile slow worms were identified across the site.

[3] Natural England. 2020. Reptiles: surveys and mitigation for development projects [online] Available from: https://www.gov.uk/guidance/reptiles-protection-surveys-and-licences. [Accessed 11/07/20].
[4] Joint Nature Conservation Committee (2003). Herpetofauna Workers' Manual. Tony Gent and Steve Gibson. Pelagic Publishing
[5] Froglife (1999) *Reptile Survey: an Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation*. Froglife Advice Sheet 10. Froglife, Halesworth

With one grass snake recorded on the last visit (11th June 2020). Table 6.2 provides a summary of the reptile findings and the peak count.

Table 6.2: Reptile Species Recorded

Visit	Date	Reptile Species Recorded (x/✓)		Comments
		Slow worm	Grass Snake	
1	6 May 2020	x	x	No reptiles recorded during visit.
2	7 May 2020	x	x	No reptiles recorded during visit.
3	15 May 2020	✓	x	One female slow worm identified under mat 112.
4	22 May 2020	✓	x	Two female slow worms identified under mat 112.
5	27 May 2020	x	x	No reptiles recorded during visit.
6	3 June 2020	x	x	No reptiles recorded during visit.
7	11 June 2020	✓	✓	Two juvenile slow worms under mat 112 and one adult grass snake mat 45.

X – No reptile species were recorded during the visit

✓ - Reptile species were recorded during the visit

6.1.1 No adder or common lizards were encountered during the survey.

7. EVALUATION

7.1 Evaluation

7.1.1 Froglife guidance[6] sets out criteria for assessing reptile populations and evaluating sites based on the size and importance of their reptile populations. The guidance acts as a mechanism to identify important reptile sites, termed Key Reptile Sites. The peak counts for adults of each species are then used to assess the significance of the reptile populations using the scoring system set out in Table 7.1.

Table 7.1: Scoring System for Evaluating Reptile Sites as Devised by Froglife.

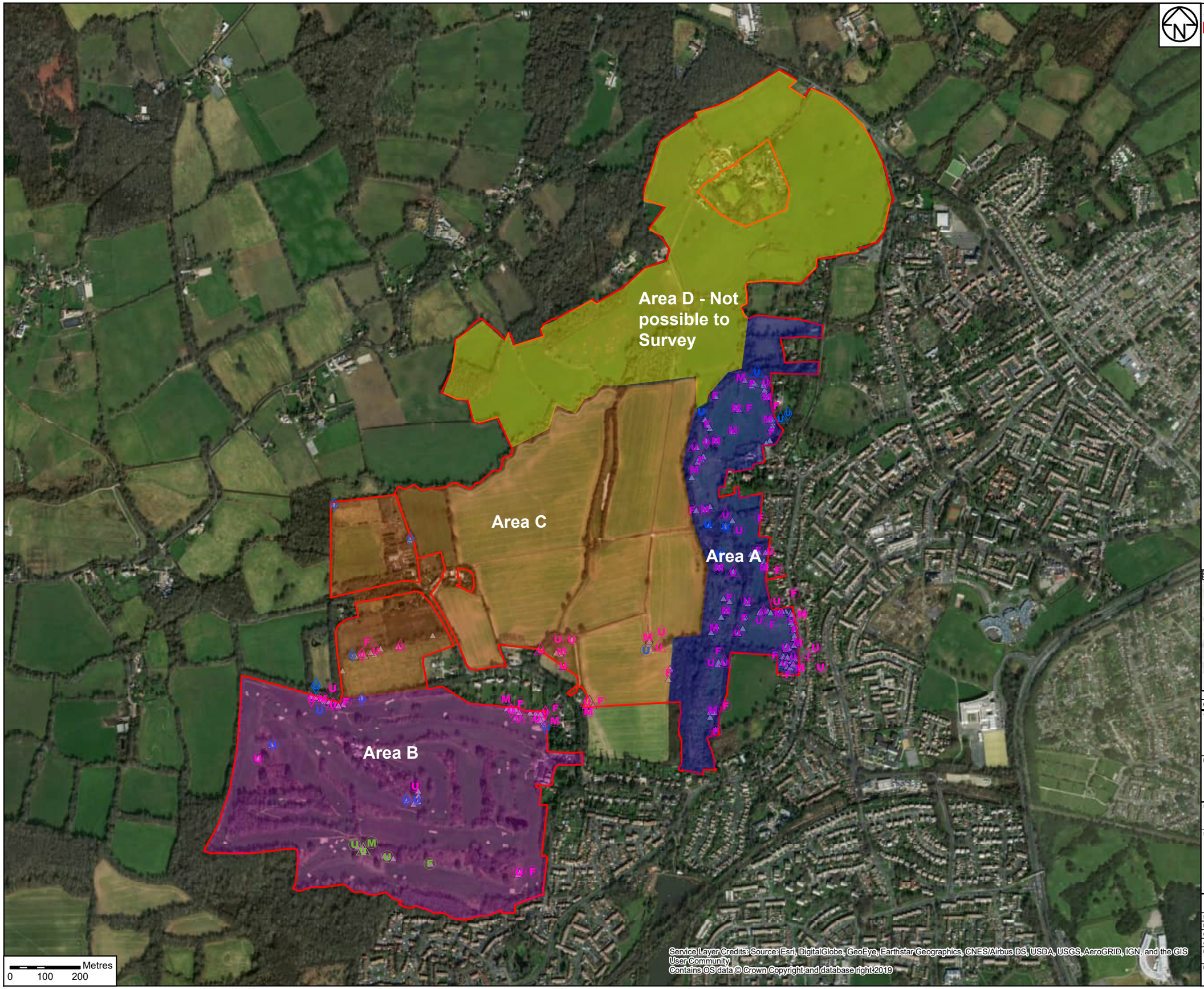
Species	Low Population	Good Population	Exceptional Population
Slow worm	<5	5-20	>20
Grass Snake	<5	5-20	>20

7.1.2 The results indicate that Area D site supports a low population of slow worm and grass snake; common lizard and adder are likely absent from the survey area.

[6] Froglife (1999). Froglife Advice Sheet 10: Reptile Survey (1999), [online]. [Accessed 15 May 2018]. Available from: http://www.froglife.org/wp-content/uploads/2014/01/FAS_10.pdf

APPENDICES

APPENDIX A. ARCADIS REPTILE SURVEY AREAS



Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

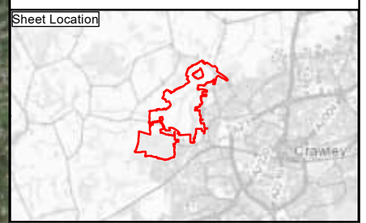
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	7/11/2019	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House 34 York Way London N1 9AB

Coordinating office: 5th Floor, 401 Faraday Street Birchwood Warrington WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 2: Results of All 2019 Reptile Surveys

	Status: S2	Revision: 01	
Scale	1:10,000	Date	7/11/2019
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

FIGURES

Legend

- Reptile Survey Lines
- Site Boundary

Figure Title
Reptile Survey Lines with IDs

Project Name
West of Ifield

Project Number	Figure No.
1620007949	1
Date	Prepared By
July 2020	AK
Scale	Issue
1:8,000 @A4	2

Client
Homes England

RAMBOLL

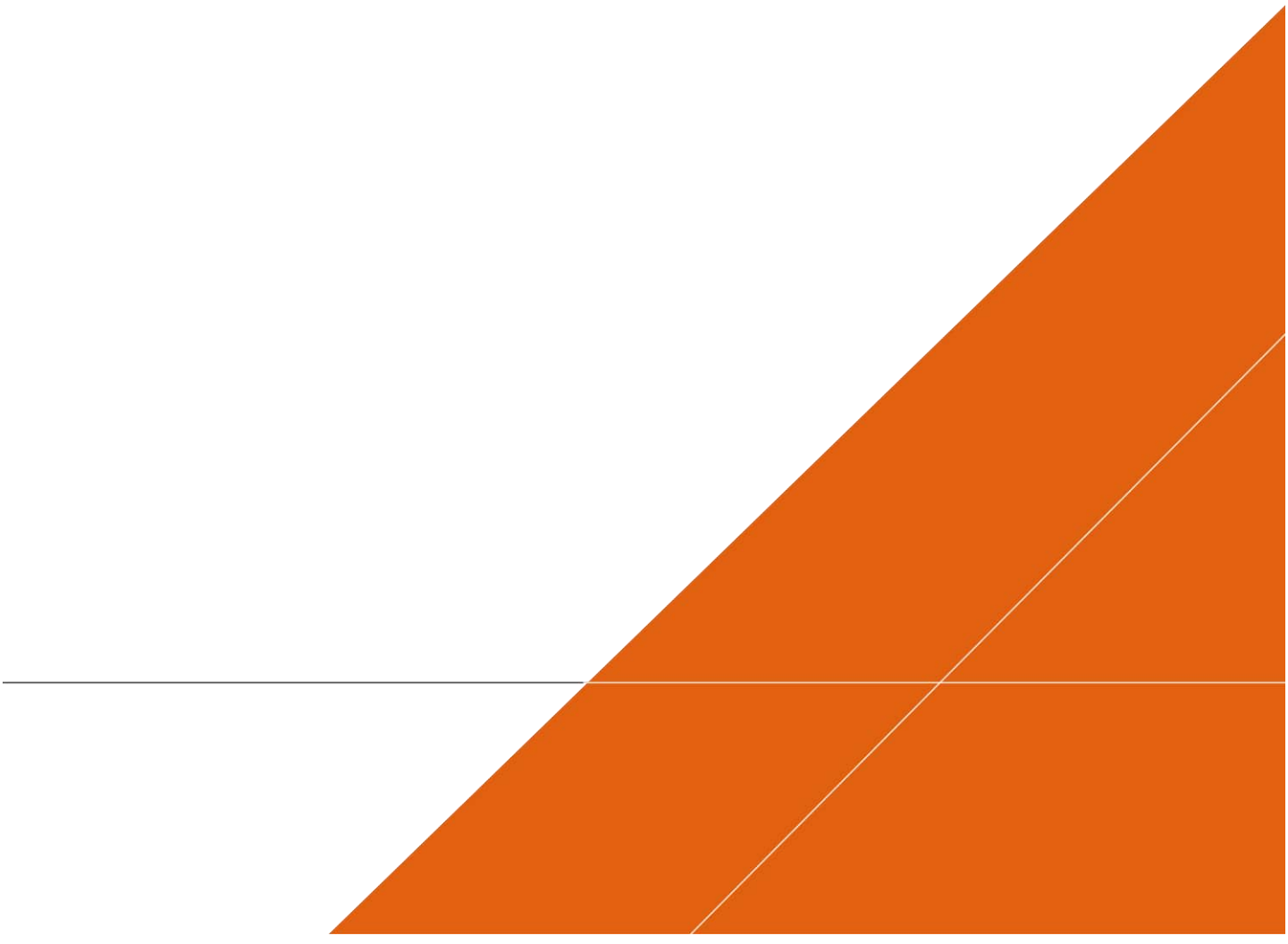
APPENDIX 8.15: LAND WEST OF IFIELD – REPTILE SURVEY REPORT

ARCADIS Design & Consultancy for natural and built assets

LAND WEST OF IFIELD

Reptile Survey Report

OCTOBER 2019



Reptile Survey Report

Author	Rory Roche
Checker	Stephen Hancock
Approver	Samantha Walters
Report Reference	WOI-AUK-XX-WS-RP-EC-0006-01-Reptile Survey Report
Date	OCTOBER 2019

VERSION CONTROL

Version	Date	Author	Changes
01	October 2019	Rory Roche	First Draft

CONTENTS

APPENDICES

Executive Summary

This report presents the findings of reptile surveys undertaken by Arcadis Consulting (UK) Ltd on behalf of Homes England, to inform an Environmental Impact Assessment (EIA) of a proposed masterplan for residential use on land to the west of Ifield, West Sussex.

An initial assessment of the proposed development site identified habitats suitable for supporting reptiles within the site, in the form of areas of long sward semi-improved grassland, dense and scattered scrub and woodland edge habitat, together with rubble piles, log piles and brash piles. A desk study was also undertaken, to identify existing information relating to the site, which returned records of reptiles within the immediate vicinity including grass snake records from within the site.

Reptile surveys were undertaken to determine which species of reptiles were present within the site and estimate population size. These surveys were undertaken in line with the methodology set out within *Survey protocols for the British Herpetofauna* (Sewell et al., 2013) and Froglife Advice Sheet 10 (1999). So that reptile populations could be estimated, the site was divided into areas based upon the habitat present, fragmentation by roads and habitat management. Areas A to D were identified as follows:

Area A –Ifield meadows and surrounding small parcels of grassland. The habitats in this area are predominantly semi-improved grassland.

Area B – Ifield Golf Course. Habitats in this area are predominantly amenity grassland with scattered trees and species-poor semi-improved grassland.

Area C – Arable fields and smaller fields managed for hay and/ or grazing.

Area D – Grassland, managed for cattle grazing. It was not possible to place reptile refugia in this area due to the presence of livestock (for both practical and health and safety reasons). The likely reptile population associated within this area was estimated by comparison with the population recorded within Area C. These areas have comparable habitat suitability for reptiles.

Surveys revealed slow worm to be widely distributed across the site, with all survey areas supporting at least a ‘good’ population of this species. Ifield Brook Wood and Meadows Local Wildlife Site (Area A) supported an ‘exceptional’ population of slow worm.

No part of the site supported a high population of grass snake. The peak counts in each areas did not exceed four adults. Grass snake were present in all areas and the population in each areas was identified as ‘low’.

Common lizard had a limited in distribution across the site. All sightings were within the area of long sward semi-improved grassland and scrub within Area B (Ifield Golf Club). The population in this area was assessed as ‘low’

Area A can be classified as a Key Reptile Site as it supported an ‘exceptional’ population of slow worm following the Froglife guidance (Froglife, 1999).

Area B supported three reptile species, and so this area also satisfies the criteria for a Key Reptile Site (Froglife, 1999).

The reptile species recorded within the site appear to be in ‘general decline’ nationally (Humphreys et al., 2011), appropriate mitigation and safeguard measures should be incorporated into the masterplan to ensure the long-term survival of these species within the site once developed.

In line with the mitigation hierarchy, the first step of the proposed mitigation would be avoidance. Where possible habitats of value to reptiles should be retained and enhanced to benefit reptiles and reduce the effects of fragmentation. Consideration should be given to the design and layout of green infrastructure to ensure that reptiles can safely move through the development once built. New habitat may need to be created to mitigate for those lost and facilitate the movement of reptiles. Displacement of individuals and reptile translocation may also be required to safeguard the reptile population.

1 Introduction

1.1 Overview

Arcadis Consulting (UK) Ltd, working on behalf of Homes England, was instructed to undertake reptile surveys to inform an Environmental Impact Assessment (EIA) of a proposed masterplan for residential use on land to the west of Ifield, West Sussex.

1.2 Site Location and Setting

The proposed development site is located to the west of Ifield, Crawley (central grid reference - TQ 24133 37360).

The site which covers approximately 200ha and supports a range of habitats including semi-improved grassland, arable fields, amenity grassland, woodland, grazing pasture, a network of hedgerows and several ponds. The River Mole flows west to east through the north of the site, and Ifield Brook flows south to north through the west of the site. Rusper Road passes through the south of the site.

The site is situated to the north-west of the A23 (Crawley Avenue) and is bordered by residential properties to the east, farmland to the west and woodland to the north and south.

An aerial image illustrating the site surveyed is presented in Image 1.

Image 1: Aerial imagery of the site

1.3 Proposed Development

The proposed development comprises the construction of approximately 3000 residential dwellings, three schools (two primary and one secondary) and associated infrastructure.

Due to the proximity of the site to Gatwick Airport (approximately 1.3km to the north), the development is to be concentrated towards the southern end of the site, with the northern part of the site forming open space.

1.4 Purpose of the reptile surveys

The purpose of the reptile surveys was to:

- identify areas of the site which supported habitats suitable for reptiles;
- determine the distribution of reptiles across the site;
- estimate the population size class of reptiles across the site;
- inform avoidance, mitigation, conservation and enhancement for reptiles within the masterplan and subsequent developments; and
- inform the need for further survey (if required).

1.5 Reptile biology

There are six native UK reptile species, namely;

- Grass snake (*Natrix natrix*);
- Common lizard (*Zootoca vivipara*);
- Slow worm (*Anguis Fragilis*);
- Adder (*Vipera berus*);
- Smooth snake (*Coronella austriaca*); and
- Sand lizard (*Lacerta agilis*).

All of these species have suffered a decline in their populations due to habitat loss and fragmentation from agricultural intensification and urbanisation. Reptiles are sensitive to habitat loss due to their complex habitat requirements for their various behaviours (basking, breeding, foraging, shelter from predation and hibernation). Most require a mosaic of grassland, open areas and light scrub as a minimum standard and some (such as the sand lizard) have much more particular habitat requirements, which are uncommon in the UK today. Due to their exothermic (cold blooded) nature, reptiles tend to be concentrated in the south of the UK, but the more common species are distributed throughout the UK. Those with widespread abundance and distribution are afforded lower levels of legal protection whereas the rarer species with concentrated distribution, such as the smooth snake and sand lizard, are classified as European Protected Species (EPS) and are afforded the highest level of protection under the Wildlife and Countryside Act (WCA, 1981, as amended) and the Conservation of Habitats and Species Regulations (2017).

Whilst the site does support areas of suitable habitat for common reptile species, the site does not support habitat for rare reptiles.

Below is a brief summary of each of the six species distribution and habitat requirements.

1.5.1 Snakes

1.5.1.1 Adder

Adder are distributed throughout the UK but absent from Ireland. They hibernate from October to March (temperature dependant) and their diet usually consists of smaller reptiles such as lizards; amphibians and rodents. Adder can be found in a wide variety of habitats, their main habitat preferences are areas of open land where prey are more abundant such as moors and grassland. They do not breed regularly and can take three years to reproduce if climate conditions are unsuitable. The adder is venomous, but use camouflage more as a method to avoid harm/predation.

No suitable habitat for adder is present within the site.

1.5.1.2 Grass snake

Grass snake are found in the southern regions of the UK. They hibernate from October to March and are associated with damp habitat areas such as watercourses, water bodies and marshes, due to the availability of amphibian prey. Female grass snake reproduce every other year, eggs are laid in June/July. Grass snake are not venomous but do excrete a foul-smelling substance if handled.

Suitable habitat for grass snake is present across the site.

1.5.1.3 Smooth snake

Smooth snakes are the rarest native British snake with their range mostly confined to the south east of Dorset, Hampshire and east Surrey. This is in part due to the fact that they predominantly feed on other reptiles, so are concentrated in the south of the country for the greater availability of prey. They are associated with heathland habitats but will also be found in areas of grassland. Much of their time is spent underground and they are rarely seen. The smooth snake hibernates from October-March and reproduce every other year, live young contained within a membrane are born.

No suitable habitat for smooth snake is present within the site.

1.5.2 Lizards

1.5.2.1 Common lizard

Common lizard are distributed throughout the UK. They can be found in a variety of different habitats including woodland, heathland, grassland, banks and ditches. They hibernate between October to March, usually within the crevices of log piles or rubble. During the summer months, they spend time basking in the sun to gain energy for foraging, preying on small invertebrates such as snails and earthworms. Lizards are ovoviviparous, fertilised eggs are not laid until the young is almost fully developed. Although one of the most common British reptiles, numbers are in decline due to habitat loss and fragmentation.

Suitable habitat for common lizard is present across the site.

1.5.2.2 Sand lizard

The sand Lizard is the rarest of all six reptile species, this is due to their niche habitat choice of dry or sandy heathland which is rare in Britain and has become increasingly rarer due to human influence in the past century. For this reason they are classified as a European Protected Species and are therefore afforded the highest level of protection under the WCA (1981, as amended). They prey on small invertebrates and their hibernation is from October to March, within piles of rubble or deadwood. Females lay eggs in June/July, within a sandy burrow, which hatch in August/September.

No suitable habitat for sand lizard is present within the site.

1.5.2.3 Slow worm

Slow worm are widely distributed throughout the UK and spend a large proportion of their time underground. Habitat preferences include embankments, allotments, rough grassland and wasteland. Like all UK reptiles they hibernate from October to March and young are produced in August to September. This species is also ovoviviparous, much like the common lizard.

Suitable habitat for slow worm is present across the site.

1.6 Legislation and conservation status

1.6.1 Legislation

Of the species likely to occur on site, slow worm, common lizard and grass snake are protected by national legislation. They are listed under Schedule 5 of the WCA (1981,as amended) which makes it an offence to:

- intentionally (or recklessly) kill, injure or take them; and
- sell, offer or expose for sale, or to possess or transport them for sale live or dead or any part of them or anything derived from them.

There is no licensing mechanism in place that permits development activities to proceed, which would otherwise result in the contravention of the WCA (1981, as amended). Where development activities would result in an offence being committed under the Act, it may be considered necessary to capture and remove the animals from the affected area and relocate them to a suitably prepared ‘receptor’ site.

1.6.2 Conservation status

The common reptile species are widespread but declining (as reported in by Humphreys et al., 2011). They are included on Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 (Anon 2006). They are also Sussex BAP Priority Species.

2 Approach and methodology

2.1 Introduction and Overview

This report outlines the results of the reptile surveys conducted across the site. This report includes the results of the following assessments:

- Habitat assessment
- Desk study; and
- Field surveys.

2.2 Habitat assessment

In order to inform the survey design, a site wide habitat assessment was undertaken to identify habitats and features likely to be of value for reptile species. This assessment was undertaken in combination with the Phase 1 habitat surveys carried out during May, June and July 2018. During this exercise, habitats which were considered suitable for reptiles were identified (including areas of long sward semi-improved grassland, scrub and woodland edge habitat, in addition to a number of rubble piles, log piles and brash piles) and mapped. This information was used to design and scope the presence/ likely absence reptile surveys.

2.3 Desk study

The purpose of the desk study is to review existing information available in the public domain and from biological data recorders and holders. Initially, desk-based ecological information was collated from within 2km of the site centre, with records of protected or otherwise notable reptile species obtained from the Sussex Biodiversity Records Centre (SBRC). Desk study information was also collected from a number of sources, including ecological appraisals from previous planning applications within the immediate surrounds of the site. Data sources included:

- Aerial photography (e.g. Google Earth mapping);
- The Multi-Agency Geographic Information for the Countryside (MAGIC) (available at: https://magic.defra.gov.uk/MagicMap.aspx);
- Information from previous surveys conducted on and around the site; and
- National Biodiversity Network (NBN) Atlas (available at: https://nbn.org.uk/).

The results of the above desktop study are presented and discussed in Section 3.

2.4 Field surveys

2.4.1 Overview

Specific surveys on the site for reptiles were conducted in 2019 by Arcadis and Babec Ecological Consultants (working on behalf of Arcadis), these surveys utilised the same methodologies to ensure that valid results were collected. The first two presence/ likely absence reptile surveys excluded a small portion of the site (as shown in Figure 2) due to the inability to contact the landowner, access was attained after these initial survey visits, such that the remaining five survey visits included this area. To ensure that a full complement of reptile surveys was undertaken with respect to the entire site, an additional two survey visits were carried out on the area of land omitted from the initial survey visits.

2.4.2 Reptile survey

Dedicated reptile surveys were undertaken by Rebecca Beale, Shaun Pryor, Tim Buckland and John Burnham in April, May and June 2019. Surveyor pen portraits are presented in Appendix D.

The survey area covered potentially suitable reptile habitat within the site where access was permitted. Where survey was not practical or in area which would expose reptile populations to increased risk of persecution this habitat was not surveyed. The omitted area covered a small percentage of the site, and it is considered that the survey effort allows robust conclusions to be made.

This survey area is presented in Figure 1.

The methodology used for the reptile surveys of the site was based upon guidance within the following documents:

- Sewell et al (2013) Survey protocols for the British herpetofauna; and
- Froglife (1999) Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10.

Suitable habitat areas were mapped as part of the habitat assessment outlined above before the reptile surveys were undertaken.

Artificial refugia made using bitumen felt mats (1m x 0.5m and 0.5m X 0.5m) were distributed where habitat was suitable, accessible and appropriate for survey, at a density in excess of 10 mats per hectare of suitable habitat. These mats were placed on three separate occasions as outlined below:

- Initial mat placement occurred in summer 2018, but it was not possible to complete the reptile survey in 2019 due to the weather conditions. These mats were left in place until the 2019 surveys.
- Some of the mats were no longer in place in April 2019 and so between the 1 and 5 April 2019 missing mats were replaced. To enable the 'new' mats to bed in only the 'Initially Placed Mats' i.e. those that had not moved since 2018 were checked on the first two survey visits (see Table 1 below).
- On 17 April 2019 more mats were placed in an 'additional area' in Area C where access had become available (Area C described in section 2.5 and location shown on Figure 2.

The mat locations are shown on Figure 1.

A total of nine survey visits were undertaken to determine presence/ likely absence of reptiles, under suitable weather conditions (when the temperature is neither too hot nor too cold for reptile basking). The dates of these survey visits are presented in Table 1.

Table 1: Areas surveyed on each survey visit

Survey Number	Survey Date	Initial Placed Mats surveyed?	Additional Mats surveyed?
1	17 April 2019;	Y	N
2	24 April 2019;	Y	N
3	29 April 2019;	Y	Y
4	7 May 2019;	Y	Y
5	17 May 2019;	Y	Y
6	24 May 2019;	Y	Y
7	28 May 2019;	Y	Y
8	5 June 2019; and	N	Y
9	11 June 2019.	N	Y

Survey visits involved carefully lifting each mat and recording details of any reptiles sheltering underneath before replacing the mat in its original position. When walking between mats, areas suitable for reptiles

were visually inspected. Incidental reptile sightings were also recorded. The order that refugia were checked and the time of day of the reptile checks was varied between the surveys to remove any survey bias.

2.5 Assessment of population density across the site

To identify the status of reptiles across the site, and inform the masterplan design, an interpretation of the population density of reptiles present across the site was required. Estimating reptile population densities is difficult for reptiles due to the factors summarised by Froglife (1999) and quoted below:

"the challenges involved in surveying them, because their ecology is not fully understood, each survey visit may only reveal a small sample of the population, and the proportion of animals available for survey varies according to weather, migration patterns, etc."

Various methodologies were considered for estimating the population of reptiles across the site. Due to the size of the site and purpose of the surveys, estimating populations from the peak counts recorded within the surveys was determined to be the most appropriate method. Multiple population density estimation matrices can be utilised, including one designed by the Herpetofauna Groups of Britain and Ireland (HGBI, 1998). These matrices were examined and an appropriate matrix which provided an adequate level of detail for the site was identified, that utilised for 'Key Reptile Sites Population Assessment'. Other assessment criteria would not have allowed for the varying value of different areas of the site to be identified.

The data collected enables a reptile population density across the site to be identified using the Key Reptile Sites Population Assessment (Froglife, 1999). The entire site was divided into 'areas' based on the habitats present, management of the habitats within these areas and the connectivity between the areas. These areas were then assessed for population density. This assessment includes the population bandings shown in the table below (only species present on site are shown in Table 22). The counts refer to peak counts in each area (i.e. the maximum number of adult reptiles of a given species seen on one survey visit).

Table 2: Population density bandings for reptiles from the Key Reptile Sites tool

Species	Low Population	Good Population	Exceptional Population
Grass Snake	<5	5 -10	>10
Common lizard	<5	5 – 20	>20
Slow worm	<5	5 - 20	>20

The site was divided in four areas (Area A to D) as illustrated on Figure 1and identified below:

Area A –Ifield meadows and surrounding small parcels of grassland. This area predominantly comprised semi-improved grassland.

Area B – Ifield Golf Course which supported amenity grassland, scattered trees and species-poor semi-improved grassland.

Area C – Large arable fields and smaller fields managed for hay and or grazing.

Area D – Cattle-grazed grassland. It was not possible to place reptile mats in this area due to the presence of livestock (for both practical and health and safety reasons). The likely reptile population associated within this area was extrapolated from the population recorded within Area C, as these two areas have comparable habitat suitability for reptiles.

Further details of the habitats present within these areas are presented in the Phase 1 Habitat Survey Report (Arcadis 2019).

Part of Area C was not surveyed in the initial two surveys due to access limitations, as described in section 2.4.2 above.

2.6 Survey limitations

Due to access restrictions an area within the west of the site (part of Area C) was excluded from the first two survey visits. Access was provided in May 2019 and mats were set out in this area, additional survey visits were undertaken to ensure the full complement of reptile surveys within suitable areas of habitat within the site.

Access was limited in parts of the site which were predominantly residential/industrial. Potentially suitable habitat for reptiles may be present in these areas. It is considered that sufficient information on the presence of reptiles across the site has been gathered to allow the likely presence or absence of reptiles based on the suitability of habitats and their connectivity to the habitats known to support reptiles. The level of detail obtained from the survey results is considered sufficient to inform the EIA and outline planning application.

Searches were carried out within the site only and it is likely that reptiles that reside in habitats adjacent to the site may use it for foraging. Potential impacts to off-site reptiles will be extrapolated from the results of the survey.

Some mats were moved during the survey period, through farm activities, interference from members of the public or by strong wind. Where this was occurred mats were re-instated on the next survey visit. It is possible that this disturbance may have deterred reptiles from using the mats. In parts of the site, it was not possible to replace mats due to safety concerns for the reptiles. A large number of mats were installed and it is considered that sufficient information on the presence of reptiles across the site has been gathered to inform this report.

The status of the reptile population on site is subject to change prior to development taking place, as reptiles are affected by changes in habitat management. However, if the management of the site remains stable the data gathered from these surveys will be sufficient to inform the outline masterplan, the impact assessment and the mitigation measures incorporated into the design of the development.

3 Results

3.1 Habitat assessment of the site

The site supported broadleaved woodland, scrub, ruderal vegetation and semi-improved grassland. Habitats with the potential to support common reptile species, including key habitat areas such as basking, foraging and hibernation areas were identified within the site. The habitats on site were assessed as not likely to be suitable for adder, but suitable for slow worm, common lizard and grass snake.

Potential habitat and features for reptiles within the site included:

- The semi-improved grassland, particularly the field margins with taller grass;
- The tall grassland and scrub on the edge of the broad-leaved woodland;
- Tall ruderal vegetation;
- Dense and scattered scrub;
- Rubble piles;
- Log piles; and
- Brash piles.

3.2 Desk study

The desk study returned records of reptiles within 2km of the site (SBRC), including records of grass snake, common lizard, slow worm and adder form within the last 10 years.

Three records of grass snake, were returned for Ifield Parish Church and Avebury Lodge Rusper Road, both located within the site.

3.3 Field survey results

3.3.1 Results Overview

Three of the four common species of reptiles were found within the site. These were: common lizard, grass snake and slow worm. The total number of reptiles recorded is presented in Table 3. No other reptile species were found. The full survey results are presented in Appendix A, and the weather data presented in Appendix B. A selection photographs of the reptiles observed on site is presented in Appendix C.

An overview of the results, showing locations where reptiles were recorded is presented in Figure 2.

Table 3: Results of 2019 reptile surveys

Species	Male	Female	Unknown (Adult)	Juvenile	Neonate	Total
Slow worm	117	115	99	1	0	332
Grass snake	0	0	56	0	0	56
Common lizard	2	1	6	0	0	9
Total	118	116	162	1	0	397

Slow worm were the most abundant species on site, grass snake were the second most common reptile, these were recorded as ‘unsexed’ as it not possible to readily identify their gender in the field, common lizard were the least common species to occur within the site.

Most juvenile reptiles do not survive past their first year of life, and so analysing the data in terms of the number of adults is more representative of the status of the reptile population on site. Table , below, shows the peak adult count per visit. The greatest number of adult slow worm (78) was recorded during visit 3 (29 April 2019), the highest peak adult count for grass snake (14) was recorded during visit 6 (24 May 2019) and

the greatest number of adult common lizard (3) was recorded during visit 2 (24 April 2019). The locations of the reptiles recorded during each visit are presented in Figure 3 to Figure 11.

Table 4 Adult reptile count per visit 2019

Visit Number	Date	Slow worm	Grass snake	Common Lizard	Total
Visit 1	17 April 2019	32	2	1	35
Visit 2	24 April 2019	32	3	3	38
Visit 3	29 April 2019	70	1	1	72
Visit 4	7 May 2019	51	3	2	56
Visit 5	17 May 2019	31	3	2	36
Visit 6	24 May 2019	20	6	0	26
Visit 7	28 May 2019	58	3	0	61
Visit 8	5 June 2019	0	0	0	0
Visit 9	11 June 2019	0	0	0	0
	Total	294	21	9	324

Few common lizard were recorded during the surveys. Common lizard also had a restricted distribution on site being recorded exclusively within the areas of long semi-improved grassland associated with the areas of woodland and scrub within the southern part of Ifield Golf Course (Area B). Common lizard were not found elsewhere on site.

Slow worm were widely distributed across the site, recorded within Ifield Brook and Wood Local Wildlife Site (LWS) (Area A), within Ifield Golf Course (Area B) and the area of agricultural and arable land (Area C).

Grass snake are a more wide-ranging species and were recorded within all areas.

3.3.2 Reptile population assessment (by area)

Overall, a range of population densities for each of the three reptile species have been recorded within the areas.

To assess the population of reptiles within each area it is necessary to identify the peak count of adult reptiles. This information is presented in Table 1.

Table 1: Reptile Peak Population Densities by Area

Site Area	Species					
	Slow worm		Grass Snake		Common Lizard	
	Peak count category on one survey visit	Population assessment	Peak count category on one survey visit	Population assessment	Peak count category on one survey visit	Population assessment
Area A	>20 (Visit 3)	Exceptional Population	<5 (Visit 4)	Low population	N/A	Absent
Area B	5 – 20 (Visit 3)	Good population	<5 (Visit 5)	Low population	<5 (Visit 2)	Low population
Area C	5 – 20 (Visit 7)	Good population	<5 (Visit 6)	Low population	N/A	Absent

3.3.2.1 Slow worm

The surveys indicate that the site as a whole is capable of supporting 'good' populations of this species, with peak counts of slow worm exceeding five individuals in each area of the site. Area A (Ifield Brook Wood and Meadow LWS) supports an 'exceptional' population of slow worm. Although Area D was not subject to survey it is likely that it too would support a 'good' population of this species through extrapolation of the results for Area C.

3.3.2.2 Grass snake

No part of the site supported a particularly high population of this species, with peak counts in all areas not exceeding four adults. Grass snake were relatively widely distributed throughout the site, with all areas of the site supporting a maximum population density of 'low'. Although Area D was not subject to survey it is likely that it too would support a 'low' population of this species through extrapolation of the results for Area C.

3.3.2.3 Common lizard

Common lizard was extremely limited in its distribution across the site, with all records of this species recorded within the area of long sward semi-improved grassland and scrub within the south of Area B (Ifield Golf Club). This area supports a 'low' population of common lizard. Although Area D was not subject to survey it is likely that it would not support this species through extrapolation of the results for Area C.

4 Discussion

4.1 Slow worm

A ‘good’ population of this species was recorded within each area of the site, with an ‘exceptional’ population recorded within Ifield Brook Wood and Meadow LWS (Area A). Slow worm are known to be common and widespread throughout West Sussex, given the relatively limited number of records returned for this species from SBRC, it is considered that the site overall, and Area A in particular, is likely to be of at least local to county level value to this species.

Based on the Key Reptile Sites Survey Assessment criteria (Froglife, 1999), given that Area A within the site supports an ‘exceptional’ population of reptiles, it is considered that Area A can be classified as a Key Reptile Site. Accordingly, as this species appears to be in ‘general decline’ nationally (Humphreys et al., 2011) and as Area A within the site is considered to be a Key Reptile Site, ensuring the maintenance of slow worm populations will be an important consideration for the planned development. It is understood that Area A is to be retained in the masterplan, and so the population of slow worm recorded here are unlikely to be significantly impacted by the proposed development.

4.2 Grass snake

Overall, the site in its entirety supports a ‘low’ population of grass snake which are distributed widely in suitable habitats across the site, such that no single area within the site was identified as being of particular value for this species. All areas had ‘low’ populations of this species. Given the number of grass snake records returned from the SBRC, it is evident that grass snake are common and widespread throughout the local area, such that it is considered unlikely that the site is of significant importance for this species at a wider geographical scale than at the local level. Nevertheless, this species appears to be in ‘general decline’ nationally (Humphreys et al., 2011), so all safeguarding individual grass snake and the grass snake population in and around the site will be an important consideration. Accordingly, it is considered that mitigation for impacts to this species will be required within the proposed development.

4.3 Common lizard

The site supported a small number of common lizard with all sightings of this species within the site occurring within the southern portion of Ifield Golf Club (Area B), in the long sward semi-improved grassland associated with the areas of woodland scrub in this location. In this area the population was ‘low’. As such, it is considered that the site overall is unlikely to be of particular value at the local value for this species. Given the relatively limited records of this species returned from the SBRC, the ‘low’ population common lizard recorded within Area B is likely to be of some value at the local level. This species appears to be in ‘general decline’ nationally (Humphreys et al., 2011), so all ensuring the maintenance of common lizard populations will be an important consideration within the proposed development.

4.4 Adder

During the surveys undertaken in 2019, no adder were observed within the survey area. However, it is known that this species has been recorded within the vicinity of the site from desk study data, which revealed a single incidence of adder located approximately 500m from the site. As such, a precautionary assessment that adder may be present at very low densities in the vicinity of the site has been made. It is however assessed that the mitigation proposals for the other common reptile species which were recorded on the site will also provide adequate mitigation for adder should they be present within the site in future.

4.5 Other native reptile species

The site is not suitable for smooth snake or sand lizard, given the lack of appropriate habitat for these species, nor did the desk study produce any records of them in the local area. As such no specific mitigation for these species is required.

4.6 Key Reptile Site Assessment

As set out above, it is considered that Area A can be classified as a Key Reptile Site as Area A within the site supports an ‘exceptional’ population of reptiles (slow worm) and, therefore, satisfies the criteria set out within the Key Reptile Sites Survey Assessment (Froglife, 1999).

Similarly, as Area B within the site was recorded to support three reptile species, this Area also satisfies the criteria set out within the Key Reptile Sites Survey Assessment such that it too is considered to form a Key Reptile Site.

5 Mitigation recommendations and further work

5.1 Introduction

This section of this report outlines the recommended mitigation proposed to ensure the favourable conservation status of reptiles within any proposed development. This section does not constitute a full outline of the reptile mitigation requirements on the site, this must be provided and evolved during detailed design.

5.2 Design mitigation

5.2.1 Avoidance

In line with the mitigation hierarchy, the first step of the proposed mitigation for impacts to common reptiles should be avoidance. Within the proposed development boundary, areas of value for reptiles should be retained and enhanced, particularly Ifield Brook Wood and Meadow LWS (Area A).

5.2.2 Mitigation

Within the proposed development, there will likely need to be embedded mitigation within the design to ensure that reptiles can utilise areas of the site and move through the site once built. This will likely include retention and enhancement of buffers of rough grassland around retained habitat features including hedgerows and between retained areas of habitats. In addition, sustainable drainage systems, where appropriate, should be designed to provide reptile habitats with the provision of rough grassland and hibernacula.

Elsewhere within the site, areas designed specifically to provide habitat for reptiles will likely need to be created, to provide of a mosaic of species-rich grassland and scrub, hibernacula and water bodies within the site.

5.3 Additional mitigation

During detailed design and construction of the development, it is likely that displacement and translocation actions will need to be undertaken to ensure that individual reptiles and populations of reptiles are safeguarded during the works. This is likely to include:

- Habitat Enhancement Creation and Management Plans, which will be produced with the detailed design and phasing of the development;
- Detailed Reptile Mitigation Strategies, which will be produced with the detailed design and phasing of the development;
- Habitat manipulation to displace reptiles into retained habitats adjacent to habitats to be removed; and
- Manual capture and translocation of reptiles from areas to be lost into retained / enhanced habitats.

There will need to be a suite of enhancement measures developed to ensure that areas identified for reptile translocation will be completed well in advance of the translocation commencing. It is also likely that a suite of monitoring and maintenance works will be required in relation to the proposed development when in operation.

6 Conclusions

Dedicated reptile surveys were undertaken across the site in 2019, three common reptile species were recorded, slow worm, grass snake and common lizard. In total, over 397 individual records of reptiles were recorded across the site.

Slow worm was widely distributed across the site, with all survey areas supporting at least a 'good' population of this species. Notably Ifield Brook Wood and Meadows LWS (Area A) within the site supported an 'exceptional' population of slow worm.

The results of the surveys suggest that no area of the site supported a particularly high population of grass snake, with peak counts in all areas not exceeding four adults. Accordingly, it can be seen that grass snake are relatively widely distributed throughout the site, with all areas of the site supporting a maximum population density of 'low'.

Common lizard was extremely limited in distribution across the site, with all sightings of this species were within the area of long sward semi-improved grassland and scrub within the south of Area B (Ifield Golf Course). This area was recorded to support a 'low' population of common lizard.

All reptile species recorded within the site appear to be in 'general decline' nationally (Humphreys et al., 2011), such that the implementation of appropriate mitigation and safeguards is required to ensure the long-term survival of these species.

In line with the mitigation hierarchy, the first step of the proposed mitigation for impacts to common reptiles will be avoidance. Within the development, many areas of value for reptiles will likely need to be retained and enhanced. In addition, within the development, there will need to be embedded mitigation within the design to ensure that reptiles can utilise areas of the site and move through the site, which will likely include some habitat creation.

During detailed design and construction of the development, it is likely that displacement and translocation actions will need to be undertaken to ensure that individual reptiles and populations of reptiles are safeguarded during the works. This is likely to include:

- Habitat Enhancement Creation and Management Plans, which will be produced with the detailed design and phasing of the development;
- Detailed Reptile Mitigation Strategies, which will be produced with the detailed design and phasing of the development;
- Habitat manipulation to displace reptiles into retained habitats adjacent to habitats to be removed; and
- Manual capture and translocation of reptiles from areas to be lost into retained / enhanced habitats.

7 References

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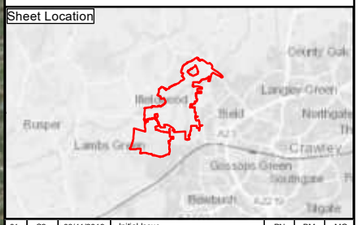
Figure 1: Location of Reptile Refugia for 2019 Surveys

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	06/11/2019	Initial Issue	PN	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office:
Arcadis House
34 York Way
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5th Floor, 401 Faraday Street
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Warrington
WA3 6GA

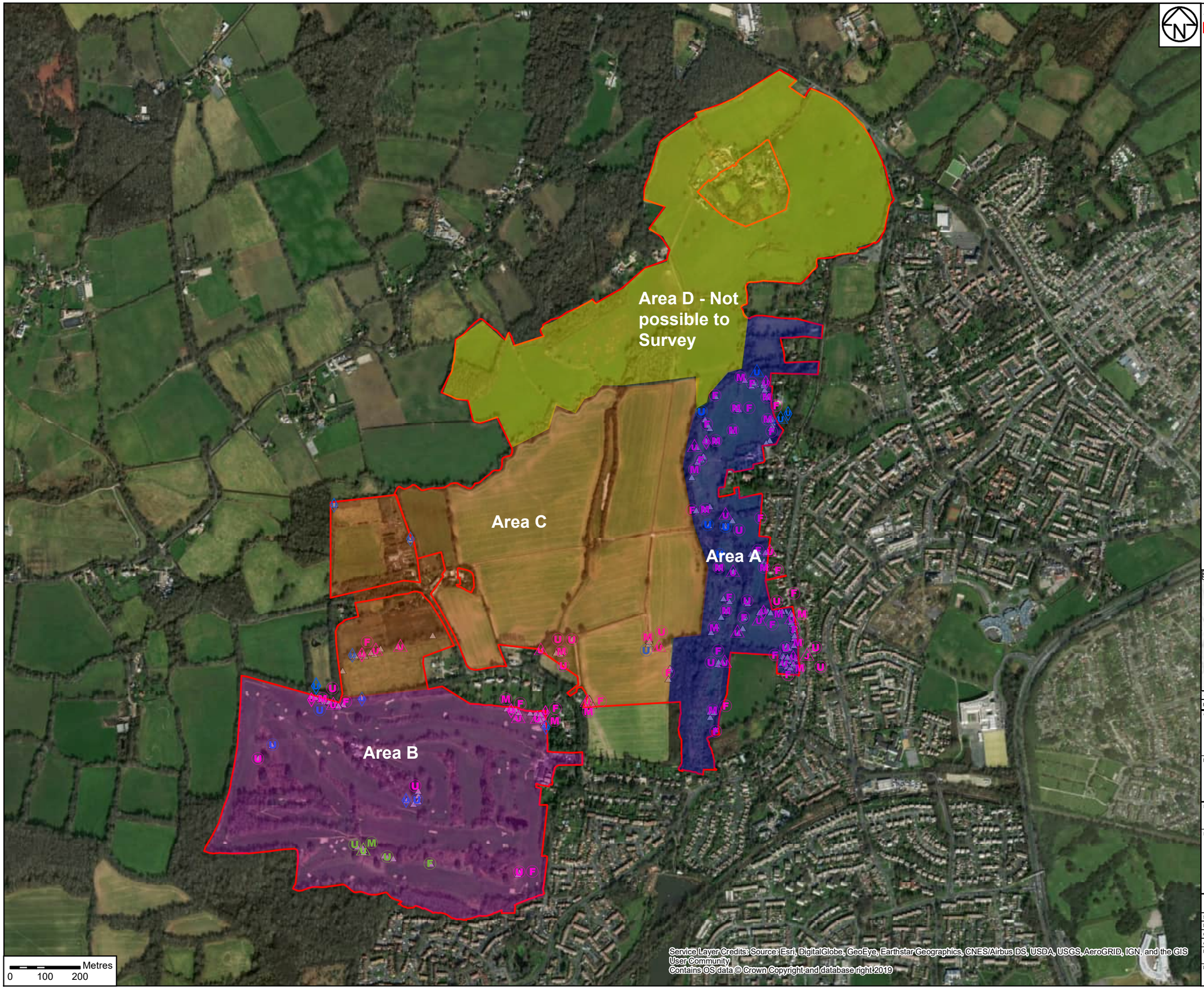
Project: Land West of Ifield

Drawing Title: Figure 1: Locations Of Reptile Refugia For The 2019 Survey

	Status: S2	Revision: 01	
Scale	1:10,000	Date	06/11/2019
Drawn By	P. Nehete		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:N | Originator | Volume | Location | Type | Role | Number

Figure 2: Results of All 2019 Reptile Surveys and Survey Areas



Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

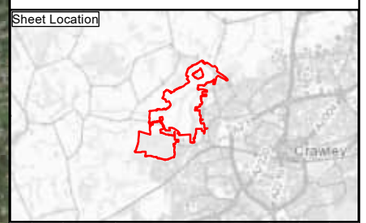
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



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01	S2	7/11/2019	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 2: Results of All 2019 Reptile Surveys

	Status: S2	Revision: 01	
Scale	1:10,000	Date	7/11/2019
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 3: Results of 2019 Reptile Survey - Visit 1

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

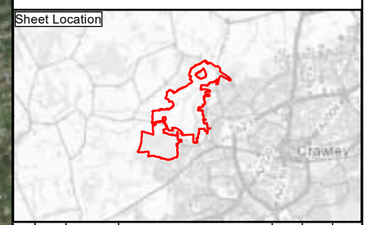
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 3 Results of 2019 Reptile Survey Visit 1

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 4: Results of 2019 Reptile Survey - Visit 2

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

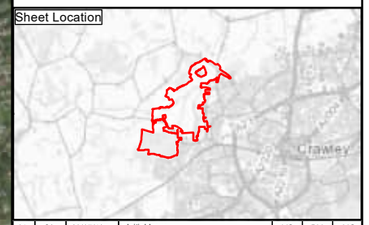
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



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01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office:
Arcadis House
34 York Way
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N1 9AB

Coordinating office:
5th Floor, 401 Faraday Street
Birchwood
Warrington
WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 4 Results of 2019 Reptile Survey Visit 2

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 5: Results of 2019 Reptile Survey - Visit 3

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

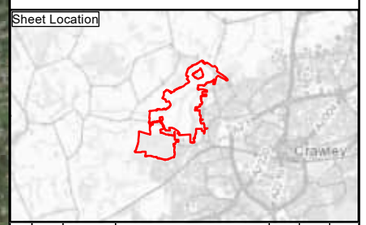
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

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Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 5 : Results of 2019 Reptile Survey Visit 3

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 6: Results of 2019 Reptile Survey - Visit 4

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

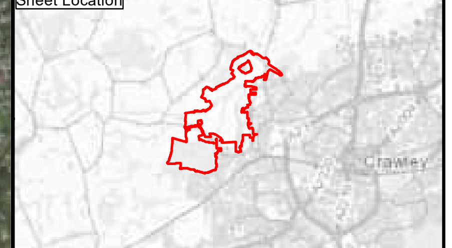
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB

Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 6 : Results of 2019 Reptile Survey Visit 4

	Status S2	Revision 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			
Drawing number	HE PIN / Originator / Volume / Location / Type / Role / Number		

Figure 7: Results of 2019 Reptile Survey - Visit 5

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

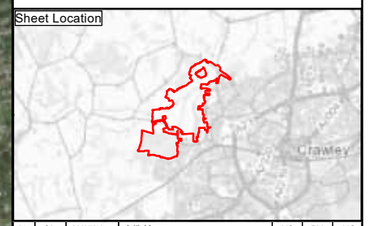
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

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Project: Land West of Ifield

Drawing Title: Figure 7 : Results of 2019 Reptile Survey Visit 5

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 8: Results of 2019 Reptile Survey - Visit 6

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

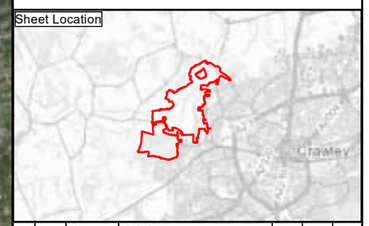
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 8 : Results of 2019 Reptile Survey Visit 6

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:\N | Originator | Volume | Location | Type | Role | Number

Figure 9: Results of 2019 Reptile Survey - Visit 7

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

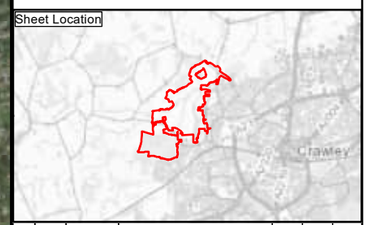
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



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01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB

Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 8 : Results of 2019 Reptile Survey Visit 7

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:N | Originator | Volume | Location | Type | Role | Number

Metres
0 100 200

Figure 10: Results of 2019 Reptile Survey - Visit 8

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

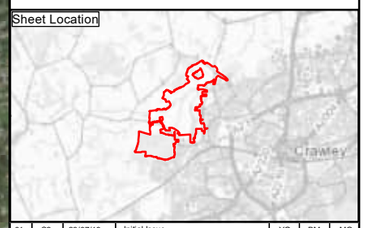
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

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Project: Land West of Ifield

Drawing Title: Figure 10 : Results of 2019 Reptile Survey Visit 8

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:N | Originator | Volume | Location | Type | Role | Number

Figure 11: Results of 2019 Reptile Survey - Visit 9

Legend

Site Boundary

Species

- Grass snake
- Adder
- Slow Worm
- Common Lizard

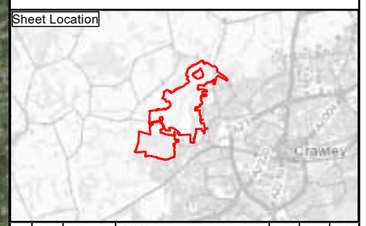
Lifestage

- A - Adult
- S - Sub-Adult
- J - Juvenile

Sex

- **M** Male
- **F** Female
- **U** Unknown (Juveniles are likely to be U)

Sheet Location



Rev	Status	Rev. Date	Purpose of revision	Drawn	Chck'd	Apprv'd
01	S2	23/07/19	Initial Issue	YG	BM	MG

Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House, 34 York Way, London, N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street, Birchwood, Warrington, WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 11 : Results of 2019 Reptile Survey Visit 9

	Status: S2	Revision: 01	
Scale	1:10,000	Date	23/07/19
Drawn By	Y. Giri		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P:N | Originator | Volume | Location | Type | Role | Number

APPENDIX A: Reptile Survey Data

Table 2: Reptile survey results

	Slow Worm						Grass Snake						Common Lizard						Notes
Visit no.	Adult Male (>230mm)	Adult Female (>230mm)	Unsexed	Juvenile	Neonate	Slow worm Total	Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Grass Snake total	Adult Male	Adult Female	Unsexed	Juvenile	Neonate	Common Lizard total	
1	9	19	4	2	0	34	0	0	2	0	0	2	0	0	1	0	0	1	
2	17	14	1	2	0	34	0	0	3	3	0	6	0	1	2	0	0	3	
3	42	23	5	8	0	78	0	0	1	6	0	7	1	0	0	0	0	1	
4	16	26	9	5	0	56	0	0	3	3	0	6	1	0	1	0	0	2	
5	7	10	14	7	0	38	0	0	3	6	0	9	0	0	2	0	0	2	
6	5	8	7	4	0	24	0	0	6	8	0	14	0	0	0	0	0	0	
7	17	18	23	9	0	67	0	0	3	5	0	8	0	0	0	0	0	0	
8	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	
9	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	
Incidental	0	0	0	0	0	34	0	0	0	0	0	0	0	0	0	0	0	0	

APPENDIX B: Survey Weather Data

Table 3: Weather data

Visit number	1	2	3	4	5	6	7	8	9
Date	17/04/2019	24/04/2019	29/04/2019	07/05/2019	17/05/2019	24/05/2019	28/05/2019	05/06/2019	11/06/2019
Surveyor	Shaun Pryor and John Burnham	Tim Buckland and John Burnham	Shaun Pryor, Alex Burrows and John Burnham	Shaun Pryor, Alex Burrows and John Burnham	Shaun Pryor, Alex Burrows and John Burnham	Shaun Pryor, Alex Burrows and John Burnham	Shaun Pryor, Alex Burrows and John Burnham	Rebecca Beale	Rebecca Beale
Start time	09:05	06:15	09:26	09:26	08:12	06:11	08:49	09:20	09:22
Finish time	16:24	12:15	17:12	14:55	14:55	10:09	14:33	11:58	12:05
Min Temp (°C)	11.9	11.2	9.7	8.9	10.4	11.0	10.9	15.0	15.0
Max Temp (°C)	17.1	17.1	13.7	13.3	12.8	14.4	14.2	16.0	16.0
Wind speed (Beaufort Scale)	1	0-1	1	2	2	1	3	0-1	0-1
Cloud cover (Oktas)	1	8	4-7	6	8	2	7	4	4
Rain	None	None	None	None	None	None	None	None	None

APPENDIX C: Photographs

Photograph 1: Multiple slow worm recorded during survey visit 1.

Photograph 2: Juvenile grass snake recorded during survey visit 2.

Photograph 3: Adult grass snake recorded during survey visit 5.

Photograph 4: Adult grass snake recorded during survey visit 6.

APPENDIX D: Key surveyor pen portraits

Table 4: Key surveyor pen portraits

Surveyor	CV details
Tim Buckland BSc MSc MCIEEM	Tim is a full member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and has a BSc in Marine Biology and an MSc in Biodiversity Survey. He has a strong understanding of ecology and holds survey licenses for great crested newts, bats, dormice and barn owls. Tim is an experienced surveyor of reptiles.
Shaun Pryor BSc GradCIEEM	Shaun has held a Natural England level 1 survey licence for dormice (class licence registration number: 2016-21149-CLS-CLS) for over six years. He has a BSc in Environmental Science. Shaun is experienced at undertaking Phase 1 habitat surveys and protected species surveys, including reptiles. He has also assisted with botanical and invertebrate surveys.
Rebecca Beale (Ecologist) BSc (hons) MSc MCIEEM	Rebecca has been a professional ecologist for 10 years. Rebecca can confidently survey for a range of species including badger, reptiles, water voles and bats.

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APPENDIX 8.16: BIRD HAZARD MANAGEMENT PLAN – WEST OF IFIELD

Intended for
Turner & Townsend on behalf of Homes England

Date
July 2021

Project Number
1620007949

BIRD HAZARD MANAGEMENT PLAN
LAND WEST OF IFIELD

RAMBOLL

BIRD HAZARD MANAGEMENT PLAN
LAND WEST OF IFIELD

Project No.	**16200007949**
Issue No.	**1**
Date	**July 2021**
Made by	**Laura Sanderson**
Checked by	**Malcolm Robertson**
Approved by	**Matthew Royall**

Made by:	Laura Sanderson
Checked/Approved by:	Matt Royall

Version Control Log

Revision	Date	Made by	Checked by	Approved by	Description
1	8 July 2021	LS	MR	MR	First Issue for Client Review (Draft)

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CONTENTS

APPENDICES

1. INTRODUCTION

1.1 Background

Ramboll UK Limited (Ramboll) was commissioned by Turner & Townsend plc on behalf of Homes England (the 'Client') to prepare a Bird Hazard Management Plan (BHMP) for land at West of Ifield, West Sussex (the 'site', as illustrated in Section 3 of this report), in relation to the redevelopment of the site for a mixed-use residential, school and associated infrastructure scheme (the 'proposed development'). The main part of the site is centred on grid reference TQ 24133 37360.

As background, the site is approximately 1.0 km south-west of Gatwick Airport. It is therefore within a 13 km radius of an aerodrome; within this distance the Civil Aviation Authority (CAA)[1] advise that implementation of a Bird Hazard Management Plan (BHMP) may be required by an appropriate authority.

The site is situated to the north-west of the A23 (Crawley Avenue) and is bordered by residential properties to the east, farmland to the west and woodland to the north and south. The site covers approximately 194 ha and supports a range of habitats including semi-improved grassland, arable fields, amenity grassland, woodland, grazing pasture, a network of hedgerows and several ponds. The River Mole flows west to east through the north of the site, and Ifield Brook, flows south to north through the site.

Due to the proximity to Gatwick Airport, the potential to increase the risk of bird strike by aircraft must be considered in the development proposals. A bird strike is defined as a collision between a bird and an aircraft which is in flight, or on a take-off or landing roll. Bird strikes arise from birds moving into the path of aircraft, generally because they are crossing an aerodrome or crossing flight paths as they move between feeding, roosting or nesting sites.

1.2 Proposed Development

The proposed development comprises the construction of approximately 3,250 – 4,000 residential dwellings, three schools, and associated infrastructure, with significant areas of public open space. Due to the proximity of the site to Gatwick Airport and in light of CAA requirements[1], the residential element of the development is to be concentrated towards the southern end of the site, with the northern part of the site primarily being used for open space, landscaping, a new road and ecology mitigation and enhancements.

1.3 Objectives and Scope

This report forms a BHMP for the site and aims to:

- describe the legal context and policy within which bird strike control measures will be undertaken;
- identify bird species of concern and evaluate the bird strike hazard risk;
- describe habitat creation measures which will be implemented to reduce bird strike hazard risk;
- describe the means by which target species are to be monitored and controlled at the construction stage and post-development;
- assign responsibilities for undertaking management;

[1] Civil Aviation Authority, 2014. Wildlife Hazard Management at Aerodromes CAP 772. http://www.caa.co.uk/docs/33/CAP%20772%20Final.pdf

The approach to this BHMP follows a safeguarding strategy through careful design and management. Bird control in accordance with the class of general licence approach (described in Section 2.1) would be avoided wherever possible and only instigated as a last resort.

In addition to Civil Aviation Authority guidance, BAA Advice Notes 3[2] and 8[3] were consulted. The report relates to the construction and operational phases of the proposed development.

1.4 Consultation

Gatwick Airport Ltd (GAL), together with their consultant Birdstrike Management Ltd (BML) were consulted in February 2021. A meeting was held on 17th February 2021 which was attended by representatives of GAL, BML, Homes England and Ramboll. During the meeting GAL and BML provided comments on an initial technical note prepared by Ramboll (ref: TN-1620007949_3-Bird Strike 20210122, dated 22nd January 2021). This BHMP takes the discussions in the meeting and comments on the initial technical note into account.

1.5 Responsibilities

Design of the proposals will determine bird strike risk to a certain extent and the designers will need to bear bird strike issues in mind at all times so that the design can contribute to bird hazard management, which will be determined prior to construction. Responsibilities for management and implementation of features in relation to bird hazard during the construction stage will lie with the principal contractor for each stage of the proposed development. Bird strike experts and/or experienced ecologists will be consulted for advice where appropriate.

It is likely that a dedicated management company will be set up to manage the public parts of the site post-construction. The contents of this BHMP will be communicated to the management company and authorised persons and the management company should take ownership of the actions in the plan.

Should any other bird management issues arise on the site that cannot be implemented by authorised persons, the services of a suitably qualified and experienced ecologist or pest control specialist would be required.

[2] BAA, 2016. Safeguarding of Aerodromes. Safeguarding Advice Note 3: Wildlife Hazards around Aerodromes.
[3] BAA, 2007. Safeguarding of Aerodromes. BAA Advice Note 8: Potential Bird Hazards from Building Design. http://www.aoa.org.uk/wp-content/uploads/2014/02/AN08-Birds-Building-Design-Oct-2007.pdf

2. LEGISLATION, PLANNING POLICY AND SAFEGUARDING SYSTEMS CONTEXT

This section describes the legal context, planning policy and safeguarding systems which apply to wild bird protection and bird strike management in the vicinity of aerodromes.

2.1 Legal Context

The key legislation with respect to bird control measures is the Wildlife & Countryside Act (1981) as amended (WCA) and the Countryside and Rights of Way Act (2000). The key provisions of the WCA in relation to the management of bird populations at the proposed development are listed below:

All wild birds, their nests and eggs are protected. In general it is an offence to kill or injure; capture or keep (alive or dead); destroy or take the eggs; and destroy, damage or take the nest of any wild bird while it is in use or being built.

Species listed on Schedule 1 of the WCA, are additionally protected against disturbance whilst building a nest and whilst on or near a nest containing eggs or young.

Under the WCA, Class and General Licences permit the killing or taking and the destruction of nests and eggs of certain species by authorised persons, subject to certain terms and conditions.

Class Licence CL12 *Birds: licence to kill or take them for air safety purposes* allows the capture alive or killing of wild birds on or around aerodromes for air safety purposes. It covers the killing and taking of birds on aerodromes or within a 13 km radius of them, for the purpose of preserving air safety only, covering the following species:

- Canada geese *Branta canadensis*;
- Egyptian geese *Alopochen aegyptiaca*;
- great black-backed gulls *Larus marinus*;
- greylag geese *Anser anser*;
- herring gulls *Larus argentatus*;
- lesser black-backed gulls *Larus fuscus*;
- mallards *Anas platyrhynchos*;
- ring-necked parakeets *Psittacula krameri*;
- feral pigeons *Columba livia*;
- rooks *Corvus frugilegus*;
- starlings *Sturnus vulgaris*; and
- woodpigeons *Columba palumbus.*

Use of Class Licences must be arranged in advance by registering with Natural England. Section 5 of the WCA describes prohibited methods of killing, injuring or taking birds under Class Licences. The list is comprehensive and includes the use of poisonous or stupefying substances, dazzling devices (including artificial light), sighting devices for night shooting, use of sound recordings, and the use of mechanically propelled vehicles, including boats.

As of 1 January 2021, General Licence GL41 allows the killing or taking of, taking damaging or destroying nests of and taking or destroying eggs of certain species of wild birds to preserve public health or public safety. This applies to Canada goose, feral pigeon, jackdaw *Corvus*

monedula and monk parakeet *Myiopsitta monachus*. In order to act under the authority of a general licence, the authorised person must be eligible to do so (in accordance with the conditions of the licence) and must comply with the terms of the licence and therefore the law. It is not necessary to register to use the GL41 licence.

Providing that they are not nesting or rearing young, all birds can be harassed by non-lethal means at all times.

2.2 Planning Policy

National and local planning policies require that the planning system protects and enhances the natural environment by providing net gains in biodiversity.

The site falls into the jurisdiction of two local authorities, most of the site is located within Horsham District Council (HDC) and the remaining area is within the boundary of Crawley Borough Council (CBC) on the eastern edges of the site. The development will consider policy from both local authorities.

The Draft Horsham District Local Plan 2019-2036[4] is currently being updated following consultation in March 2020. The following briefly summarise chapters and policies that are relevant to Biodiversity Net Gain and biodiversity in general and to the development proposals at the site. These are outlined in Chapter 7 Conserving and Enhancing the Natural Environment. (For full details please follow the hyperlink provided in the foot note below).

The key and most relevant policy will be Strategic Policy 27 - The Natural Environment and Landscape Character. Under this policy proposals will be required to maintain and enhance the Green Infrastructure Network, the Nature Recovery networks and secure net gains in biodiversity.

Additional policies to consider in relation to biodiversity will be:

- Policy 25 – Environmental Protection
- Policy 25 – Strategic Policy: Environmental Protections
- Policy 26 - Air Quality
- Policy 32 - Local Greenspace
- Strategic Policy 28 - Countryside Protection
- Strategic Policy 30 - Protected Landscapes
- Strategic Policy 31 - Green Infrastructure and Biodiversity

The Horsham District Local Plan Regulation 18 (2020) sets out the policies relating to biodiversity through Policy 31 Green Infrastructure and Biodiversity**,** which includes the following:

1. Development will be supported where it can demonstrate that it maintains and enhances the existing network of green infrastructure, the Nature Recovery Network, natural capital and biodiversity. Proposals that would result in the loss of existing green infrastructure or part of the Nature Recovery Network will be resisted unless it can be demonstrated that new opportunities will be provided that mitigates or compensates for this loss and ensures that the ecosystem services of the area are retained.

2. Proposals will be expected to retain and enhance existing freshwater features, hedgerows, trees and deciduous woodland and the provision of additional hedgerow and tree planting will be sought subject to appropriate consideration of local and wider context, habitats and species.

[4] Horsham District Council 2019: Draft Horsham District Local Plan 2019-36. [online] Available from: https://strategicplanning.horsham.gov.uk/consult.ti/LocalPlanReview/viewCompoundDoc?docid=10336756&sessionid=&voteid=&partId=10339124

3. Where the felling of a tree is necessary, for example due to disease, replacement planting with a suitable species and location to retain the link with the wider network of habitats and Green Infrastructure, will be required.

4. Development proposals will be expected to remove invasive species and will be required to contribute to the enhancement of existing biodiversity and deliver, as a minimum, a 10% net gain through the delivery of appropriate on-site biodiversity net gain or, where this is not practicable, to off-set the delivery to the Nature Recovery Network.

5. Proposals should create and manage appropriate new habitats, taking into account pollination, where practicable. The Council will support new development which retains and /or enhances significant features of nature conservation on development sites. The Council will also support development which makes a positive contribution to biodiversity, and where appropriate the Nature Recovery Network, through the creation of green spaces, and linkages between habitats to create local and regional ecological networks and allow the movement of wildlife through development sites.

The Crawley Local Plan was adopted in 2015. The following paragraphs provide a summary of the draft and adopted policies that are relevant to delivering Biodiversity Net Gain.

The most relevant policies are found within in the Green Infrastructure Supplementary Planning Document[5] (SPD) this contains policies on the green infrastructure networks, trees, open space, biodiversity and Countryside and the High Weald area of outstanding natural beauty (AONB).

Part 5 of the SPD is Policy ENV2 - Biodiversity. This supports the Local Plans objective to deliver a net gain in biodiversity over the period of the plan.

The summary provided within the document states that ENV2 includes:

- An expectation to incorporate features to encourage biodiversity where appropriate;
- Where possible enhance existing features of nature conservation value within and around the development;
- A hierarchy of biodiversity sites to be conserved and enhanced where possible;
- Protection of sites of special scientific interest (SSSI) adjacent to Crawley;
- Protection of and support for management of ancient woodland, aged and veteran trees;
- Minimising impacts on local wildlife sites;
- Support for the designation of new sites; and
- The need for sufficient survey information to accompany applications.

Additional policies which are relevant to biodiversity and the site are listed as follows:

- Policy CH2 Principles of Good Urban Design
- Policy CH3 Normal Requirements of All New Development
- Policy CH6 Tree Planting and Replacement Standards
- Policy CH7 Structural Landscaping
- Policy CH9 Development Outside the Built-Up Area
- Policy CH10 High Weald Area of Outstanding Natural Beauty
- Policy CH11 Rights of Way and Access to the Countryside
- Policy CH13 Conservation Areas
- Policy CH17 Historic Parks and Gardens
- Policy ENV1 Green Infrastructure
- Policy ENV2 Biodiversity
- Policy ENV3 Local Green Space
- Policy ENV4 Open Space, Sport and Recreation

[5] Crawley Borough Local Plan 2015-2030 [online] Available from: https://crawley.gov.uk/sites/default/files/documents/PUB285867.pdf

- Policy ENV5 Provision of Open Space, Sport and Recreational Facilities

2.3 Safeguarding Systems

According to the Civil Aviation Authority[6], safeguarding systems need to be put in place to guard against new or increased wildlife hazards caused by developments both on and in the vicinity of an aerodrome. They should include details of activities employed by the aerodrome operator to control or influence areas beyond the boundary of the airfield, in the vicinity of the aerodrome (up to 13 km and in some instances beyond, or less than 13 km, as determined by risk and effectiveness of interventions) and where practicable, could include:

- Establishment of a process with the local planning authorities for consultation on proposed developments that have the potential to be wildlife attractant within 13 km of the aerodrome;
- Means to influence land use and development surrounding the aerodrome such that the strike risk does not increase and, where practicable, is reduced;
- Means to help encourage landowners to adopt wildlife control measures and support landowners' efforts to reduce wildlife strike risks, via land use agreements; and
- Procedures to conduct and record the results of off-aerodrome site monitoring visits.

[6] CAP 772: Wildlife Hazard Management at Aerodromes. Civil Aviation Authority (2017)

3. SITE INFORMATION

3.1 Baseline Ecology Conditions

A Phase 1 habitat survey undertaken for the project indicated that the development site comprised a range of habitats, but was dominated by open grassland and arable fields, interspersed with small woodlands, trees, ponds and wet ditches (Figure 1). A golf course is present in the south of the site. The area also supported amenity grassland and plantation woodland[7].

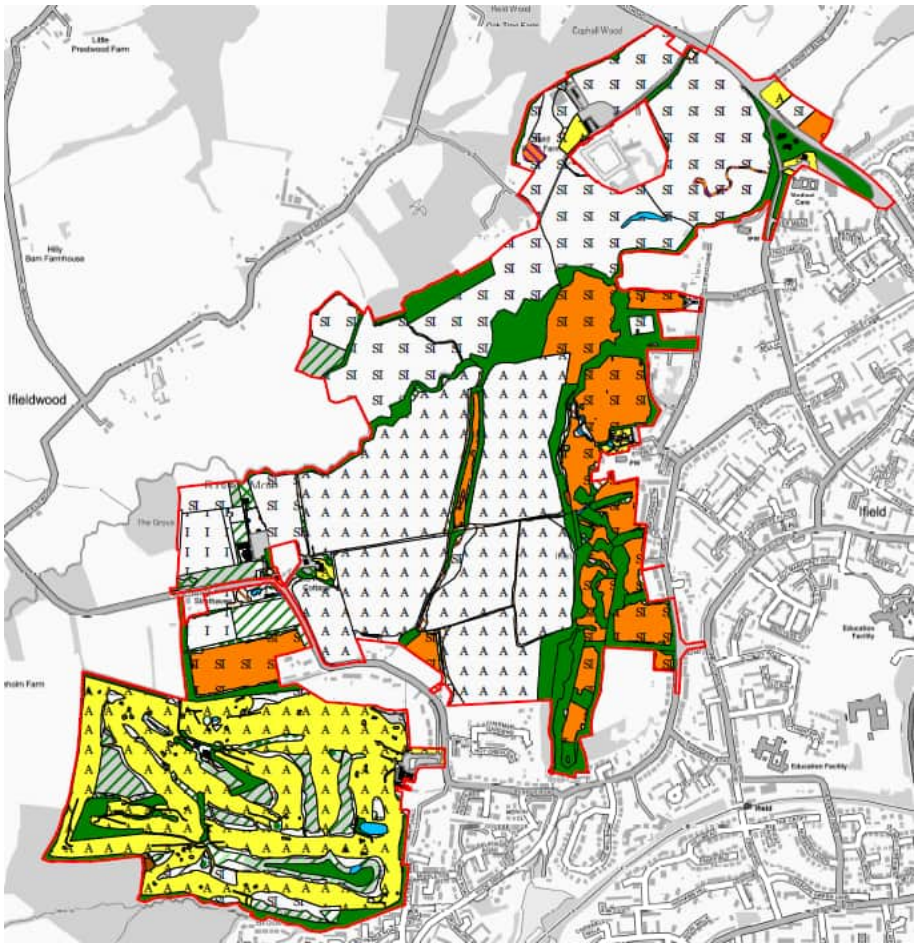


Figure 1: Phase 1 Habitat Map (Ramboll)

Breeding and wintering bird surveys were undertaken at the site in 2018/2019[8] [9], with additional early breeding bird surveys in March to April 2020[10]. The results indicate that the site supports a range of woodland and farmland birds. The majority of bird registrations were small songbirds, with lower numbers of corvids, game birds, pigeons and doves, gulls, and wildfowl. Breeding birds were found across the site but were concentrated around hotspots, these being Ifield Brooks Meadows, woodland areas, river corridors and some grassland areas.

The songbirds included small mixed-thrush flocks in the winter (redwing *Turdus iliacus* (<180), fieldfare *Turdus pilaris* (1), song thrush *Turdus philomelos* (<23) and mistle thrush *Turdus viscivorus* (<9)) along with a peak count of 40 starling (of which 49 were also recorded in the breeding bird survey).

The existing habitats attracted low numbers of wildfowl and waders, including individual moorhen *Gallinula chloropus*, mallard, Mandarin duck *Aix galericulata*, grey heron *Ardea cinerea* and little

[7] Arcadis (2019): Land West of Ifield. Extended Phase 1 Habitat Survey Report.
[8] Arcadis (2019): Land West of Ifield. Breeding Bird Survey Report Including Barn Owl Assessment.
[9] Arcadis (2019): Land West of Ifield. Wintering Bird Survey.
[10] Ramboll (2020): R1620007949Land West of Ifield. Early Breeding Bird Survey March to April 2020.

egret *Egretta garzetta*, which were associated with the ponds and wet ditches. Low numbers of Canada goose and Egyptian goose were recorded on the semi-improved grassland and amenity grassland around the site. It is understood that areas in the north of the site are periodically prone to flood, however the bird surveys did not record any significant congregations of wildfowl or waders in these areas. Furthermore, the desk study held few records of wildfowl or wading birds within 2km of the site which confirms that the area does not attract large flocks of wildfowl and wading birds.

No gull breeding was recorded in the surveys, but these species were recorded using the grassland on the site. A peak count of 152 black-headed gull *Chroicocephalus ridibundus* was recorded during the winter bird survey, and peak counts of 40 herring gull, five common gull, and one lesser black-backed gull were recorded in the breeding bird surveys (though not breeding).

Woodpigeons were recorded in relatively high numbers (<1,041 peak count wintering and <163 in the breeding bird survey). Any flooding of grassland or arable fields would deter winter flocks of woodpigeons from using such areas. Corvid numbers were lower, but a peak count of 119 jackdaws was recorded during the breeding bird survey. The wood pigeons and jackdaws were associated with the areas of grassland and mature woodland edge habitats.

3.2 Completed Development Ecology Conditions

The proposed development does not contain substantial new habitat features likely to be attractive to significant numbers of large bird species or flocks of birds. Specifically:

- There will be no large expanses of unmanaged grassland areas;
- There will be no new large open water features;
- A large proportion of the development will be private residential, comprising terraced, semi-detached and detached houses, without large expanses of flat roofs;
- There will be no uncovered food-waste storage areas;
- There will be no access points into the buildings for large or flocking birds.

The landscape proposals' shrub and tree planting will be suitable for use by foraging and nesting birds, and along with the building roofs and newt mitigation ponds and other watercourses, are likely to be the main bird hazard areas of the site. The shrub planting is likely to be attractive to small passerine species for nesting, which are considered less likely to pose a risk to aviation. The low-level nature of the planting is less likely to be suitable for nesting by larger species and flocking species. Flat and shallow-pitched roofs and canopies are likely to be attractive to roosting and loafing gulls and pigeons, but will be limited in extent. Newt mitigation ponds and other watercourses, as well as managed areas of species-rich grassland, will be designed to be less attractive to large and flocking species.

4. BIRD RISK EVALUATION

4.1 Target Bird Species

Approximately 90% of recorded bird strike incidents in the UK occur within the perimeter of the aerodrome itself and at low altitudes (<500ft), and approximately 70% of bird strikes occur at altitudes less than 200ft [11]. It should be noted that in the period 2012-2016, 95.3% of bird strike incidents reported no damage to the aircraft[12].

Birds considered of highest risk to aircraft are those that occur in flocks and/or are large in size (>100g), including gulls, waders, waterfowl, pigeons, starling, crows, game birds, raptors, and swifts *Apus apus*, swallows *Hirundo rustica* and martins. Small songbirds are generally considered less of a risk to aviation as they do not form dense flocks[13]. The Civil Aviation Authority (CAA) figures confirm that, in the UK, gulls create the largest risk of bird strike (Appendix 1). Parakeets are also listed on CL12, being of risk due to their flocking tendencies. They are more common in London than in rural areas. Species/species groups including waders, raptors, swifts, swallows and martins are listed by the CAA, but are not included on CL12.

In the following sections, loafing refers to bird behaviour not associated with breeding or feeding activity, (i.e. roosting, sleeping or resting birds) and nesting refers to breeding birds.

4.2 Summary of Pre-development Bird Strike Risk

The majority of birds associated with the site are small songbirds, which are considered to be a low risk to aviation due to their small size and relatively solitary nature. Starlings are an exception as they can gather in large numbers, particularly in winter. The site does not support large flocks of wildfowl and these birds are not abundant in the wider area. Furthermore, there are no permanent large wetlands in the area, that could attract these birds in the future.

Wood pigeons occur in relatively high numbers on the site. Wood pigeon prefer to nest in mature deciduous trees, but will also nest in climbing plants, hedgerows and ledges on buildings. Woodpigeons aggregate on farmland where they feed on spilt grain, seeds and vegetation, but also visit suburban gardens, a peak count of >1000 is significant, but this is a common and widespread species that is likely to be present in comparable numbers in the surrounding area.

Jackdaws (with a moderate peak count of 119) are associated with open grassland and parkland and nest in holes in trees, rocks or man-made structures. They mainly feed on invertebrates, but will also take fruit, seeds and carrion.

Black-headed gulls (with a moderate peak count of 152) are associated with open grassland and ploughed fields/ bare soil where they feed on invertebrates, seeds and carrion. In towns they may also feed on refuse. Black-headed gulls nest on or close to the ground.

Herring gulls (of which moderate numbers (40) were recorded) are opportunist and feed mainly on animal material and scavenging scraps. These birds nests on ledges of cliffs and buildings.

None or very few of the following species have been recorded on the site:

- Canada geese;
- Egyptian geese;
- Greylag geese;
- Great black-backed gulls;

[11] https://www.easa.europa.eu/document-library/researchprojects/easa2008c49
[12] Civil Aviation Authority (2017) Reported Birdstrikes 2012-2016. https://www.caa.co.uk/Data-and-analysis/Safety-and-security/Datasets/Birdstrikes/
[13] CAP 772: Wildlife Hazard Management at Aerodromes. Civil Aviation Authority (2017)

- Lesser black-backed gulls;
- Parakeets;
- Gamebirds;
- Raptors;
- Swifts;
- Swallows; and
- Martins.

5. SITE DESIGN AND HABITAT CREATION

Several of the existing areas of notable bird activity identified in the breeding bird survey would be retained through the development (i.e. Ifield Brooks Meadows, woodland areas and river corridors) and so bird activity (and thus bird strike risk involving birds from these areas) would likely be comparable (or potentially lower due to cat predation or greater recreational pressure).

New habitats which would attract target species such as large ponds, lakes, wetlands and reedbeds; large blocks of closed canopy broad-leaved woodland; and large areas of unmanaged open grassland or cultivated land will not be created as part of the proposed development.

Several of the bird species recorded in the surveys are known to use urban habitats and would be expected to use the developed site, for instance starling, wood pigeon, jackdaw, thrushes and gulls. Predicting what the net situation would be will form part of the Environmental Statement, but populations of these species would likely be broadly comparable with the baseline, or with populations in areas of Crawley with a similar housing/land-use mix. The absence of large arable fields post-development would mean that significant flocks of gulls and pigeons would likely not occur.

The following section describes in more detail habitat creation measures and how this can be achieved whilst minimising bird strike risk.

5.1 Habitat Creation Measures

In accordance with the HDC and CBC Local Plan, landscaping should focus on creating a network of structurally complex green corridors through the site rather than large blocks of homogenous habitats. This should comprise a matrix of rough grassland, wildflower meadows, hedgerows and scrub or heath habitats. These habitats will also benefit other species, if they are connected to suitable habitats in the wider landscape, but the lack of large open habitats will deter flocks of birds from loafing or foraging on the site.

5.1.1 Existing Habitat Retention and Recreation

Where possible, existing high-quality habitats will be retained within the scheme. If habitats that are destroyed are recreated nearby on a like-for-like basis, this should not increase the risk of bird strike, particularly if these are designed in a mosaic of habitats to avoid large areas attractive to flocks of birds. Where new habitats need to be created to compensate for habitat loss or to enhance biodiversity, these should target Species of Principal Importance known to occur in the area and avoid attracting the birds which have been identified as posing a particular risk to aircraft i.e. wood pigeons, wildfowl, gulls and jackdaws.

5.1.2 Grassland

Grasslands and meadows would, where possible, be well-drained and have a closed sward, maintained at >30cm to deter breeding, feeding and roosting waterbirds that prefer short grassland where they can see approaching predators. Shrub and tree planting would be used to avoid large expanses of grassland attractive to geese and gulls.

5.1.3 Aquatic Habitats

New pond and wet ditch creation is required at the site to mitigate for impacts on great crested newts *Triturus cristatus.* Good pond design (in accordance with Million Ponds Project advice[14]) will be instigated to avoid increasing the risk of bird strike. This will include:

[14] Million Ponds Project (undated). Supplementary Advice Factsheet: Designing Wildlife Ponds to Minimise the Risk of Birdstrike.

- Creating small waterbodies, which are known to be less likely to attract flocks of birds and large waterfowl. Networks of smaller ponds would be created. Where larger waterbodies are required, these will be located further away from Gatwick Airport and/or close to existing waterbodies. Design of such waterbodies would seek to reduce their attractiveness for waterbirds (for instance through having long thin waterbodies rather than circular areas of open water);
- Making ponds shallow where possible. This prevents diving birds such as common tern *Stirna hirundo* using them for foraging, and can prevent fish from colonising, making them less suitable for foraging heron and increasing the biodiversity value for amphibians and invertebrates;
- Avoid positioning ponds within large areas of improved or amenity grassland, which provides foraging opportunities for swans and geese;
- Where possible, siting ponds away from arable land, which can provide focal points for large flocks of gulls;
- Avoid large expanses of reedbeds which can be attractive to starling flocks (although small reedbeds and tall marginal vegetation surrounding ponds can be encouraged, to make the ponds less suitable for large and flocking bird species); and
- Locating ponds in sheltered locations, within woodlands or close to hedgerows and areas of scrub, or providing new planting screening around them, to make them less attractive to waders. Large trees should be avoided which can attract roosting corvids.

Aquatic habitats would be planted with aquatic plants to provide new habitats for invertebrates and great crested newts, such as spiked water-milfoil *Myriophyllum spicatum*, shining pondweed *Potamogeton lucens*, horned pondweed *Zannichellia palustris*, bladderwort *Urticularia* spp., broad-leaved pondweed *Potamogeton natans*, curled pondweed *Potamogeton crispus*, amphibious bistort *Persicaria amphibium*, arrowhead *Sagittaria aquatilis*, water forget-me-not *Myosotis Scorpiodes* and marsh cinquefoil *Potentilla palustris*.

Sustainable Drainage Systems (SuDS) and rain gardens would be used in formal landscaped areas. Small trees or other natural screening structures can be used to obstruct bird flight lines. No significant concentrations of wildfowl have been recorded, but is understood that as a general principle, surface water attenuation/SUDS features would be designed to draw down at greenfield run off rates and would not hold significant permanent surface water. The water features would be designed to 'drain down' in 24 hours.

Areas of wet woodland may also be created where the hydrology is suitable.

5.1.4 Trees and Woodland

Tree planting would avoid the creation of blocks of large trees species (i.e. above 20m) which are attractive to roosting corvids. Small groups (<15 trees) of smaller tree species would be planted at low density (4 m centres). Tree and shrub planting would be dominated by wind-dispersed species such as field maple *Acer campestre*, common alder *Alnus glutinosa*, silver birch *Betula pendula*, hazel *Coryllus avellana*, privet *Ligustrum vulgare*, goat willow *Salix caprea*, grey willow *Salix cinerea* and gorse *Ulex europaeus*), with fewer fruit producing species which can attract large flocks of wintering thrushes.

5.1.5 Living Roofs and Green Walls

Very large areas of living roofs will be avoided, especially in the north of the site, as these may provide nest sites for herring gulls; however, smaller areas of living roofs may be feasible in the south of the site and green walls may be used to provide habitat for songbirds, bats and invertebrates.

5.1.6 Landscaping Planting

The landscape planting proposals represent an attractant for foraging and nesting birds. The proposed landscape planting includes retained and new planting including a number of fruiting species which are likely to be attractive to foraging birds. However, the majority of landscape planting is not likely to be significantly different from pre-construction habitats in terms of attractiveness to birds. Within the landscape planting, where possible the fruiting species will be dispersed amongst non-fruiting species.

5.1.7 Residential Gardens

Residential gardens would be relatively small and surrounded by fences, making them less attractive to target species. Bird feeding and provision of bird boxes within small residential gardens is unlikely to attract large and flocking species, but rather small songbirds which are unlikely to pose a risk to aviation.

5.2 Building Design

Shallow pitched roofs are attractive to birds for nesting and loafing. Flat roofs may be attractive for loafing/nesting gulls. A limited number of shallow pitched and flat roofs may potentially be proposed, with some public buildings such as schools. Residential houses would have traditional pitched roofs which are less attractive to nesting and loafing birds. Nesting opportunities for small songbirds would be provided on and within buildings, and residents would not be discouraged from providing further nesting opportunities for such species.

6. CONSTRUCTION STAGE BIRD HAZARD MANAGEMENT

The clearance of habitats present for construction activities will change the suitability of the site for birds, potentially favouring certain species at certain times of year and deterring other species. The high levels of disturbance are likely to make the site less attractive to many bird species. Site clearance could potentially if unmanaged, in some parts of the site, create large open areas or areas of bare ground where these are not currently present. Such large open areas would deter most small passerine species recorded in the surveys from using these areas, however, if construction activity were not continual, these areas could potentially attract other species. Notably, flocks of black-headed gull, other gull species and potentially other species such as wood pigeon, starling and jackdaw could potentially be attracted to large bare areas created in the construction stage (particularly if vegetation is allowed to develop again after clearance has taken place).

6.1 Control Measures

Existing site uses, including agricultural land, will be retained in operation for as long as possible prior to commencement of each respective construction stage. Therefore, areas of the site would not be 'cleared' in early, separate phases well in advance of the respective construction stage (and the hazard from bird strike would not increase). Areas of the site would typically be programmed for clearance immediately prior to construction. This will minimise the amount of time that cleared bare earth will be left undisturbed with the opportunity to re-vegetate, and would reduce the risk of cleared areas being flooded and becoming attractive to waterfowl

Stockpiled material would be covered with sheeting or other appropriate material to prevent it being attractive to gulls and other species. Similarly, waste requiring storage on site prior to removal for disposal would be covered to avoid increasing bird activity.

Construction Environmental Management Plans (CEMPs) will be implemented for each phase, which would consider the risk of bird strike in the various development parcels and provide measures to deter flocking of relevant bird species. These will include management measures such as avoiding large areas of bare soil and stockpiled material, and as a last resort carrying out operations to move birds on or implementing other bird deterrent measures.

If bird deterrent measures are employed these will involve the use of some or all of the following equipment:

- a hand-held distress call used by nominated personnel;
- a portable distress call broadcasting unit equipped with a standard set of calls provided for aerodrome use; and
- use of Irri-Tape or other similar bird-repellent tape, tied to tree branches to scare birds.

Static and automated devices will only be employed for limited times to achieve bird dispersal from small areas. Relevant staff members will be trained in the use of the above deterrent techniques.

A common sense approach will be encouraged, emphasising the need to manage the site to prevent nesting and loafing in open areas, and feeding, and to be alert to significant populations of bird species which may be present from time to time.

7. POST-DEVELOPMENT BIRD HAZARD MANAGEMENT

7.1 Control Measures

The primary method of reducing the number of birds on a site is to reduce the attractiveness of the site for large and flocking bird species. This involves reducing the space and attractiveness of potential nesting and shelter areas on the site, eliminating potential sources of food on the site (i.e. litter, open rubbish bins etc.) and, if necessary, performing sporadic and varied scaring techniques.

The measures identified below should be implemented for the life of the proposed development to ensure that the site does not pose a bird hazard risk.

7.1.1 Elimination of Feeding Opportunities

There will be a presumption against bird feeding on the site, either intentionally or by default (i.e. from discarded waste). Signs will be erected in recreational areas such as children's play space to deter people from feeding birds. Regular waste collection from commercial and residential properties will be undertaken as part of municipal waste collection. As the largest threat is likely to be from gulls, good site hygiene will be essential to avoid attracting herring gulls to the area. Bins will be stored in locked internal areas where possible. Waste storage from commercial facilities such as food retail, bars and cafes will be in sealed, self-closing containers. This will also apply to community amenity facilities such as the education facilities.

In the event that significant numbers of target species are attracted to the landscape planting for foraging, fruiting species may need to be removed and replaced with non-fruiting varieties.

Large open areas such as parks, school playing fields and playgrounds can potentially attract foraging gulls (which are attracted to discarded food) and design or operational measures to address such concentrations of birds would be devised.

7.1.2 Detection of Nesting and Loafing

Large and flocking species will be discouraged from nesting on any site buildings. Nesting opportunities for smaller passerine species through provision of bird boxes would be provided and encouraged. For commercial and public buildings, a safe roof access methodology will be developed to allow foot access to flat or shallow pitched roofs and regular inspections and monitoring will be undertaken. Where roof access is not possible, the roofs can be observed from ground level using high-powered binoculars, or using night vision equipment to assist in detecting birds after dark. The gull breeding season stretches from March to June. During this time, weekly roof inspections will be undertaken from roof or ground level in order to detect evidence of any nesting gulls and to devise any measures to further dissuade them from nesting/breeding in these locations. For the remainder of the year, roof inspections and monitoring will be undertaken at least once a month.

7.1.3 Deterrence and Physical Intervention

Where deemed necessary if problems with target bird species are identified, target bird species will be deterred from nesting or loafing on any buildings or other features. This will be determined by and implemented by the relevant appointed management team(s). Bird deterrent measures will be adopted to disperse roosting and loafing birds from the site. As during the construction stage, this will involve the use of some or all of the following equipment:

- a handheld distress call used by nominated personnel;
- a portable distress call broadcasting unit equipped with a standard set of calls provided for aerodrome use; and

- use of Irri-Tape or other similar bird-repellent tape, tied to tree branches to scare birds.

Static and automated devices will only be employed for limited times to achieve bird dispersal from small areas. All security personnel and relevant staff members will be trained in the use of the above deterrent techniques.

At all times of the year a common sense approach will be encouraged, emphasising the need to prevent nesting and loafing on buildings, and feeding, and to be alert to significant populations of bird species which may be present from time to time.

7.1.4 Further Measures

Should it be found that the management measures described in the previous sections are not wholly effective; more involved measures will be considered. Such measures would include designed deterrent fixtures, and should be fitted by experienced operators. These could include:

- the installation of wires, approximately 30 cm above roof surfaces and other structures, such that birds attempting to land are prevented from doing so as they are unable to fold their wings easily;
- bird spikes can be placed on roofs where birds are persistently loafing. They should completely cover the roof and be placed in such density so as to completely exclude birds from landing. Spikes may also be placed on the tops of external lights, or high towers where birds are found to be loafing. Bird spikes are standard products and should be sited, fitted and maintained in accordance with manufacturers' recommendations; and
- bird netting can be placed over the roofs. This should be sited, fitted and maintained in accordance with the manufacturers' recommendations. This method is unpopular with the public, unsightly and can have implications for animal welfare if birds become snagged, and would be undertaken as a last resort.

In the event that excessive breeding is attempted by target species despite all preventative measures having been undertaken, nests and eggs may be removed by an authorised person following registration with Natural England for the class licence to kill or take certain wild birds to preserve air safety. All up-to-date terms and conditions of the licence will be complied with in such a case, including reporting of all action taken. Natural England bird licensing is evolving and the licensable species or methods available are likely to be subject to change, and therefore it is imperative that advice is sought in advance of considering this option. Furthermore, the public perception (including from residents) is likely to be unfavourable.

Breeding behaviour can be detected easily and includes territorial and aggressive behaviour; persistent loafing in one location by a pair of birds; nest building; egg laying and incubation.

If the nominated personnel judge the deterrent methods in use to be insufficient at any time an inspection by a qualified ecologist should be undertaken immediately, and further advice sought. GAL may need to be consulted

8. MONITORING

The monitoring strategy for construction and post-development stages will be devised and agreed in consultation with GAL. This will include a monitoring regime targeting congregations of target species, and an escalation process if these are identified. Options would be discussed with GAL in advance of any measures to deter or scare birds being implemented, to ensure all management options have been exhausted first. The mechanisms for control and responsibilities would be confirmed at this stage. The need to undertake measures to enable lethal control under licence would only be implemented as a last resort, following consultation with GAL, where all other measures have been explored first.

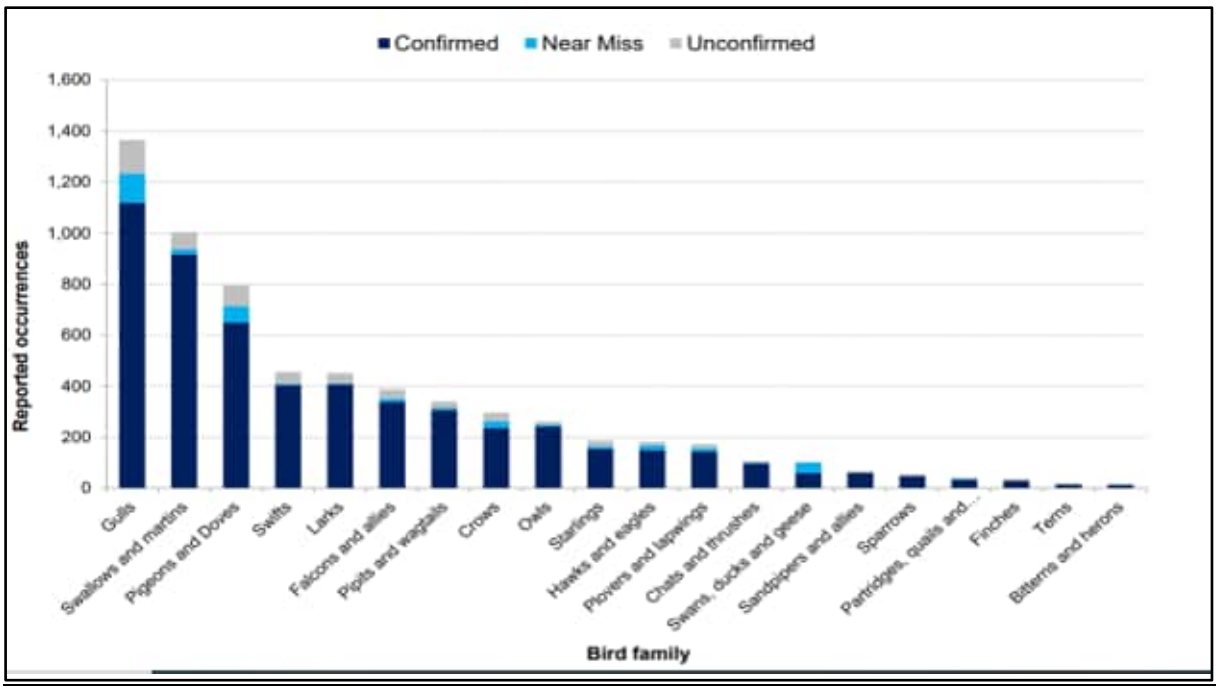
8.1 Recording of Control Activities

At all stages of the project, surveillance logs will be maintained, recording details such as date and time of day that significant bird numbers are observed and the species of birds involved; the behaviours which have triggered particular actions or control measures; the actions employed; and the effectiveness of these actions/control measures. A short visual guide will be available which will give details of the target species (i.e. lesser black-backed gull and herring gull) involved and allow their identification by the person carrying out monitoring activity.

9. FURTHER SURVEYS

Update breeding bird surveys (particularly for target bird species considered to pose a risk to air safety) should be undertaken every two to three years throughout the planning, construction and post-development period to ensure bird information is up to date, with a thorough understanding of how bird species are using the site.

APPENDIX 1
BIRD STRIKE BY TAXA



Bird strike incidents 2012-2016 by taxa (taken from Civil Aviation Authority data) Error! Bookmark not defined.

APPENDIX 8.17: LAND WEST OF IFIELD – EARLY BREEDING BIRD SURVEY MARCH TO APRIL 2020

Intended for
Turner & Townsend on behalf of Homes England

Document type
Report

Date
July 2020

LAND WEST OF IFIELD
EARLY BREEDING BIRD SURVEY MARCH TO APRIL 2020

RAMBOLL

LAND WEST OF IFIELD
EARLY BREEDING BIRD SURVEY MARCH TO APRIL 2020

Revision	**1st Issue**
Date	**14th July 2020**
Made by	**Dan Sullivan**
Checked by	**Malcolm Robertson**
Approved by	**Matt Royall**
Description	**Bird Survey Report**

Ref	R-1620007949_1-Breeding Birds

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APPENDICES

FIGURES

1. INTRODUCTION

1.1 Scope of the Report

1.1.1 Ramboll UK Limited (Ramboll) has been appointed by Turner & Townsend plc on behalf Homes England (herein referred to as 'the Applicant') to undertake an early breeding bird survey in respect of a proposed development at Land West of Ifield.

1.1.2 This current report presents baseline information on breeding birds derived from a supplementary survey to a previous 2019 Breeding Bird Survey carried out on site by Arcadis between May and July 2019[1], covering the later part of the breeding season. The current survey was commissioned to cover the early part of the breeding season with visits in March and early April 2020, in case early breeding birds were missed in the previous survey. Due to the large size of the site and issues in gaining access to some areas, survey visits were carried out in two stages per month with the survey in March and April covering all accessible site areas over two site visits each month.

1.2 Site Description

1.2.1 The site surveyed is proposed to be developed as a large scale housing development with around approximately 3000 - 4000 dwellings, three schools and associated infrastructure. There will also be significant areas of public open space, mainly in the north of the site. The site directly adjoins the town of Ifield. The main part of the site is centred on grid reference TQ 24133 37360 (as shown in the appended Figure 1).

1.3 Legislation

1.3.1 All wild birds in the UK are protected under the Wildlife and Countryside Act 1981 (as amended) 'the WCA 1981'. This makes it illegal to:

i. Kill, injure or take any wild bird;
ii. Take, damage or destroy the nest of any wild bird while it is being built or in use;
iii. Take or destroy the eggs of any wild bird; and
iv. Possess or control any wild bird or egg unless obtained legally.

1.3.2 Some species, listed on Schedule 1 of the WCA 1981 receive a higher level of protection, making it illegal to intentionally or recklessly disturb any bird listed on Schedule 1 while nest building or at or near a nest containing eggs or young, or to disturb any of its dependent young.

2. METHODS AND LIMITATIONS

2.1 Methods

2.1.1 This report is based on a survey of accessible site areas and inaccessible site areas viewed from adjoining public areas. The site boundaries are shown in Figure 1.

2.1.2 The survey approach was based on the Common Bird Census methodology[2]. The surveyor walked a route across the survey area approaching to within 50 m of all safe points (where access had been agreed or where public access was available) to ensure adequate coverage but at the same time being careful to avoid double counting birds. Visits were made on the following dates with weather conditions as described below:

[11] Arcadis. Land West of Ifield. Breeding Bird Survey including Barn Owl Assessment. November 2019.
[2] http://www.bto.org/sites/default/files/u16/downloads/forms_instructions/bto_bird_species_codes.pdf [accessed 06/06/17]

March survey visit:

Stage 1 – Survey of main farmland area 11/3/20, 06:50 – 13:25. Cloud cover 75%, calm increasing to moderate breeze by end of survey, no rain, temp 9-13 ºC; and
Stage 2 – Survey of golf course and all other areas where accessible or visible from footpaths and public land 12/3/20 , 07:00 – 14.00. Cloud cover 90%, light air at start, increasing to gentle breeze by end, one heavy rain shower near end of survey, temperature 4-10 ºC.

April survey visit:

Stage 1: Survey of main farmland areas - 1/4/20, 06:40 – 12.20. Cloud cover 50%, calm at start, increasing to light breeze by end of survey, no rain, temperature 1-10 ºC; and
Stage 2: Survey of all other areas where accessible or visible from footpaths and public land 10/4/20, 06:50 – 09:55. Cloud cover 40%, calm at start, increasing to light air by end of survey, no rain, temperature 7-22 ºC.

2.1.3 The survey areas differed slightly in the two months and the areas surveyed in each are shown on Figure 1 and Figure 2.

2.1.4 For most species, birds exhibiting breeding behaviour were considered to be holding different territories if they were separated by at least 100 m. If the surveyor was able to determine that birds were separate individuals then in those cases the records are shown appropriately on the map.

2.1.5 Bird registrations were recorded on a field map using British Trust for Ornithology (BTO) two-letter species codes and activity recording codes. The field map was used as a basis for drawing up a visit map of any significant bird records from the survey visit. Territories have not been accurately mapped as this would have required data obtained from more survey visits over the full breeding season. Nevertheless it is considered that the level of survey gives an indication of the distribution across the site for those species recorded, and of the locations of species activity post breeding season.

2.2 Limitations

2.2.1 This report has been prepared by Ramboll solely for the benefit of the Applicant. It shall not be relied upon or transferred to any third party without the prior written authorisation of Ramboll.

2.2.2 Due to the survey taking place partially during a lockdown period for Covid-19 the golf course could not be fully surveyed during April due to access constraints, although it was possible to survey parts of this area from a footpath which ran along the northern edge of the course and partially through the eastern part of the course.

2.2.3 The majority of the site was accessible on the days of the vists, however access could not be gained to some areas. These were viewed from adjacent public areas, roads and footpaths running through or adjacent to them. In this way the majority of the site could be viewed from within 50 m with small areas not visible from this proximity. Overall given that the majority of the site could be viewed the results are considered to give a good overview of the early spring breeding bird assemblage on site despite not being able to access all areas.

3. SURVEY RESULTS

3.0.1 A full list of the bird species recorded, together with their Latin names and their behaviour on site is provided in Appendix A.

3.0.2 Forty-six species were recorded during this early breeding bird survey on, over or near the site. These species included a wide range of birds typical of the habitats present on the site and in the

vicinity in this part of south-east England. The birds recorded included seven S41 species of principal importance, eight Red List species (five of which are S41), seven Amber List species (of which two are S41 species) and five Sussex Biodiversity Action Plan (BAP) species. Two specially protected species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded although these species (fieldfare and redwing) were likely late wintering birds rather than breeding because these species do not regularly nest in southern England.

Table 3.1: Notable birds recorded in the site

Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
Mallard	*Anas platyrhynchos*			*			Small numbers, singles and pairs seen at various points on river running through site. Peak count for the whole site was 11.
Kestrel	*Falco tinnunculus*			*			One male seen in Ifield Brook Meadows and likely same male also in farmland in north of site.
Black headed gull	*Chroicocephalus ridibundus*			*			Small numbers flying over site or loafing in open fields.
Common gull	*Larus canus*			*			Five seen loafing in field in northern part of site.
Herring gull	*Larus argentatus*	*	*				Peak count per survey of 5, seen loafing on open farmland in central site area.
Stock dove	*Columba oenas*			*			Group of four seen foraging in open farmland on site on last survey visit.
Dunnock	*Prunella modularis*	*		*	*		Pairs and single birds scattered throughout site in hedgerows, scrub and woodland areas.
House sparrow	*Passer domesticus*	*	*		*		Maximum count in one set of survey visits of 7. Mainly seen in small groups near housing areas, such as on edge of Ifield Brook Meadows.
Fieldfare	*Turdus pilaris*		*			*	Small groups and single fieldfare seen around centre of site in farmland near woodland and with hedgerows with trees, also one seen on golf course. Peak count in one day of 18.
Redwing	*Turdus iliacus*		*			*	Group of four seen in Ifield Brook Meadows
Song thrush	*Turdus philomelos*	*	*				Scattered sparsely throughout the site with peak count of 9, present in hedgerows and woodland patches and edges.
Mistle thrush	*Turdus viscivorus*		*				Two single birds seen in hedgerows around farmland areas.
Starling	*Sturnus vulgaris*	*	*		*		Peak count in one set of survey visits of 49. Found in small to medium sized groups, mainly foraging in grassland areas

Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
							such as grazed farmland and grassland in Ifield Brook Meadows.
Bullfinch	*Pyrrhula pyrrhula*	*		*	*		Small numbers seen in hedgerows around farmland, seen on one visit with 5 seen scattered with 2 pairs and a single bird all seen around central farmland area.
Linnet	*Linaria cannabina*	*	*		*		Small numbers (3) seen flying around farmland and in hedgerow.

APPENDIX A
BIRD SPECIES LIST

APPENDIX A
BIRD SPECIES LIST

Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
Canada goose	*Branta canadensis*						Small numbers seen on golf course land, maximum count per survey of 3.
Mallard	*Anas platyrhynchos*			*			Small numbers, singles and pairs seen at various points on river running through site. Peak count for the whole site was 11.
Grey heron	*Ardea cineria*						One bird fishing in river, two flying over site.
Pheasant	*Phasianus colchicus*						Small numbers present in pairs or singly scattered over site in woodland, scurb and hedgerows. Peak count of 14 for combined last two visits covering the whole site.
Moorhen	*Gallinula chloropus*						Peak count of 3 over whole site on ponds in golf course.
Buzzard	*Buteo buteo*						Pair seen in survey area in trees in central farmland area and foraging around central site areas.
Kestrel	*Falco tinnunculus*			*			One male seen in Ifield Brook Meadows and likely same male also in farmland in north of site.
Black headed gull	*Chroicocephalus ridibundus*			*			Small numbers flying over site or loafing in open fields.
Common gull	*Larus canus*			*			Five seen loafing in field in northern part of site.
Herring gull	*Larus argentatus*	*	*				Peak count per survey of 5, seen loafing on open farmland in central site area.
Stock dove	*Columba oenas*			*			Group of four seen foraging in open farmland on site on last survey visit.
Wood pigeon	*Columba palumbus*						Scattered over whole site with occasionally large groups in open fields, woodland, hedgerows and solitary trees.
Collared dove	*Streptopelia decaocto*						Maximum count over whole site in one set of survey visits was 8. Scattered over site in pairs or singly in farmland and other areas with trees.
Great spotted woodpecker	*Dendrocopos major*						Heard and occasionally seen over whole site in areas with woodland and treelines.
Green woodpecker	*Picus viridis*						Maximum count of 8 in one set of survey visits. Mainly heard, occasionally single birds seen

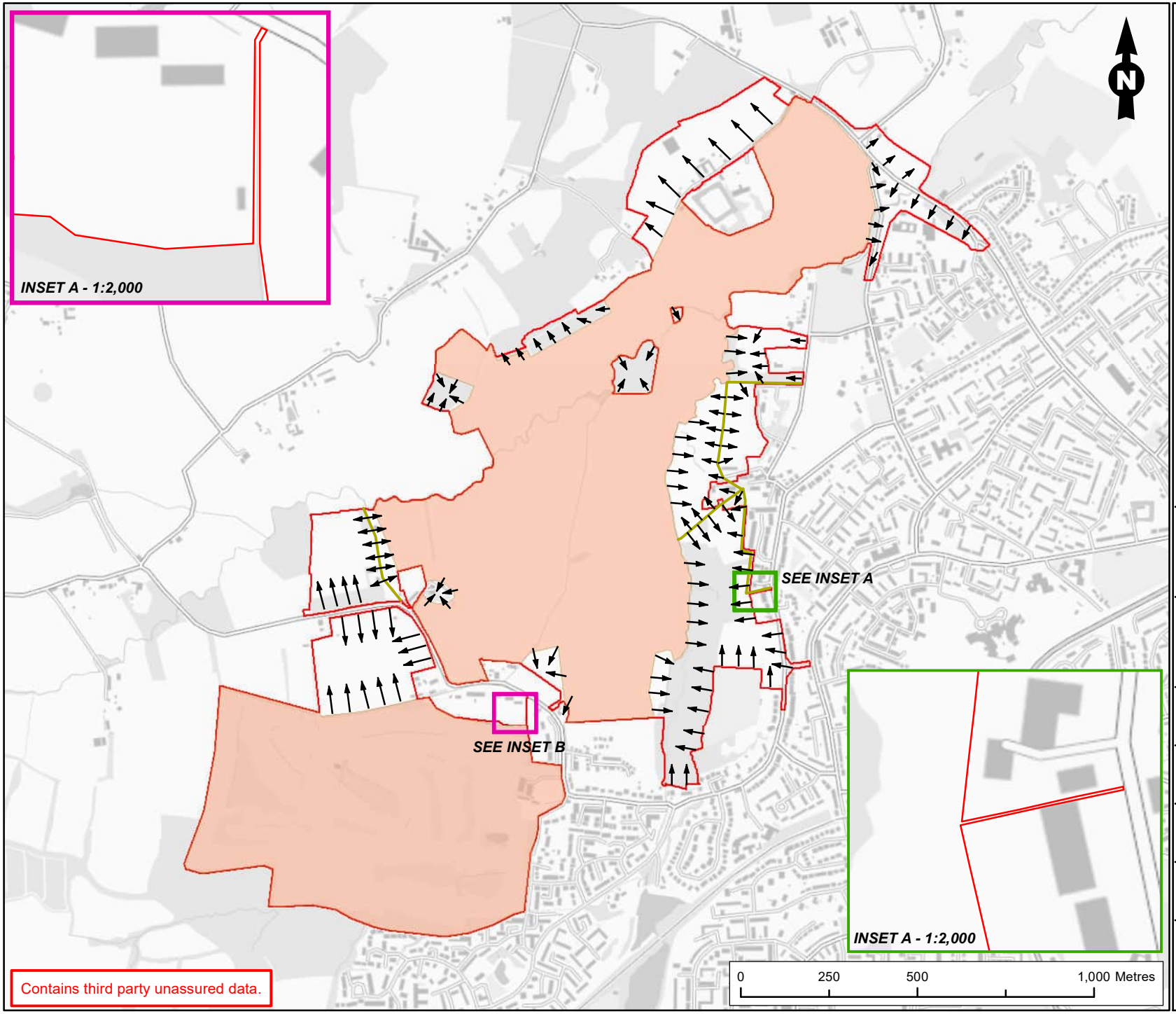
Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
							in areas near grassland and open areas.
Pied wagtail	*Motacilla alba*						Single birds seen flying over farmland areas. Peak count of 3.
Wren	*Troglodytes troglodytes*						Singles and pairs present scattered over whole site in woodland, scrub and hedgerow areas.
Nuthatch	*Sitta europaea*						Seen once in tree in hedgerow in farmland on western edge of site.
Treecreeper	*Certhia familiaris*						Pairs and singles seen and heard on golf course, in hedgerow on farmland and in Ifield Brook Meadows
Dunnock	*Prunella modularis*	*		*	*		Pairs and single birds scattered throughout site in hedgerows, scrub and woodland areas.
Robin	*Erithacus rubecula*						Single birds and pairs seen and heard frequently in all site areas containing woodland and hedgerows.
Stonechat	*Saxicola rubicola*						Single bird seen once on golf course.
House sparrow	*Passer domesticus*	*	*		*		Maximum count in one set of survey visits of 7. Mainly seen in small groups near housing areas, such as on edge of Ifield Brook Meadows.
Blackbird	*Turdus merula*						Singles and pairs on site in all significant areas of scrub, woodland and hedgerows with trees.
Fieldfare	*Turdus pilaris*		*			*	Small groups and single fieldfare seen around centre of site in farmland near woodland and with hedgerows with trees, also one seen on golf course. Peak count in one day of 18.
Redwing	*Turdus iliacus*		*			*	Group of four seen in Ifield Brook Meadows
Song thrush	*Turdus philomelos*	*	*				Scattered sparsely throughout the site with peak count of 9, present in hedgerows and woodland patches and edges.
Mistle thrush	*Turdus viscivorus*		*				Two single birds seen in hedgerows around farmland areas.
Blackcap	*Sylvia atricapilla*						Scattered in farmland areas singly or as pairs in golf course, maximum count in one set of survey visits of 5.

Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
Whitethroat	*Sylvia communis*						Small numbers present in scrub on golf course and hedgerows in farmland, peak count of four.
Coal tit	*Periparus ater*						Seen singly and in pairs scattered around site with most in golf course area, peak count for one set of survey visits was four.
Blue tit	*Cyanistes caeruleus*						Singles and pairs found in all areas of scrub, woodland and hedgerow, common.
Great tit	*Parus major*						Frequently seen and heard all over site in hedgerows, scrub and woodland areas.
Long tailed tit	*Aegithalos caudatus*						Small groups seen foraging in hedgerows and scrub over whole site with peak count of 16 in one set of survey vists.
Chiffchaff	*Phylloscopus collybita*						Scattered over whole site wherever woodland and hedgerows present with peak count of 28
Carrion crow	*Corvus corone*						Crows present scattered over whole site with peak count of 64, found in pairs, singly and in small groups in open fields and golf course areas, and in trees all over site.
Rook	*Corvus frugilegus*						Single rooks seen twice foraging in open farmland areas.
Jackdaw	*Corvus monedula*						Small groups of jackdaws seen and heard frequently over whole site, mostly on farmland areas.
Jay	*Garrulus glandarius*						A few seen on golf course, with peak count per day of 3.
Magpie	*Pica pica*						Peak count of 34 present over whole site in open areas and trees, mainly in small grouos, pairs and singly.
Starling	*Sturnus vulgaris*	*	*		*		Peak count in one set of survey visits of 49. Found in small to medium sized groups, mainly foraging in grassland areas such as grazed farmland and grassland in Ifield Brook Meadows.
Chaffinch	*Fringilla coelebs*						Small numbers sparsely scattered over site areas containing hedgerows and woodland with peak count of 6

Common Name	Species	S41	Red	Amber	L BAP	Schedule 1	Breeding Status / Notes
Bullfinch	*Pyrrhula pyrrhula*	*		*	*		Small numbers seen in hedgerows around farmland, seen on one visit with 5 seen scattered with 2 pairs and a single bird all seen around central farmland area.
Goldfinch	*Carduelis carduelis*						Only small numbers with peak count per survey of 6, flying around farmland areas and foraging.
Greenfinch	*Chloris chloris*						Small numbers seen on one occasion in western part of golf course
Linnet	*Linaria cannabina*	*	*		*		Small numbers (3) seen flying around farmland and in hedgerow.

FIGURES

FIGURE 1
MARCH 2020 SURVEY LOCATIONS



Legend

- Site Boundary
- Full Site Access Site Boundary
- Public Paths
- Area viewed from nearest accessible point

Figure Title
Bird Surveys:
Areas accessed in March

Project Name
Land West of Ifield

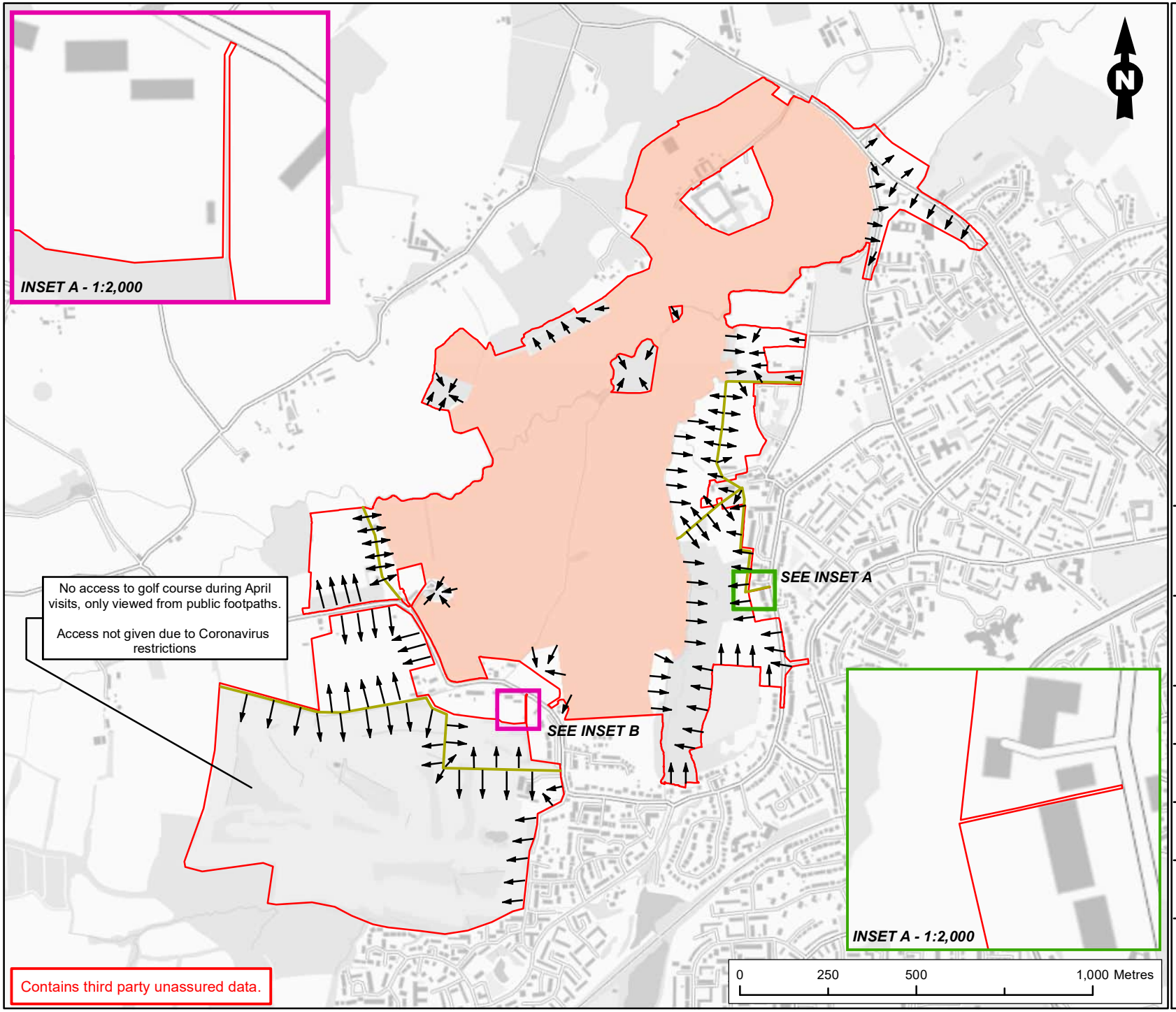
Project Number	Figure No.
1620007949	1
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:15,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

FIGURE 2
APRIL 2020 SURVEY LOCATIONS



Legend

- Site Boundary
- Full Site Access Site Boundary
- Public Paths
- Area viewed from nearest accessible point

Figure Title
Bird Surveys:
Areas accessed in April

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	2
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:15,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

FIGURE 3 (A-G)
SURVEY RESULTS

Legend

- Accessible in April only
- Site Boundary
- 5CM — April Observations
- MA — March Observations

Figure Title
Area A - North of Area New Access

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3A
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:4,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Public Footpath
- 5CM April Observations
- MA March Observations

Figure Title
Area A - Area East of farm (Central Section)

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3B
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:3,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Public Footpath
- 5CM April Observations
- MA March Observations

Figure Title
Area A - Area East of farm (Northern Section)

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3C
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:3,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Public Footpath
- 5CM April Observations
- MA March Observations

Figure Title
Area A - Area East of farm (Southern Section)

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3D
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:4,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Public Footpath
- 5CM — April Observations
- MA — March Observations

Figure Title
Area A - North West of Site Boundary

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3E
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:4,000 @A4	1

Client
Homes England

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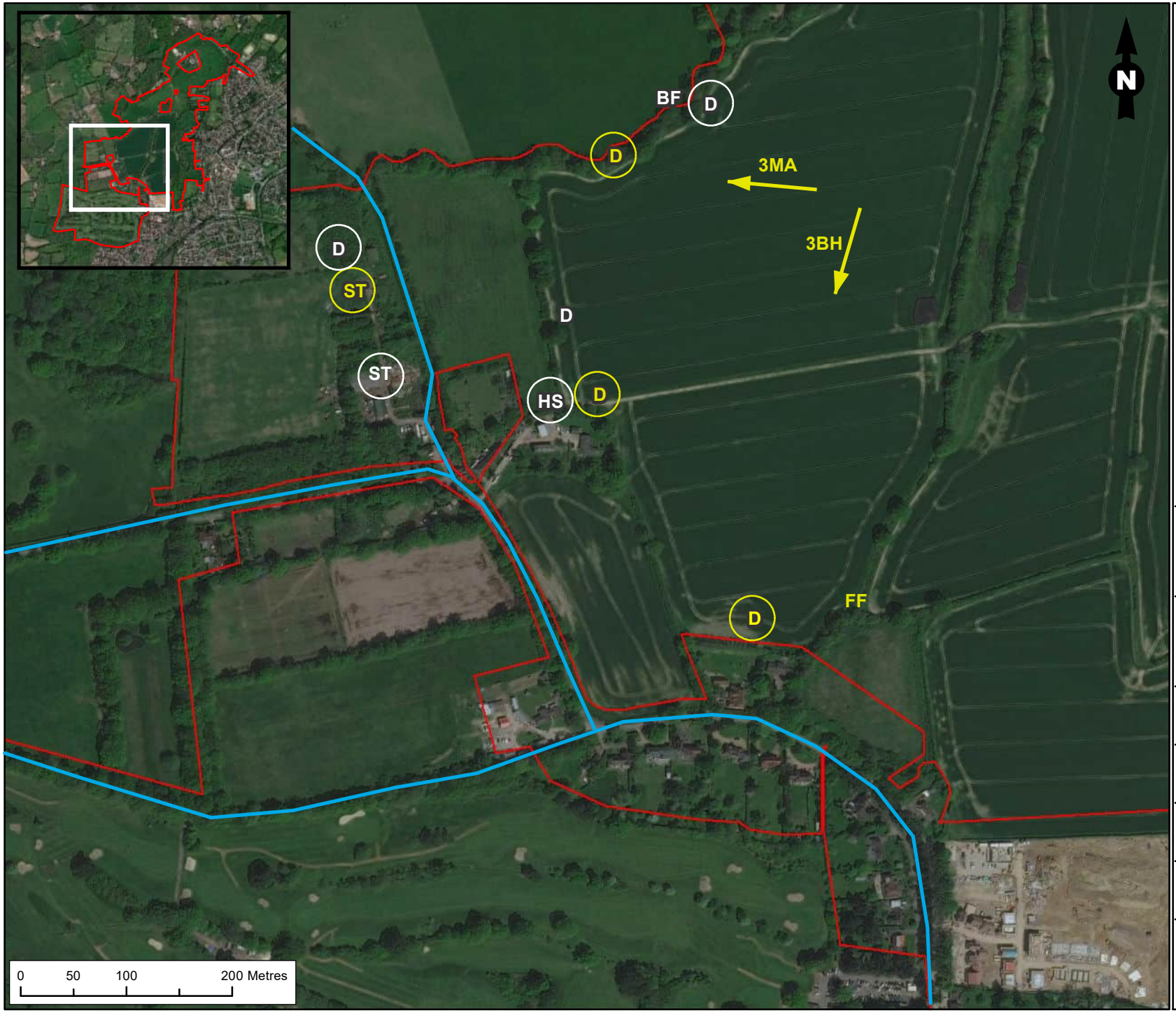


Legend

- Site Boundary
- Public Footpath
- 5CM April Observations
- MA March Observations

Figure Title
Area A - North West of Golf Course

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3F
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:5,000 @A4	1

Client
Homes England

RAMBOLL

Service Layer Credits: Esri, HERE, Garmin, (c) OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Legend

- Site Boundary
- Public Footpath
- 5CM April Observations
- MA March Observations

Figure Title
Area A - Golf Course

Project Name
Land West of Ifield

Project Number	Figure No.
1620007949	3G
Date	**Prepared By**
July 2020	CF
Scale	**Issue**
1:5,000 @A4	1

Client
Homes England

RAMBOLL

Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

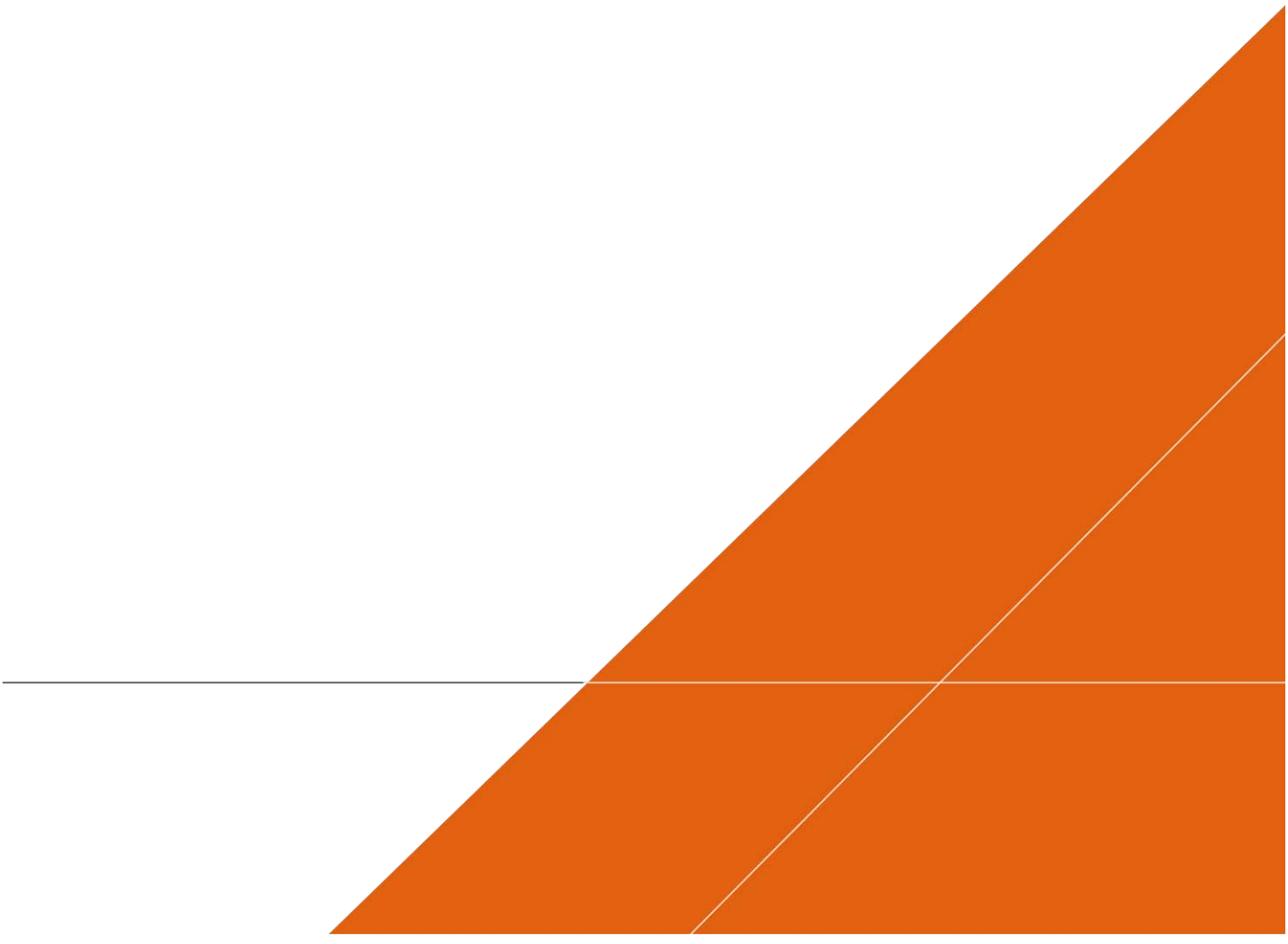
APPENDIX 8.18: LAND WEST OF IFIELD – BREEDING BIRD SURVEY REPORT INCLUDING BARN OWL ASSESSMENT

ARCADIS Design & Consultancy for natural and built assets

LAND WEST OF IFIELD

Breeding Bird Survey Report including Barn Owl Assessment

NOVEMBER 2019



Breeding Bird Survey Report including Barn Owl Assessment

Author	Liam Price
Checker	Brandon Murray
Approver	Samantha Walters
Report Reference	WOI-AUK-XX-WS-RP-EC-0011-01-Breeding Bird Survey Report
Date	NOVEMBER 2019

VERSION CONTROL

Version	Date	Author	Changes
1	November 2019	Liam Price	First Issue

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APPENDIX E : BARN OWL BUILDING INSPECTION SURVEY RESULTS

APPENDIX F : BREEDING BIRD SURVEY VISIT TOTAL OF ALL BIRDS RECORDED PER SURVEY 'VISIT'

APPENDIX G : BTO SPECIES CODES UTILISED IN THE MAPPING

APPENDIX H : PEN PORTRAITS OF KEY SURVEYORS

Executive Summary

Arcadis Consulting (UK) Limited was commissioned on behalf of Homes England to undertake a survey for breeding birds of the land associated with the proposed housing development west of Ifield, Crawley, West Sussex. This report has been prepared to inform a proposed masterplan for residential use on this land.

The proposed development comprises the construction of approximately 3000 residential dwellings, three schools (two primary and one secondary) and associated infrastructure. Due to the proximity of the site to Gatwick Airport (approximately 1.3km to the north), the development is to be concentrated towards the southern end of the site, with the northern part of the site forming open space.

The site covers approximately 200ha and supports a range of habitats including semi-improved grassland, arable fields, amenity grassland, woodland, grazing pasture, a network of hedgerows and several ponds. The River Mole flows west to east through the north of the site, and Ifield Brook, flows south to north through the site. Rusper Road passes through the south of the site. The site is situated to the north-west of the A23 (Crawley Avenue) and is bordered by residential properties to the east, farmland to the west and woodland to the north and south.

As would be expected with a heterogeneous site of this nature, breeding bird activity levels varied across the site, depending upon the habitats present. Overall, the following qualitative observations were made:

- A high density of birds was recorded in the woodland on Ifield Golf Course in the south of the site.
- Large numbers of birds were recorded within the site along the riparian corridors. These corridors provide abundant feeding and nesting opportunities for a range of species.
- The Local Wildlife Site in east of the site supported a high density of birds. The semi-natural broadleaved woodland, scrub and semi-improved neutral grassland provide foraging and nesting opportunities for a range of species.
- Some of the semi-improved grasslands within the site supported high densities of breeding birds. These grasslands tended to be relatively small and enclosed by hedges and / or areas of woodland.

In total 55 bird species were recorded during the field surveys, of these 18 are considered notable.

An assemblage of ‘farmland’ bird species was recorded. Of the birds that form this assemblage within the site, all except three species were confirmed, probably or possibly breeding species.

Incidental records of kingfisher and red kite, species specially protected under Schedule 1 of the Wildlife and Countryside Act, were recorded during the survey. It is not thought that these species are breeding on the site.

Records of barn owl were returned at least 1.4km from the site, they were not recorded on site during the breeding bird surveys (which would be expected as the surveys were not timed to coincide when barn owl would be active).

A building inspection revealed 12 buildings with potential to support roosting barn owl, of these three structures also had the potential to support breeding barn owl. Two structures had evidence of usage by barn owl.

Across the site, the habitat was assessed as largely being sub-optimal or lower value for barn owl foraging (5.37% of the site was optimal foraging habitat).

It is concluded that the site supports roosting and breeding barn owl, and is likely to be used by foraging barn owl.

1 Introduction

1.1 Overview

Arcadis Consulting (UK) Ltd, working on behalf of Homes England, was instructed to undertake ecological surveys to inform an Environmental Impact Assessment (EIA) of a proposed masterplan for residential use on land to the west of Ifield, West Sussex.

This report contains the results of a breeding bird survey within the proposed development site boundary. This report details the results of this survey and where appropriate design considerations to inform the development of the scheme.

1.2 Site Location and Setting

The proposed development site is located to the west of Ifield, Crawley (central grid reference - TQ 24133 37360) (see Image 1 for the site location and survey boundary).

The site which covers approximately 200 ha in total and supports a range of habitats including semi-improved grassland, arable fields, amenity grassland, woodland, grazing pasture, a network of hedgerows and several ponds. The River Mole flows west to east through the north of the site, and Ifield Brook, flows south to north through the west of the site. Rusper Road passes through the south of the site.

The site is situated to the north-west of the A23 (Crawley Avenue) and is bordered by residential properties to the east, farmland to the west and woodland to the north and south.

An aerial image illustrating the site surveyed is presented in Image 1.

Image 1: Aerial imagery of the site

1.3 Proposed Development

The proposed development comprises the construction of approximately 3000 residential dwellings, three schools (two primary and one secondary) and associated infrastructure. Due to the proximity of the site to Gatwick Airport (approximately 1.3km to the north), the development is to be concentrated towards the southern end of the site, with the northern part of the site forming open space.

1.4 Overview of UK bird biology

It is estimated that 247 bird species are regularly recorded within the UK and these species are assessed within the Birds of Conservation Concern (BoCC) surveys and assessments, see section 1.6.1. However, the lifecycles, resource requirements and biology of these species varies greatly, and these species can be split into four broad categories:

- Resident birds, which spend the entire year within the UK;
- Summer visitors which usually breed within the UK;
- Winter visitors, which breed elsewhere and migrate to the UK for winter;
- Passage migrants, which visit at certain times of year, particularly, spring and autumn.

The assemblage of birds present within specific locations and particular seasons is affected by a number of factors including the habitats present and climate.

Whether or not habitats are utilised by particular bird species depends upon the breeding habits, the availability of feeding resources and stages in a species lifecycle. Considering the habitats present within the site, the key bird groups which were considered and surveyed to inform the development were:

- Breeding farmland birds;
- Breeding woodland birds;
- Breeding birds associated with the riparian and other aquatic areas of the site;
- Wintering birds foraging on the farmland and present within the woodland; and
- Wintering birds associated with the aquatic features on the site.

For details of the wintering bird surveys conducted on the site, please refer to the associated report (ES Appendix 7.10).

1.5 Applicable bird legislation

The following legislation concerning bird species is relevant to this breeding bird baseline report:

In the UK, all wild bird species and their eggs are protected when nesting by law under Section 1 of the Wildlife and Countryside Act (WCA) 1981 (as amended) (HMSO, 1981). In addition, there are several pieces of legislation or policy which afford certain species extra legal protection, or emphasise their conservation importance, as outlined below:

- Species that have additional protections when breeding are listed under Schedule 1 Part 1 of the WCA.
- Species of Principal Importance for conserving biodiversity are listed under Section 41 of the 2006 Natural Environment and Rural Communities (NERC) Act (HMSO, 2006).

Certain species of plants and animals that do not naturally occur in Great Britain that have become established in the wild and represent a threat to the natural fauna and flora are listed under Schedule 9 of the WCA. These species are considered harmful to native wildlife.

1.6 Conservation status

1.6.1 General bird conservation

It is difficult to place an overall trend on bird conservation status, as the large number of species within the UK have different requirements. Some species have been adversely affected by changes in land management practices, urban development and climate change, other species have benefitted from these changes. However, the BoCC list (last updated in 2015) gives an indication of the conservation status of birds known to be resident in the UK (Eaton et al., 2015).

Bird species that are of high nature conservation concern, listed as ‘Red-List’ and ‘Amber-list’ on the Royal Society for the Protection of Birds (RSPB) list of BoCC. This list is subject to regular updates and is derived from the review of the population status of bird species that are regularly breeding within the UK. The list is based on data from national monitoring schemes. A brief outline of the ‘Red, Amber, Green’ criteria is given below in Table 1.

Table 1: Outline of BoCC criteria

Criteria	Status
Red	Globally threatened Historical population decline in UK during 1800–1995 Rapid (> or =50%) decline in UK breeding population over last 25 years Rapid (> or =50%) contraction of UK breeding range over last 25 years
Amber	Moderate (25-49%) decline in UK breeding population over last 25 years Moderate (25-49%) contraction of UK breeding range over last 25 years Moderate (25-49%) decline in UK non-breeding population over last 25 years Species with unfavourable conservation status in Europe (SPEC = Species of European Conservation Concern) Five-year mean of 1–300 breeding pairs in UK > or =50% of UK breeding population in 10 or fewer Sites, but not rare breeders > or =50% of UK non-breeding population in 10 or fewer Sites > or =20% of European breeding population in UK > or =20% of NW European (wildfowl), East Atlantic Flyway (waders) or European (others) non-breeding populations in UK
Green	No identified threat to the UK population’s status

In 2015, of the 247 species considered to be breeding in the UK, 67 species were on the red list, 96 were on the amber list and 84 were on the green list (for an explanation of the categories refer to Table 1).Overall, although there was an increase of birds species on the ‘green list’ since the data was last analysed in 2009, there was also an increase in species on the ‘red list’ (an increase of 15 species). This is indicative of an overall negative trend in the status of bird populations overall in the UK. This trend appears to be part of a continuous trend since the first analysis was conducted in 1996. This is presented in Image 2 below, which shows the proportion of the UK bird species list in each of the BoCC categories since analysis began in 1996.

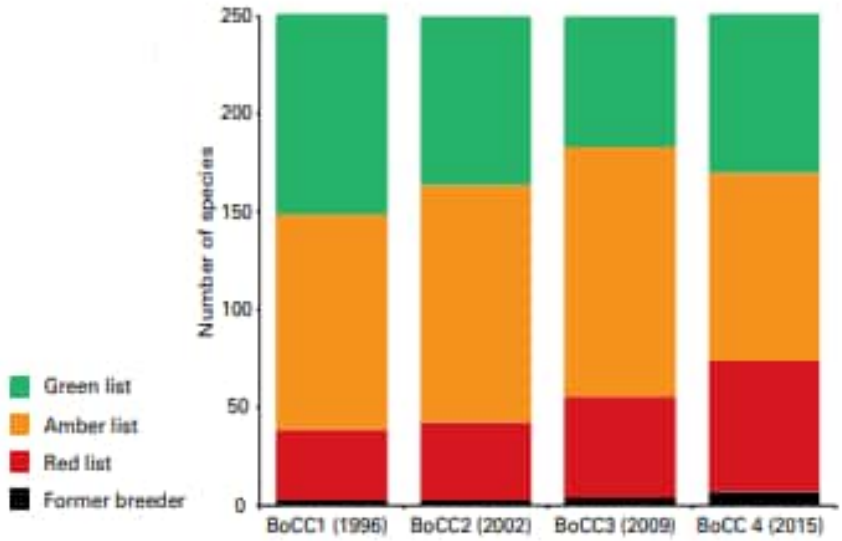


Image 2: The status of British bird species within the BoCC categorisation 1996 – 2015 extracted from Eaton et al. (2015)

The sections below provide a commentary on the status of three assemblages of bird species relevant to the site, their current status and identified conservation issues.

1.6.2 Farmland bird conservation

Farmland birds have undergone a significant decline in numbers since the 1950's. The RSPB farmland bird indicator (RSPB, 2018) suggests that farmland bird numbers may have declined by 48% between 1970 and 2007 and declined by 9% between 2010 and 2015. Populations of turtle dove (*Streptopelia turtur*), grey partridge (*Perdix perdix*), corn bunting (*Emberiza calandra*) and tree sparrow (*Passer montanus*) have declined by more than 80% (Hayhow et al., 2017).

It is considered that this decline is not solely due to loss of farmland, but primarily due to intensification in agriculture, loss of hedgerows and changes in farming practices (such as the loss of field margins and increasing planting of winter sown crops, which reduce the availability of feeding resources over winter) (Hayhow et al., 2017).

1.6.3 Woodland bird conservation

Woodland birds are calculated to have declined by up to 23% between 1970 and 2015 (Hayhow et al., 2017). There are more birds of woodland on the BoCC red list than of any other habitat. There are potentially multiple causes for this decline, from a loss of habitat, climate change and changes in management within woodlands are likely to be significant factors (Hayhow et al., 2017).

1.6.4 Waterfowl and wetland bird conservation

Wetland bird populations are estimated to have declined by 8% between 1975 and 2015 (Hayhow et al., 2017). The causes of this decline are many and varied, largely due to the extremely variable nature of the biology of the individual species in this group. Causes of decline may result from persecution across the species range (particularly for migratory species), changes in habitats (due to management, climate change and urban development) and changes in availability of feeding resources. Overall, it appears that generalist species (i.e. those which do not have specific habitat or feeding resource requirements) are not declining or declining less than more specialist species. It is also possible that recorded declines could be accounted for by fewer species migrating to the UK due to climate change (Hayhow et al., 2017).

2 Approach and Methodology

2.1 Desk study

A desk study was undertaken to review existing biological information. Information was provided by the Sussex Biological Records Centre (SBRC) for breeding birds within a 2km radius of the site as recommended in the Institute of Environmental Assessment's 'Guidelines for Baseline Ecological Assessment' (1997) and CIEEM's (Chartered Institute of Ecology and Environmental Management) Guidelines for Preliminary Ecological Appraisal (2017). Only records from within the last 10 years were obtained.

In addition, the Multi-Agency Geographic Information for the Countryside database (MAGIC, 2019) was searched for statutory designated sites of nature conservation importance which are present within 10km of the site and designated for their bird interest. This database was also searched to identify areas that receive payments under Higher Land Stewardship.

The results of this desk study are presented in Section 3.

2.2 Habitat assessment

2.2.1.1 Initial Assessment

An initial habitat assessment was carried out to identify key habitats of potential value to breeding birds. This included a search for likely nesting, breeding and foraging areas during a series of visits to the site in May, June and July 2018 by Porscha Thompson ACIEEM, Siân Carr MCIEEM and Julie Player ACIEEM. This was done in conjunction with extended Phase 1 Habitat Surveys. Pen portraits of key surveyors are presented in Appendix H.

2.2.1.2 Assessment of habitat quality for foraging barn owl

As a component of the barn owl (*Tyto alba*) surveys, an assessment of the foraging value of the habitat within the site was conducted, this was based upon the 'Phase 1' habitat categories recorded. This assessment graded the habitats under four categories, dependent upon their value for barn owl foraging. The categorisations utilised are based upon the guidance provided within the IEEM guidance (Shawyer 2011) and are presented in Table 2 below.

The results of this assessment are presented in Section 3.

Table 2: Barn owl habitats as defined within the IEEM guidance (Shawyer 2011)

Habitat Name	Value for foraging barn owl	Description from guidance
Type 1 Habitat	Optimal	*Type 1 Habitats are those which provide optimum habitat to field voles (Microtus agrestis) (for breeding, foraging and shelter) and are of the highest value to barn owl. This habitat type is usually permanent, unimproved or semi-improved grassland, rank and heterogeneous in appearance, often of mixed height, with fully or partly collapsed dead grass stems (straw) often dominating the leaf sward. This grassland possesses a high abundance of raised tussocks per unit area (typically 4-40/m^2) coupled with a basal litter layer or 'thatch' of straw, at least 30 mm deep (Note: won't find this if viewed from distance but assume where you can) (Shawyer, 1998). Type 1 Habitats usually receive no real management or anything other than periodic light grazing by farm animals. Long-term set-aside grassland and unmanaged fields, wasteland, ditches, riverbanks, field margins and road verges are the most common examples of this habitat type. When viewed in the wider landscape, Type 1 Habitats can usually be recognised, particularly in the autumn, winter and early spring, by their golden or green/brown appearance, and are sometimes described as 'white grassland'.*

Habitat Name	Value for foraging barn owl	Description from guidance
Type 2 Habitat	Sub-optimal	*Type 2 Habitats are sub-optimal to field voles and are of intermediate and often transient value to barn owl. This type of improved or semi-improved grassland is characterised by having a homogeneous, more even-height sward, sometimes displaying some lush and emerging tussock structure but little sign of a litter layer or 'thatch'. It can sometimes constitute a mature clover/grass ley and usually receives some level of farm management such as occasional fertilizer application, annual topping or light grazing. When seen in the wider landscape, Type 2 Habitats normally have a more uniform, dark green appearance, than Type 1 Habitats.*
Type 3 Habitat	Very poor	*Type 3 Habitats offer very poor habitat for field voles and most other small mammals and as such are of low value to barn owl. These improved grasslands are characterised by having a homogeneous sward, which is often kept short throughout much of the year, no tussock structure and are devoid of any litter layer at their base. They are usually mown closely for hay or silage, heavily grazed by sheep, horses or cattle or used for public amenity. They normally display a uniform bright green appearance when viewed in the wider landscape. Acid grasslands and those grasslands overgrown with scrub which can restrict barn owl from hunting, also fall into this habitat category. Type 3 Habitat is not normally illustrated on the final survey map because of its poor suitability to barn owl.*
Other Habitats	Little or no value	*Non-grassland habitats, such as arable fields and mature woodland are generally of little or no value as a permanent foraging resource to barn owl. Arable fields containing cereals, rapeseed, or other food crops do not provide suitable habitat for field voles, although at certain times of the year, such as during harvest, they can, for short periods, expose wood mice (Apodemus sylvaticus) and temporarily attract barn owl. Prior to harvest, however, arable crops are largely impenetrable to foraging barn owl because of the stiff nature of the crop and high density of planting. For the purpose of the survey, arable fields without grass margins and woodlands (except those possessing wide grass rides or young plantations) are, therefore, considered unsuitable for barn owl and are not illustrated on the eventual survey map.*

2.3 Field Survey

2.3.1 Breeding bird survey

The survey work consisted of walked transect surveys, following methods adapted from Gilbert et al. (1998) and in line with the British Trust for Ornithology (BTO) guidance for breeding bird surveys. Surveys were carried out by David Darrell-Lambert, a suitably experienced bird surveyor with over 30 years of bird survey experience. David is a Schedule 1 licence holder for barn owl for England, this has been extended for other species including black redstart (*Phoenicurus ochruros*) and little ringed plover (*Charadrius dubius*). A pen portrait for David is presented in Appendix H.

A total of four surveys were undertaken in 2018 on 11 and 25 May, 3 June and 1 July. All survey visits began at dawn (approximately one hour before sunrise) or later if birds began singing later due to the weather conditions and low light levels. The direction of the route was varied on each survey so that either clockwise or anti-clockwise route was taken.

Transect routes were chosen proactively to align within 100m of notable features and habitat potentially suitable for nesting birds, which was identified during the habitat assessment. The transect route was designed to cover all habitat types within the site. Key features covered were:

- Ifield Brook Wood and Meadows Local Wildlife Site;
- Ifield Golf Course;
- Ifield Brook and River Mole;

- Areas of woodland, largely in the centre of the site;
- Areas of semi-improved grassland around the periphery of the site.

The survey transects were walked at a constant pace and birds seen or heard were identified and counted. All bird species were mapped and recorded using standard BTO species and behaviour codes.

During the survey, birds identified were placed into four categories, as presented in Table 3.

Table 3: Breeding categories utilised within the breeding bird surveys

Category	Description
Confirmed breeder	Observations that confirm a species is breeding on or near to the site: occupied nest(s), nest containing eggs or young, recently fledged young, used nest or eggshells (recent), distraction-display/injury feigning, adults entering or leaving nest-site in circumstances indicating occupied nest, adult carrying food or faecal sac.
Probable breeder	Observations of behaviour suggesting that a species is probably breeding: pair observed in suitable nesting habitat in breeding season, permanent territory(s) presumed through registration of consistent territorial behaviour (for example song), courtship/display, visiting probable nest sites, agitated behaviour from adults, nest building.
Possible breeder	Species observed or heard singing in the breeding season within suitable breeding habitat.
Non-breeding	Species only recorded flying over the area, displaying wintering behaviour, suspected to be still on migration or a summering non-breeder.

The results of these surveys are presented in Section 3.

2.3.2 Barn owl building assessment

All buildings surveyed for the potential to support bats were simultaneously surveyed for barn owl. The barn owl surveys were led by Ewan Gibson (GradCIEEM) who held a valid Natural England barn owl survey licence (CL29), accompanied by Rory Roche. Pen portraits of key surveyors are presented in Appendix H.

The surveys took place in 14 and 15 July 2019. The survey work involved a pair of surveyors inspecting the exterior of each building to determine whether there were potential suitable access points for barn owl. Should the building be suitable for barn owl, the interior was inspected where access was necessary, safe and permitted for signs of barn owl activity. No access at height was permitted due to safety concerns. Signs of barn owl include: birds present, active nests, disused nests, pellets/feathers indicating a nest or a roost site. The searches were undertaken from ground level. Buildings were categorised according to the categorisations presented in Table 4 following the guidelines set out by CIEEM (2012).

Table 4: Categories and indicative barn owl signs as described by CIEEM (2012)

Building Category	Description	Indicative signs
Temporary Rest Site	A temporary night-time stopping-off place for a barn owl.	Chalky-white droppings, occasional pellet or moulted-feather.
Active Roost Site	A place at which breeding does not occur, but where the bird is seen or heard regularly or its current or recent presence (last 12 months) can be recognised by observed signs.	Thick, chalky-white, streaky droppings, usually accompanied by pellets and moulted feathers.
Potential Nest Site	Sites at which a barn owl could breed	An entry point of at least 80 mm diameter (about tennis ball size) or vertical slot of this width backed by a sufficiently large and

Building Category	Description	Indicative signs
		dark chamber with a floor area greater than 250 mm x 250 mm.
Confirmed Nest Site	A place which breeding is confirmed to occur	Nest material being and/or food being delivered, eggs presence, sight or sound of chicks.

2.4 Survey Limitations

2.4.1 Desk study

Desk study records do not constitute a full list of the species which are present within an area. The absence of a record does not necessarily demonstrate the absence of a species.

2.4.2 Field survey

During the breeding bird surveys, it was not possible to access all the site. Small portions were inaccessible in the north east of the site. Fog was present initially during the survey on 11 May 2018; however, birdsong was heard and the fog quickly lifted. It is considered that these factors did not impact upon the validity of the results of the survey.

3 Results

3.1 Desk study

3.1.1 Designated sites with relevance to birds

3.1.1.1 International statutory designated sites within 10km

No internationally designated sites were present within 10km of the site. The nearest is Mole Gap to Reigate Escarpment SAC, approximately 13km to the north.

3.1.1.2 National statutory designated sites within 2km

There are three statutory designated sites within 2km of the proposed development site;

- House Copse SSSI (0.67km S);
- Buchan Hill Ponds SSSI (1.6km S); and
- Target Hill Park Local Nature Reserve (LNR) (1.9km SE).

Notable bird species, such as linnet (*Linaria cannabina*) and yellowhammer (*Emberiza citrinella*), are known to be present within Target Hill Park LNR. However, this area is separated from the site by 1.9km of urban land, while abundant woodland and grassland lie to the south. As such it is considered unlikely that the site is significantly utilised by birds from the LNR.

3.1.1.3 Non-statutory designated sites within 1km

A total of seven non-statutory designated sites are present within 1km of the site, details of which are presented in Table 5 below. Given the habitats present in these areas, their distance from the site and their potential to have species linkages with the habitats on the site, all seven of these sites have the potential to support bird populations linked to the breeding bird assemblage using the site.

Table 5: Non-statutory designated sites with the potential to be linked / be impacted by works on the Ifield site within 1km.

Site Name	Designation	Distance (m)	Direction	Notes
Ifield Brook Wood and Meadows LWS	LWS	0m – within the proposed development boundary	N/a	The site incorporates a number of relatively herb-rich meadows enclosed by thick hedges, Ifield Brook itself and some woodland. The value of the site lies in its combination of different habitats, the relatively unimproved nature of many of the fields and its proximity to a large town. The mosaic of different habitats are likely to be of use to breeding birds, due to their provision of foraging and nesting opportunities.
Hyde Hill LWS	LWS	0m – partially within the proposed development boundary	N/a	The site which lies just west of Crawley is of considerable local importance to nature conservation. The combination of habitats, with semi-natural woodland, thick hedgerows, streams and rough grassland, is an important feature. The site supports uncommon plants and butterflies, plus a diversity of breeding birds. The mosaic of habitats are likely to be of use to breeding birds, due to their provision of foraging and nesting opportunities.

Site Name	Designation	Distance (m)	Direction	Notes
Ifield Pond and surroundings LWS	LWS	120m	South	This large pond, situated on the edge of Crawley, is of considerable local importance notably on account of its birdlife, dragonflies and amphibians. The pond is bisected by a railway line. The main pond is south of the railway, though the area to the north is also of great wildlife value. The riparian habitats are likely to be of use to breeding and foraging birds.
Willoughby Fields LWS	LWS	332m	North east	Willoughby Fields is a large site containing unimproved grassland fields with a network of hedgerows, areas of scrub and small copses that lies between the River Mole and an unnamed stream on the outskirts of Langley Green in Crawley. A considerable amount of tree and hedge planting has been carried out on the site. The mosaic of habitats are likely to be of use to breeding birds, due to their provision of foraging and nesting opportunities.
Wood near Lower Prestwood Farm LWS	LWS	463m	North west	This woodland is dominated by Hornbeam (*Carpinus betulus*) and Ash (*Fraxinus excelsior*), mainly as trees grown from coppice. There are very few mature standards remaining as most have been felled. Birch (*Betula* sp.) and particularly Sycamore (*Acer pseudoplatanus*) are also frequent in some areas. The shrub layer, consisting of several species, forms variable cover and there is a dense species-rich ground flora. This woodland habitat is likely to be utilised by breeding birds, due to the foraging and nesting opportunities it provides.
Orltons Copse LWS	LWS	897m	North west	The site consists of two large areas of oak (*Quercus* sp.)/Hornbeam woodland separated by smaller areas of oak/Hazel (*Corylus avellana*) and oak/Hazel/Ash woodland. There are several small streams throughout and a hay meadow. This mixture of habitats, provides for a rich bird community. The mosaic of different habitats are likely to be of use to breeding birds, due to their provision of foraging and nesting opportunities.
Woldhurstlea Wood LWS	LWS	940m	South east	Woldhurstlea Wood is of considerable local importance to nature conservation. Much of this small wood is semi-natural and it has many characteristics of an ancient semi-natural woodland, including a rich ground flora. The birdlife is fairly diverse. This woodland habitat is likely to be utilised by breeding birds, due to the foraging and nesting opportunities it provides.

3.1.2 Species records

Of the 49 species records returned for the site, 19 were red list species and 18 amber list species on the Birds of Conservation Concern 4 (BoCC4) list (Eaton et al., 2015). Of those 49 species, 20 species were listed on Section 41 of the NERC Act (2006) while eight were listed on Schedule 1 of the WCA. Four species were listed under Annex 1 of the EC Birds Directive (European Commission, 2009); Dartford warbler (*Sylvia undata*), kingfisher (*Alcedo atthis*), nightjar (*Caprimulgus europaeus*) and red kite (*Milvus milvus*). Dartford warbler and red kite are also listed as 'Near Threatened' on the IUCN red list (IUCN , 2019). All the records returned were species on the Sussex Notable Bird List (Sussex Ornithological Society, 2017).

Of the 49 species present within the desk study results, 40 have the potential to be breeding on site based upon the habitats present. Key habitats are presented in section 3.2. Full details of the records returned within the desk study can be found in Table 12 in Appendix B. Table 12**Error! Reference source not found.** presents the species records returned, along with a series of other details, including whether the records are of confirmed, possibly or non-breeding birds. Also included is an assessment of the potential for each species to nest within the site. This assessment is based on the suitability or habitat on site and/or the absence of that species from the south east of England as a breeding species. Where birds were only identified wintering, these are not included within this breeding bird table.

3.2 Initial habitat assessment

The habitats present on the site were reviewed and key habitats for breeding birds were identified. These habitats provide foraging and nesting opportunities:

- Arable
- Broadleaved plantation woodland / mixed plantation woodland / broadleaved semi-natural woodland
- Dense / continuous scrub
- Hedgerows
- Riparian corridor and running water
- Semi improved grassland
- Standing water

Full details of the locations of these habitats and their value to breeding birds is presented within Appendix C.

3.3 Habitat assessment for foraging barn owl

The habitats of the site were assessed for their potential to support barn owl foraging. In summary 5.37% of the site provided optimal barn owl foraging habitat, with the remaining 94.63% of the site supporting sub-optimal or lower value barn owl foraging habitats. These areas of habitat are presented on Figure 8 and are shown in Table 6 below.

Table 6: Areas of habitats with varying value for foraging barn owl

Habitat Classification	Habitat suitability	Area on site	Percentage of habitat
Type 1 Habitat	Optimal	10.30	5.37
Type 2 Habitat	Sub-optimal	59.77	31.13
Type 3 Habitat	Very poor	39.84	20.75
Other Habitats	Little or no value	82.10	42.76

3.4 Breeding bird field survey

3.4.1 Introduction

This section of the report outlines the results of the breeding bird surveys conducted. The reporting is broken down into the following sections to allow the key information to be identified and analysed:

- Overview and assemblage;
- Number of bird observations per visit;
- Schedule 1 birds;
- Breeding farmland birds; and
- Notable birds and/or birds of conservation concern.

3.4.2 Overview and assemblage

During the breeding bird surveys, a total of 2,217 birds were recorded. Table 14 in Appendix D outlines the species found and the total number of birds recorded during the surveys. A total of 54 bird species were recorded during the field surveys. The locations of the birds recorded within the site are presented on Figure 1. A heat map of the distribution of the birds across the site is presented on Figure 5. Further details of the breeding bird assemblage is provided in section 4.

3.4.3 Breeding status of birds recorded within the surveys

In line with the methodology, the breeding status of species was assessed throughout the surveys. The table below (Table 7) presents the results of these assessments. Birds are placed within the most definitive category within which they were placed (i.e. if a bird species was confirmed to be breeding on site, it will not be listed within the probable or possible breeders lists). The locations of all birds considered to be breeding on the site are presented on Figure 4.

Table 7: Breeding status of the species recorded within the site

Confirmed breeders (on or near to site)	Probable breeders	Possible breeders	Not breeding
Eurasian blackbird	Stock dove	Eurasian bullfinch	Eurasian buzzard
Blackcap	Woodpigeon	Eurasian collared dove	Grey heron
Blue tit		Chaffinch	European herring gull
Carrion crow		Coal tit	Northern house martin
Common chiffchaff		Grey wagtail	Common kestrel
Dunnock		European goldfinch	Western lesser black-backed gull
Eurasian green woodpecker		European greenfinch	Mandarin duck
Goldcrest		Garden warbler	Common swift
Great spotted woodpecker		House sparrow	Yellow wagtail
Great tit		Eurasian jackdaw	Greater Canada goose

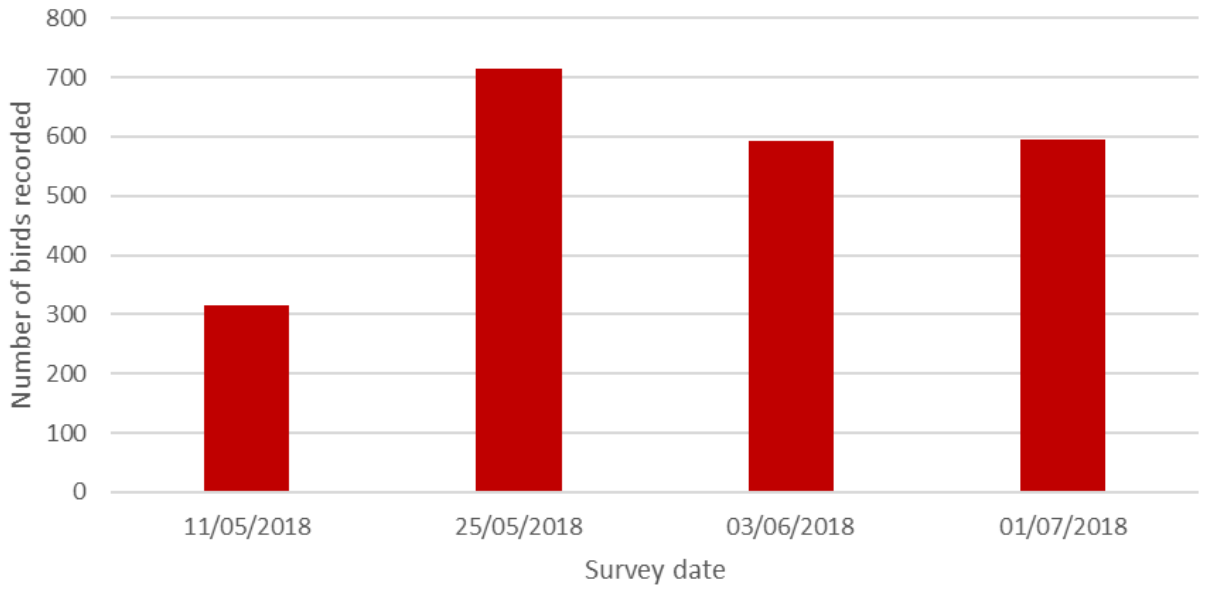
Confirmed breeders (on or near to site)	Probable breeders	Possible breeders	Not breeding
Eurasian jay		Common linnet	Mallard
Lesser whitethroat		Long-tailed tit	Eurasian reed warbler
Mistle thrush		Ring-necked pheasant	
Common magpie		Eurasian skylark	
Eurasian common moorhen		Eurasian swallow	
Eurasian nuthatch		Eurasian treecreeper	
Pied wagtail		Tawny owl	
European robin		Yellowhammer	
European starling			
Song thrush			
Common whitethroat			
British wren			

In total, 22 species were confirmed breeders, 2 were probable breeders and 18 were possible breeders meaning a total of 42 species have the potential to be breeding within or in the vicinity of the site. These species range from common and widespread species (e.g. magpie (*Pica pica*)) to much more notable species (linnet).

3.4.4 Number of bird observations per visit

The image below (Image 3) presents the number of bird observations during each visit. Overall, the distribution of birds was largely as expected, with a peak in late May as more summering birds arrived and/or breed, producing offspring.

Image 3: Chart showing the number of birds recorded during each survey visit.



3.4.5 Schedule 1 birds

No birds that are listed under Schedule 1 Part 1 of the WCA (HMSO, 1981) were recorded on site during the breeding bird surveys. However, incidental sightings of two Schedule 1 species (kingfisher and red kite) were observed during other surveys on the site as identified in section 3.6. In addition, evidence of barn owl was observed during the building inspections conducted in 2019 see section 3.5. It is considered that the following Schedule 1 species are likely to be supported by the site:

- Barn owl;
- Kingfisher; and
- Red kite.

3.4.6 Breeding farmland birds

Within the site, an assemblage of farmland birds was observed during the surveys. In order to determine the value of this assemblage, those birds identified as 'farmland' species was extracted from the dataset. The species selected were based upon:

- The 19 species listed on the UK Farmland Bird Indicator List 1970 – 2007 (RSPB, 2018);
- More generalist species which were observed to be reliant on the farmland within the site.

The birds which were identified as being 'farmland birds' and were recorded during the surveys are shown in the results table below (Table 8). Peak counts within the surveys are highlighted.

The locations of the farmland birds recorded on the site are presented in Figure 2.

Table 8: Farmland birds recorded on site

Species	11/05/2018	25/05/2018	03/06/2018	01/07/2018	Total	Breeding status
European Goldfinch			1		1	Possible
European Greenfinch	1	1	2	1	5	Possible
Eurasian Jackdaw	5	6	9	5	25	Possible
Common Kestrel	10	8	1		19	Not breeding
Common Linnet			1		1	Possible
Long-tailed Tit	6	6	8	5	25	Possible
Mallard	2	2	2	3	9	Not breeding
Eurasian Skylark				2	2	Possible
Stock Dove	1	3			4	Probable
European Starling			2		2	Confirmed
Song Thrush	11	21	14	11	57	Confirmed
Common Whitethroat	3	1	1	1	6	Confirmed
Woodpigeon	6	4	5	6	21	Probable
Yellowhammer		1			1	Possible
Yellow Wagtail	1		2		3	Not breeding
Total	46	53	48	34		

3.4.7 Notable birds and/or birds of conservation concern

The table below (Table 9) present the records of birds which are notable, due to their listing on Section 41 of the NERC Act, listing on the Sussex BAP, or listing on the Red or Amber lists of BoCC. Not listed in the table are three introduced species; greater Canada goose (*Branta canadensis*), mandarin duck (*Aix galericulata*) and ring-necked pheasant (*Phasianus colchicus*). The former two of these species are listed under Schedule 9 of the WCA. None of the birds present were listed on Schedule 1 of the WCA. In total, 18 'notable' bird species were recorded within the bird surveys. Of these, eight of these were listed under the BoCC Red list, including common linnet and mistle thrush (*Turdus viscivorus*). Further, the same eight species were listed under Section 41(S41) of the NERC Act and the Sussex BAP. The locations of these sightings are presented in Figure 3.

Table 9: Summary of notable bird species

Species	NERC S41	BoCC List	Sussex BAP
Common kestrel		Amber	
Common linnet	Y	Red	Y
Common swift		Amber	
Dunnock	Y	Amber	Y
Eurasian bullfinch	Y	Amber	Y
Eurasian green woodpecker		Amber	
Eurasian skylark	Y	Red	Y
Eurasian swallow		Amber	
European herring gull	Y	Red	Y
European starling	Y	Red	Y
Grey wagtail		Red	
House sparrow	Y	Red	Y
Mallard		Amber	
Mistle thrush		Red	
Northern house martin		Amber	
Song thrush	Y	Red	Y
Stock dove		Amber	
Western lesser black-backed gull		Amber	

3.5 Barn owl survey (buildings)

A summary table of the barn owl building surveys is presented in Table 10.

In summary, 28 buildings/building groups were assessed for their potential to support nesting barn owl. Of these, only 12 buildings / groups had the potential to support nesting barn owl, and only one building had definitive evidence of barn owl usage. There was one building where it was not possible to make a determination upon due to access restrictions. Of these buildings, three had the potential to support barn owl breeding. A summary of the status of the 12 buildings with barn owl roosting / nesting potential is provided in Table 10. The locations of these structures and roosting classification are presented in Figure 6 and Figure 7, and full descriptions of the buildings assessed are presented in Appendix B.

Table 10: Summary of structures where barn owl roosting / nesting potential was identified

Building number	Detail of nesting potential identified	Photograph
B6	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	
B7	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	
B8	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	

Building number	Detail of nesting potential identified	Photograph
B11	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; Potential to support barn owl breeding (low risk above the office area) – access possible over the shutters.	
B14	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	
B15	No evidence of usage as a temporary roost site; Potential roost site; No potential for breeding.	
B20	No evidence of usage as a temporary roost site; Potential roost site; No potential for breeding.	

Building number	Detail of nesting potential identified	Photograph
B21a	Old evidence of temporary roosting (one barn owl pellet) Potential to be utilised as a roost; Potential to support barn owl breeding.	
B21c	Old evidence of temporary roosting (droppings found, not definitive barn owl but possible considering the barn owl pellet in B21a); Potential to be utilised as a roost; No potential to support barn owl breeding.	
B22	No evidence of usage as a temporary roost site (although full internal survey not undertaken for safety); Potential roost site; Potential breeding site (precautionary – no full internal inspection).	

Building number	Detail of nesting potential identified	Photograph
B23	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	
B26	No evidence of usage as a temporary roost site; Potential to be utilised as a roost; No potential for breeding.	

Barn owl was not recorded during the breeding bird surveys.

3.6 Incidental record summary

Incidental bird sightings were recorded during the Phase 1 habitat survey, carried out in May, June and July 2018, including robin (*Erithacus rubecula*), buzzard (*Buteo buteo*), red kite, kingfisher and kestrel (*Falco tinnunculus*). A likely kingfisher nesting site comprised sand/clay bank with holes and bird dropping was recorded along Ifield Mill Stream. Several trees were recorded with bird boxes attached within Ifield Brook and Meadows LWS.

Incidental bird sightings were made during water vole and otter surveys, carried out on 10 May 2019. Notable species included buzzard and kingfisher. The kingfisher was sighted on Ifield Brook at grid reference (TQ 24585 37124).

4 Discussion

4.1 Introduction

This section discusses the important bird species and assemblages on the site along with their numbers and distribution. To aid discussion of the survey results, the results are subdivided into the following subsections:

- Overall activity;
- Overall bird assemblage;
- Notable bird species including;
  - Schedule 1 birds;
  - Birds of conservation concern (red and amber);
  - Section 41 (species of principal importance) and birds on the Sussex BAP; and
- The farmland bird assemblage on the site.

4.2 Overall activity

Bird activity was recorded across the site. As would be expected with a heterogeneous site of this nature, activity levels varied across the site, depended upon the habitats present and the species which utilise these habitats. A 'heatmap' is presented in Figure 5 which shows the usage of the site by birds. The following qualitative observations were made:

- A high density of birds was recorded in the areas of woodland on Ifield Golf Course in the south of the site. The woodland was a mixture of broadleaved and coniferous scattered, semi-natural and plantation woodland. The remainder of the golf course supported amenity grassland and semi-improved grassland of limited value to breeding birds.
- Large numbers of birds were recorded along the riparian corridors throughout the site. Hedgerows and semi-natural broadleaved woodland lined the running water habitats. These habitats provide abundant feeding and nesting opportunities for a range of species.
- The Local Wildlife Site in east of the site was used by a high density of birds. The mosaic of semi-natural broadleaved woodland, scrub and semi-improved neutral grassland provide foraging and nesting opportunities for a range of species.
- Some of the areas of semi-improved grassland across the site were utilised in high densities. These areas tended to be relatively small and enclosed by hedges and / or areas of woodland. The open areas provide foraging habitat, while the field boundaries provide shelter, in addition to further foraging opportunities.

4.3 Overall bird assemblage summary

In total 55 bird species were recorded during the field surveys. Of these 55, 18 are considered notable due to their conservation status or legal protection.

The assemblage was largely typical of the habitats present within the site.

An assemblage of bird species was typical of farmland bird species and there were assigned to a "farmland bird assemblage". This assemblage is discussed in section 4.5.

Several 'notable' species, those on the BoCC list as Red or Amber, listed under Section 41 of the NERC Act, listed under Schedule 1 of the WCA or on the Sussex BAP were recorded. These are discussed, in section 4.4.

A small number of non-native bird species were present within the site, including two listed under Schedule 9 of the WCA; greater Canada goose and mandarin duck. The latter species is relatively widespread, but in low densities.

4.4 Notable birds and birds of conservation concern

Of the species recorded during the breeding bird surveys within the site, a total of 18 were considered notable. This section outlines the conservation status of these species, potential impacts and mitigation

required. Where these species are part of the 'farmland bird assemblage', they are also discussed as a component of an assemblage in section 4.5 (which also considers species which are not necessarily notable but of conservation concern).

4.4.1 Schedule 1 birds recorded

It is assessed that red kite, kingfisher and barn owl may be using the site, but that red kite is unlikely to be breeding within the site. These species were incidentally record within the site and were not recorded during the breeding bird surveys.

4.4.2 Notable 'songbirds' (Passeriformes)

This section outlines the notable passerine species, which includes 'farmland' species.

A number of notable passerine species were recorded, namely bullfinch (*Pyrrhula pyrrhula*) (red listed, peak count 8), dunnock (*Prunella modularis*) (amber listed, peak count 24), song thrush (*Turdus philomelos*) (red listed, peak count 34) and European starling (*Sturnus vulgaris*) (red listed, peak count 46).Yellow wagtail (*Motacilla flava*), yellowhammer (*Emberiza citrinella*), grey wagtail (*Motacilla cinerea*), Northern house martin (*Delichon urbicum*), Eurasian skylark (*Alauda arvensis*), Eurasian swallow (*Hirundo rustica*), house sparrow (*Passer domesticus*), mistle thrush and linnet were all recorded on site in small numbers (9 mistle thrush was the peak count within this group on a single visit) and are red listed in the UK on the BoCC list.

Two incidental sightings of kingfisher were made, this species is amber listed.

4.4.3 Notable Waders and Gulls (Charadriiformes)

Two notable gulls were recorded, European herring gull (*Larus argentatus*) and western lesser black-backed gull (*Larus fuscus*). Peak counts of 40 and 1 were recorded for the former and latter, respectively.

4.4.4 Notable Birds of Prey (Falconiformes and Strigiformes)

Common kestrel was the only notable bird of prey recorded on site during the breeding bird survey, although it was not breeding. Kestrel was recorded just twice on site.

Buzzard and red kite, which is listed under Schedule 1 of the WCA, were both recorded during other surveys. Their breeding status on the site is not known, but given they were not recorded during the dedicated breeding bird surveys, it is considered unlikely that they are breeding on the site.

4.4.5 Notable Waterfowl (Anseriformes)

The only notable waterfowl species recorded on the site was mallard (*Anas platyrhynchos*), which was not thought to be breeding on the site. A peak count of 13 was recorded for this species.

4.4.6 Other notable species

Several other notable species were present from a range of different taxa; common swift (*Apus apus*) (amber listed, peak count 40), Eurasian green woodpecker (*Picus viridis*) (Amber listed, peak count 3), stock dove (*Columba oenas*) (Amber listed, peak count 10). It was considered that swift was not breeding on the site and that the birds recorded were foraging. Green woodpecker was found to be breeding on the site in low numbers. Stock dove was categorised as probably breeding on the site.

4.5 Farmland bird assemblage

Within the site, a notable assemblage of farmland birds was recorded. Most of these species were 'confirmed', 'probably' or 'possibly' breeding within the site, except for common kestrel, mallard and yellow wagtail.

In total, 181 individual 'farmland birds' were recorded, an average of 45 birds recorded per survey. This is a recorded average of less than 1 bird per four hectares of survey area, per survey. It was noted that the number of each farmland bird species recorded during the surveys remained relatively constant. This suggests that the site is relatively important to the small number of individuals recorded using the site.

The data collected suggests that the site supports a relatively broad assemblage of common farmland birds, with a density that is likely to be limited by the low productivity of the habitats within the site (i.e. most of the site is intensively farmed arable land of limited value to nesting and foraging birds).

4.6 Barn owl assessment

Records of barn owl were returned at least 1.4km from the site, but none were recorded on the site during the breeding bird surveys (which is as would be expected since most of the survey took place when barn owl are not active).

During the building inspection, 12 buildings had potential to support barn owl roosting, with three structures with potential to support barn owl breeding. Two structures had evidence of usage by barn owl.

Across the site, the habitat was assessed as largely being sub-optimal or lower value for barn owl foraging (5.37% of the site was optimal foraging habitat).

It is concluded that the site may support roosting and breeding barn owl and has the potential to support some barn owl foraging.

5 Further Survey

No further surveys are required at this time. The requirement for further survey at later stages of the planning process will be determined by the details of the phasing of the development, and the mitigation approach determined for each phase.

6 Conclusions

As would be expected with a heterogeneous site of this nature, activity levels varied across the site, depending upon the habitats present and the species which utilise these habitats. Overall, the following qualitative observations were made:

- A high density of birds was recorded in the woodland on Ifield Golf Course in the south of the site.
- Large numbers of birds were recorded along the riparian corridors throughout the site. These habitats provide abundant feeding and nesting opportunities for a range of species.
- The Local Wildlife Site in east of the site was used by a high density of birds. The semi-natural broadleaved woodland, scrub and semi-improved neutral grassland provide foraging and nesting opportunities for a range of species.
- Some of the areas of semi-improved grassland within the site were utilised in high densities. These areas tended to be relatively small and enclosed by hedges and / or areas of woodland.

In total 55 bird species were recorded during the field surveys of these 18 are considered notable.

An assemblage of ‘farmland’; bird species was recorded. All except three of these species were confirmed, probably or possibly breeding species within the site. In total during the surveys, 181 individual ‘farmland birds’ were recorded, with an average number of records of 45 birds per survey. This is a recorded average of less than one bird per four hectares of survey area, per survey.

Incidental records of kingfisher and red kite, species listed under Schedule 1 of the WCA, were recorded in 2018 and/or 2019, demonstrating their use of the site. It is not thought to be likely that these species are breeding on the site.

Records of barn owl were returned at least 1.4km from the site, but none were recorded on the site during the breeding bird surveys (which is as would be expected since most of the survey took place when barn owl are not active).

During the building inspection, 12 buildings had potential to support barn owl roosting, with three structures with potential to support barn owl breeding. Two structures had evidence of usage by barn owl.

Across the site, the habitat was assessed as largely being sub-optimal or lower value for barn owl foraging (5.37% of the site was optimal foraging habitat).

It is concluded that the site may support roosting and breeding barn owl, and has the potential to support some barn owl foraging.

7 References

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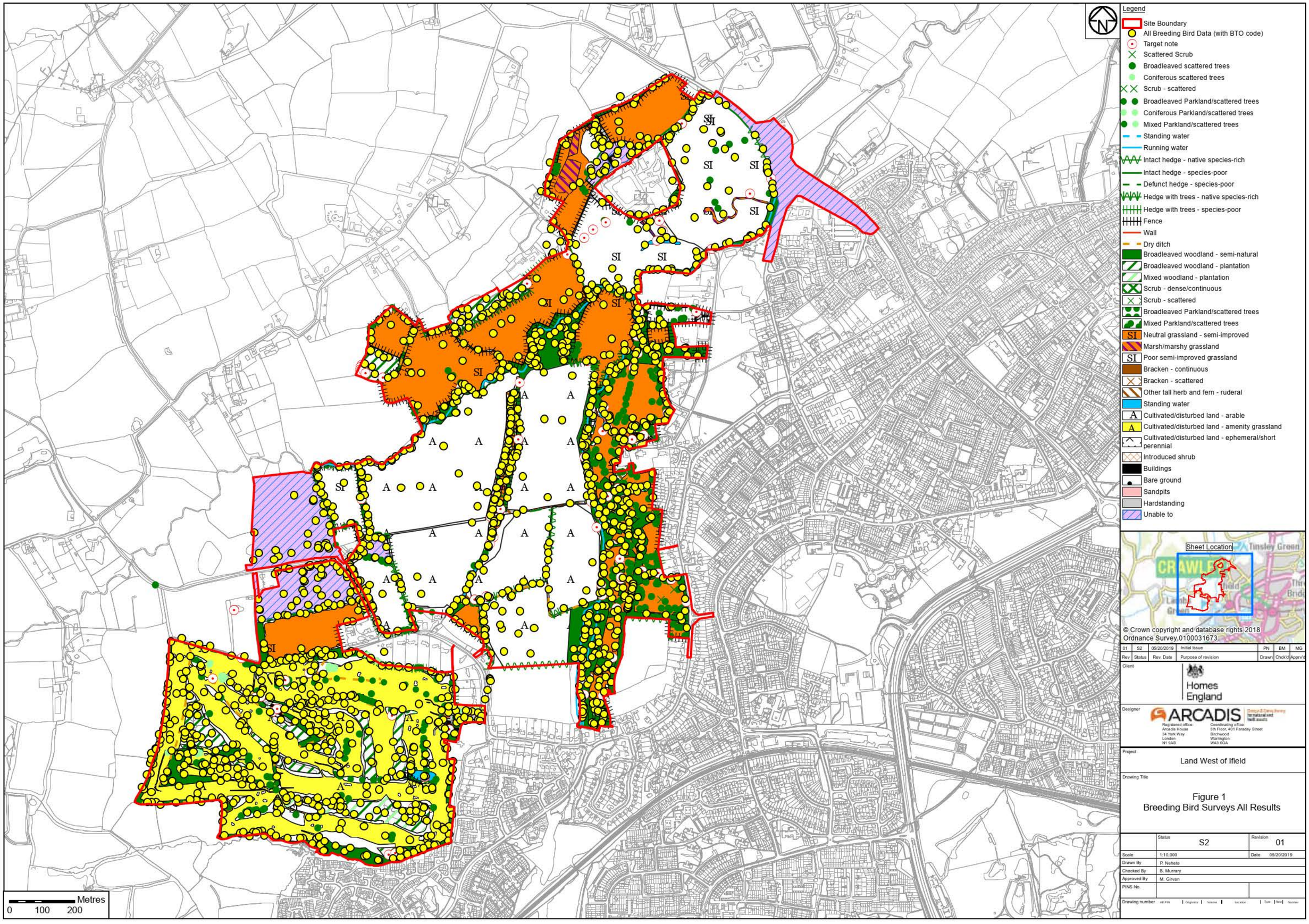
Figure 1: All breeding bird survey results

N.B. All BTO codes used in this map are presented in Appendix G.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Broadleaved scattered trees
Coniferous scattered trees
Scrub - scattered
Broadleaved Parkland/scattered trees
Coniferous Parkland/scattered trees
Mixed Parkland/scattered trees
Standing water
Running water
Intact hedge - native species-rich
Intact hedge - species-poor
Defunct hedge - species-poor
Hedge with trees - native species-rich
Hedge with trees - species-poor
Fence
Wall
Dry ditch
Broadleaved woodland - semi-natural
Broadleaved woodland - plantation
Mixed woodland - plantation
Scrub - dense/continuous
Scrub - scattered
Broadleaved Parkland/scattered trees
Mixed Parkland/scattered trees
SI Neutral grassland - semi-improved
Marsh/marshy grassland
SI Poor semi-improved grassland
Bracken - continuous
Bracken - scattered
Other tall herb and fern - ruderal
Standing water
A Cultivated/disturbed land - arable
A Cultivated/disturbed land - amenity grassland
Cultivated/disturbed land - ephemeral/short perennial
Introduced shrub
Buildings
Bare ground
Sandpits
Hardstanding
Unable to
Metres
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Sheet Location
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CRAWLEY
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01 S2 05/20/2019 Initial Issue PN BM MG
Rev. Status Rev. Date Purpose of revision Drawn Chck'd Apprv'd
Client
Homes England
Designer
ARCADIS
Registered office: Arcadis House 34 York Way London N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street Birchwood Warrington WA3 6GA
Project
Land West of Ifield
Drawing Title
Figure 1
Breeding Bird Surveys All Results
Status S2
Revision 01
Scale 1:10,000
Date 05/20/2019
Drawn By P. Nehete
Checked By B. Murrary
Approved By M. Girvan
PINS No.
Drawing number HE P/N Originator Volume Location Type Role Number


Legend
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CRAWLEY
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Project
Land West of Ifield
Drawing Title
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Drawn By P. Nehete
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Approved By M. Girvan
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Legend

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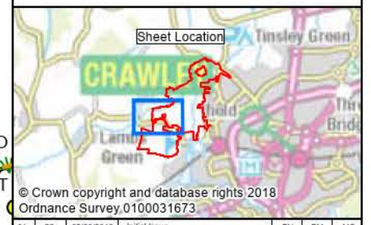

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Client: Homes England

Designer: ARCADIS

Registered office: Arcadis House 34 York Way London N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street Birchwood Warrington WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 1 Breeding Bird Surveys All Results

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Scale	1:3,500	Date 05/20/2019
Drawn By	P. Nehete	
Checked By	B. Murrary	
Approved By	M. Girvan	
PINS No.		

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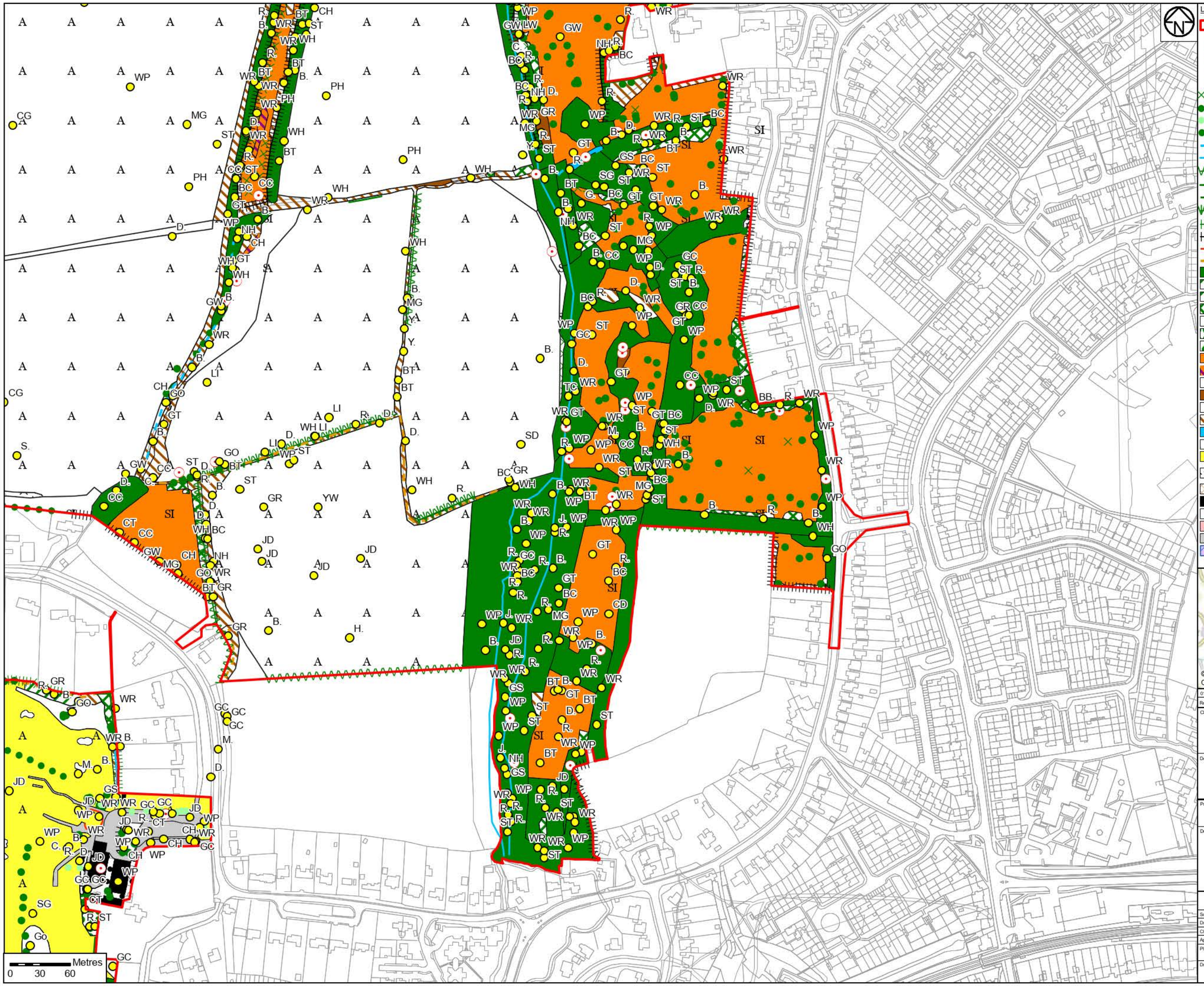

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Project: Land West of Ifield

Drawing Title: Figure 1
Breeding Bird Surveys All Results

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Drawn By	P. Nehete		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

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Registered office: Arcadis House 34 York Way London N1 9AB
Coordinating office: 5th Floor, 401 Faraday Street Birchwood Warrington WA3 6GA

Project: Land West of Ifield

Drawing Title: Figure 1
Breeding Bird Surveys All Results

	Status: S2	Revision: 01	
Scale	1:3,500	Date	05/20/2019
Drawn By	P. Nehete		
Checked By	B. Murrary		
Approved By	M. Girvan		
PINS No.			

Drawing number: HE P/N | Originator | Volume | Location | Type | Role | Number

Metres
0 30 60