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Breeding bird surveys

Padbury Brook Solar Farm, Bicester, Oxfordshire

November 2022

A report by

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Report details

Site name:	Padbury Brook Solar Farm
Site address:	Land near Stratton Audley, Cherwell, Oxfordshire, OX27 9BE
Grid reference:	SP623272
Surveyor:	Adrian George BSc (Hons), MCIEEM
Report date:	16th November 2022
Report author:	James Gilroy BSc
Report review:	Colin Hicks BSc (Hons) MCIEEM
Report reference:	WOR-2672.BBS

Declaration of compliance

BS 42020:2013

This study has been undertaken in accordance with British Standard 42020:2013 Biodiversity, Code of practice for planning and development.

Code of Professional Conduct

The information which we have prepared is true, and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Validity of survey data and report

The findings of this report are valid for 12 months from the date of survey. The full survey effort has not been fully completed and this purpose of this report is not to determine any likely impact. If work has not commenced within this period, an updated survey by a suitably qualified ecologist will be required.

Revisions

Date	Report no:	Approved by:	Comment
30/08/2022	WOR-2672.BBS	CDH	Original report
16/11/2022	WOR-2672.BBS.2	CDH	Updated report

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1. Introduction

Western Ecology has been commissioned to complete breeding bird surveys within an area of agricultural land located near to Stratton Audley in Oxfordshire. A solar farm with associated infrastructure is proposed.

1.2. Survey aims

The purpose of the surveys is to determine the importance of the breeding bird assemblage that the site of the proposed solar farm site supports.

1.3. Site location

The site comprises an area of agricultural land located within a rural area. The village of Stratton Audley is located approximately 800m to the southwest of the proposed development area, with the town of Bicester located approximately 3.7km to the southwest (at the closest point).

2. Survey methodology

2.1. Desktop survey

The desktop survey collated existing biological records for the site and adjacent areas and identified any nature conservation sites that may be affected by the proposals. This comprises an important part of the assessment process, providing information on ecological issues that may not be apparent during the site survey.

Consultees for the data search included:

- Thames Valley Environmental Records Centre (TVERC) provided biological records for protected/notable bird species.
- Natural England - GIS dataset of SSSI Impact Risk Zones and statutory nature conservation sites.

2.2. Field survey

Breeding Bird Surveys (BBS) were completed by Adrian George using a methodology based upon a combination of Common Bird Census methodology, devised by the British Trust for Ornithology (BTO), and the national Breeding Bird Survey (BBS) techniques, jointly devised by the BTO, Royal Society for the Protection of Birds (RSPB) and the Joint Nature Conservation Committee.

This involved a suitably experienced surveyor slowly walking a predetermined transect and recording all birds seen or heard onto pre-printed maps using BTO codes and symbols to describe species present and associated activity.

Classification of breeding status

The results of the breeding bird surveys were assessed against the European Ornithological Atlas Committee (EOAC) criteria for breeding bird status as follows:

Non-breeding

- Flying over
- Species observed but suspected to be still on Migration
- Species observed but suspected to be summering non-breeder

Possible breeder

- Species observed in breeding season in suitable nesting habitat
- Singing male present (or breeding calls heard) in breeding season in suitable breeding habitat

Probable breeding

- Pair observed in suitable nesting habitat in breeding season
- Permanent Territory presumed through registration of territorial behaviour (song etc) on at least two different days a week or more part at the same place or many individuals on one day
- Courtship and Display (judged to be in or near potential breeding habitat; be cautious with wildfowl)

- Visiting probable Nest site
- Agitated behaviour or anxiety calls from adults, suggesting probable presence of nest or young nearby
- Brood patch on adult examined in the hand, suggesting Incubation
- Nest Building or excavating nest-hole

Confirmed breeding

- Distraction-Display or injury feigning
- Used Nest or eggshells found (occupied or laid within period of survey)
- Recently Fledged young (nidicolous species) or downy young (nidifugous species). Careful consideration should be given to the likely provenance of any fledged juvenile capable of significant geographical movement. Evidence of dependency on adults (e.g. feeding) is helpful. Be cautious, even if the record comes from suitable habitats
- Adults entering or leaving nest-site in circumstances indicating Occupied Nest (including high nests or nest holes, the contents of which cannot be seen) or adults seen incubating
- Adult carrying Faecal sac or Food for young
- Nest containing Eggs
- Nest with Young seen or heard

Table 1 – survey timings and weather conditions

Date	Time Started	Time finished	Weather
21/04/2022	06:30	08:15	Sunny, dry and cool. 7-10°C, light NW breeze and <10% cloud.
17/05/2022	06:00	07:50	Sunny, dry and mild. 9-13°C, light SE breeze and 20% cloud cover.

Target species primarily consisted of wetland birds in particular waders, wildfowl, and gulls as well as Schedule 1 raptors and owls. Records were made of other notable species which were determined based on the following criteria:

Schedule 1 of the Wildlife and Countryside Act (1981)

The Wildlife and Countryside Act (WCA) 1981 (as amended) affords greater protection to certain breeding species and are as such listed as specially protected under Schedule 1 of the Act.

Birds of Conservation Concern (BoCC) 5

Commonly referred to as the UK Red List for birds, this is the fifth review of the status of birds in the UK, Channel Islands and Isle of Man, and updates the last assessment in 2015. Using standardised criteria, 244 species with breeding, passage or wintering populations in the UK were assessed by experts from a range of bird NGOs and assigned to the Red, Amber or Green lists of conservation concern.

Red list species are those that are Globally Threatened according to IUCN criteria; those whose population or range has declined rapidly in recent years; and those that have declined historically and not shown a substantial recent recovery.

Amber list species are those with an unfavourable conservation status in Europe.

Species on the Green List fulfil none of the above criteria and are of least conservation concern.

Biodiversity Action Plan species

Species of bird are listed as Biodiversity Action Plan Priority Species and species listed as species of principal importance under Section 41 of the Natural Environments and Rural Communities (NERC) Act 2006.

2.4. Survey constraints

Breeding bird surveys usually involve at least 3 visits between the period April – July, however due to logistical issues 2 survey visits were undertaken in April and May. As this captures the early to mid breeding season, it is not considered likely that additional later breeding species would have been recorded at this site given the cropping regime within the site, and is not considered to be a constraint to the objective of identifying indicative breeding territories

There are no other constraints to the surveys

2.5. Study area

The survey area for the breeding bird surveys was the footprint of the proposed development, hereafter referred to as the 'Site', and its immediate surroundings This is the area included within the line described as "Survey area" within the legend of Map 1.

3. Results

3.1. Desktop survey

The biological records search returned records of bird notable species within the geographical parameters of the search (2km). Due to the broad scale of many records, it is not possible to determine if they relate to the Site itself, and whether they relate to breeding or wintering periods. Details are contained in Table 2 below.

Table 2. Notable species records within 2km

Species	Number of records	UK Legislation
Corn Bunting	1	NERC Section 41; Red conservation status
Cuckoo	1	NERC Section 41; Red conservation status
Grey Partridge	3	NERC Section 41; Red conservation status
Hobby	2	WCA Schedule 1 species
Kestrel	7	Amber conservation status
Lapwing	2	NERC Section 41; Red conservation status
Linnet	3	NERC Section 41; Red conservation status
Reed Bunting	1	NERC Section 41; Amber conservation status
Skylark	8	NERC Section 41; Red conservation status
Song Thrush	2	NERC Section 41; Red conservation status
Starling	2	NERC Section 41; Red conservation status
Swift	21	Red conservation status
Willow Warbler	2	Amber conservation status
Yellowhammer	9	Amber conservation status

There are no statutory nature conservation sites with qualifying features relating to migratory, overwintering and/or wetland bird species, located within 10km of the Site.

SSSI Impact Risk Zones

The Site is within an area identified as a SSSI Impact Risk Zone for this size or type of development.

3.2. Habitat Assessment

The Site predominantly comprises arable fields under autumn/winter cereal cropping regimes, enclosed by hedgerows. Other boundary habitats include woodland edge and mixed scrub. Autumn/winter sown cereal cropping is likely to attract ground nesting birds such as Skylark particularly during the early breeding season when vegetation height and structure will be more suitable for nesting. Suitability is likely to decrease throughout the breeding season as the crops grow up and become too tall and dense for successful breeding.

Hedgerows, woodland edge and mixed scrub habitats which enclose the field compartments provide suitable breeding habitat for a wide variety of bird species, especially passerines which have previously been recorded within the Site (during wintering bird surveys) such as Dunnock, Wren and Yellowhammer. Individual trees associated with hedgerow boundaries or woodland edge may also provide nesting opportunities for raptor species.

3.3. Breeding bird transect survey

The breeding bird assemblage recorded within the Site during the surveys is characteristic of farmland habitats.

A total of 12 target or notable species were recorded within the Site, consisting of 4 BoCC Amber list species (Dunnock, Stock Dove, Wood Pigeon and Wren), 6 BoCC Red list species (Linnet, Grey Partridge, Skylark, Song Thrush, Yellowhammer and Yellow Wagtail). Of these, 4 species are listed under Section 41 of the NERC Act (2006) (Linnet, Grey Partridge, Skylark, Song Thrush, Yellowhammer and Yellow Wagtail). Two species listed under Schedule 1 of the WCA (1981) were also recorded (Red Kite and Hobby).

A further 18 species were recorded which are BoCC Green list species.

The majority of the notable and target species activity was associated with the hedgerow boundaries which enclose the field compartments. Ground nesting species such as Skylark and Yellow Wagtail were recorded in the field interiors, associated with the arable crops within and adjacent to the Site. Skylark were recorded in relatively moderate numbers with a total of 7 likely territories recorded within the arable habitats. A pair of Grey Partridge were recorded foraging along a hedgerow base during one visit.

Hobby was recorded as a pair, circling an individual tree along a hedgerow boundary within the Site. It is likely that Hobby are nesting within this tree.

A number of species were recorded either foraging or flying over the Site and are not considered to be using the Site for breeding. These species include Swallow, Wood Pigeon, Stock Dove, Red Kite.

Table 3. Species recorded during nesting bird transects.

Species	April survey	May survey	Breeding evidence	Conservation status	Breeding status
Blackbird	3	3	Repeated singing	Green[1]	Probable breeder
Blackcap	1	2	Repeated singing	Green	Possible breeder
Blue Tit	4	5	Carrying food	Green	Confirmed breeder
Carrion Crow	1	3	None recorded	Green	Non-breeder
Chaffinch	5	3	Repeated singing	Green	Probable breeder
Chiffchaff	2	1	Repeated singing	Green	Probable breeder
Dunnock	6	8	Repeated singing; nest with young heard	Amber[2]	Probable breeder
Goldfinch	1	1	Repeated singing	Green	Possible breeder
Great Spotted Woodpecker	2	1	Birds in suitable habitat	Green	Possible breeder

[1] BoCC 5 – Green listed species

[2] BoCC 5 – Amber listed species

Great Tit	2	2	Juveniles seen	Green	Confirmed breeder
Hobby	2	0	Pair seen in suitable habitat	S1[3]	Probable breeder
Jay	1	0	None recorded	Green	Non-breeder
Jackdaw	2	1	None recorded	Green	Non-breeder
Lesser Whitethroat	0	2	Repeated singing	Green	Possible breeder
Linnet	1	2	Repeated singing	Red[4]; S41[5]	Possible breeder
Long-tailed Tit	0	2	Birds in suitable habitat	Green	Possible breeder
Magpie	2	0	None record	Green	Non-breeder
Nuthatch	1	0	Bird in suitable habitat	Green	Possible breeder
Grey Partridge	0	1	Pair foraging	Red; S41	Possible breeder
Red Kite	0	1	None recorded	S1	Non-breeder
Robin	4	6	Repeated singing; carrying food; territorial behaviour	Green	Confirmed breeder
Skylark	9	7	Repeated singing	Red; S41	Probable breeder
Song Thrush	0	1	Singing in suitable habitat	Red; S41	Possible breeder
Stock Dove	0	2	None recorded	Amber	Non-breeder
Swallow	0	2	None recorded	Green	Non-breeder
Whitethroat	5	7	Repeated singing	Green	Probable breeder
Woodpigeon	1	1	None recorded	Amber	Non-breeder
Wren	9	6	Repeated singing; territorial behaviour	Amber	Confirmed breeder
Yellowhammer	8	4	Repeated singing; carrying food	Red; S41	Confirmed breeder
Yellow Wagtail	0	1	Bird in suitable habitat	Red; S41	Possible breeder

[3] Listed under Schedule 1, Wildlife & Countryside Act (1981)

[4] BoCC 5 – Amber listed species

[5] Listed under Section 41, NERC Act (2006)

4. Evaluation of potential impacts

The importance of the Site for breeding birds has been assessed in light of current nature conservation policy, planning policy and wildlife legislation by an experienced ecologist.

If it is considered that the proposed development is likely to have no effect on features that have been identified as present, or potentially present, they may be scoped out at this stage.

4.1 Legislation

All wild birds are protected under the Wildlife and Countryside Act 1981 (as amended) from being killed, injured or captured whilst their nests and eggs are protected from being damaged, destroyed or taken. Birds which are listed under Schedule 1 of the Act are given additional protection against disturbance.

Fifty-nine species of bird are listed as species “of principal importance for the purpose of conserving biodiversity”.

4.2 Potential impacts

The breeding bird assemblage recorded at this Site is considered to by typical of farmland habitat in terms of both species range and numbers, and the Site is likely to be of local value.

The majority of species, including notable and target species were recorded within hedgerows and other boundary habitats (such as scrub and woodland), and breeding activity is likely to be confined to these areas. Ground nesting species that were recorded included Grey Partridge, Skylark and Yellow Wagtail. Skylark is a species which nest within open vista habitats such as arable field compartments, while Grey Partridge and Yellow Wagtail are likely to use boundary habitats such as hedgerow bases for nesting.

Hobby are likely to be nesting with a mature tree along an eastern hedgerow boundary (as shown in Map 1).

Potential impacts associated with this proposed development on the breeding bird assemblages recorded here involve destruction of active nests, habitat loss and displacement.

Active nest sites

Although hedgerows and boundary habitats will be retained and will be protected by a 5m buffer during the construction and operational phases, any small-scale vegetation clearance (such as widening gateways, creating new access) that may be required has potential to impact active nests in a way that may be an offence. Vegetation clearance within the field interiors also has potential to damage or destroy nests of ground nesting species such as Skylark. Mitigation is therefore recommended for any vegetation clearance.

Hobby are likely nesting within an individual tree along the eastern hedgerow boundary, and are protected under Schedule 1 under WCA (1981) against disturbance. Construction activities have potential to cause to disturbance to this nest site through increased human presence, regular machinery movements and noise, and specific mitigation in relation to nesting Hobby during the construction phase is recommended.

The operation of the proposed development is unlikely to cause disturbance, as any maintenance visits to the are likely to be limited to occasional, short term visits, which when viewed against the current baseline of active agricultural land is not considered likely to impact this potential nest site. No mitigation for the operational phase is recommended.

Habitat loss and displacement

Although the arable habitats within the Site were found to support seven Skylark territories, winter sown cereal crops (such as those within the Site) have been strongly linked to a decline in Skylark breeding success Chamberlain *et al.* (2000). This is due to cereal crops becoming too dense and tall, preventing access to the ground which has been shown to reduce second and third brood attempts later into the breeding season. A study looking at changes in biodiversity between solar farms and undeveloped sites by Montag *et al.* (2016) found that overall diversity and abundance of birds was higher in solar farms compared to adjacent 'control' sites. The study found that Skylark territories were not reduced within solar farms when compared to control plots, whilst abundance of all bird species was significantly higher in solar plots, when compared to control plots. Any birds nesting within field interiors may be temporarily displaced during the construction phase, however it is likely they would re-establish territories during the operational phase. Taking into account the abundance of similar habitat comprising large open fields in the adjacent landscape, the low potential for the existing arable habitats for successful nesting, and the potential benefits to a wide variety of bird species, the proposed solar farm would have a negligible impact on local farmland bird populations.

Recent studies conducted by the Royal Society for the Protection of Birds (RSPB) (Shotton, 2020) further supports high bird usage of solar farms by farmland bird species, including species such as Yellowhammer. The habitat loss associated with the proposed development involves the permanent loss of approximately 60ha of arable land which will be converted to extensively managed grassland habitat. The newly created grassland habitats will provide a benefit to the majority of the ground nesting species recorded here, such as Grey Partridge and Yellow Wagtail.

Boundary habitats (such as hedgerows, woodland edge and scrub) are to be retained at this Site and will be protected by a 5m buffer zone, delineated by suitable fencing, during the construction phase. This buffer will also be maintained throughout the operational phase. The Site will therefore continue to support the breeding assemblage associated with boundary habitats recorded here during the construction and operation of the proposals.

No mitigation for habitat loss or displacement is recommended.

5. Recommendations for mitigation strategy

Mitigation is recommended to prevent construction activities damaging or destroying any active nests that may be present within hedgerows, scrub and the arable field compartments. Additional mitigation is also recommended to ensure that construction activities do not cause disturbance to the Hobby nest associated with the eastern boundary. Mitigation for these impacts is detailed below.

All retained hedgerow/woodland/scrub habitats should be protected by a 5m buffer zone and should be maintained for the duration of the construction phase. This protection zone should be delineated by a suitable fence and maintained for the duration of the works, and there should be no access, storage of materials, ground disturbance, burning or contamination within the fenced areas. This will ensure that active nests associated with the field boundaries or margins will not be impacted.

Any construction activities affecting breeding habitats associated with the field interiors, or if small scale vegetation clearance involving hedgerows (such as gate way widening) is required, it should be completed during the period September to February inclusive, outside the accepted bird nesting season. If this is not practicable, prior to the start of works these habitats should be thoroughly inspected by a suitably qualified person prior to disturbance or removal. If nesting birds are found, all activities likely to damage the immediate area should be delayed until chicks have fledged.

Hobby usually select disused Crow nests for nesting and do sometimes return to the same nest site in subsequent years. It is therefore recommended that a suitable buffer zone should be implemented around the tree in which Hobby were recorded nesting and this should be maintained for the duration of the accepted breeding season (March to August, inclusive). No information regarding specific buffer distances for nesting Hobby in farmland is available, however, a study by Messenger & Romme (2007) has shown Hobby are tolerant of vehicle movements but can be disturbed by humans on foot, close to nest sites. Based on disturbance distances described by Ruddock & Whitfield (2007) for similar raptor species and those outlined for forestry operations in Scotland (Forestry Commission Scotland (FCS) Guidance Note 32, 2006), a buffer zone of 100m should be implemented around the Hobby nest tree (as shown in Map 1), and delineated by suitable fencing and signage, in which there should be no access for site personnel on foot for the duration of the breeding season.

Provided these mitigation measures are implemented, the impacts of the proposed development on the existing breeding bird assemblage at this site are considered to be negligible.

6. Conclusion

The Site supports a breeding bird assemblage that is characteristic of farmland habitats and is considered to be of only local value. The majority of all breeding activity was associated with hedgerows and other boundary habitats such as woodland edge and mixed scrub. The proposed development is considered to pose a negligible impact upon species using these habitats which will remain functional during the operation phase and continue to support the vast majority of the breeding assemblage recorded. Ground nesting species such as Skylark which utilise open habitat such as field interiors may be temporarily displaced during construction, but this a short term, temporary impact.

Mitigation is recommended to ensure that construction activities do not harm any active birds nests or disturb nesting Hobby. Providing this is adhered to no adverse impacts are considered likely, while a long-term benefit to the wider species assemblage recorded here is likely.

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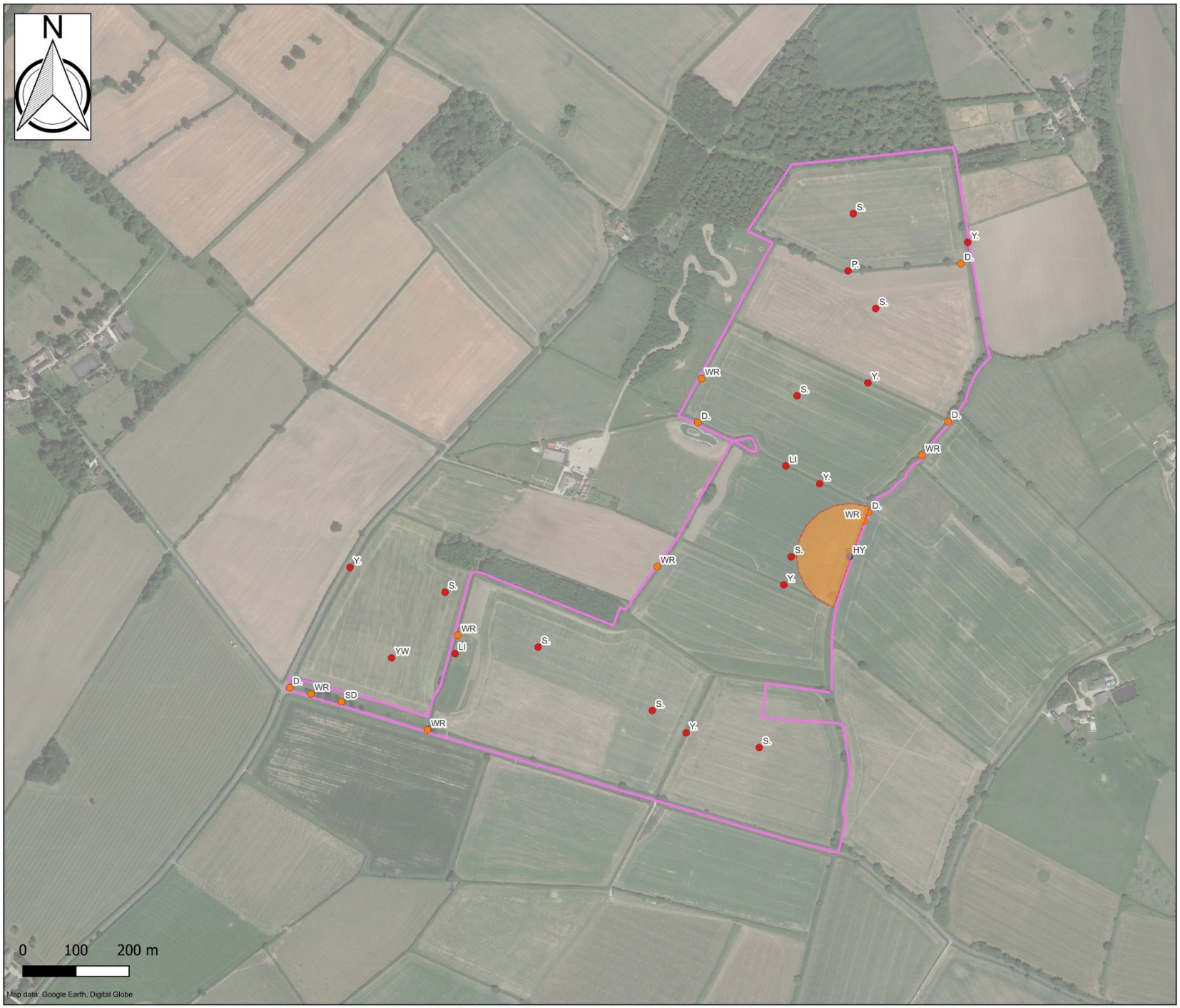
Appendix 1:

Indicative breeding territories of target and notable bird species and recommended exclusion zone for Hobby



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Legend

Development footprint

Indicative target & notable species breeding terr

- Amber list species
- Red list species
- Schedule 1 listed species

D = Dunnock
HY = Hobby
LI = Linnet
P. = Grey Partridge
S. = Skylark
Y. = Yellowhammer
YW = Yellow Wagtail

100m buffer for Hobby nest

Title: Map 1. - Indicative breeding territories for target & notable species

Project: Padbury Brook Solar Farm, Bicester, Oxfordshire

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