Hilfield Solar Farm and Battery Storage

Ecological Appraisal

on behalf of Elstree Green Limited

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Ecological Appraisal

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Disclaimer

Contents

1 Summary

1.1 BSG Ecology was commissioned in 2020 to conduct an Preliminary Ecological Appraisal (PEA) of land to the north east and west of Elstree Aerodrome, Elstree, Hertfordshire by Aardvark EM Ltd on behalf on Elstree Green Limited, to inform the design of a proposed solar farm and battery storage.

1.2 An ecology desk study, extended Phase 1 habitat survey, and protected species surveys for badger, breeding birds and great crested newt (GCN) were carried out. This report presents the methods, limitations and results of these surveys, makes an assessment of the potential ecological impacts of the proposed development, and sets out measures to avoid, reduce, mitigate or compensate for these impacts, as appropriate.

1.3 The 'Site' is dominated by an eastern and a western parcel of predominantly agricultural land situated to the north east and west of Elstree Aerodrome, respectively. These two parcels are connected by a strip of land directly north of the aerodrome which is proposed for an underground cable route. These three areas which together form the "survey area" are shown in Figure 1.

1.4 Two statutory Local Nature Reserves (LNRs) and 35 non-statutory Local Wildlife Sites (LWSs) are situated within 2 km of the Site. These include three LWSs directly adjacent to the Site boundaries.

1.5 The Site is dominated by intensively managed arable land of limited ecological value, with smaller areas of poor semi-improved grassland. Within the wider survey area (but outside the Site) there are areas of good semi-improved grassland directly north of the aerodrome. Within the Site there are also boundary hedgerows and small areas of woodland which are Habitats of Principal Importance (HPIs), five ponds (all of which have potential to be HPIs) plus scattered mature trees, two small streams and small areas of scrub and tall ruderal vegetation. The Site borders several areas of mature broadleaved woodland including an area of ancient woodland at Little Kendals Wood to the north east of the eastern parcel.

1.6 The Site provides suitable habitat for the following protected species: bats (for which roosting, foraging and commuting habitat is present), badger, hazel dormouse, water vole, breeding and wintering birds, reptiles, and amphibians. It also provides habitat for a range of invertebrate species. Most of the Site's suitability for these species is confined to areas which are proposed for retention in the solar farm, including the hedgerows and ponds, or to the area proposed for the cable route.

1.7 Active badger setts are present within the eastern parcel of the Site. A small population of gGCN is breeding within two onsite ponds. The Site supports a variety of common and widespread breeding bird species (including priority species) as well as an estimated four pairs of skylark.

1.8 The Site has some suitability for wintering gulls associated with the nearby Hilfield Park Reservoir (designated as an LNR and LWS in part for wintering birds) but is likely to only provide sporadic foraging for a low number of gulls and is not considered to provide a significant proportion of the foraging habitat that is available locally for the roosting population at Hilfield Park Reservoir.

1.9 Habitat impacts from the proposed development will mainly be a loss of arable farmland (i.e. conversion to grassland around the solar arrays). However, extensive habitat retention, creation and enhancement has been designed into the scheme (see the site layout, Landscape and Ecology Enhancement Plan and Landscape and Ecology Management Plan), including the creation of grassland under low-intensity management, pond

enhancement and creation, hedgerow and tree planting, and the provision of bat, dormouse and barn owl boxes and hibernation sites for amphibians and reptiles. The proposed development will therefore produce a biodiversity net gain in line with national planning policy.

1.10 The designed-in mitigation includes the retention (with landscape buffer zones) of all hedgerows, woodland, watercourses, ponds and adjacent offsite areas designated as LWSs. This will avoid significant population-level impacts on the species identified above.

1.11 In the absence of additional mitigation, however, the proposed development has the potential for impacts on adjacent designated sites and on individual bats, dormice, GCN, reptiles and nesting birds. Construction mitigation is therefore proposed to protect adjacent designated sites and retained habitats during construction, and to protect each of these species.

1.12 **If the designed-in and additional mitigation measures are implemented in full, the proposed development will mitigate or compensate for all ecological impacts, will produce a biodiversity net gain in accordance with planning policy and will comply with wildlife legislation**.

2 Introduction

Background to commission

2.1 Elstree Green Limited is proposing the development of a solar farm and battery storage on land northeast and west of Elstree Aerodrome, Hertfordshire.

2.2 The solar farm and battery storage will comprise ground-mounted photovoltaic solar arrays and battery-based electricity storage containers together with a substation, inverter/transformer stations, site accesses, internal access tracks, security measures, access gates, other ancillary infrastructure and biodiversity enhancements.

2.3 BSG Ecology was commissioned on 20 March 2020 by Aardvark EM Ltd on behalf on Elstree Green Limited to conduct an Ecological Appraisal of the proposed development.

Site description

2.4 The 'Site' comprises two parcels of agricultural land to the northeast and west of Elstree Aerodrome in Hertfordshire, on the rural fringe of Greater London. These are set in a mixture of arable farmland and pasture, with the suburban areas of Bushey, Borehamwood and Radlett situated approximately 500 m southwest, 800 m north and 800 m east, respectively. The boundaries of these parcels are shown in Figure 1.

2.5 The western parcel is approximately 48.1 ha in extent and is centred approximately at OS National Grid Reference TQ15129653. This parcel includes land to the north, east and south of Hilfield Farm on both sides of Hilfield Lane. To the east it borders Elstree Aerodrome and agricultural land, while to the south and south east it borders the wooded grounds of a country house, Hilfield Castle, and the nearby Hilfield Park Reservoir. To the south-west and west are the M1 and A411 roads, while to the north the western parcel borders other agricultural land.

2.6 The eastern parcel is approximately 82.4 ha in extent and is centred approximately at OS National Grid Reference TQ16619744. To the west, south, and east it borders Aldenham Road, Butterfly Lane and the A5183 Watling Street roads, respectively, and it is surrounded by other agricultural land, with woodland and the grounds of the Haberdasher's Aske's School to the south. Aldenham School and grounds is situated to the north west of the eastern parcel. At the corner of Butterfly Lane and Watling Street are Belstone Football Club's sports pitches.

2.7 In addition to the Site, the 'Survey Area' included an area of additional land to the north of the airport (the "airport parcel") that links the eastern and western parcels and includes part of the grassland margin north of the runway, as well as several grazing fields to the north east and east of the runway. This area is proposed for a cable route, the corridor for which is shown in Appendix 1. The installation of this cable is included in this appraisal.

Description of the proposed development

2.8 Elstree Green Limited is seeking planning permission to develop a solar farm and battery storage on the Site, comprising photovoltaic panels plus associated transformer/inverter infrastructure, battery storage area and substation. The two parcels will be connected by a cable route running through the northern perimeter of Elstree Airport. The layout is appended to this report as Appendix 1.

2.9 A range of ecology mitigation and enhancements have been designed into the development. These have been informed by the ecology surveys described in this report.

2.10 The arrays will be set within permanent grassland on areas of the Site currently in arable use. In the proposed development, boundary features (such as hedgerows and watercourses) and other areas of more ecologically valuable habitat will be retained, with adjacent buffer habitat. Further areas within the Site will also be retained and/or enhanced as wildlife areas.

2.11 The mitigation and enhancement measures are set out in the Site layout (see Appendix 1), the Landscape and Ecology Enhancement Plan (see Appendix 3) and the separate Landscape and Ecological Management (LEMP; Document Ref: R009). They are summarised in section 5 of the current report, prior to the impact assessment in section 6. These mitigation and enhancement measures have been assumed in the Impact Assessment section of this appraisal.

2.12 It has been assumed in this appraisal that small impacts on (or temporary losses of) the more ecologically valuable habitats may be necessary to provide access during construction of the cable route.

Scope of Study

2.13 This report provides an Ecological Appraisal of the proposed development. It sets out the methods and findings of a desk study and a series of ecology surveys undertaken to inform this appraisal, comprising an extended Phase 1 habitat survey, a GCN survey, a breeding bird survey, and a badger survey.

2.14 This report sets out the features of ecological interest at the Site and wider Survey Area and evaluates potential ecological impacts associated with the proposed development, taking into account the designed-in ecology mitigation and enhancements. It then sets out the required further mitigation measures that will be necessary for avoiding, compensating and mitigating these impacts.

3 Methods

Desk study

3.1 The local biological records centre, Hertfordshire Environmental Records Centre (HERC), was contacted for records of non-statutory designated sites and protected, invasive and otherwise notable species within 2 km of the Survey Area. The data were returned on 30 March 2020.

3.2 The Multi Agency Geographic Information for the Countryside (DEFRA, 2020b) website was searched to establish whether any statutory designated wildlife sites occur within 2 km of the Survey Area, whether any internationally designated wildlife sites occur within 10 km of the Survey Area, and whether any European Protected Species licences have been granted within 2 km of the Survey Area. In addition a search was made for ponds within 500 m of the Survey Area using freely available online Ordnance Survey Mapping and aerial photography.

3.3 In addition, the British Trust for Ornithology (BTO) was contacted for the most recent count records or waterbirds from the monthly Wetland Bird Survey (WeBS) carried out at Hilfield Park Reservoir (see BTO, 2020). These data cover winter 2014–2015 to winter 2018–2019 and were returned on 25 November 2020.

Field survey

Extended Phase 1 habitat survey

3.4 A Phase 1 habitat survey of the Survey Area was carried out on 26 March 2020 by Claire Wiggs, Ecologist at BSG Ecology, with reference to industry standard guidance (JNCC, 2010). This involved a walkover of the Survey Area, during which habitats present were identified and mapped, and notes (Target notes, TN; see Appendix 2) were made on plant species and other features of ecological interest.

3.5 The Phase 1 habitat survey was “extended” to include an assessment of the potential of the Survey Area to support protected and other species of conservation importance.

3.6 The survey was updated in relation to ponds, in relation to extensions to the western edge of the Survey Area, and in relation to the grassland on and near Elstree Aerodrome by Tom Flynn, Principal Ecologist at BSG Ecology and Philip Chapman, Ecologist at BSG Ecology on 30 April 2020.

Limitations

3.7 The time of year in which the Phase 1 habitat survey was carried out is within the optimal period for this survey. There were no significant limitations identified to this survey.

Biodiversity Impact Assessment

3.8 A biodiversity impact assessment of the proposed development using the DEFRA 2.0 Biodiversity Net Gain calculator1 has been carried out and is reported separately (BSG Ecology, 2020).

[1] Available at http://publications.naturalengland.org.uk/file/5985083561607168

Badger survey

3.9 A badger survey of the Survey Area was undertaken during the extended Phase 1 habitat survey on 10 and 14 September 2020 by Dr Philip Chapman. This involved searching the Survey Area for evidence of badger activity; particular attention was given to field boundaries and areas of scrub and woodland as this is where any setts were most likely to be located. Evidence searched for included sett entrances, dung pits, latrines, foraging (snuffle) holes, paw prints, pathways in vegetation and badger hairs caught on fencing or vegetation.

3.10 Categories of badger setts (main, annexe, subsidiary and outlier, as set out by Neal and Cheeseman, 1996, and Harris *et al*., 1994) were identified. Once a sett was discovered, an indication of the level of activity was also made (active, partially used and disused), according to Harris *et al*. (1989).

Limitations to methods

3.11 Some small areas of extremely dense scrub could not be completely accessed for the badger survey. However, these areas were limited in size and were inspected carefully along their entire external boundaries for trails leading into the interior which might give evidence of badgers or other animals accessing them. No area of scrub was detected which had such trails that could not be further and fully inspected; therefore it is considered unlikely that the presence of any badger setts within the Survey Area was missed. In addition, these areas are recommended for retention in Section 5. Therefore this limitation is not considered to have limited this appraisal.

Breeding Bird Characterisation Survey

3.12 A breeding bird characterisation survey was undertaken by Dr Philip Chapman (PC) and Bill Haines (BH). This comprised three survey visits between April and June 2020. Dates and weather conditions of the survey visits are set out in Table 1.

Table 1: Dates and weather conditions of breeding bird characterisation survey visits.

Date	Start time	Wind (Beaufort	Cloud Cover	Precipitation	Temperature (°C)	Surveyor
27/04/2020	05:41	0-1	2/8 – 5/8	None	6-17	PC
11/05/2020	05:25	3	1/8 – 4/8	None	6-12	PC
08/06/2020	05:10	1-2	7/8 – 8/8	None	10-13	BH

3.13 Each survey was started within 45 minutes after sunrise. During each visit the Survey Area was walked at a slow pace to enable all birds detected to be identified and located. Frequent stops were made to scan suitable habitats and to listen for singing and calling birds. All areas of suitable breeding habitat within the Survey Area boundary and immediately adjacent areas were approached to within 50 m.

3.14 During the survey the location and activity of each bird detected (including those seen or heard) was recorded and mapped using standard two-letter BTO species codes combined with activity symbols.

3.15 Birds exhibiting breeding behaviour were assigned to one of two categories: likely breeding or confirmed breeding, derived from the breeding evidence categories in the methodology for the BTO Bird Atlas (BTO, 2014), with the categories ‘possible’ and ‘probable’ combined into a single category (‘likely breeding’).

- Likely breeding: birds heard singing or alarm calling or a pair simply present in suitable breeding habitat; a repeat observation of territorial behaviour (song or alarm calling) on two or more different visits in the same location; courtship behaviour or display in suitable breeding habitat; birds apparently visiting a nest site; or evidence of nest building (including excavation of a hole).

- Confirmed breeding: one or more adults undertaking a distraction display; the presence of a used nest or eggshells; the presence of recently fledged or downy young (that are clearly of local origin); apparently incubating adults or adults commuting to and from a nest hole; adult birds carrying faecal sacs or food for young; or, a nest with eggs or young present.

3.16 To inform this ecological appraisal, the numbers of potential territories identified, the abundance of species at the county and national level, the quality of the habitat present and the geographical range of the birds concerned have been considered, based on national and regional accounts.

3.17 The conservation status of each species of bird was also taken into account and the following lists were considered:

- The Wildlife and Countryside Act 1981 (as amended), Schedule 1;
- Species of Principal Importance (SPI) for the Conservation of Biodiversity in England as listed in accordance with section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 (S41);
- Species of high conservation concern (red list species) and species of medium conservation concern (amber list species) included in Birds of Conservation Concern (BOCC) 4 (Eaton *et al*., 2015).
- Species listed as priority species within Hertfordshire on the Hertfordshire Biodiversity Action Plan

Limitations

3.18 As with all breeding bird surveys following this technique, the process is open to some subjectivity in interpretation except where active nests are located. Therefore, these territories will be classed as putative and their mapped locations will indicate the 'centre' of a territory and not necessarily the breeding location.

3.19 The areas of off-site woodland were not systematically surveyed for breeding birds, although birds seen and heard in these habitats from within the Survey Area (up to approximately 20 m into the woodland from the Survey Area boundary) were recorded as birds within these areas may include part of the Survey Area within their territories.

3.20 The time of year in which these surveys were carried out is within the optimal period for these surveys. There were no significant limitations identified to these surveys.

Great crested newt

HSI assessment

3.21 All ponds within the Survey Area, or within 250 m of the Survey Area boundary (where accessible) were subject to a Habitat Suitability Index (HSI) assessment for GCN *Triturus cristatus*, with reference to industry standard guidance (Oldham, 2000; ARG UK, 2010). The HSI assessment was carried out by Dr Tom Flynn on 30 April 2020. Weather conditions at the time of survey were mild (15ºC on average), with no wind or rain.

3.22 Mapping and aerial imagery indicate there are eight ponds onsite and a further 15 ponds within 250 m of the Survey Area boundary (see Figure 1). It was not considered necessary or proportionate to survey ponds beyond 250m because (1) the presence of ponds within the Survey Area meant that further surveys for this species would need to be carried out in any case; (2) the development will retain habitats of value to this species such as hedgerows and woodland, and will convert arable areas to grassland (which will improve habitat for this species), and is therefore considered a low impact development (compared with e.g. a residential or commercial development which would involve wholesale replacement of habitats with buildings or hardstanding, and (3) this species is considered unlikely to travel 250 m or more across the largely open arable land which surrounds the Site, to use largely open arable land within the Site.

3.23 The HSI assessment method involves allocating scores to features associated with a pond such as size, quality of surrounding habitat and presence of fish. These scores are then combined to calculate the overall HSI score for each pond as a number between 0 and 1, with 0 being the least suitable and 1 being the most suitable. The HSI score allows each pond to be placed in one of five pre-defined categories defining its suitability for GCN as follows: <0.5: poor; 0.5–0.59: below average; 0.6–0.69: average; 0.7 – 0.79:good; >0.80: excellent.

Environmental DNA survey

3.24 An Environmental DNA (eDNA) survey for GCN was undertaken on 30 April 2020 by Dr Tom Flynn and Dr Philip Chapman following methods for survey and analysis outlined in Biggs *et al*. (2014). This covered onsite Ponds 1–5 and offsite Ponds D and K (see Figure 1).

3.25 Of the three onsite ponds not surveyed, all were found to be dry and/or defunct during the Site visit on 30 April 2020, and therefore unsuitable for GCN.

3.26 Of the 15 offsite ponds, Pond A held water but is separated from the Site by the busy A41 road, which is considered likely to present a significant dispersal barrier for GCN. The remaining offsite ponds could not be accessed (see “Limitations” below)

3.27 The survey involved the surveyors collecting water samples from around the perimeter of the waterbody. Samples were then sent for analysis by a certified laboratory (Surescreen Scientifics Ltd) to identify the presence or absence of GCN DNA.

Population survey

3.28 Following the results of the eDNA survey which showed that GCN are present in Ponds 2 and 4 (see below), a survey was undertaken to estimate the GCN population size class in these ponds, with reference to industry standard guidance (Langton et al. 2001). This recommends that six appropriately-timed survey visits should be undertaken between March and June, with at least three of the overnight visits carried out between mid-April and mid-May. Due to the limitations imposed on overnight stays by the COVID-19 pandemic it was not possible to conduct overnight bottle trapping at this Site (see “Limitations to Methods” below). Two survey methods (a post-dusk torch survey and an egg search) were therefore utilised, rather than the usual three.

3.29 Torch surveys involved searching for GCN after sunset using two Clulite Clubman (1 million candle power) torches. All accessible parts of a pond’s margins were slowly walked and searched for GCN.

3.30 Egg searches were conducted in order to determine whether GCN were breeding. This involved searching marginal and aquatic vegetation for the distinctive leaf folding pattern and egg size and colour produced by GCN. Results from egg searches are only useful for

indicating presence/likely absence, and not population size. The presence of GCN eggs also provides clear evidence of attempted breeding at a pond.

3.31 GCN population surveys were carried out on the dates and under the weather conditions indicated in Table 2. The surveys were led by Dr Tom Flynn (Principal Ecologist at BSG Ecology), as well as Glyn Brown and Natalie White (both experienced independent ecologists). All three surveyors have extensive experience of GCN survey and hold Natural England GCN survey licences (2015-17735-CLS-CLS, 2019-40154-CLS-CLS, and 2015-19083-CLS-CLS, respectively).

Table 2: Survey conditions during overnight surveys for great crested newt.

Visit	Date	Survey leader[1]	Temperature (after torch survey)	Wind Speed (Beaufort)	Rainfall	Turbidity[1]		Vegetation	
						P2[2]	P4	P2	P4
1	30/04/2020	TF	9	1	No	2	4	3	4
2	07/05/2020	TF	15	2	No	2	4	3	4
3	20/05/2020	TF	16	1	No	3	3	3	3
4	28/05/2020	TF	12	1	No	3	4	3	4
5	04/06/2020	GB	15	1	No	3	4	1	4
6	10/06/2020	NW	11	1	No	2	3	2	4

[1]TF: Tom Flynn. GB: Glyn Brown. NW: Natalie White.
[2]Water turbidity scored on a categorical scale from 0 (clear) to 5 (turbid). Vegetation cover scored on a categorical scale from 0 (no emergent or aquatic vegetation cover) to 5 (extensive cover with little or no open water). P2 = Pond 2, P4 = Pond 4. (See Figure 1).

Limitations to methods

3.32 Access was not possible for HSI and eDNA survey of 13 offsite Ponds B–C, E–I and L–Q. It is therefore possible that some of these ponds contain breeding GCN. Of these, Ponds C and E are adjacent to the southern edge of the airport parcel and are at least 400 m from either the nearest part of the proposed solar farm or the cable route. Due to the distance, and the habitats present in the nearest part of the Site proper (intensive arable land) it is considered unlikely that GCN from these ponds (if present) are using the areas of the Site that are to be impacted by the proposed development.

3.33 Ponds B, G, H, I, O, P, and Q are all separated from the Site by busy roads which are likely to provide a significant dispersal barrier to GCN. All of these ponds are surrounded by extensive areas of terrestrial habitat suitable for GCN, and any newts breeding in these ponds are therefore considered unlikely to use areas of the Site that are to be impacted by the proposed development.

3.34 Ponds F, N and M (between 20 m and 130 m from the Site) are not separated from the Site by any dispersal barriers, although Ponds F, M and N are also surrounded by significant areas of suitable terrestrial habitat and it is also considered unlikely that GCN using these ponds would be commuting the closest areas of the Site within the footprint of the solar farm.

3.35 Pond L is in a small offsite area of woodland immediately adjacent to the northern boundary of the northern parcel (see Figure 1). It is not surrounded by significant areas of terrestrial habitat and it is therefore possible that GCN in this pond (if present) use the northern boundary of Field 12 (see landscape plan appended as Appendix 3) for foraging, and may commute across this field.

3.36 Presence of GCN in Ponds F, L, M and N is assumed for the purposes of this appraisal report.

3.37 Comprehensive access to all areas of Pond 4 to sample for eDNA was not possible due to dense vegetation, particularly fringing scrub and dense emergent vegetation. However, this limitation is not significant as the laboratory testing returned a positive result for this pond (see Results section).

3.38 The same access limitations affected the post-dusk torch survey of Pond 4 although its relatively small size (approximately 9 m x 6 m) and the position of accessible banks on opposite sides of the pond meant that the great majority of the waterbody was visible during torch surveys. The relatively high turbidity of both ponds (assessed as 3 out of 5 on at least half of the visits) and vegetation cover (assessed as 4 out of 5 on the majority of visits) also affected the visibility of the ponds during torching, potentially leading to an underestimate of the number of newts using the pond.

3.39 Bottle trapping for GCN might have compensated for this limitation by increasing counts of newts in parts of the pond that could not be surveyed effectively using torches. However, the health and safety risks of overnight stays during the 2020 COVID-19 pandemic (and the closure of most accommodation) meant that bottle trapping for GCN was not considered safe during the spring 2020 survey season. An alternative means of carrying out bottle trapping (surveyors return home between the dusk torch survey and dawn trap checking visits) was also not considered safe due to the risks attached to driving while fatigued. Also, the access limitations of Pond 4 would have limited bottle trapping in much the same manner as torching.

3.40 In the case of Pond 4, these limitations may have led to the lack of any GCN recorded during torching counts despite the positive eDNA result for this waterbody. In the light of this, it was assigned a precautionary assessment of having a “low” population of up to 10 adults (See Results section).

3.41 In the case of Pond 2, it is possible that the recorded small population (peak count: seven adult GCN, see the Results section) could have been under-recorded and that a medium population (11 to 100 individuals, see English Nature, 2001) is present. However, numbers of adult GCN significantly greater than 10 individuals are considered unlikely to be present, as the area of this pond severely affected by high turbidity was restricted to the north-eastern corner where dogs had accessed the water. The water clarity in the majority of the pond adequate for detecting GCN using torch surveys.

3.42 Apart from the limitations discussed above, no other limitations were identified for the GCN surveys at the Site.

Assessment of ecological impacts

3.43 Potential ecological impacts of the proposed development were assessed with reference to industry standard guidance on ecological impact assessment (CIEEM, 2018).

3.44 Upon collection of all baseline information (desk study and field survey data), the baseline information was used in conjunction with legislation and policy to identify ecological features at the Site, which were then assigned a geographical level of importance. Potential impacts on these features were then identified and assign a geographical level of importance in order to determine significance (primarily based on conflict with policy and legislation connected to nature conservation).

Personnel

3.45 The extended Phase 1 habitat survey was carried out by Claire Wiggs BSc qualCIEEM, Dr Tom Flynn BA, MSc, DPhil, MCIEEM, CEcol and Dr Philip Chapman BA MSc PhD qualCIEEM. The desk study was conducted by Dr Philip Chapman, who also authored this Ecological Appraisal report. The report was technically reviewed by Dr Tom Flynn, who also

provided technical oversight for the project. All staff have suitable experience in ecological survey and assessment; for further details see www.bsg-ecology.com/people.

4 Baseline Ecology

Statutory designated Sites

International and national statutory designations

4.1 No internationally or nationally designated sites are present within 10 km of the Survey Area.

Local statutory designations

4.2 Two statutory LNRs are present within 2 km of the Site boundary. Hilfield Park LNR is adjacent to the south of the airport parcel and approximately 200m south of the western parcel, and is designated for its marshy reservoir margins of value of value for breeding warblers, butterflies and dragonflies. Stanmore Common LNR is 1.3 km south of the western parcel and is designated for its areas of woodland and heathland, as well as two ponds. These sites are of County level importance.

Non-statutory designated sites

4.3 There are 35 non-statutory LWS within 2 km of the Site boundary. Little Kendals LWS and Little Kendals Wood LWS are adjacent to the north-east, Hilfield Park Reservoir LWS and LNR are adjacent to the south, and Wood North of Aldenham Park LWS is adjacent (10 m) to the south-east, beyond Butterfly Lane. These and the remaining sites are of County level importance and are summarised in Table 3 below.

Table 3: Non-statutory designated Sites within 2 km of the Site

Site Name	Description[2]	Closest Site Parcel[3]	Distance and direction
Hilfield Park Reservoir LWS	A large reservoir of county importance for its wintering water birds including a gull roost and moulting pochard *Aythya farina* and Tufted Duck *A. fuligula*. Only breeding site in Herts for black-necked grebe *Podiceps nigicollis*. Banks with planted native and non-native trees, grassland and marshy margins including locally rare plant species and a good diversity of dragonfly and butterfly species.	AP	Adjacent S
Meadow at Little Kendals LWS	Species-rich neutral grassland with indicator species partly surrounded by hedgerows and with a small brook crossing the site to the east. Scattered scrub and some aquatic vegetation along the brook.	EP	Adjacent NE
Little Kendals Wood LWS	Remnant ancient woodland with a mixture of native mature standard trees and coppiced areas and woodland indicator species. Open damp area in the east with marshy vegetation.	EP	Adjacent NE
Wood N. of Aldenham	Old/ancient woodland which has been extensively planted with many exotic species but retaining	EP	10 m SE

[2] Modified and summarised from designation information provided by HERC and Natural England (2020)

[3] Section of the Site to which the designated site is closest. AP: Airport parcel. EP: Eastern parcel.. WP: Western parcel. See Section 1.3.

Park LWS	pedunculate oak *Quercus robur* and ash *Fraxinus excelsior,* plus some areas of hazel *Corylus avellana* and hornbeam *Carpinus betulus* coppice and ground flora including woodland indicator species. Small pond on the northern edge.		
Woodland strip opposite Medburn House LWS	Ancient semi-natural woodland with closed canopy with pedunculate oak and areas of elm *Ulmus* sp. and hawthorn *Crataegus monogyna* scrub. Ground flora including woodland indicator species.	EP	20 m E
Grassland S. of Kendall Hall Farm LWS	Semi-improved neutral grassland with some damp areas supporting a moderate species richness including grassland indicator species.	EP	40 m E
Land by Elstree Sub Station LWS	Moderately species-rich semi-improved, part secondary, neutral grassland with indicator species. The site also includes areas of tall herbs, mixed-species hedgerows and to the east an area of thick continuous scrub.	WP	100 m N
Haberdashers' Aske's School Building LWS	Buildings, ponds and environs important for protected species.	EP	180 m SE
Aldenham Country Park Grasslands & Reservoir Margins LWS	Mosaic of habitats including remnant semi-improved neutral/acid grassland with indicator species, wet woodland, fen/swamp and hedgerows.	AP	270 m SE
Kendal Wood LWS	Ancient semi-natural woodland with standards of pedunculate oak and coppices of hornbeam and hazel. Some broadleaved planting present, including old Sweet Chestnut *Castanea sativa*. Diverse ground flora with woodland indicator species. Ancient boundary bank with hedge along northern margin. Large pond with emergent/aquatic vegetation.	EP	380 m N
Meadow N.W. of Tylers Farm LWS	Area of species-rich, damp neutral grassland with indicator species, also including a wet ditch and scattered scrub.	WP	420 m W
Cobdenhill Dell LWS	Old pit supporting frequent ancient hornbeam coppice around the edge with some pedunculate oak woodland. Ground flora with woodland indicator species. Scrubbier areas with abundant ash and some pedunculate oak, hazel and elder *Sambucus nigra*. Boundary bank and hedge remnants present	EP	450 m NE
Wellhouse Dell LWS	Old chalk pit with surrounding boundary banks supporting semi-natural broadleaved woodland dominated by sycamore with relict coppices. Some scrub areas. The ground flora supports ancient woodland indicator species.	EP	630 m NE
Elstree Road Pastures LWS	Moderately species-rich semi-improved neutral grassland with grassland indicator species, crossed by a wet ditch supporting a good diversity of marginal species and willow *Salix* sp. scrub. Some tall herbs and mixed species hedgerows along the boundary.	WP	700 m SE
Rough Ground	Moderately species-rich semi improved grassland with	WP	710 m W

North of Bushey Jewish Cemetery East LWS	grassland indicator species, and a small stream running through it. Tall herbs and scattered scrub are also present.		
Organ Hall Pastures LWS	70 ha complex of partly damp semi-improved/unimproved neutral grasslands representing the largest such area in the county and including typical grassland indicator species. The site is divided by old hedgerows, some with ditches and a stream, into a number of fields.	EP	900 m NE
Pasture by Railway, Borehamwood LWS	Neutral marshy grassland with a bordering hedge and wet ditch with grassland, fen and swamp indicator species.	EP	920 m E
Theobald Street Wood LWS	Disturbed ancient semi-natural woodland with remnants of semi-natural canopy including pedunculate oak and hornbeam and hazel coppice. Sycamore *Acer pseudoplatanus* is dominant in much of the remaining canopy and the ground flora includes many woodland indicator species. Scrub dominated by hawthorn and areas of with tall herbs or bracken *Pteridium aquilinum* also present in places. Hedge remnants, stream and pond also present.	EP	940 m NE
Parkfields Open Space (Borehamwood) LWS	Field complex supporting mostly old semi-natural neutral grassland, hedgerows, a ditch, and scattered to dense scrub. Mixture of damp and drier areas with grassland indicators and a good The site is good for invertebrate fauna, particularly butterflies and grasshoppers.	EP	950 m E
Paddock by Summerhouse Lane LWS	Moderately species-rich semi improved neutral grassland with grassland indicator species, and scrub at the western end.	WP	960 m NW
King George Recreation Ground LWS	Relatively unimproved neutral and acid grassland with some ancient ridge-and-furrow. Grassland indicator species. There is a small central copse with mature pedunculate oak and ash with understorey including Midland hawthorn *Crataegus laevigata*.	WP	1.12 km SW
Fields by Heathbourne Road LWS	Two fields of species-rich unimproved acid grassland with a diverse flora including many grassland indicator species. Some scrub encroachment, and bordering hedgerows/ broadleaved woodland	WP	1.16 km SE
Wood Hall Wood LWS	Ancient semi-natural woodland mostly cleared and replanted with mixed native broadleaved and coniferous species. Some mature hornbeam and field maple *Acer campestre* remaining. Ground flora includes woodland indicator species. Frequent scrubby areas with elm. A remnant boundary bank with hedge present.	EP	1.29 km NE
Scrubbitts Wood LWS	Ancient semi-natural woodland supporting a canopy of pedunculate oak, ash and wild cherry *Prunus avium*, with some other woody species. Moderately diverse ground flora with woodland indicator species recorded.	EP	1.37 km N
Hartspring Meadow LWS	Old secondary neutral grassland on raised ground with herb-rich areas including indicator species. Embanked	WP	1.53 km NW

	ground along the edges supports dense scrub and trees.		
Copse by Watford Road LWS	Semi-natural, probably ancient woodland surrounding an old pit supporting a mixed canopy. Ground flora contains Bluebell *Hyacinthoides non-scripta* and other woodland indicator species.	EP	1.58 km NW
Composers Park LWS	Grassland complex supporting unimproved to semi-improved neutral grassland with indicator species. Hedgerows partly surround the fields and, in the north-west, old pollarded willows are present beside a seasonal pond. Damp drain also crosses the site.	AP	1.6 km SE
Berrygrove Wood LWS	Ancient semi-natural woodland of pedunculate oak and ash with hazel coppice, now largely replanted but retaining some semi-natural canopy and indicator species. Diverse butterfly and dragonfly fauna.	WP	1.84 km NW
Hartsbourne Road School LWS	Area around school with unimproved acid grassland fragments with a good mix of grassland indicator species.	WP	1.86 km S
The Gorse LWS	Ancient semi-natural woodland mostly cleared and replanted with conifers and some broadleaved species. Remnants of semi-natural woodland including pedunculate oak and hornbeam and other native species. Ground flora including woodland indicator species. Hedgerow along margins.	EP	1.87 km NE
Meadow S. of Liddisdale LWS	Old, damp acid grassland supporting a good diversity of grasses and herbs including grassland indicator species. Patches of bracken and gorse *Ulex europaeus*.	WP	1.92 km S
Dellfield Wood LWS	Small remnant of ancient semi-natural woodland dominated by ash and wild cherry with frequent coppiced areas dominated by hazel with some hornbeam. Some scrub and hedge remnants to the boundary.	EP	1.93 km NW
Wood Hall Farm Wood LWS	Ancient semi-natural woodland mostly cleared and replanted. Some mature pedunculate oak, hornbeam and ash remaining. Ground flora includes woodland indicator species. Thick hedgerow along margins.	EP	1.94 km NE
St. James Churchyard, Bushey LWS	Churchyard with species-rich unimproved neutral grassland with grassland indicator species, and scattered planted ornamental trees.	WP	1.95 km SW
Porters Park Golf Course LWS	Golf course on former parkland, supporting semi-improved neutral grassland with small areas of unimproved acid grassland. Some of planted broadleaf woodland and scrub plus a stream and pond with records of amphibians.	EP	1.96 km N

Habitats

4.4 The Survey Area is dominated by intensively managed arable land, although it also includes significant areas of grassland, with the area north of Elstree aerodrome (inside the Survey Area but outside the Site) classed as good semi-improved grassland. Within the Survey Area there are also boundary hedgerows and small areas of woodland which meet the

descriptions of HPI[4] in Maddock (2011), plus five ponds (all of which have potential to meet the description of HPIs). The Survey Area also includes scattered trees, two small streams and small areas of scrub and tall ruderal vegetation. The Survey Area borders several areas of mature broadleaved woodland including an area of ancient woodland at Little Kendals Wood to the north east of the eastern parcel.

4.5 No other habitats within the Survey Area are considered to represent HPIs, although the Site is bordered by woodland matching the description of the Lowland Mixed Deciduous Woodlands HPI (to the north east and south of the eastern parcel), including an area of ancient woodland designated as a local wildlife site (see Table 3 above).

Table 4: Habitats at the Site

Habitat	Description
Arable farmland	The majority of the eastern and western parcels of the Site support arable farmland under intensive cultivation with very few field margins over 1 m. Those wider than 1 m are shown on Figure 2 as grassland (described below). In 2020 this arable land was predominantly cultivated for oilseed rape and wheat (see Photograph 13). The fields supported minimal arable weeds. The arable fields are of low intrinsic ecological value and are not HPIs. The intense nature of the agricultural practice and very limited margins mean they are not considered to be good (ecological) examples of arable land. This habitat is of Negligible level importance.
Poor semi-improved grassland	Part of the eastern parcel adjacent to Slade Farm is managed as horse grazing paddock. This features a less diverse grassland sward dominated by false oat grass *Arrhenatherum elatius*, with some tufted hairgrass *Deschampsia cespitosa* and soft rush *Juncus effusus* in wetter areas surrounding a damp ditch (see "Ditches" below). The forb community is largely confined to undesirable perennial species including ragwort *Senecio jacobaea* and creeping thistle *Cirsium arvense*. Other pockets of similar grassland are found along field margins. This grassland is classified as poor semi-improved grassland. It is of limited intrinsic ecological value and does not meet the description of any HPIs. This habitat is of Site level importance.
Semi-improved neutral grassland	The majority of the airport parcel is grassland under an apparently light mowing regime (see Photograph 9). This is dominated by grasses overall (particularly red fescue *Festuca rubra*, but other grasses are present such as sweet vernal grass *Anthoxanthum odoratum*) with a range of forbs, including common vetch *Vicia sativa*, meadow vetchling *Lathyrus pratensis*, common knapweed *Centaurea nigra*, meadow buttercup *Ranunculus acris*, common sorrel *Rumex acetosa*, white clover *Trifolium repens* and yarrow *Achillea millefolium*. Due to the range of species present, this grassland is classified as semi-improved grassland, rather than poor semi-improved grassland. The dominance of grasses in most areas and the lack of ancient meadow indicators suggest that it is not unimproved grassland, which is consistent with reports (not verified by BSG Ecology) that the airfield was used to grow arable crops in the 20th century. In the eastern part of this area, the habitat appears to be

[4] As listed by Natural England in accordance with Section 41 of the Natural Environment and Rural Communities Act 2006.

	unmanaged and the grassland has abundant encroaching scrub (dominated by bramble; see Photograph 10). Based on the species present, and the dominance of grasses, none of the grassland present within the Survey Area meets the description of the HPI habit *Lowland Meadows;* this HPI is limited to unimproved grassland belonging to communities MG4, MG5 and MG8 of the National Vegetation Classification. However, the semi-improved neutral grassland within the Survey Area is of some ecological value, since unlike poor semi-improved grassland (see above), this habitat is not common and widespread and nor can it be rapidly re-created. This habitat is of District level importance.
Improved grassland	Two fields in the airport parcel are heavily grazed by horses, with the grass community dominated by perennial ryegrass *Lolium perenne* (Photograph 11). Due to the lack of diversity in grass and forb species, and the strong dominance of perennial rye-grass, this grassland is categorised as Improved grassland. This habitat is of very limited intrinsic ecological value and does not meet the description of any HPIs. This habitat is of Negligible level importance.
Dense scrub	Areas surrounding the horse paddock in the eastern parcel and around the eastern end of the airport parcel are dominated by dense scrub, with species including blackthorn, hawthorn, elder and bramble. A large area of scrub is also present at the southern tip of the western parcel, between Hilfield Lane and the A41 roads. This is dominated by hawthorn forming a dense thicket (see Photograph 12). This habitat does not meet the description of any HPIs and is of Site level importance.
Broadleaved woodland	Part of the area at the southern tip of the western parcel is semi-natural broadleaved woodland dominated by ash, with a ground flora dominated by bramble *Rubus fructicosus* agg. Other small pockets of broadleaved woodland within the Survey Area include a narrow strip along the Hilfield Brook in the western parcel and small areas surrounding Pond 2 north of Elstree Aerodrome and Pond 3 on the northern boundary of the eastern parcel. The Survey Area borders areas of mature broadleaved woodland including Little Kendals Wood to the north-east of the eastern parcel; this is ancient woodland and a LWS, see above. All of the above woodland corresponds to the description of the Lowland Mixed Deciduous Woodland HPI (Maddock, 2011) and is of Local to District level importance.
Bare ground	A compacted gravel track and turning area in the western parcel is classified as bare ground. This habitat does not meet the description of any HPIs and is of Negligible level importance.
Tall ruderal vegetation	The north-western boundary of the horse paddock in the eastern parcel is dominated by tall ruderal vegetation, particularly stinging nettle *Urtica dioica* and thistles *Cirsium* sp. This habitat is of limited ecological value and does not meet the description any HPIs.
Scattered	Scattered patches of scrub comprising bramble, blackthorn and hawthorn,

scrub	with some dog rose *Rosa canina*, are present within the horse paddocks in the eastern parcel, in the eastern portion of the airport parcel and in several other locations (Photograph 10). This habitat is of limited or moderate ecological value and does not meet the description of any HPIs.
Ponds	Five ponds are present within the Survey Area, all of which are situated on internal or external field boundaries within the main Site (see Figure 1). Pond 1 held water in March 2020 but was dry by September 2020. It is extensively shaded by woodland and scrub and the marginal vegetation is dominated by reed sweet grass *Glyceria maxima*. Ponds 2, 3, 4, and 5 appear permanently wet. Ponds 2, 3 and 4 have extensive emergent vegetation dominated by reedmace *Typha latifolia* (Photograph 4), and an extensive surface cover of duckweed *Lemna* sp. Water starwort *Calitriche* sp. was abundant in Pond 4. Pond 5 has minimal marginal or aquatic vegetation and is heavily shaded by trees. Ponds 2 and 4 are considered to be HPI habitat, based on the presence of GCN *Triturus cristatus* (see *Amphibians* below). Ponds 1, 3 and 5 have potential to be HPI habitat, based on other criteria (such as macrophyte or invertebrate diversity) but survey has confirmed absence of GCN. Irrespective of their HPI status, all of the onsite ponds are overgrown, with Pond 2 additionally showing extensive evidence of disturbance caused by dogs entering the water (i.e. turbidity, eroded banks and paw marks/slides adjacent on the section of bank closest to the adjacent public footpath) These factors reduce the ecological value of the ponds on Site, however they remain of Local level importance as part of a wider network of waterbodies. Ordnance Survey maps indicate the presence of three further ponds within the within the Survey Area. The locations of these were visited in March 2020 and were found to be dry, being damp, scrub-filled depressions within hedgerows or the edge of offsite woodland. They were therefore considered unsuitable breeding habitat for GCN. The locations of these former ponds are indicated on Figure 1.
Streams	Two small flowing streams (the Hilfield Brook in the western parcel and a second stream running north-east through the eastern parcel) are present within the Survey Area (see Photograph 5-6), together with several damp ditches. Both flowing watercourses are shallow with a stony bottom with minimal aquatic and marginal vegetation. Much of the length of these watercourses is enclosed within, or overhung by hedgerows or trees. These habitats do not fit any of the descriptions of HPIs and are of Local level importance.
Dry ditches	Some fields within the Survey Area (particularly within the eastern parcel) are bounded by ditches adjacent to hedgerows. These were all dry or largely dry at the time of survey and featured minimal aquatic vegetation. In addition, semi-natural ditches are present within the south and south west of the eastern parcel which feed into the Aldenham Brook. These also did not hold standing water at the time of the survey but featured damp soils and some marshy vegetation such as hard rush and tufted hairgrass.

	These habitats do not fit any of the descriptions of HPIs and are of Site level importance.
Hedgerows	Most of the internal and external boundaries on Site and in the wider Survey Area comprise mature native hedgerows, some of which are species-poor and some of which are species-rich, with dominant species including hawthorn, blackthorn *Prunus spinosa* and field maple *Acer campestre* (see Photographs 1–2). Hedgerows on the internal boundaries tend to be heavily managed and cut to approximately 1.5–2 m height (Photograph 1), while hedgerows on external boundaries tend to be overgrown and to comprise scrubby treelines (Photograph 2). Standard trees, predominantly mature pedunculate oak with some ash are common, particularly in the northern part of the eastern parcel. All hedgerows within the Survey Area meet the definition of the *Hedgerows* Habitat of Principal Importance (HPI; see Maddock, 2011) under the NERC Act 2006 (Appendix 4). This habitat is of Local level importance.
Scattered trees	In addition to the hedgerow trees mentioned above, the Site includes scattered field trees (e.g. see Photographs 7-8). These are predominantly mature pedunculate oaks and as a habitat are of Local level importance. Due to the timescales involved, mature trees are effectively a non re-creatable feature.

Species

Bats

4.6 HERC returned 339 records of bats from within 2 km of the Survey Area, of which 293 were identified to species. All bats are European Protected species (see Appendix 4). These records comprised common pipistrelle *Pipistrellus pipistrellus* (135 records), soprano pipistrelle *Pipistrellus pygmaeus* (57), noctule *Nyctalus noctula* (26), brown long-eared bat *Plecotus auritus* (22), Daubenton's bat *Myotis daubentonii* (16), Nathusius' pipistrelle *Pipistrellus nathusii* (14), serotine *Eptesiacus serotinus* (13), Natterer's bat *M. nattereri* (five), Leisler's bat *N. leisleri* (four) and Brandt's bat *M. brandtii* (one). The nearest records of a bat to the Survey Area were single records of common and soprano pipistrelle recorded on or adjacent to the eastern parcel of the Site near Aldenham Road in 2014. There were six other records within 100 m of the Survey Area.

4.7 Of the above records, 85 correspond to roosting bats. The nearest roost to the Survey Area was a maternity roost of common pipistrelle recorded approximately 60 m from the southern corner of the eastern parcel in 2007, although this roost was only recorded to 100 m accuracy. The next nearest roosts also involved common pipistrelle: an unspecified roost recorded approximately 110 m north of the eastern parcel in 1997 and a maternity roost recorded approximately 110 m east of the western parcel (and 140 m south of the eastern parcel) in 2007. The remaining roosts were all at least 200 m from the Survey Area boundary.

4.8 Three European Protected Species mitigation licences (EPSMLs) for bats were granted within 2 km of the Survey Area; the closest of these was granted 560 m south east of the western parcel and related to a roost of soprano pipistrelle.

4.9 The desk study data therefore indicate that a range of bat species are present in the vicinity of the Survey Area.

4.10 The mature field and hedgerow trees within the Survey Area provide suitable roosting habitat for bats and the areas of woodland adjacent to the Site boundary also contain mature trees likely to provide suitable roosting habitat. The mature trees, woodland, hedgerows, scrub, semi-improved grassland and stream corridors within the Survey Area, as well as the woodland areas immediately adjacent to the Site boundary provide suitable habitat for foraging and commuting bats.

4.11 The Survey Area as a whole is largely unlit, which typically increases its value for most bat species. However the dominant habitat, open intensively managed arable land, is likely to be of very limited value as foraging habitat for all bat species.

4.12 A bat activity survey has not been undertaken, since the retention of woodland and boundary features such as hedgerows means that no significant effects on bat activity are anticipated from the proposed development.

Badger

4.13 HERC returned 67 records of badger *Meles meles* from within 2 km of the Survey Area. Badger is protected under the Protection of Badgers Act 1992 (see Appendix 4). The closest records of badger were two records of setts in the woodland approximately 80 and 95 m south of the eastern parcel of the Site in 1991. There were also six records from the Hilfield Park Reservoir Hertfordshire Wildlife Trust (HWT) nature reserve approximately 100 m south east of the western parcel. The remaining records were at least 250 m from the Survey Area.

4.14 The Survey Area provides suitable habitat for badger, with suitable habitat for sett building present in the hedgerows, scrub and woodland.

4.15 Three active setts (Setts 2-4) and two disused badger setts (Setts 1 and 5) were found during the Phase 1 habitat survey.

4.16 The disused Setts 1 and 5 are outside the Survey Area to the west and north-east of the Site. These sett entrances were partly or completely blocked with accumulated leaf litter and debris with no evidence of recent use by badgers.

4.17 Setts 2-4 are located close to each other in the east of the Site and had fresh spoil, active latrines and badger hair indicating current use by badgers.

4.18 A more detailed description of these setts and a map showing their locations has been provided as a separate confidential appendix (see Appendix 5).

4.19 In addition to these setts, isolated active badger latrines were found at the base of hedgerows in the eastern parcel, these were concentrated within a 250 m radius of Setts 2-4.

4.20 The survey evidences indicates that the Survey Area supports two or at most three small groups of badgers concentrated within the eastern parcel.

4.21 Badger is a common and widespread species in the UK, therefore it is not appropriate to apply a geographic level of importance to the badger population at the Site. This species is included in this assessment because of the (welfare-related) legal protection it receives under the Protection of Badgers Act 1992, and not for reasons of nature conservation.

Hazel dormouse

4.22 HERC returned one record of hazel dormouse *Muscardinus avellanarius* (a European protected species) from within 2 km of the Survey Area, a 1967 record with its location

withheld. In addition, one EPSML for hazel dormouse was granted in the region of the National Grid substation 220 m to the north west of the Site in 2015. The Survey Area has suitable habitat for this species in hedgerows, woodland and scrub, with relatively good connectivity to suitable habitat in the wider landscape, including to the location of the EPSML and to areas of woodland.

4.23 A dormouse survey has not been undertaken, since the retention of hedgerows in the proposed development means that there is unlikely to be significant loss of habitat for this species, and no negative impacts are anticipated.

Other mammals

4.24 HERC returned 64 records of other protected and notable mammal species for which the Survey Area provides suitable habitat. These comprise 36 records of hedgehog *Erinaceus europaeus* (a Species of Principal Importance[5] (SPI), 14 records of water vole *Arvicola amphibius* (a SPI and also specially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), see Appendix 2), 12 records of brown hare *Lepus europaeus* (a SPI), and two records of harvest mouse *Micromys minutus* (a SPI).

4.25 Two records of brown hare originated from the eastern parcel of the Site in 1990 and 2003. The closest record of harvest mouse was in the Hilfield Park Reservoir HWT reserve approximately 100 m south east of the western parcel of the Site in 2006. The Survey Area has suitable habitat for brown hare in the arable fields and grassland, and for harvest mouse in areas of rough grassland in field margins and east of the aerodrome. Populations of brown hare and harvest mouse using the Survey Area are likely to be of Local level importance only.

4.26 The closest records of water vole were eight records from the Hilfield Park Reservoir HWT reserve approximately 100 m south east of the western parcel of the Site, most recently in 2006. The Site has suitable habitat for this species in the streams and ditches, particularly in the Hilfield Brook and the second flowing stream in the eastern parcel. Individuals of water vole using the Site are likely to be of Local level importance only.

4.27 The closest records of hedgehog were two records from the Hilfield Park Reservoir HWT reserve approximately 100 m south east of the western parcel of the Site in 1991 and 2012. The Site has some suitable habitat for this species in the hedgerows, woodland, scrub and semi-improved grassland, with the immediately adjacent woodland also providing suitable foraging and breeding areas. Individuals of hedgehog using the Site are likely to be of Local level importance only.

Breeding birds

4.28 HERC returned 17,023 records of birds from within 2 km of the Survey Area, comprising 175 species. The majority of these records originate from Hilfield Park reservoir and the surrounding habitats forming the Hilfield Park Reservoir LWS, which at its closest is situated adjacent to the airport parcel and approximately 20 m to the south and east of the western parcel. All birds are protected during the breeding season by the Wildlife and Countryside Act 1981 (as amended).

4.29 Of these species, the Survey Area provides suitable breeding habitat (in mature trees) for two species specially protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended; see Appendix 4): barn owl *Tyto alba* (48 records) and red kite *Milvus milvus* (417 records).

[5] As listed by Natural England in accordance with Section 41 of the Natural Environment and Rural Communities Act 2006. See Appendix 4

4.30 There were six records of barn owl from within the western parcel of the Site adjacent to the A41, although these were given to only 100 m accuracy. The majority of the remainder come from unspecified locations within the Hilfield Park Reservoir LWS. Similarly, there were 47 records of red kite from within the western parcel of the Site, although these were given to only 100 m accuracy. 331 records came from the Hilfield Park reservoir LWS, with most of the remainder at least 1 km from the Site.

4.31 The Survey Area provides suitable habitat for an additional 17 SPIs for which records were returned in the desk study: bullfinch *Pyrrhula pyrrhula* (175 records), dunnock *Prunella modularis* (134), song thrush *Turdus philomenos* (129), reed bunting *Emberiza schoeniclus* (117), starling *Sturnus vulgaris* (110), yellow wagtail *Motacilla flava* (108), skylark *Alauda arvensis* (92), house sparrow *Passer domesticus* (53), spotted flycatcher *Muscicapa striata* (49), linnet *Linaria cannabina* (47), cuckoo *Cuculus canorus* (36), yellowhammer *E. citrinella* (15), grey partridge *Perdix perdix* (12), corn bunting *E. calandra* (eight), marsh tit *Poecile palustris* (six), turtle dove *Streptopelia turtur* (five) and tree sparrow *Passer montanus* (three).

4.32 Records of house sparrow, dunnock, starling, reed bunting, linnet, bullfinch, yellow wagtail and song thrush were returned from the south western part of the western parcel of the Site, although the great majority of these records were given at 1 km resolution, so it is unclear whether they relate to birds using the Survey Area or adjacent areas. Records of all the above SPIs except corn bunting and tree sparrow were also returned from unspecified locations within Hilfield Park Reservoir LWS to the south of the western parcel.

4.33 The hedgerows, woodland, scrub and trees within the Survey Area provide suitable breeding habitat for the majority of these SPIs and the arable fields provide suitable breeding habitat for skylark, grey partridge and yellow wagtail. The hedgerows, woodland, scrub and trees also have suitability for a variety of common and widespread species.

Survey results

4.34 A total of 26 bird species that could be breeding within or adjacent to the Survey Area were recorded during the three breeding bird survey visits combined. These are summarised in Table 5 together with breeding status (confirmed, or likely). The indicative central point of each territory or location of individual bird records is shown in Figure 3.

Table 5: Summary results of breeding bird survey

Common name	Scientific name	Breeding Status		Total pairs
		Confirmed	Likely	
Blackbird	*Turdus merula*		✓	21
Blackcap	*Sylvia atricapilla*		✓	37
Blue tit	*Cyanistes caeruleus*	✓		18
Carrion Crow	*Corvus corone*	✓		1
Chaffinch	*Fringilla coelebs*	✓		9
Chiffchaff	*Phylloscopus collybita*		✓	7
Dunnock	*Prunella modularis*		✓	25
Garden warbler	*Sylvia borin*		✓	1
Goldfinch	*Carduelis carduelis*		✓	2
Great tit	*Parus major*	✓		25
House sparrow	*Passer domesticus*	✓		1
Lesser whitethroat	*Sylvia curruca*		✓	2

Linnet	*Linaria cannabina*		✓	3
Long-tailed tit	*Aegithalos caudatus*		✓	1
Ring-necked pheasant	*Phasianus colchicus*		✓	1
Red-legged partridge	*Alectoris rufa*		✓	2
Reed bunting	*Emberiza schoeniclus*		✓	2
Robin	*Erithacus rubecula*		✓	40
Skylark	*Alauda arvensis*		✓	5
Song thrush	*Turdus philomenos*		✓	5
Swallow	*Hirundo rustica*			1
Stock dove	*Columba oenas*	✓		3
Treecreeper	*Certhia familiaris*		✓	1
Common whitethroat	*Sylvia communis*		✓	32
Woodpigeon	*Columba palumbus*		✓	10
Wren	*Troglodytes troglodytes*	✓		75

4.35 In addition to the above, a further 26 bird species were recorded during the survey visits for which no evidence of breeding was noted. This included individuals flying over the Survey Area or species which may breed locally but for which suitable nesting habitat either does not occur on Site or where no behaviour suggesting breeding was recorded.

4.36 The majority of these species were common and widespread, although two species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) were recorded: peregrine *Falco peregrinus* (one flyover, no suitable breeding habitat in the Survey Area), and red kite *Milvus milvus* (occasional individuals soaring over the Survey Area and suitable breeding habitat present but no evidence of breeding). In addition, three species listed as SPI were recorded: starling *Sturnus vulgaris*, yellow wagtail *Motacilla flava* (suitable breeding habitat within the Survey Area but occasional flyovers only and no evidence of breeding), and herring gull *Larus argentatus* (no suitable breeding habitat within the Survey Area, sporadic foraging and flyovers only and no evidence of breeding).

4.37 Apart from the non-breeding records of red kite listed above, no evidence of any Schedule 1 protected species was recorded within the Survey Area.

4.38 Of the 26 species of bird recorded as breeding within or adjacent to the Survey Area, eight appear on one or more schedules or lists of species of conservation importance. These eight species together with an indication of their relevant status are included in Table 7. The status of each species in Hertfordshire is also provided as listed within the Birds of Hertfordshire (HNHS, 2016), including if identified as a Hertfordshire Biodiversity Action Plan species (HBAP, see HEF, 2006).

Table 7: Status of Breeding Birds in Hertfordshire.

Common name	**Species name**	**WCA 1[6]**	**S41[7]**	**Red List[8]**	**Amber List[5]**	**Status in Hertfordshire[9]**
Dunnock	*Prunella modularis*		✓		✓	Widespread

[6] Species listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended). Species on this list are offered extra protection against disturbance whilst nesting.
[7] Species of Principal Importance (SPI) for the Conservation of Biodiversity in England as listed in accordance with section 41 of the Natural Environment and Rural Communities Act (NERC) 2006 (S41).
[8] Species of high (red list) and medium (amber list) conservation concern included in Birds of Conservation Concern 4 (Eaton et al., 2015).
[9] As recorded by HNHS (2015).

Common name	Species name	WCA 1[6]	S41[7]	Red List[8]	Amber List[5]	Status in Hertfordshire[9]
						and common resident
House sparrow	*Passer domesticus*		✓	✓		Declining resident species
Linnet	*Carduelis cannabina*		✓	✓		Widespread and numerous breeding and wintering species (HBAP)
Reed bunting	*Emberiza schoeniclus*		✓		✓	Common resident species (HBAP)
Skylark	*Alauda arvensis*		✓	✓		A common resident and winter visitor (HBAP)
Song thrush	*Turdus philomenos*		✓	✓		Widespread and numerous resident species (HBAP)
Stock dove	*Columba oenas*				✓	A widespread and numerous resident species

4.39 The value of populations of each of these eight species within the Survey Area is discussed in the following paragraphs.

4.40 Dunnock: This species is common and widespread species, with the UK resident population estimated at 2.3 million territories (Musgrove, 2013). It is an SPI primarily because 100 % of the population of the subspecies *occidentalis* occurs in the UK. However, it has suffered a moderate long term decline in breeding populations within the UK, so is Amber listed under BoCC. This species is a numerous resident within Hertfordshire (HNHS, 2015). The Survey Area has an estimated 25 breeding pairs; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. The dunnock is a generalist that will breed in any hedgerow or dense scrub. The population of dunnock using the Survey Area is considered to be of Site value only.

4.41 House sparrow: This species is a SPI and Red under the BoCC due to a long term major decline in breeding populations within the UK. It is estimated that there are 5.3 million territories within the UK (Musgrove et al, 2013). Within Hertfordshire this species is considered a declining resident. The Survey Area has an estimated one breeding pair; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. House sparrow is a generalist species that will breed in hedgerows or scrub, but is often associated with human settlements. The population of house sparrow using the Survey Area is considered to be of Site value only.

4.42 Linnet: This species is a SPI and Red under the BoCC due to a long term major decline in breeding populations within the UK. It is estimated that there are 410,000 territories within the UK (Robinson, 2005). Within Hertfordshire this species is considered a widespread and numerous resident although it is gradually declining (HNHS, 2015) and is a Hertfordshire

Biodiversity Action Plan species. The Survey Area has an estimated three breeding pairs; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. Linnet is a generalist species, found where there are abundant sources of seed, and therefore typically associated with lowland farmland. Linnet will nest in dense, thorny hedgerows or areas of scrub. The population of linnet using the Survey Area is considered to be of Site value only.

4.43 Reed bunting: This species is listed as amber under the BoCC due to a moderate long-term decline in breeding populations within the UK. It is also a SPI. It is estimated that there are 250,000 territories within the UK (Musgrove et al, 2013). Within Hertfordshire this species is considered common resident although it is gradually declining (HNHS, 2015) and is a Hertfordshire Biodiversity Action Plan species. The Survey Area has an estimated two breeding pairs; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. Reed bunting nests predominantly in reeds and other long vegetation near water although it will also forage for seeds in arable land. The population of reed bunting using the Survey Area is considered to be of Site value only.

4.44 Stock dove: This species is listed as Amber under the BoCC due to a long term moderate decline in breeding populations within the UK. It is estimated that there are 260, 000 territories within the UK (Musgrove et al, 2013). Within Hertfordshire this species is widespread and numerous. The Survey Area has an estimated three breeding pairs; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. Stock dove forages in a variety of open habitats and requires large trees with natural cavities for nesting. The population of stock dove using the Survey Area is considered to be of Site value only.

4.45 Skylark: This species is listed as Red under the BoCC due to a long term severe decline in breeding populations within the UK. It is also a SPI. It is estimated that there are 1.5 million territories within the UK (Musgrove et al, 2013). Within Hertfordshire this species is considered a numerous resident and winter visitor and is stable or only slowly declining (HNHS, 2015) although it is listed as a Hertfordshire Biodiversity Action Plan species. The Survey Area has an estimated five breeding pairs including one within the airport parcel and four within the Site itself. This does not meet the 1% threshold for either county or national populations and is therefore not considered significant. Skylark are ground nesting birds preferring open surfaces of firm, level or unobstructed soils preferably well clothed in grasses or cereals (Snow & Perrins 1998). As such skylark is the only breeding species recorded that favours open farmland, heathland or grassland for nesting. The population of skylark using the Survey Area is considered to be of Site value only.

4.46 Song thrush: This species is listed as Red under the BoCC and is a SPI due to a severe long term decline (-59%) in breeding populations within the UK. It is estimated that there are 1.2 million territories within the UK (Musgrove et al, 2013). Within Hertfordshire this species is considered a widespread numerous resident (HNHS, 2015) although it is listed as a Hertfordshire Biodiversity Action Plan species. The Survey Area has an estimated five breeding pairs; this does not meet the 1% threshold for either county or national populations and is therefore not considered significant. Song thrush is a generalist species that will nest in any suitable cover including scrub or hedgerows. The population of song thrush using the Survey Area is considered to be of Site value only.

4.47 In addition to these seven species, three species of warbler were recorded as probably breeding on or adjacent to the Survey Area: blackcap (estimated 37 breeding pairs), chiffchaff (seven pairs) and garden warbler (one pair). An assemblage of breeding warblers is listed as a designated feature of the Hilfield Park Reservoir LNR/LWS, and therefore the Survey Area is considered to provide supporting habitat for these species, which breed in scrub, woodland and hedgerows.

4.48 None of these three warbler species are of national conservation concern, being green listed under BoCC, and all are widespread and common in Hertfordshire (HNHS, 2015). The populations of these species within the Survey Area do not meet the 1% threshold at either county or national level, and are therefore not considered significant. The breeding populations present within the Survey Area are of Local value.

4.49 The habitats within the Survey Area are not considered suitable for any other warbler species or for black-necked grebe (the other breeding species listed as a designated feature of the Hilfield Park Reservoir LWS).

Breeding bird summary

4.50 The majority of the breeding birds within the Survey Area are common and widespread species associated within woodland and farmland and are of Site level importance only. Those notable species have been discussed above. The majority of the nesting habitats are found within the hedgerows within the Survey Area or within the woodlands immediately adjacent to the Survey Area. Skylark (five pairs) and the non-native gamebirds ring-necked pheasant (one pair) and red-legged partridge (two pairs) are the only species recorded breeding within the open arable habitat within the Survey Area. Due to the low numbers of skylark breeding within the Survey Area, these are considered to be of Site level importance only. Pheasant and red-legged partridge are introduced and reared in large numbers for game shooting, these species are of negligible level importance.

Wintering birds

4.51 The arable farmland within the Survey Area has limited suitability for winter foraging by gulls, largely during or following ploughing. Gull species recorded by HERC include black-headed gull *Chroicocephalus ridibundus* (520 records), Mediterranean gull *Icthhyaetus melanocephalus* (498), lesser black-backed gull *L. fuscus* (299), herring gull *L. argentatus* (240), common gull *L. canus* (162), great black-backed gull *L. marinus* (68), yellow-legged gull *L. michahellis* (16), and Caspian gull *L. cachninnans* (six). Herring gull is an SPI and a red-listed species of conservation concern (Eaton et al, 2015). The remaining species are amber-listed.

4.52 Wintering gulls are a designated feature of the Hilfield Park Reservoir, which hosts one of two winter gull roosts in Hertfordshire and is considered of county importance for wintering gulls. Wetland Bird Survey Data average and peak counts for gull species wintering at Hilfield Park Reservoir between winter 2014–2015 and 2018–2019 are shown in Table 8:

4.53 Table 8. Summary results from Wetland Bird Survey data

Species	BH		CM		HG		LB	
Winter	Mean[2]	Peak[3]	Mean	Peak	Mean	Peak	Mean	Peak
2014-15	20	32	4	12	0	2	1	3
2015-16	105	200	5	11	2	3	3	10
2016-17	23	39	3	8	1	1	1	4
2017-18	132	660	21	115	2	4	3	12
2018-19	152	664	4	15	1	2	2	4

[1]BH= Black-headed gull. CM: Common gull. HG: Herring Gull. LB: Lesser black-backed gull
[2]Mean of six monthly WeBS counts for the reservoir between October and March inclusive, to nearest individual
[3]. Peak of six monthly WeBS counts for the reservoir between October and March inclusive.

4.54 No other wintering gull species were recorded in Wetland Bird Survey counts from Hilfield Park Reservoir during this five-year window. Wintering populations of these species in Hertfordshire are estimated (HNHS, 2015) as follows: Black-headed gull >20,000, common gull 5,000-10,000, herring gull 500-1000, lesser black-backed gull <1000. Given that Hilfield Park Reservoir holds one of only two major wintering gull flocks in Hertfordshire, it is therefore possible that the counts derived from WeBS represent an underestimate of the total roosting populations of these species. None of these populations reach the 1% threshold of national wintering populations and they are therefore not significant at the national scale.

4.55 Gulls are active, opportunistic and wide-ranging species, regularly ranging over tens of kilometres (Spaans 1971, Camphuysen et al 2011, NTGG 2020), and it is considered unlikely that the entire roosting population of gulls uses the fields within the Survey Area on a regular basis. Rather, the Survey Area probably represents one of a large range of foraging areas that are visited by gulls, likely to include other areas of arable farmland and pasture, but also landfill sites, urban areas, and other waterbodies. Based on an analysis of online aerial imagery covering land within a 10 km radius of the reservoir (a relatively conservative estimate for daily foraging by gulls), the Survey Area represents approximately 2% of the arable land and less that 0.05% of all farmland available within this radius. An active landfill site is also present approximately 7.8 km north-west of the reservoir (Defra, 2020a), and extensive urban areas are available to the west, south and east of the reservoir.

4.56 The Site is well-drained and features undulating topography, and is therefore unlikely to feature significant areas of standing water in winter (of particular value for foraging gulls). It is considered that while the Survey Area may attract a small proportion of foraging gulls associated with the Hilfield Park Reservoir LWS on a sporadic basis (such as during ploughing or other agricultural activities which disturb the soil and uncover invertebrates), it is unlikely to regularly support a significant proportion of the roosts. The value of the Survey Area to gulls is therefore considered to be of Site level importance only.

4.57 The arable farmland within the Survey Area is not considered suitable for significant winter foraging by waders, due to its topography and drainage as described above. WeBS peak counts of the most likely wader species to use the site, Lapwing *Vanellus vanellus*, did not exceed two individuals between winter 2014–15 and winter 2018–19. The value of the Site to waders is therefore considered to be of maximum Site level value.

4.58 The Survey Area does not include suitable habitat for moulting pochard or tufted duck, and populations of these species using the Survey Area are therefore of Negligible level importance.

Winter bird summary

4.59 The Site is not considered likely to support significant foraging populations of gulls or waders or to represent a significant proportion of available habitat in the local area for these species. The Site is of negligible importance for other wintering bird species. Therefore no further assessment or survey of these groups is considered necessary.

Reptiles

4.60 HERC returned 40 records of reptiles from within 2 km of the Survey Area, all relating to grass snake *Natrix helvetica*. All reptiles are SPIs. Of these records, 15 were from unspecified locations within Hilfield Park Reservoir to the south of the western parcel. The next nearest record was approximately 300 m to the south of the western parcel, on the south side of Elstree Airport.

4.61 Since it is dominated by arable land, the majority of the Survey Area provides poor habitat for reptiles, however the semi-improved grassland in the airport parcel, (in particular the

unmanaged areas with scattered scrub around the eastern end of the runway) provide suitable habitat for common reptile species, and small numbers of reptiles could be present in areas of rough grassland around hedgerows, ditches and ponds. The value of the Survey Area for reptiles is therefore considered to be of Site level.

Amphibians

4.62 HERC returned 38 records of amphibians from within 2 km of the Survey Area boundary. These comprise GCN (GCN; 26 records; a European protected species) and common toad *Bufo bufo* (12 records, an SPI). The nearest record of a GCN was approximately 105 m south of the eastern parcel. The nearest record of a common toad was approximately 105 m north-west of the western parcel.

4.63 Of the five onsite ponds, two have "good" suitability for GCN (Ponds 2 and 3, HSI = 0.72 and 0.73, respectively). Two have "average" suitability (Ponds 1 and 4, HSI = 0.60 and 0.66). Pond 5 has "below average" suitability (HSI = 0.59). Of the offsite ponds for which access was obtained, Pond D has "excellent" suitability (HSI = 0.89) while Pond K has "poor" suitability (HSI = 0.47).

4.64 The hedgerows, scrub, woodland and grassland within the Survey Area provide suitable terrestrial habitat for GCN and common toad, although the majority of the grassland is of low suitability due to grazing. The arable farmland may be crossed by dispersing juvenile amphibians but is not considered suitable terrestrial habitat for amphibians.

4.65 Ponds 1, 3, 5, D and K are tested negative for GCN eDNA, and GCN are therefore likely to be absent from these waterbodies. Pond 4 tested positive for GCN. Pond 2 was not tested for eDNA because torch survey results had already revealed presence of GCN in this waterbody (see below).

4.66 Torchlight surveys revealed that Pond 2 has a Small population of GCN, with a peak count of seven adults recorded on 07 May 2020 (see Table 9 below).GCN eggs were recorded in this waterbody during the first survey visit. Peak counts of eight smooth newts *Lissotriton vulgaris* were also recorded in Pond 2, along with common toad (maximum three individuals) and common frog *Rana temporaria* (maximum one individual).

4.67 No GCN were recorded during torch surveys of Pond 4. One common toad was recorded. Considering the small size of Pond 4, the generally poor quality surrounding terrestrial habitat, and the lack of adult or juvenile GCN seen during torchlight surveys, Pond 4 is considered likely to support a Small population of GCN (less than ten individuals)

Table 9. Results of the great crested newt population survey.

Pond	Adult GCN count for survey visits 1–6						Adult smooth newt count for survey visits 1-6						Evidence of GCN breeding	Other amphibians recorded
	1	2	3	4	5	6	1	2	3	4	5	6		
2	3	7					1	8	6		1		Y	Common toad, common frog
4													N	Common toad
Peak count	3	7					1	8	6		1			

4.68 GCN is widespread in Hertfordshire and the small populations of GCN within Ponds 2 (seven individuals) and 4 (less than ten individuals) are therefore considered to be of Local level importance.

Invertebrates

4.69 HERC returned 1,338 records of protected and notable invertebrates from within 2 km of the Survey Area, the majority of which correspond to moths and butterflies. Due to the intensive agricultural management of the fields comprising the majority of the Survey Area, these areas are considered unlikely to support significant assemblages or populations of rare or notable invertebrates. However, the mature trees, hedgerows, ponds and good semi-improved grassland within the Survey Area, plus the adjacent mature woodland, have suitability for invertebrates.

4.70 An invertebrate survey has not been undertaken (as no negative impacts are anticipated), therefore the importance of insect populations and assemblages using the Survey Area cannot be fully assessed.

Plants

4.71 HERC returned 201 records of 61 protected and notable plant species from within 2 km of the Survey Area. Three old records of protected or notable plants originated from within the Survey Area: one record of good-king-Henry *Blitum bonus-henricus* from east of Slade's Farm in the eastern parcel in 1991, a record of tormentil *Potentilla erecta* from the region of the western parcel in 1991, and a record of bluebell *Hyacinthoides non-scripta* (protected against sale only) in the airfield parcel in 1988. Tormentil and good-king-Henry are listed as Near Threatened and Vulnerable on the UK Red List respectively, while Bluebell is partially protected under Schedule 8 of the Wildlife and Countryside Act 1981 (as amended, see Appendix 4). None of these species were detected during the Phase 1 habitat survey.

4.72 In general, due to the intensive agricultural management of the majority of the Survey Area, it is considered unlikely to support significant assemblages of notable or protected plant species. Plant populations and assemblages within the Survey Area are considered likely to be of Site importance only

4.73 Additionally, 24 records were returned of two invasive plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended): Japanese knotweed *Fallopia japonica* (18 records) and giant hogweed *Heracleum mantegazzianum* (six)..

4.74 These included a record of Japanese knotweed from the Survey Area on the northern edge of the horse paddock in the eastern parcel. Japanese knotweed was detected in this location on the Phase 1 survey and forms a patch measuring approximately 25 m^2.

5 Designed-in Ecology Mitigation and Enhancement

Designed-in mitigation and avoidance measures

5.1 The following mitigation is designed in to the development as set out in the site layout (see Appendix 1) the Landscape and Ecology Enhancement Plan (LEEP; see Appendix 2) and the Landscape and Ecology Management Plan (Document Ref.R009). This designed-in mitigation has been taken into account in the assessment of impacts in the previous section.

Habitats

5.2 Habitats will be retained, enhanced or created across the Site as follows:

- Internal and boundary hedgerows will be retained with buffers of at least 5 m width containing retained or created rough or wildflower grassland.
- Onsite woodland in the southern parcel and surrounding Ponds 1 and 3, plus dense scrub retained with a 15 m buffer of retained or created rough or wildflower grassland.
- Adjacent designated sites (Little Kendals Wood LWS and Meadow at Little Kendals Wood LWS) retained with a 15 m buffer of retained or created rough or wildflower grassland.
- Ponds retained with a 15 m buffer of rough or wildflower grassland (except Ponds 2 and 4 which have breeding GCN, where a 50 m buffer will be applied).
- Ponds 2 and 4 will be enhanced through the removal of the majority of the encroaching swamp vegetation.
- Two defunct ponds on the hedgerow north of Pond 4 will be reinstated (or alternative ponds dug on adjacent areas).
- Watercourses with a 10 m buffer of rough or wildflower grassland and/or marshy vegetation.
- Approximately 6.5 ha of poor semi-improved grassland in the southern half of the horse grazing paddocks, which will be managed as breeding habitat for skylark
- Nest boxes for dormouse and barn own, and bat boxes will be installed on trees at the Site.

5.3 The above measures will avoid adverse impacts on HPI and designated sites and will avoid or minimise potential impacts on the majority of protected species potentially present on Site (including most breeding birds, bats, water vole, hazel dormouse, hedgehog, and amphibians). It will also target habitat creation (e.g. of rough grassland in the most ecologically appropriate locations).

5.4 In addition to the retention and enhancement listed above, further areas will be planted with native planting to create new areas of habitat as follows:

- Grazed permanent neutral grassland (considered as ‘modified’ grassland in the biodiversity calculation, since the grazing will mean limited species diversity) under the solar arrays and within the fenced solar fields.

- Creation of tussocky neutral grassland with wildflowers in retained "nature areas" other than the landscape screening planting. These include a 2.4 km-long "green corridor" along the stream within the eastern parcel and connecting Ponds 2 and 4 (specifically to provide habitat enhancements for GCN and incorporating the buffer zones described above), a 6 ha "green wedge" around the Hilfield Brook in the western parcel, and a further area to the south east of this along Hilfield Lane.

- Hedgerow creation and enhancements to include 3.1 km of new native screening hedgerows across both parcels, and the bulking out of existing hedgerows and planting with a diverse range of native scrub and tree species.

- Creation of a 0.7 ha area to be managed as a traditional orchard in the eastern parcel.

- Creation of two areas totalling 2.0 ha of parkland, comprising permanent neutral grassland and widely-spaced standard trees.

5.5 Areas of arable land or bare ground within buffer zones will be seeded with appropriate suitable wildflower grassland seed mixes as specified in the LEMP.

5.6 On-going management of grassland will be by low intensity grazing within the fenced area of solar panels, and by appropriate conservation mowing regimes elsewhere (as set out in the LEMP).

5.7 New and retained hedgerows will receive on-going management to optimise their ecological value, e.g. by rotational cutting once every three years.

Protected species

5.8 Gates suitable for the passage of badgers, hedgehogs, brown hare and other smaller animals (measuring at least 35 x 25 cm) will be included within perimeter fencing of solar arrays to avoid fragmentation of the landscape for these species. As a minimum one such gap will be created on each side of each field being included in any fence.

5.9 Specific enhancements for GCN will be undertaken within the areas in closest proximity to the breeding ponds (Ponds 2 and 4). The grassland creation will be species rich but target tussocky grass species (e.g. cock's foot), to provide shelter and cover and to provide foraging resources in the form of invertebrates.

5.10 Two hibernacula (piles of logs, rubble and earth suitable for hibernating GCN and other small animals) will be added within the enhanced areas in proximity to the breeding ponds (Ponds 2 and 4).

5.11 Practical measures to achieve the above design mitigation are set out in detail within the LEMP.

6 Impact Assessment

Designated sites

6.1 The nature of the proposed development means that there will be no increase in visitor pressure to designated sites as a result of the proposed development during its operational phase.

6.2 The slight increase in traffic during the construction period (estimated by the Applicant at an average of 8 deliveries per day over the 40 week construction period) will have a negligible effect on air quality at nearby designated sites, and no increase in traffic is anticipated during the operational phase. Construction and operation of the proposed development are not considered likely to lead to increased water pollution, due to the retention of boundary features such as watercourses, with protective buffers.

6.3 Owing to the change from intensive arable management to grazing of the land surrounding the solar arrays, it is likely that the proposed development may be associated with a net reduction in water pollution due to reduced agricultural inputs and the displacement of arable land with permanent grassland.

6.4 The loss of arable land to create the solar arrays is likely to represent a minor loss of sporadically-used supporting habitat for low numbers of gulls associated with the Hilfield Park Reservoir LWS, and this impact will be at the Site level only and is not considered sufficient to significantly impact the conservation status of this designated feature of the LWS.

Little Kendals Wood LWS and Meadow at Little Kendals LWS

6.5 The only potential impacts on designated sites from the construction, operation and decommissioning of the Proposed Development are direct impacts during construction and decommissioning on the designated sites immediately adjacent to the eastern parcel of the Site (Little Kendals Wood LWS and Meadow at Little Kendals LWS).

6.6 In the absence of suitable mitigation, potential direct impacts of construction on these designated sites and notable habitat (semi-natural ancient woodland) are limited to: light pollution, dust pollution, or works within the root protection areas of this site.

6.7 However a 15 m buffer zone from any operations will be included on all sides of these designated site. Apart from light pollution (which is covered under *Additional Mitigation* in the following section) this will limit such impacts to a negligible level.

Habitats

Habitat loss

6.8 The proposed development (comprising the PV modules, substation and battery storage area) is being built wholly within the arable fields at the Site, with the exception of the northern portion of Fields 19–20 (see Appendix 3), which are currently poor semi-improved grassland (this habitat will be retained in the finished design). The only other habitats to be directly impacted are:

- A short section of hedgerow/scrub removal in Field 17 to widen an existing farm entrance for a permanent access track to be built.

- Loss of small areas of improved and poor semi-improved grassland for the creation of construction, operational and maintenance tracks.

- Temporary loss of small sections of hedgerow and a narrow strip of semi-improved neutral grassland during trenching for the cable route within the airport parcel.

Construction impacts on habitats

6.9 Without appropriate mitigation during the construction phase, there is also potential for impacts on retained habitats at the Site through processes such as dust deposition, soil compaction, and direct damage by machinery. Mitigation for such occurrences is usually controlled via an appropriate construction management plan to be agreed with the Local Planning Authority.

Biodiversity Net Gain

6.10 The landscape proposals for the Site (see Appendix 3) have been designed to increase the net biodiversity value of the Site. The landscape proposals include the following provisions to achieve a net gain in biodiversity (for more detailed descriptions, see the previous section, or the LEMP document.

- Grazing pasture creation within the solar array areas (largely in place of arable land).
- Hedgerow creation and enhancement.
- Rough and wildflower grassland creation and enhancement in landscape buffer zones and other “wildlife areas”.
- Orchard creation.
- Grazed parkland creation in the east of the Site.

6.11 An accompanying Biodiversity net gain report has been produced (BSG, 2020). The calculation indicates that the proposed development will achieve a 39.54 % net gain for area habitats and a 23.30 % net gain for hedgerows, in line with paragraph 170 of the NPPF and Local Planning policy.

6.12 Overall the proposed development will have a beneficial effect on habitats at the local level.

Bats

Bat roosts

6.13 No areas of woodland or field trees with bat suitability, or significant areas of hedgerow are being removed for the construction of the proposed development. Only minor arboricultural works (the removal of short sections of hedgerow) are proposed, principally along the cable route within the airport parcel to accommodate the cable route. The proposed development is unlikely to reduce the local availability of roosting sites for bats and therefore population-level impacts from loss of roosting sites are unlikely.

6.14 These minor works are unlikely to damage, destroy or disturb any bat roosts, however without precautionary measures during construction, there remains a small risk of this occurring.

Bat foraging habitat and landscape connectivity

6.15 Watercourses, ponds, woodland, significant areas of scrub and trees are retained in the design with at least a 10 m landscape buffer. Temporary losses of hedgerow along the cable route in the airport parcel will be reinstated, and the remainder of the hedgerow network is

retained in the design with at least a 10 m landscape buffer. The completed development does not feature permanent lighting.

6.16 The proposed development will therefore not cause significant loss or fragmentation of bat foraging habitat, either at the Site level or more widely. The conversion of arable land to grazing pasture may increase the value of the Site as foraging habitat; since the latter is likely to produce a higher biomass of flying invertebrates. Similarly, the proposed creation and enhancement of hedgerows is likely to increase landscape connectivity for commuting bats.

6.17 Any indirect impact to commuting and foraging habitat for bats is limited to light pollution during construction and decommissioning (see *Additional Mitigation* in the following section).

6.18 Overall, due to habitat creation, the proposed development will have a beneficial effect on local bat populations at the local level.

Badger

6.19 The proposed development does not involve major construction work or excavation within 30 m of three active badger setts or the one possibly active badger sett identified within the Survey Area, and the habitats immediately surrounding these setts are within areas proposed for retention and enhancement. Killing, injury or disturbance of individual badgers, or damage or destruction of badger setts is therefore unlikely, however there is a risk of badgers being fenced into construction areas or being injured by becoming trapped in excavations.

6.20 Precautionary mitigation has been recommended to avoid the risk of these impacts occurring (see *Additional Mitigation* in the following section)

Hazel dormouse

6.21 All hedgerows, woodland and significant areas of scrub are retained within the design with at least a 10 m landscape buffer. The proposed development will therefore not destroy significant habitat for hazel dormouse or affect landscape connectivity for this species. The proposed enhancement planting of native hedgerow has the potential to improve habitat availability and landscape connectivity for hazel dormouse.

6.22 Without appropriate protection measures during construction (see *Additional Mitigation* in the following section), there is a low risk of killing, injury and/or disturbance of hazel dormouse (if present) in small lengths of hedgerow to be temporarily lost, predominantly for construction of cable routes in the airport parcel.

6.23 Overall, due to the retention of habitat and new planting, the proposed development will have a negligible effect on local dormouse populations.

Water vole

6.24 All watercourses on Site are retained with at least a 10 m landscape buffer, therefore the proposed development is unlikely to destroy significant habitat for water voles. The proposed enhancement planting of tussocky neutral grassland along the watercourse corridors in both parcels is likely to provide an increase in available habitat for water vole.

6.25 No new stream crossings are proposed, however without appropriate protection measures during construction, other works taking place in close proximity to the watercourses (e.g. installation of perimeter fencing crossing the watercourses) have a low risk of killing or injuring individual water voles.

6.26 Overall, given the retention of watercourses, the proposed development will have a negligible effect on local populations of water vole.

Harvest mouse and hedgehog

6.27 Although the security fencing of the solar arrays has the potential to reduce landscape permeability to hedgehog, this is minimised in the design through connecting holes on all field-to-field boundaries. The retention of hedgerows, scrub and woodland within landscape buffers, and the habitat creation and enhancement listed above under *Designed-in Ecology Mitigation and Enhancements* (including the conversion of almost all of the Site to grassland under low-intensity management and scrub planting) mean that the available habitat for hedgehog and harvest mouse is likely to significantly increase in extent and quality.

6.28 Overall, given the proposed habitat creation, the proposed development will have a beneficial effect on these species at the local level.

Brown hare and skylark

6.29 The loss of arable farmland has potential to reduce the available foraging and breeding habitat for brown hare and skylark. This arable farmland will be replaced with neutral grassland (under the solar panels) and tussocky grassland areas with wildflowers. Evidence (albeit limited) on the use of solar farms by breeding skylark is mixed, although there is an indication that adjacent farmland land tends to be preferentially selected by skylark over solar farms for breeding purposes (Montag *et al*., 2016).

6.30 However, the Site will offer significantly improved foraging opportunities for skylark during the operational phase, as the grassland habitats will support a larger biomass of insect prey items than the arable land they will replace. The completed design includes retention and enhancement of two areas of grassland under low intensity management: 6.5 ha of former horse grazing paddock in the eastern parcel and 6 ha of wildflower meadow around Hilfield Brook in the western parcel. These will be managed to avoid cutting or grazing in April-June to provide suitable nesting conditions for skylark (set out in the LEMP, see BSG Ecology, 2020). Considering the low numbers of skylark likely to be affected by the proposed development (an estimated five territories across the Survey Area, minus one territory contained within the airport parcel that is unlikely to be affected) and the poor quality of the existing habitat for skylark (intensively-managed arable land with no unsown plots or strips suitable for undisturbed nesting), these areas are considered to be appropriate compensation for the loss of skylark habitat in arable land in the proposed development. The proposed development is likely to be neutral in terms of its effects on skylark.

6.31 Security fencing for the solar farm is likely to reduce landscape permeability for brown hare, however the design of perimeter fencing includes holes on every field-to-field boundary to allow passage of animals including brown hare, so this effect is likely to be limited. Furthermore, given the two areas managed for breeding skylark, plus the remaining planting of grassland under low-intensity management in “green corridors” as described under *Designed-in Ecology Mitigation and Enhancement* (to create a total of approximately 29.1 ha), and the low-intensity grazing of grassland around the solar arrays themselves (which provide suitable habitat for this species), the development will increase the habitat suitability of the Site for brown hare. Overall, a neutral effect on brown hare (or possibly a beneficial effect at the Site level) is anticipated.

6.32 Overall, given the proposed habitat creation, the proposed development is considered to, at worst, have a neutral effect on these two species, with potential for a beneficial effect at the Site level for skylark.

Tree and scrub nesting birds

6.33 The hedgerows, scrub and trees at the Site are to be retained in the design. Significant nesting or foraging habitat will therefore not be lost for tree or scrub-nesting nesting birds, and significant impacts on the populations of these species are therefore considered unlikely. The proposed enhancement planting of native hedgerow has the potential to improve habitat and resource availability for breeding birds. The proposed development is likely to be beneficial at the site level for tree and scrub nesting birds.

6.34 Without appropriate protection measures during construction (see *Additional Mitigation* in the following section), there is a low risk of destroying or damaging nests and young of breeding birds (if present) during vegetation clearance in the small lengths of hedgerow to be temporarily lost, e.g. during the construction of cable routes in the airport parcel.

6.35 Overall, given the proposed habitat creation, the proposed development will have a beneficial effect on tree and scrub nesting birds at the Site level.

Reptiles

6.36 The proposed development will not destroy significant habitat for reptiles (if present), as boundary habitats are being retained and buffered and the area of semi-improved grassland in the airport parcel is being retained. Landscape connectivity for reptiles is unlikely to be reduced. Therefore the proposed development is unlikely to cause adverse impacts on local reptile populations. The habitat creation listed above, particularly the buffer areas and the replacement of arable farmland with grassland under low-intensity management, is likely to represent a significant net increase in terrestrial habitat and habitat connectivity for reptiles.

6.37 In the absence of appropriate protective measures during construction (see *Additional Mitigation* in the following section), the construction of the cable route through the semi-improved grassland within the airport parcel may kill and injure individual reptiles, if present.

6.38 Overall, given the proposed habitat creation, the proposed development will have a beneficial effect on reptiles at the local level.

Great crested newt and other amphibians

6.39 The ponds, hedgerows and scrub on Site are all being retained with landscape buffers, and therefore the proposed development will not destroy significant breeding or foraging habitat for GCN or other amphibians (intensively-managed arable farmland is poor habitat for these species). The habitat creation listed above, particularly replacement of arable farmland with grassland under low-intensity management, is likely to represent a significant net increase in terrestrial habitat and habitat connectivity for amphibians, and cessation of ploughing and other arable operations is likely to have a positive impact on GCN survival within the Site.

6.40 Without appropriate protective measures during construction, there is potential for killing and injury of individual GCN (a breach of wildlife legislation) and other amphibians during construction work in proximity to the breeding ponds (Ponds 2 and 4), and offsite Pond F, L, M, and N (assuming GCN is present in these ponds). Depending on the distribution of habitats, some individuals may range some distance from ponds to forage or hibernate, including crossing areas of unsuitable habitat such as arable land to reach isolated ponds or hibernation sites. Natural England advise that '*as a general guide, suitable habitats within 250 m of a breeding pond are likely to be used most frequently'* (English Nature, 2001). Due to distance and/or the presence of dispersal barriers, impacts on GCN (if present) in the remaining offsite ponds not sampled (see *Methods*) are considered unlikely.

6.41 Overall, given the retention and enhancement of ponds and boundary features and the proposed habitat creation, the proposed development will have a beneficial effect on GCN at the local level, and assuming construction mitigation proposed below is adopted, the risk of killing and injury is likely to be minimal

Invertebrates

6.42 The semi-improved grassland in the airport, hedgerows, scrub and mature trees are all retained in the finished design with a landscape buffer zone, the proposed development is unlikely to cause adverse impacts on invertebrate populations. The habitat creation and enhancement listed above is likely to significantly increase the quantity and quality of available habitat for invertebrates.

6.43 Overall, given the retention of boundary features and the proposed habitat creation, the proposed development will have a beneficial effect on invertebrates at the local level.

Plants

6.44 Overall, given the retention of boundary features and the proposed habitat creation, the proposed development will have a beneficial effect on plant diversity at (at least) the site level.

Invasive plants

6.45 In the absence of appropriate protective measures during construction (see *Additional Mitigation* in the following section), the proposed development has potential to cause the spread of the stand of Japanese knotweed within the eastern parcel, such as by the moving of soil in this area, and further field (e.g. through transfer of pieces of rhizome on vehicle tracks and tyres) further afield. In addition to being an offence, this could have adverse impacts on habitats.

7 Additional Mitigation

7.1 The following mitigation will be necessary to address the ecological impacts not avoided or mitigated by the designed-in mitigation described previously. The majority of this mitigation relates to measures to be taken before and during construction to protect adjacent designated sites, retained habitats and protected species.

7.2 This additional mitigation will be set out in detail in a Construction Ecological Management Plan (CEMP) to be produced prior to the start of construction.

Pre-construction mitigation

7.3 Before construction begins, a lighting strategy will be designed (and set out in the CEMP) to avoid light spill on the hedgerows or woodlands and on the wider landscape during the construction phase.

7.4 The buffers for hedgerows, trees, woodland, ponds, watercourses and designated sites will be protected during construction by installing site security fencing in each field before the installation of the main solar infrastructure. This will safeguard these habitats and areas against accidental damage by machinery, and through limiting the proximity of vehicles, will limit dust deposition and disturbance on designated sites. It is recommended that impacts to trees are separately assessed by a suitably qualified arboriculturist, based on guidance in British Standard 5837:2012 *Trees in relation to design, demolition and construction*.

7.5 Buffer zones will not be possible at hedgerow crossing points of tracks and cable routes, and where construction, operation and maintenance tracks utilise existing agricultural access tracks.

7.6 A suitably qualified contractor will be appointed to treat or clear the stand of Japanese knotweed in the eastern parcel in order to avoid any risk of causing it to spread.

7.7 To ensure vegetation clearance for the cable route does not impact any tree roosting bats, a ground-level survey is to be undertaken prior to these works commencing, once the preferred route and crossing points have been determined. If any feature is identified as suitable for roosting bats and is required to be removed, further inspection by a licensed ecologist will be undertaken to ensure that it is not a current bat roost. If an active roost or resting place is discovered, all works that could affect it must cease, and the ecologist will advise on suitable options (such as licenced mitigation or an alternative route for hedgerow crossing).

7.8 Due to the highly mobile nature of badgers an update badger survey will be carried out prior to commencement of construction in order to assess the status of the setts recorded during the current survey, detect any new setts which might have been created and assess impacts to these appropriately.

7.9 Clearance of vegetation on arable field habitats should be undertaken outside of the bird breeding season (i.e. avoiding March to August inclusive), to avoid destruction of skylark nests. To reduce the likelihood of skylark (or other ground nesting birds) nesting within the Site, cleared land should maintained bare (e.g. by mowing every two weeks during the breeding season) until the construction work commences.

Construction mitigation

7.10 Existing rough grassland within retention areas will be scarified before enrichment seeding of wildflowers, rather than removing all vegetation in order to re-seed from scratch.

7.11 Where the cable route is trenched trenching through hedgerows and semi-improved neutral grassland in the airport parcel, these habitats will be reinstated by retaining and replanting coppiced stools (for hedgerows) and turves (for grassland).

7.12 All excavations will be kept covered overnight, or ramps provided to prevent badgers and other animals becoming trapped within them.

Protected species method statements or licenses

7.13 Method statements and/or licencing will be necessary to ensure that construction works avoid potential impacts on protected species as follows:

Great crested newt (works within 250 m of Ponds 2 and 4)

7.14 If all construction work (including clearance of arable land, groundworks and installation of solar arrays and fencing) within a 250 m radius of Ponds 2 and 4 and offsite Ponds F, L, M and N can be conducted within a between December to February inclusive (i.e. the period when GCN will be hibernating), a non-licensed precautionary approach is likely to be adequate to minimise the risk of killing, injuring or disturbing individual GCNs. The method would be set out in the CEMP, and would involve a suitably experienced ecologist walking over the area prior to the work to confirm the absence of hibernation habitat. If hibernation habitat was found, this would be taped off with a suitable buffer, and works or entry into that area would be avoided.

7.15 If this timing is not practical, a Natural England mitigation licence for GCN will need to be obtained to allow works in proximity to Ponds 2, 4, F, L, M and N to proceed without conflicting with legislation protecting GCN. The detailed method statement for these works would be subject to agreement by Natural England. They could include, for example inspections and hand searches by a suitably experienced ecologist prior to works, or the use of plastic fencing to temporarily exclude GCN from entering construction areas in close proximity to the ponds.

7.16 The above two approaches would also be appropriate for the digging out of the two defunct ponds on the hedgerow between Pond 2 and Little Kendals Wood. Vegetation clearance within Ponds 2 and 4 (which would be for the sole purpose of enhancing the ecological value of these two ponds) should take place between December and February (when GCN will be hibernating away from the pond), or should be covered by the above Natural England licence, or a separate conservation licence.

Hazel dormouse (clearance of hedgerows or scrub)

7.17 Clearance of short sections of hedgerows (including any widening works around existing field entrances to create access tracks) are to take place under a precautionary non-licensed method statement to avoid impacts on hazel dormouse. This will be detailed in the CEMP and will entail any vegetation suitable for use by dormouse, such as scrub, being cut to 150 mm above ground level between December and March under supervision of a suitably experienced ecologist. The remaining ground level vegetation will then be removed during the following active period (i.e. between May and September). This will avoid damaging or disturbing dormice nests. If an active dormouse nest (resting place) is discovered all works must cease, and the ecologist will recommend further mitigation and licensing as appropriate.

Badger (works within 30 m of an active sett)

7.18 The design will avoid any ground disturbance or digging within 30 m of badger setts. If such works become necessary, the sett will be closed under a Natural England licence, with

appropriate mitigation carried out to obtain the licence (such as the construction of an alternative sett elsewhere in the retained nature areas).

Nesting birds (clearance of hedgerow or scrub)

7.19 Clearance of scrub and hedgerows is to be undertaken following a precautionary method statement to avoid impacts on nesting birds. This method will be detailed in the CEMP and would involve a suitably experienced ecologist searching the vegetation for evidence of breeding birds immediately prior to vegetation clearance. If an active nest is found, work will stop within a suitable area around the nest until the ecologist can confirm that the nesting attempt has concluded.

7.20 Cleared sections of hedgerow will be replanted after completion of the cable route with a mixture of native woody species to avoid any losses of habitat for dormouse or breeding birds.

Reptiles (trenching work for cables)

7.21 Vegetation clearance and digging in semi-improved neutral grassland or through hedgerows for cable laying will be conducted under a precautionary method statement to avoid impacts on reptiles. This will be detailed in the CEMP, and will involve clearance of grassland via a phased cut. Any semi-improved grassland turf removed for trench digging will be replaced after backfilling, and any hedgerows or scrub removed will be replanted with a suitable mix of native woody species.

Decommissioning works

7.22 A precautionary approach for the above protected species is recommended during eventual decommissioning works (to be described in a precautionary method statement drafted and agreed before works commence). This would likely entail undertaking works at an appropriate time of year (likely to be outside of the hibernation period for reptiles and GCN) and the work being supervised by an experienced ecologist to ensure that these species are not adversely affected by the work.

8 Conclusion

8.1 If the designed-in mitigation and additional mitigation set out above are implemented in full, it will be possible to adequately mitigate or compensate all ecological impacts from the Proposed Development.

8.2 The proposed development will be in line with national and local planning policy (the NPPF and Hertsmere Local Plan, respectively), will avoid breaches of wildlife legislation, and given the proposed positioning of the solar arrays on intensive arable fields of limited value to wildlife, the proposals also present opportunities to provide improved habitats for wildlife and improved ecological networks.

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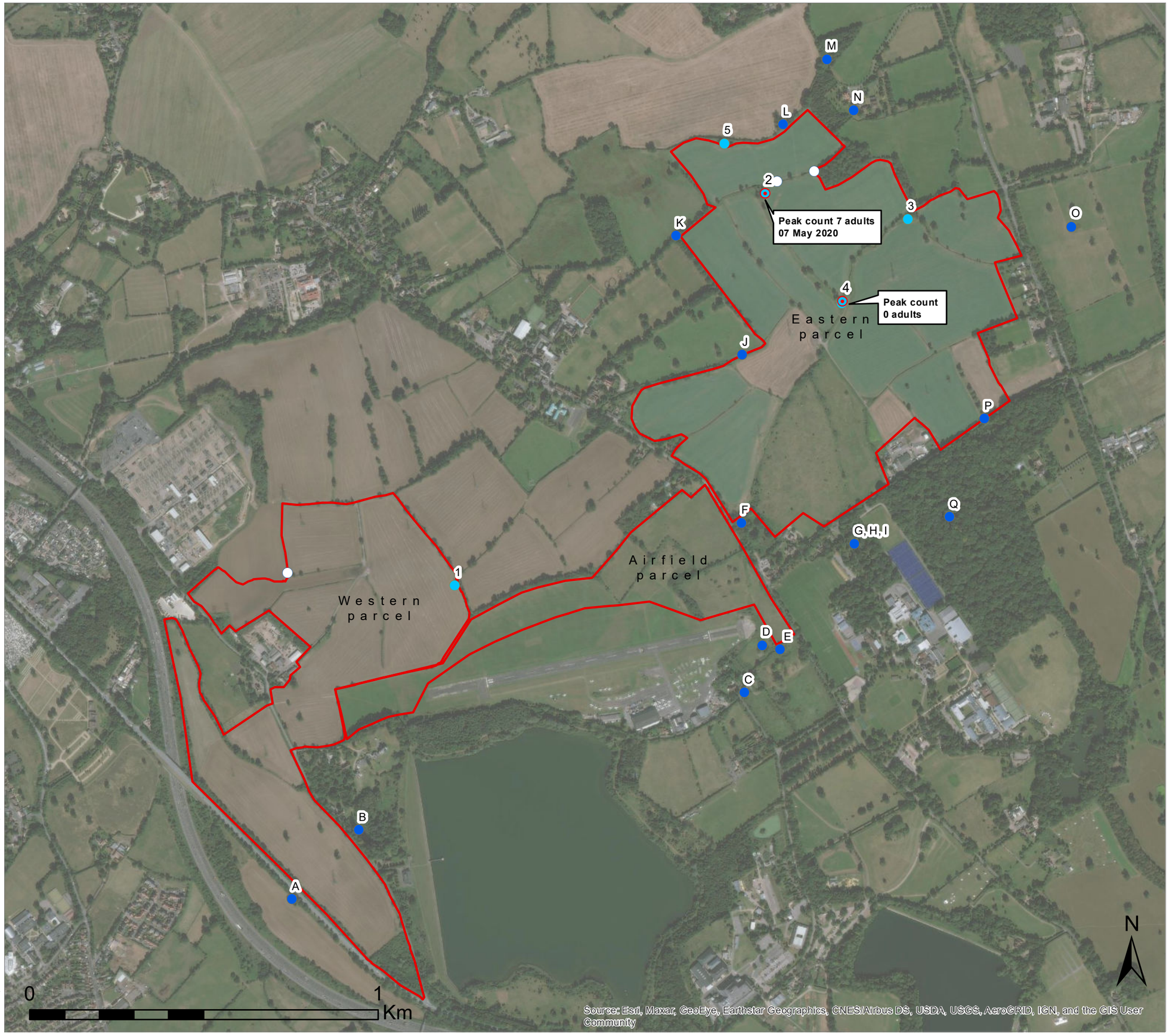
10 Figures



LEGEND

- Survey area boundary
- Pond containing great crested newts
- 1 Onsite pond
- A Offsite pond
- Dry pond

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PROJECT TITLE

ELSTREE ENSO ENERGY SOLAR FARM AND BATTERY STORAGE, FURTHER WORK

DRAWING TITLE

Figure 1: Site boundary and areas, and location of ponds

DATE: 17/12/2020 CHECKED: PMC SCALE: 1:10,500

DRAWN: SR/KW APPROVED: TF VERSION: 1.9

Sources: BSG Ecology survey data

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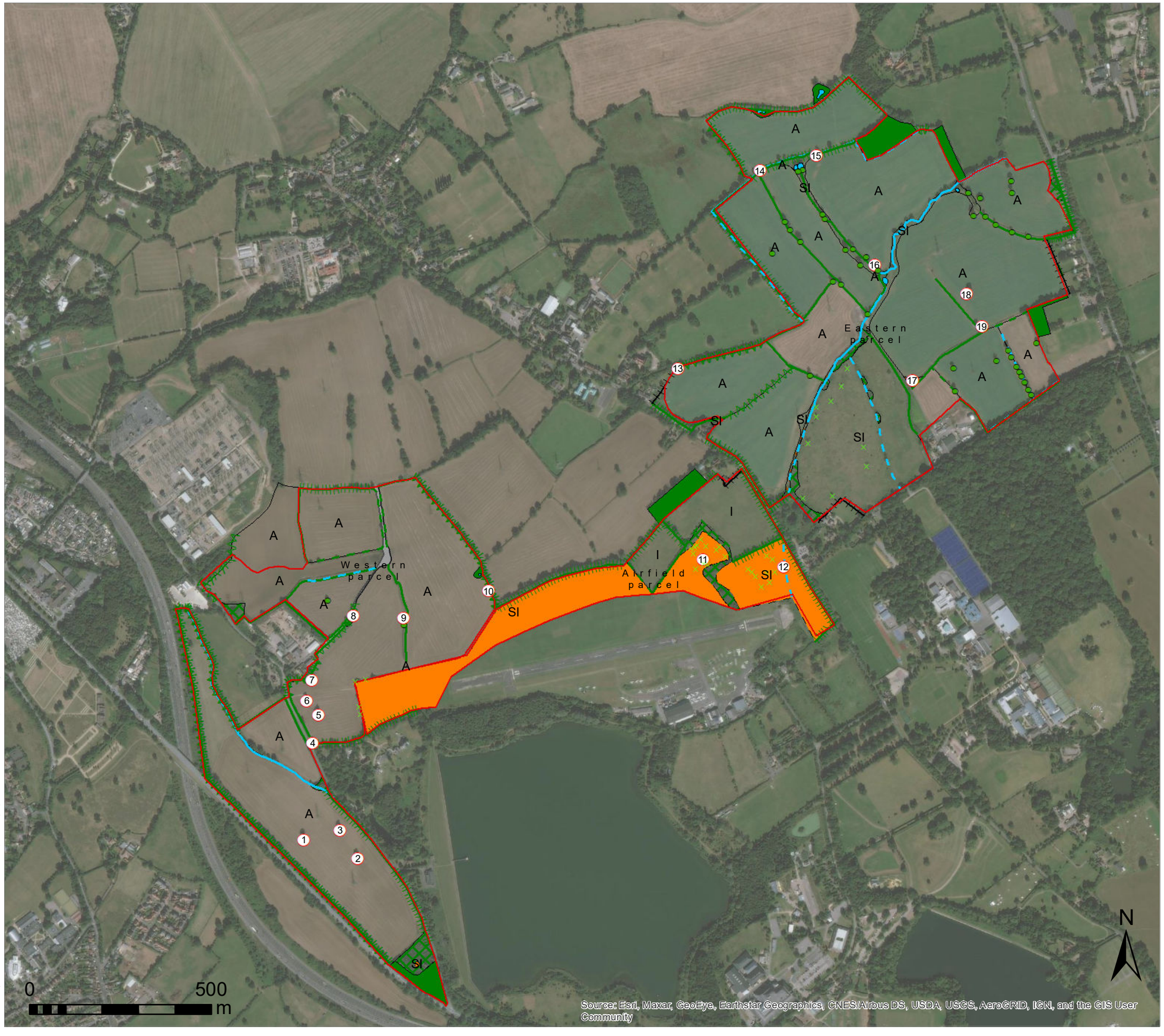

LEGEND

- Survey area boundary
- A — Arable
- Bare ground
- Broadleaved semi-natural woodland
- Dense scrub
- Ephemeral or short perennial
- Hardstanding
- I — Improved grassland
- SI — Semi-improved neutral grassland
- Tall ruderal
- Standing water
- Running water
- Dry ditch
- Species-rich intact hedge
- Species-poor intact hedge
- Species-rich defunct hedge
- Species-poor defunct hedge
- Species-rich hedge with trees
- Species-poor hedge with trees
- Fence
- Wall
- Broadleaved tree
- Scattered scrub
- 1 — Target note

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DRAWING TITLE

Figure 2: Phase 1 habitats plan

DATE: 17/12/2020 CHECKED: PMC SCALE: 1:10,000

DRAWN: SR/KW APPROVED: TF VERSION: 1.8

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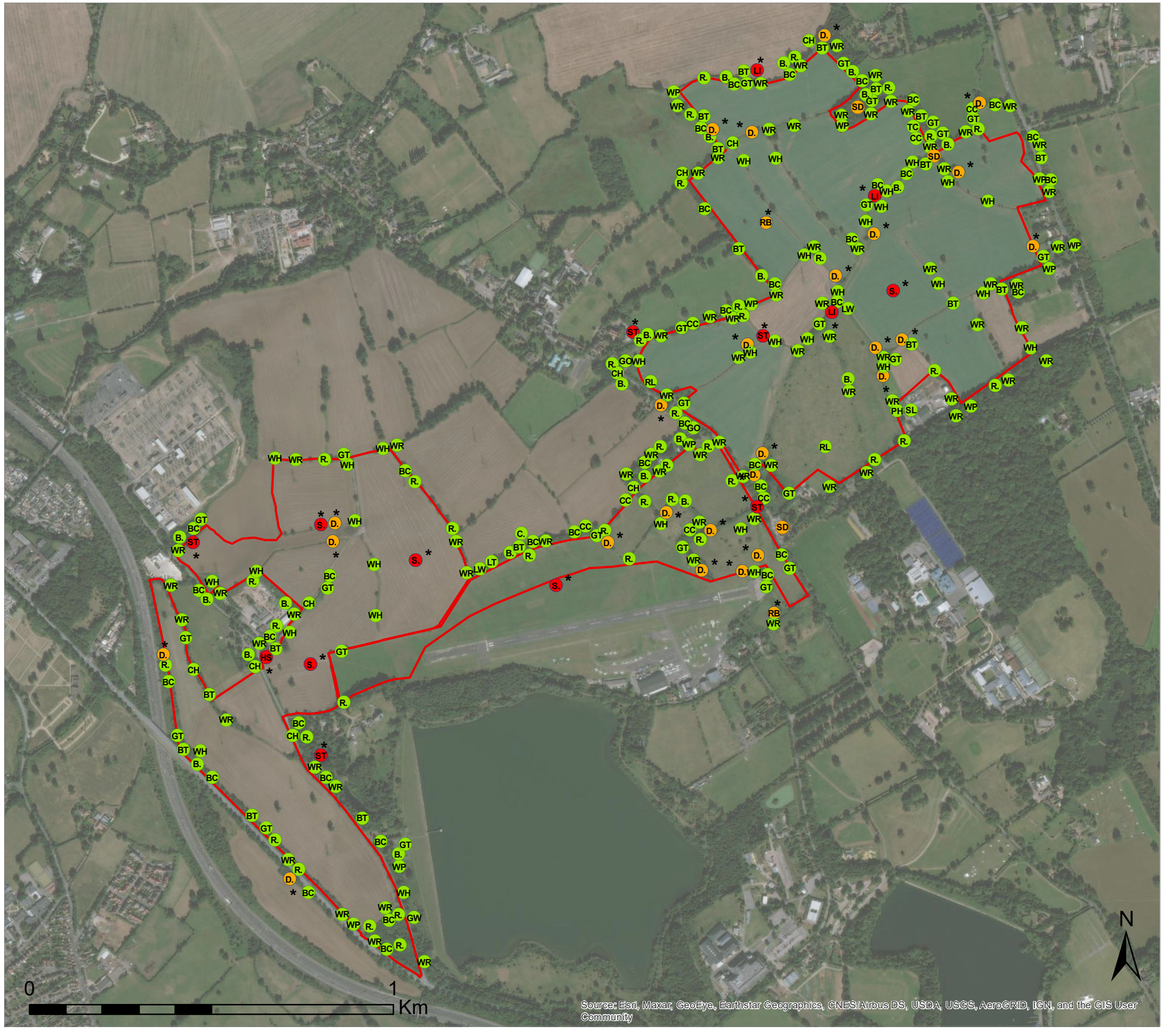

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LEGEND

Survey area boundary

Species of Principal Importance (SPI)

Bird of Conservation Concern (BoCC) status

Red list

Amber list

Green list

BTO code	Common name	Scientific name	Count
B.	Blackbird	*Turdus merula*	21
BC	Blackcap	*Sylvia atricapilla*	37
BT	Blue tit	*Cyanistes caeruleus*	18
C.	Carrion crow	*Corvus corone*	1
CC	Chiffchaff	*Phylloscopus collybita*	7
CH	Chaffinch	*Fringilla coelebs*	9
D.	Dunnock*	*Prunella modularis*	25
GO	Goldfinch	*Carduelis carduelis*	2
GT	Great tit	*Parus major*	25
GW	Garden warbler	*Sylvia borin*	1
HS	House sparrow*	*Passer domesticus*	1
LI	Linnet*	*Linaria cannabina*	3
LT	Long-tailed tit	*Aegithalos caudatus*	1
LW	Lesser whitethroat	*Sylvia curruca*	2
PH	Pheasant	*Phasianus colchicus*	1
R.	Robin	*Erithacus rubecula*	40
RB	Reed bunting*	*Emberiza schoeniclus*	2
RL	Red-legged partridge	*Alectoris rufa*	2
S.	Skylark*	*Alauda arvensis*	5
SD	Stock dove	*Columba oenas*	3
SL	Swallow	*Hirundo rustica*	1
ST	Song thrush*	*Turdus philomenos*	5
TC	Treecreeper	*Certhia familaris*	1
WH	Common whitethroat	*Sylvia communis*	32
WP	Woodpigeon	*Columba palumbus*	10
WR	Wren	*Troglodytes troglodytes*	75

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PROJECT TITLE

ELSTREE ENSO ENERGY SOLAR FARM AND BATTERY STORAGE, FURTHER WORK

DRAWING TITLE

Figure 3: Breeding bird territory map

DATE: 17/12/2020 CHECKED: PMC SCALE: 1:10,000

DRAWN: KW APPROVED: TF VERSION: 1.4

Sources: BSG Ecology survey data

11 Photographs

Photograph 1: Typical heavily-managed mature native hedgerow in the western parcel.	**Photograph 2: Typical grown out boundary hedgerow with trees in the eastern parcel.**
	
Photograph 3: Dry pond (Pond 4) in the eastern parcel	**Photograph 4: Pond 5 in the eastern parcel showing extensive cover of *Typha latifolia*.**
	
Photograph 5: Course of the Hilfield Brook in the western parcel.	**Photograph 6: Typical section of the Hilfield Brook.**
	

Photograph 7: View of the eastern parcel showing scattered mature trees and poor semi-improved grassland field margin.	**Photograph 8: Mature pedunculate oak in the western parcel.**
	
Photograph 9: Semi-improved grassland in the airport parcel to the north of the runway.	**Photograph 10: Semi-improved grassland with scattered scrub in the eastern parcel to the east of the runway.**
	
Photograph 11: Improved grassland in the east of the airport parcel.	**Photograph 12: Dense scrub in the southern tip of the western parcel**
	

Photograph 13: Typical arable farmland in the western parcel