

Chimmens Solar Farm, Dartford
Ecological Appraisal Report

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1 Summary

- 1.1 BSG Ecology were commissioned by Renewable Energy Systems (RES) to carry out an Ecological Appraisal in support of a planning application for a proposed solar farm at Chimmens Farm, Dartford, (henceforth, 'The Site').
- 1.2 The Site is situated just north of the M20 and south of Horton Kirkby, and is centred at Ordnance Survey National grid Reference TQ 56943 66677. Habitats on the Site are dominated by arable land with some areas of modified and other neutral grassland as well as a network of hedgerows both with and without trees. Additionally, there are several smaller areas and field margins managed under existing environmental stewardship schemes.
- 1.3 This Ecological Appraisal report was informed by ecological records data from Kent and Medway Biological Records Centre and a suite of ecological surveys of the Site carried out in 2022 and 2023; these included an extended Phase 1 habitat survey, UKHab survey and condition assessment, winter bird surveys, breeding bird surveys, and badger surveys.
- 1.4 The Site is immediately adjacent to several designated Local Wildlife Sites and areas of ancient woodland. It is also within 15 km of the Thames Estuary and Marshes SPA, SSSI, and Ramsar site (approximately 14.3 km).
- 1.5 The habitats on the Site are dominated by arable land with some areas of modified and other neutral grassland, and a network of hedgerows and trees. There are also smaller areas and field margins managed under existing environmental stewardship schemes currently running until December 2023. Some small areas of broad leafed semi-natural woodland contiguous with the ancient woodland adjacent to the Site are also present. There are no ponds or watercourses within the Site, though ponds have been identified outside the Site, within 250 m of the blue line but not within 250 m of proposed works.
- 1.6 Protected species that are present include breeding birds and badgers and the habitats present suggest that dormouse, foraging and roosting bats, and reptiles are present.
- 1.7 Overall the proposed development is likely to have a beneficial effect on the biodiversity and ecological value of the Site as many of the higher value features will be retained and extensive habitat creation and enhancement will take place, including grassland creation and new hedgerow planting.
- 1.8 The creation and enhancement of the habitats proposed will enhance the Site for many protected species and species groups, such as reptiles, nesting birds (excluding skylark), bats and invertebrates. There is however likely to be an adverse effect on skylark as a result of the proposed development, which will likely lead to a net loss of between five and seven skylark territories once on site mitigation and compensation measures are considered.

2 Introduction

Background to commission

- 2.1 BSG Ecology were commissioned by Renewable Energy Systems (RES) on 12 April 2023 to carry out an Ecological Appraisal in support of a planning application for a proposed solar farm at Chimmens Farm, Dartford, (henceforth, 'The Site').
- 2.2 This Ecological Appraisal updates a Preliminary Ecological Appraisal of the Site (BSG Ecology, 2022), describing in detail the results of the full suite of ecological surveys carried out at the Site to provide an assessment of its ecological value and potential to support protected and notable species and set out recommendations for mitigation measures where required.
- 2.3 This Ecological Appraisal report outlines potential impacts on the ecological features as a result of the proposed development while considering the embedded mitigation, including a biodiversity net gain (BNG) assessment as calculated using the current approved metric (Defra 4.0).

Site description

- 2.4 The Site is situated just north of the M20 and south of Horton Kirkby, and is centred at Ordnance Survey National grid Reference TQ 56943 66677.
- 2.5 Habitats on the Site are dominated by arable land with some areas of modified and other neutral grassland as well as a network of hedgerows both with and without trees. Additionally, there are several smaller areas and field margins managed under existing environmental stewardship schemes (currently running until December 2023). Some small areas of broad leaved semi-natural woodland contiguous with the ancient woodland adjacent to the Site are also present. There are no ponds or watercourses within the Site, although two ponds have been identified outside the Site, within 250 m.

Description of project

- 2.6 The Site is proposed for construction and operation of a solar farm with all associated works, equipment, necessary infrastructure and biodiversity net gains. The site will include solar arrays, a substation, and a cable route. There will also be extensive grassland creation and new hedgerow planting.
- 2.7 The Figures within this report contain two area boundaries – the 'red line' boundary encompasses areas proposed for solar arrays and related works and infrastructure, while the 'blue line' boundary encompasses a wider area within the ownership boundary that has been surveyed and used to inform this Ecological Appraisal. No works are planned within areas outside of the red line boundary and these will continue under existing agricultural management. These boundaries are shown in Figure 1.

Scope of study

- 2.8 The purpose of this Ecological Appraisal Report is to provide a comprehensive assessment of the ecological value and features of interest of the Site, outlining the potential impacts on these features that could occur as a result of the proposed development, and setting out recommendations for avoidance and mitigation measures where required. This report also includes recommendations for habitat creation and enhancement measures within the proposed development, including those that are necessary to meet the biodiversity net gain requirements of the project. These are already outlined in the Landscape Masterplan (Pegasus, 2023) but will be refined in future.

3 Methods

3.1 This section describes the methods and rationale used to produce this Ecological Appraisal Report.

Desk study

3.2 Kent and Medway Biological Records Centre (KMBRC) was contacted for records of non-statutory designated sites and records of protected and notable species within a 2 km radius of the Site boundary (the 'blue line' boundary). The data was returned on 23 September 2022.

3.3 The DEFRA MAGIC website (MAGIC, 2022) was consulted to establish whether any statutory designated sites occur within the vicinity of the Site. Statutory designated Sites were considered within the following areas according to their level of designation; internationally designated sites (Ramsar, Special Protection Areas (SPAs), Special Areas of Conservation (SACs)) were considered up to 15 km from the Site, while Nationally designated sites (Sites of Species Scientific Interest (SSSI)) were considered up to 2 km from the Site.

3.4 Additionally, the DEFRA MAGIC website (MAGIC, 2022) was used to search for any registered ancient woodland and European Protected Species Mitigation (EPSM) licenses granted within 2 km of the Site.

3.5 Finally, aerial imagery (MAGIC, 2022) was consulted to identify any ponds within 250 m of the Site and gain an understanding of the Site's context and habitat connectivity to the wider area.

Field survey

Extended Phase 1 habitat survey

3.6 An extended Phase 1 habitat survey of the Site was conducted by Kai Hayes and Joe Bishop, ecologists at BSG Ecology, on the 21 and 22 September 2022. Conditions were dry, calm, and overcast, with no recent precipitation. The temperature during the survey was 17°C. This survey covered the whole of the area within the blue line boundary as shown in Figure 1, with the exception of three small areas which were added to the boundary subsequent to the survey. These were surveyed as part of the UK Hab survey and condition assessment in 2023 (see below).

3.7 The Phase 1 habitat survey was undertaken with reference to JNCC survey guidelines (JNCC, 2010). This involved a walkover survey, during which the habitats present were recorded and mapped, noting the plant species present. Relative abundance of plant species was estimated by the surveyor using the DAFOR scale. Photographs were taken to provide supporting evidence (see Section 9).

3.8 The survey was extended to include an assessment of the potential of the Site to support protected, notable and / or invasive non-native species.

UK Hab survey and condition assessment

3.9 The Phase 1 survey was updated to UK Hab specifications and a habitat condition assessment carried out by Kai Hayes and Joe Bishop, ecologists at BSG Ecology on the 14 and 15 July 2023. Conditions during the survey were dry, warm, and sunny. This survey covered the whole of the area within the blue line boundary shown in Figure 1.

3.10 The survey was undertaken with reference to the UK Habitat Classifications (Butcher *et al.* (2020). This involved a walkover survey, during which the habitats present were recorded and mapped. One meter-square quadrats were taken at representative locations within each habitat parcel and the plant species and abundance noted.

3.11 Condition assessments were undertaken during the field survey, for each parcel of habitat identified. The habitat classification that was assigned informed the relevant condition assessment sheet to use (Natural England 2023).

3.12 A number of criteria are detailed within the condition assessment sheet (Natural England 2023), against which the habitat is scored with either a 'Pass' or 'Fail'. The total number of Passes is tallied, which then results in an overall score of 'Poor', 'Moderate' or 'Good' condition.

Biodiversity net gain calculation

3.13 The baseline habitats within the Site were digitised post-survey using QGIS software, and area calculations for each parcel of habitat obtained from the GIS to be inputted to the biodiversity net gain calculation.

3.14 The proposed habitats (and their condition) that are to be present on Site post-development were based on the final Landscape Masterplan (Pegasus, 2023) and agreed through liaison with the project team on what is realistically achievable on Site both practically and ecologically, given the nature of the Site. Proposed habitats were digitised using QGIS software and area calculations for each parcel of habitat obtained from the GIS to be inputted to the biodiversity net gain calculation.

3.15 Only areas of planned works within the red line boundary were included in the biodiversity net gain calculation. Professional judgement was used in some areas where there was deviation between the red line boundary as provided by RES, and the reality on Site; for example, in some locations the red line boundary does not extend all the way to a hedgerow or field boundary, and in other cases extends slightly beyond it into adjacent fields – in these cases habitats were surveyed and mapped to existing field boundaries as this is considered to more accurately reflect the areas of planned works in reality. Additionally, some areas within the red line have been excluded from the biodiversity net gain calculation as they will experience no material change as a result of the proposed development and do not have a baseline value. For example, existing roads are necessarily included within the red line as they will be needed for access purposes but will not be altered by the proposed development (where hedgerows are to be trimmed or removed to enable access or visibility splays, these have been included in the biodiversity net gain calculation). Part of the red line illustrating the proposed cable route also passes through the off-Site ancient woodland at Horton Wood, however as the intention is for this cable to be drilled underground, the woodland will not be impacted and therefore this area is also excluded from the biodiversity net gain calculation (see Impacts and Recommendations for further details on the drilling).

3.16 The calculation was carried out using the DEFRA Metric 4.0 calculation tool.

Bird surveys

Winter bird surveys

3.17 In order to ascertain the use of the Site by winter birds, and in particular whether it is used by bird species for which the Thames Estuary and Marshes SPA, SSSI, and Ramsar sites are designated, monthly winter bird surveys were undertaken during the period October 2022 – March 2023. Given the distance to the internationally designated sites (over 12 km), this survey effort is considered proportionate. The data was regularly checked in order to identify whether species which would merit a higher survey effort occurred. This approach was agreed with Helen Forster on Kent County Council Ecology team in December 2022 (written correspondence with John Baker of BSG Ecology, December 2022). This is also in line with current industry guidance (Bird Survey & Assessment Steering Group, 2023).

3.18 The surveys were carried out by Joe Bishop, ecologist at BSG Ecology, and Bill Wadsworth, Helen Lucking, and Melissa Randall, ecologists at Corylus Ecology. This survey covered the whole of the area within the blue line boundary.

3.19 The surveys involved a walkover over the Site whereby any bird species and activity were noted. These surveys were undertaken shortly after dawn, with the exception of the survey on 25 November 2022 which took place shortly before dusk, thus providing information on the use of the

Site by winter birds at both times of the day. Survey dates and weather conditions are shown in Table 1, below.

3.20 *Table 1: Winter bird survey dates and weather conditions*

Visit number	Date	Surveyors	Weather
1	28/10/22	Joe Bishop Bill Wadsworth	Start time: 08:45 Cloud cover (otaks): 6 Temp (°C): 18 Wind speed (beaufort): 2 Wind direction: N Precipitation: None Visibility: Good
2	25/11/22	Bill Wadsworth Helen Lucking	Start time: 15:00 Cloud cover (otaks): 1 Temp (°C): 10 Wind speed (beaufort): 2 Wind direction: N Precipitation: None Visibility: Good
3	22/12/2022	Helen Lucking Melissa Randall	Start time: 08:40 Cloud cover (otaks): 8 Temp (°C): 9 Wind speed (beaufort): 2 Wind direction: E Precipitation: Light shower Visibility: Poor (Fog)
4	27/01/23	Bill Wadsworth Melissa Randall	Start time: 08:50 Cloud cover (otaks): 6 Temp (°C): 4 Wind speed (beaufort): 2 Wind direction: NE Precipitation: None Visibility: Good
5	24/02/2023	Bill Wadsworth Melissa Randall	Start time: 08:30 Cloud cover (otaks): 7 Temp (°C): 3 Wind speed (beaufort): 2 Wind direction: W Precipitation: None Visibility: Good
6	20/03/23	Bill Wadsworth Melissa Randall	Start time: 08:51 Cloud cover (otaks): 8 Temp (°C): 10 Wind speed (beaufort): 4 Wind direction: S Precipitation: None Visibility: Good

Breeding bird surveys

3.21 To gain information about the use of the Site by breeding birds, four breeding bird surveys were undertaken throughout the period April – June 2023 by Bill Wadsworth and Helen Lucking, ecologists at Corylus Ecology. This survey covered the whole of the area within the blue line boundary.

3.22 The surveys involved a walkover over the Site whereby any bird species and activity were noted. These surveys were undertaken shortly after dawn, with the exception of the survey on 05 June 2023 which took place shortly before dusk, thus providing information on the use of the Site by breeding birds at both times of the day. Survey dates and weather conditions are shown in Table 2, below.

3.23 *Table 2: Breeding bird survey dates and weather conditions.*

Visit number	Date	Surveyors	Weather
1	20/04/23	Bill Wadsworth Helen Lucking	Start time: 07:30 Cloud cover (otaks): 3 Temp (°C): 13 Wind speed (beaufort): 2 Wind direction: E Precipitation: None Visibility: Good
2	19/05/23	Bill Wadsworth Helen Lucking	Start time: 05:30 Cloud cover (otaks): 8 Temp (°C): 14 Wind speed (beaufort): 2 Wind direction: E Precipitation: None Visibility: Good
3	05/06/23	Bill Wadsworth Melissa Randall	Start time: 19:45 Cloud cover (otaks): 0 Temp (°C): 10 Wind speed (beaufort): 2 Wind direction: NE Precipitation: None Visibility: Good
4	16/06/23	Bill Wadsworth Melissa Randall	Start time: 05:35 Cloud cover (otaks): 0 Temp (°C): 13 Wind speed (beaufort): 0 Wind direction: - Precipitation: None Visibility: Good

3.24 This method is informed by the most recent industry guidance (Bird Survey & Assessment Steering Group, 2023). The data from each of the four visits was then collated and used to inform the locations of indicative territories either on or immediately adjacent to the Site. This interpretation is based largely on professional judgement as the industry guidance cited above does not provide guidance on the process for identifying territories. The presence of an indicative territory was determined based on evidence which would suggest breeding is occurring or likely to occur, such as carrying food, the presence of a nest or recently fledged young, birds recorded in song

repeatedly or in suitable breeding habitat. Guidance on this procedure is provided in Marchant (1983).

Badger survey

- 3.25 In order to obtain up-to-date information on the use of the Site by badgers *Meles meles*, a detailed badger survey was undertaken by Bill Wadsworth on 22 May 2023. This survey covered the whole of the area within the blue line boundary. An additional survey was conducted on 23 September 2023 specifically to cover the area of woodland proposed for an underground drilled cable route and a buffer from this of 30 m.
- 3.26 These surveys involved a walkover of the Site to search for signs of badger activity such as setts, runs, latrines, and snuffle holes. Any signs of badger were recorded and mapped using a handheld GPS device.
- 3.27 Any setts located were recorded with information on number of entrances, extent of apparent activity in the vicinity and the presence of paths or latrines noted. This information was then used to determine the likely nature of the setts and whether they are in current use.
- 3.28 The setts have been classified based on the following adapted definitions from Neal and Cheeseman (1996) and Harris *et al.* (1989):
- Main sett - Normally where cubs are raised and in continuous and regular use throughout the year. Typified by large spoil heaps/mounds and well-trodden paths. There can be many entrances to the sett (often with some of these disused), although a main sett can sometimes only have a single entrance. There may be a scratching tree or playing area near the sett and usually a sizable latrine nearby.
 - Annexe sett - Intermediate-sized and may be used by breeding badgers. Normally close (<150m) to a main sett and connected to it by obvious paths. They may not be in use all the time, even if the main sett is very active but will be most of the time. May support a second litter if there is one.
 - Subsidiary sett - Similar to annexe setts but are likely to be further away (at least 50 m from the main sett) and not as well connected to the main sett as annexe setts. May only be used intermittently.
 - Outlier sett - Small setts with one or two entrance holes which are used sporadically by badgers as a temporary refuge (Neal & Cheeseman, 1996). Spoil heaps are likely to be small and there may not be obvious paths connecting to other setts.

Consideration of other species

- 3.29 Incidental observations of other protected and notable species were noted during the surveys described above.
- 3.30 Based on the habitats present on Site and the nature of the proposed development, which will retain many of the higher-value habitats (such as hedgerows, woodland, grassland and field margins), surveys for the following species were not undertaken as they are unlikely to experience any significant adverse impacts as a result of the proposed development: bats, dormice, great crested newt, and reptiles. The rationale for this in each case is provided below.

Great crested newt

- 3.31 There are no ponds or watercourse on Site, and although there are two ponds within 250 m of the wider blue line boundary, these are more than 250 m from the red line area proposed for solar infrastructure and separated from this by agricultural land, so it is considered unlikely that there would be any adverse effects on this species as a result of the proposed development.

Dormice

- 3.32 The majority of hedgerows and woodland areas on Site are to be retained with appropriate buffers, as shown in Figure 3. Therefore, it is considered unlikely that there will be any adverse effects on dormice. Small sections of hedgerow may need to be trimmed or removed to enable access and visibility splays; where necessary, this can proceed under a working method statement as advised by an experienced ecologist (see Impacts and Recommendations for details) due to the very short length needed at any given location.
- 3.33 Note that if larger areas of hedgerow are required to be removed then further surveys for dormice will be necessary (see Impacts and Recommendations for details).

Bats

- 3.34 The majority of hedgerows and woodland areas on Site are to be retained with appropriate buffers, as shown in Figure 3, and trees are to be removed. Therefore, it is considered unlikely that the proposed development will have any adverse effects on foraging or roosting bat species. Small areas of hedgerow may need to be trimmed or removed to enable access and visibility splays; however provided this is limited to small areas this is unlikely to have significant impacts on bats such as through fragmentation or loss of flightlines.
- 3.35 Note that if larger areas of hedgerow are required to be removed then further surveys to determine the use of hedgerows by bats may be necessary (see Impacts and Recommendations for details).
- 3.36 No trees are to be removed or affected indirectly such as via lighting, therefore no adverse effects on roosting bats are considered likely.

Reptiles

- 3.37 Areas of suitable habitat for reptiles (such as hedgerow bases and semi-improved grassland and field margins) will largely be retained within the proposed development (see Figure 3). Therefore, there will not likely be significant impacts on reptile species. Some small areas of suitable reptile habitat may need to be removed as part of the proposed development, but due to this being restricted to small areas full reptile surveys were not considered proportionate. Small areas of suitable reptile habitat can be cleared under a working method statement as advised by an experienced ecologist (see Impacts and Recommendations for details).

Evaluation

- 3.38 The assessment of the importance of ecological features of the Site has been undertaken with reference to relevant parts of the *Guidelines for Ecological Impact Assessment in the United Kingdom* published by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018).
- 3.39 The importance of an ecological feature is considered within a defined geographical context. The following frame of reference has been used in this case:
- International (European)
 - National (United Kingdom)
 - Regional (South East England)
 - County (Kent)
 - District (Sevenoaks)
 - Local (Between Site and District)
 - Site (The immediate boundary of the Site)

3.40 The evaluation of importance has been carried out with reference to the most extensive available data, with ecological knowledge and professional judgement used to supplement this where appropriate. The following sources of information have been used to determine the importance of ecological receptors:

- Citations and other designation information for statutory designated sites, including information on the geographic importance of qualifying habitats and species and other interest features provided by Natural England;
- Information on the interest features of non-statutory designated sites provided by the Local Biological Records Centre (Kent and Medway Biological Records Centre (KMBRC));
- Presence on national biodiversity lists such as Species and Habitats of Principal Importance (SPI and HPI, as designated under the NERC Act 2006 (Anon, 2006));
- (Birds only) presence on the Amber or Red List in Birds of Conservation Concern (Stanbury et. al., 2021).

Limitations to methods

3.41 The summer of 2022 was hotter and drier than average, and the Phase 1 habitat survey was undertaken towards the end of September. These conditions made it challenging to make a comprehensive assessment of grassland areas and field margins on Site. Additionally, the Phase 1 habitat survey covered the whole of the ownership boundary shown in Figure 1, with the exception of three small areas which were added to the boundary subsequent to the survey. However, as a detailed UK Hab survey and botanical condition assessment was carried out of the entire Site during the appropriate time of year and conditions in 2023, the limitations of the Phase 1 survey are not considered to be a significant limitation to the ecological assessment presented in this report.

3.42 The method used for the breeding bird surveys is informed by the most recent industry guidance (Bird Survey & Assessment Steering Group, 2023). However, this guidance recommends six survey visits to be carried out unless there is reason to believe the survey effort could be reduced on the grounds of habitat quality. The Site is dominated by arable land, and though other habitats such as hedgerow and woodland are present, these are to be retained and bolstered, therefore the survey effort set out above is considered robust for the purposes of assessing the impact of the loss of arable land in terms of impacts to the ornithological interest of the Site.

4 Results and Evaluation

4.1 This section describes the results of the ecological surveys carried out on Site, identifying the key ecological features present and evaluating the importance of these within a defined geographical context. Figure 2 shows the locations of these with reference to the Site.

Designated sites

4.2 A number of statutory and non-statutory designated sites occur within the vicinity of the Site. These are shown on Figures 1a and 1b. Designated sites are considered to be of importance at the following scales, based upon the level of designation:

- Ramsar Sites; Special Areas of Conservation (SAC): Special Protection Areas (SPAs): Internationally important
- Sites of Special Scientific Interest (SSSI): Nationally important
- Local Wildlife Sites (LWS) and Local Nature Reserves (LNR): County importance
- Other sites: District importance

Statutory designated sites

Thames Estuary and Marshes

4.3 This Site is located 12.6 km from the Thames Estuary and Marshes SPA and 11.7 km from the Ramsar site.

4.4 The SPA qualifies under Article 4.1 as it regularly supports over winter:

- Hen harrier *Circus cyaneus* 1% of the population in Great Britain - Five-year peak mean for 1993/94 to 1997/98
- Avocet *Recurvirostra avosetta* (Western Europe/Western Mediterranean - breeding) 28.3% of the population in Great Britain - Five-year peak mean for 1993/93 to 1997/98

4.5 The SPA also qualifies under Article 4.2 as it regularly supports over winter:

- Dunlin *Calidris alpina alpina* (Northern Siberia/Europe/Western Africa) 2.1% of the population - Five-year peak mean for 1993/94 to 1997/98
- Knot *Calidris canutus* (North-eastern Canada/Greenland/Iceland/North-western Europe) 1.4% of the population - Five-year peak mean for 1993/94 to 1997/98
- Black-tailed godwit *Limosa limosa islandica* (Iceland - breeding) 2.4% of the population - Five-year peak mean for 1993/94 to 1997/98
- Grey plover *Pluvialis squatarola* (Eastern Atlantic - wintering) 1.7% of the population - Five-year peak mean for 1993/94 to 1997/98
- Redshank *Tringa tetanus* (Eastern Atlantic - wintering) 2.2% of the population - Five-year peak mean for 1993/94 to 1997/98

4.6 The SPA also qualifies under Article 4.2 as it regularly supports on passage:

- Ringed plover *Charadrius hiaticula* (Europe/Northern Africa - wintering) 2.6% of the population - Five-year peak mean for 1993/94 to 1997/98

4.7 The SPA also qualifies under Article 4.2 as supporting an internationally important assemblage of birds in winter, totalling 75,019 waterfowl (five-year peak mean 1991/92-1995/96). This assemblage includes: avocet, grey plover, knot, dunlin, black-tailed godwit, and redshank.

4.8 The Ramsar qualifies under criterion 2 as it supports one endangered plant species and at least 14 nationally scarce plants of wetland habitats. The site also supports more than 20 British Red Data Book invertebrates.

4.9 The Ramsar also qualifies under criterion 5 as supporting an internationally important assemblage of birds in winter, totalling 45,118 waterfowl (five-year peak mean 1998/99-2002/2003).

4.10 The Ramsar also qualifies under criterion 6 as it supports the following species/populations occurring at levels of international importance:

Species with peak counts in spring / autumn:

- Ringed plover, Europe/Northwest Africa: 595 individuals, representing an average of 1.8% of the GB population (five-year peak mean 1998/9- 2002/3)
- Black-tailed godwit, Iceland/W Europe: 1640 individuals, representing an average of 4.6% of the population (5-year peak mean 1998/9-2002/3)

Species with peak counts in winter:

- Grey plover, E Atlantic/W Africa (wintering): 1643 individuals, representing an average of 3.1% of the GB population (five-year peak mean 1998/9-2002/3)
- Red knot, W & Southern Africa (wintering): 7279 individuals, representing an average of 1.6% of the population (five-year peak mean 1998/9-2002/3)
- Dunlin, W Siberia/W Europe: 15171 individuals, representing an average of 1.1% of the population (five-year peak mean 1998/9-2002/3)
- Common redshank: 1178 individuals, representing an average of 1% of the GB population (five-year peak mean 1998/9- 2002/3)

North Downs Woodland

4.11 The Site is located 9.3 km from the North Downs Woodland SAC. The SAC citation for the North Downs Woodland is as follows:

“This site consists of mature beech Fagus sylvatica forests and yew Taxus baccata woods on steep slopes. The stands lie within a mosaic of scrub, other woodland types and areas of unimproved grassland on thin chalk soils. The beech and yew woodland is on thin chalk soils and where the ground flora is not shaded dog’s mercury Mercurialis perennis predominates. Associated with it is stinking iris Iris foetidissima and several very scarce species such as lady orchid Orchis purpurea and stinking hellebore Helleborus foetidus. The chalk grassland, on warm south-facing slopes, is dominated by upright brome Bromopsis erecta and sheep’s-fescue Festuca ovina but supports many other plants which are characteristic of unimproved downland, including the nationally rare ground pine Ajuga chamaepitys.”

Peter’s Pit

4.12 The Site is located 14 km from the Peter’s Pit SAC. The SAC citation for Peter’s Pit is as follows:

“Peter’s Pit is an old chalk quarry with adjoining soil-stripped fields on the North Downs, with scattered ponds situated amongst grassland, scrub and woodland. The ponds have widely fluctuating water levels and support large breeding populations of great crested newt Triturus cristatus. The site has an undulating terrain in which many rain fed ponds, of various sizes, have developed. Those which dry up early in the season are of less interest, but five ponds are sufficiently large to support very substantial populations of amphibians, particularly the great crested newt. The value of the site for newts is enhanced by the presence, around the edges and between the ponds, of areas of scrub with loose rock which serve as day and winter refuges. Aquatic vegetation provides shelter in the pond environment.”

Farningham Wood

4.13 The Site is located 1.45 km from Farningham Wood Site of SSSI and LNR. The SSSI citation for Farningham Wood is as follows:

“Thanet sands, and Woolwich and Blackheath Beds cap the Chalk giving rise to a range of soil conditions which, combined with the continuity of woodland cover, has resulted in the presence of a rich ground flora. Bramble Rubus fruticosus and bluebell Hyacinthoides non-scripta are generally dominant, but a number of species uncommon in Kent occur including lily-of-the-valley Convallaria majalis, Solomon’s seal Polygonatum multiflorum and bird’s-nest orchid Neottia nidus-avis. There is also a colony of the nationally scarce Deptford pink Dianthus armeria.

The canopy and shrub layers are similarly varied. Trees present include pedunculate and sessile oak Quercus robur and Q. petraea, hornbeam Carpinus betulus and ash Fraxinus excelsior, although some areas consist almost entirely of planted sweet chestnut Castanea sativa coppice, especially on the more acidic soils. Shrubs are best represented on the more chalky soils and include spindle Euonymus europaeus, wayfaring tree Viburnum lantana and guelder rose V. opulus. Amongst the invertebrates, a number of species indicative of ancient woodland occur including certain beetles and the hoverfly Brachypalpoides lanta. The nationally rare fly Volucella inanis has been recorded recently. Additional habitat variety is provided by the ponds in the centre of the wood. Although there is little aquatic vegetation, the ponds support 3 species of newt including the uncommon great crested newt Triturus cristatus.”

Non-Statutory designated sites

4.14 Table 3 below summarises the non-statutory sites present within 2 km of the Site.

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

Site name	Designation	Distance and direction from the Site (at closest point)
Horton Wood, Horton Kirkby	Local Wildlife Site, Ancient Woodland	Adjacent to the Site to south and east and partly included along a thin strip of the Site between F5 and F11 shown as Access Option 1 in Figure 1.
Saxten’s Wood, Fawkham Green	Local Wildlife Site, Ancient Woodland	Adjacent east / north-east
Wilmay Copse WT Reserve	Woodland Trust Reserve, Local Wildlife Site, Ancient Woodland	Adjacent east / north-east
Saxten’s & Cage WT Reserve	Woodland Trust Reserve, Local Wildlife Site, Ancient Woodland	600 m south-west
RNR Fawkham Road	Roadside Nature Reserve	700 m south
Knatts Valley, West Kingsdown	Local Wildlife Site, Ancient Woodland	1.75 km south-west

St Peter and St Paul's Churchyard, Farningham	Local Wildlife Site	1.75 km west
Mount Wood WT Reserve	Woodland Trust Reserve	2 km west
Grassland Adjacent Farningham Wood	Local Wildlife Site	1.75 km north-west
RNR DA08 Station Road	Roadside Nature Reserve	1.75 km north
DA08 Sutton at Hone Lakes	Local Wildlife Site	1.75 km north
Field Edge near Fawkham	Ancient Woodland	1.75 km north-east
Churchdown Wood, Fawkham	Local Wildlife Site, Ancient Woodland	2 km north-west

Habitats

UK Habitat Classifications

4.15 The habitats recorded on Site during the UK Habitat Classification survey are described in Table 4 below, and shown on Figure 2. This survey updates and incorporates the results of the Phase 1 survey from 2022 (as described in the PEA (BSG Ecology, 2022)).

Table 4. Habitats within the Site

UK Habitat Classification	Description
Arable	<p>The Site is dominated by intensively managed arable land (see Figure 2 – fields F1, F4, F5, F7; see Photograph 1 for an example of this habitat). At the time of the UK Hab survey these fields comprised mainly cereal crops, although it is possible that they are rotated with other arable crops.</p> <p>All of these fields occur within the red line proposed for solar infrastructure with the exception of F1.</p> <p>This habitat is of low ecological value and does not meet the description of any Habitat of Principal Importance (Maddock, 2011). It is considered to be of importance at the Site level only.</p>
Modified Grassland	<p>There are several fields of modified grassland present across the Site (see Figure 2 – F2, F3, F6, F8, F10, F11, F12, F13, and F15; see Photograph 2 for an example of this habitat). Each of these is described in more detail and species lists provided below. As with the arable fields it is possible that these fields are rotated with arable production or other forms of management.</p> <p>Only fields F6, F8, and part of F3 occur within the red line proposed for solar infrastructure.</p> <p><u>F2, F3, F6, F8, and F10</u> appear to have been sown as a hay crops or lay crops. They had been recently sown during the Phase 1 survey in 2022 and during the UK Hab survey of 2023 had a middling sward dominated almost exclusively by a few species of grass with very few forbs:</p> <ul style="list-style-type: none"> - F2 is dominated by several species of grass including perennial

	<p>ryegrass <i>Lolium perenne</i>, smooth meadow grass <i>Poa pratensis</i>, red fescue <i>Festuca rubra</i>, timothy <i>Phleum pratense</i>, barren brome <i>Anisantha sterilis</i>, and soft brome <i>Bromus hordeaceus</i>. No forbs were recorded in any of quadrats taken in this field.</p> <ul style="list-style-type: none"> - F3 is dominated by four species of grass: timothy, perennial rye grass, smooth meadow grass, and red fescue. No forbs were recorded in any of quadrats taken in this field. - F6 is dominated by timothy, perennial rye grass, and smooth meadow grass, red fescue, cock's foot <i>Dactylus glomerata</i>, barren brome and soft brome. No forbs were recorded in any of quadrats taken in this field. - F8 is dominated by perennial rye grass and timothy, smooth meadow grass, rough meadow grass <i>Poa trivialis</i>, and false oat grass <i>Arrhenatherum elatius</i>. No forbs were recorded in any of quadrats taken in this field. - F10 is dominated by rough meadow grass, Yorkshire fog <i>Holcus lanatus</i>, and false oat grass. Common mouse-ear <i>Cerastium fontanum</i> is also present in low numbers. <p>F11 is adjacent to areas used for horse grazing. During the Phase 1 survey the whole field was mown, while during the UK Hab survey the central area was left unmanaged with a tall sward. It is dominated by grasses including perennial rye grass, cock's foot, rough meadow grass, soft brome, barley <i>Hordeum vulgare</i>, False oat-grass, Yorkshire fog, smooth meadow grass, couch grass <i>Elymus repens</i>, creeping bent <i>Agrostis stolonifera</i> and red fescue. Forbs present include meadow buttercup <i>Ranunculus acris</i>, common dandelion <i>Taraxacum officinale</i>, broadleaf plantain <i>Plantago major</i>, ribwort plantain <i>Plantago lanceolata</i>, broad-leaved dock <i>Rumex obtusifolius</i>, creeping buttercup <i>Ranunculus repens</i>, scentless mayweed <i>Tripleurospermum inodorum</i>, red bartsia <i>Odontites vernus</i>, creeping thistle <i>Cirsium arvense</i>, bristly oxtongue <i>Helminthotheca echioides</i>, cut-leaved cranesbill <i>Geranium dissectum</i>, and field bindweed <i>Convolvulus arvensis</i>.</p> <p><u>F12, F13 and F14</u> all appear to be used rotationally as horse paddocks (see Photographs 6 and 7), as different areas were either grazed or left fallow during the Phase 1 and UK Hab surveys. As such they are considered to constitute a single habitat parcel under rotational management. Grazed areas had a very short sward with bare patches indicative of intensive grazing and poaching, while fallow areas had a longer sward. Grasses present include perennial rye grass, smooth meadow grass, Yorkshire fog, timothy, soft brome, creeping bent, couch grass, meadow foxtail <i>Alopecurus pratensis</i>, and false oat-grass. Forbs present include white clover <i>Trifolium repens</i>, broadleaf plantain, ribwort plantain, meadow buttercup, common dandelion, black medick <i>Medicago lupulina</i>, mayweed <i>Anthemis sp.</i>, hawkbit <i>Leontodon sp.</i>, red bartsia <i>Odontites vernus</i>, broad-leaved dock, chicory <i>Cichorium intybus</i>, common mouse-ear, self-heal <i>Prunella vulgaris</i>, creeping thistle, cut-leaved cranesbill, field bindweed, shepherd's purse <i>Capsella bursa-pastoris</i>, and ragwort <i>Jacobaea vulgaris</i>.</p> <p><u>F15</u> was added to the survey boundary subsequent to the initial Phase 1 survey in September 2022, but was included in the UK Hab survey in June 2023. It also appears to be a hay or lay crop; it has a tall sward and is dominated by grasses including perennial ryegrass, red fescue, timothy, barren brome, and soft brome. Common hogweed <i>Heracleum sphondylium</i> was also observed.</p> <p>This habitat is of low ecological value and does not meet the description of any Habitat of Principal Importance (Maddock, 2011). It is considered to be of importance at the Site level only.</p>
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<p>Other neutral grassland</p>	<p>There are two fields of other neutral grassland present on site: F6C and F9 (see Figure 2; see Photograph 3 for an example of this habitat). Both occur within the red line area proposed for solar infrastructure.</p> <p><u>F6C</u> is patchwork of grasses, forbs, and ruderal vegetation that appears to have been left unmanaged between the Phase 1 survey in September 2022 and the UK Hab survey in June 2023, and is succeeding towards a more grass dominated habitat. Grasses present include smooth meadow grass, red fescue, Yorkshire fog, soft brome, cock's foot, false-oat grass, barren brome, creeping bent, and barley. Forbs present include hawkweed, <i>Hieracium lachenalia</i>, cut-leaved cranesbill, white clover, pyramidal orchid <i>Anacamptis pyramidalis</i>, black medick, common vetch <i>Vicia sativa</i>, creeping buttercup, ox-eye daisy <i>Leucanthemum vulgare</i>, common dandelion, creeping thistle, broadleaf plantain, ribwort plantain, and common mouse-ear. Some small hawthorn <i>Crataegus monogyna</i> is also present.</p> <p><u>F9</u> is a diverse grassland and wildflower mix, likely sown as such at some point in recent years and since left unmanaged. There is some variation in the species mix across the field, perhaps due to different sowing times, but overall the parcel is similar enough to be classified as the same habitat. Grasses present include smooth meadow grass, Yorkshire fog, red fescue, cock's foot, false-oat grass and soft brome. Forbs present include St John's Wort <i>Hypericum sp.</i>, cut-leaved cranesbill, hawkweed, ox-eye daisy, field madder <i>Sherardia arvensis</i>, tufted vetch <i>Vicia cracca</i>, creeping thistle, ground ivy <i>Glechoma hederacea</i>, creeping buttercup, white clover, birds-foot trefoil <i>Lotus corniculatus</i>, rosebay willowherb <i>Chamaenerion angustifolium</i>, common vetch, pyramidal orchid, common nettle <i>Urtica dioica</i>, field bindweed, self-heal, creeping cinquefoil <i>Potentilla reptans</i>, common knapweed <i>Centaurea nigra</i>, wild carrot <i>Daucus carota</i>, wild marjoram <i>Origanum vulgare</i>, and meadowsweet <i>Filipendula ulmaria</i>. Some woodland plants were also found at the edges of the field, including wood avens <i>Geum urbanum</i> and wild strawberry <i>Fragaria vesca</i>, and some bramble <i>Rubus fruticosus</i> is also present.</p> <p>This habitat does not meet the description of any Habitat of Principal Importance (Maddock, 2011). However, these areas comprise diverse mixes of grasses and wildflowers and likely provide important foraging habitat for a wide range of species, and therefore are of ecological value. They are considered to be of importance at the District level.</p>
<p>Arable margins</p>	<p>There are numerous arable margins across the site (Figure 2; see Photographs 4 and 5 for examples of this habitat) that have been sown with various nectar or seed mixes as part of existing environmental stewardship schemes (currently running until December 2023). These areas have been sown at different times so vary between wildflower and ruderal dominated areas to more grass dominated areas. The more grass dominated margins were classified as strips of semi-improved grassland in the Phase 1 habitat survey as there is no specific category for arable margins in Phase 1 terms. However, having reviewed the habitat descriptions and information from the landowner about how these areas are managed, they are more accurately described as arable margins in the UK Habitat Classification system.</p> <p>This habitat does not meet the description of any Habitat of Principal Importance (Maddock, 2011). However, these areas comprise diverse mixes of grasses and wildflowers and likely provide a better foraging habitat for a wide range of species than other areas on the Site. They considered to be of importance at the local level.</p>

<p>Lowland mixed deciduous woodland</p>	<p>Several small areas of lowland mixed deciduous woodland are present within the red line boundary and are contiguous with off-Site areas of ancient woodland (see Figure 2) Tree species present include: hazel <i>Corylus avellana</i>, hawthorn <i>Crataegus monogyna</i>, blackthorn <i>Prunus spinosa</i>, elder <i>Sambucus nigra</i>, oak <i>Quercus robur</i>, and field maple <i>Acer campestre</i>. A scrubby ground layer is present including bramble and ivy <i>Hedera helix</i>.</p> <p>This habitat meets the description of the lowland mixed deciduous woodland Habitat of Principal Importance (HPI). It is of good ecological value and considered to be of importance at the District level.</p>
<p>Species-rich Hedgerow</p>	<p>Several species-rich hedgerows (comprising five or more woody species per 30 m) are present across the Site (see Figure 2 – H1, H3, H9, H10, H12, H13, H14, H15, H16, H17, H18, H20, H21, H22, H23, H25, H26, H27). Common woody species present include oak, field maple, hazel, hornbeam <i>Carpinus betulus</i>, hawthorn, blackthorn, ash <i>Fraxinus excelsior</i>, dogwood <i>Cornus sanguinea</i>, elder.</p> <p>All of these hedgerows occur within the red line proposed for solar infrastructure with the exception of H20, H23, H24, H25, H26, H27.</p> <p>As these hedgerows are dominated by native species they meet the descriptions of the Hedgerows Habitat of Principle Importance (HPI) description (Maddock, 2011). They are of good ecological value and considered to be of importance at a District level.</p>
<p>Species-poor hedgerow</p>	<p>Several species-poor (comprising fewer than five woody species per 30 m) hedgerows are present across the Site (see Figure 2 – H2, H4, H5, H6, H7, H8, H11, H19, H24, H28, H29).</p> <p>All of these hedgerows occur within the red line proposed for solar infrastructure with the exception of H5, H19, H28.</p> <p>As these hedgerows are dominated by native species they meet the descriptions of the Hedgerows Habitat of Principle Importance (HPI) description (Maddock, 2011). They are of high ecological value and considered to be of importance at the District level.</p>
<p>Mixed scrub</p>	<p>An area of dense mixed scrub is present on the edge of field F9 (see Figure 2) in the south-west of the Site. Species present include hazel, blackthorn, field maple, hawthorn, oak, ash, and dogwood.</p> <p>This habitat does not meet the description of any Habitat of Principal Importance (Maddock, 2011). Scrub habitats can provide habitat and foraging resources to a range of species, and therefore this habitat is of ecological value. Due to its size however, it is considered to be of importance at the Site level only.</p>
<p>Ruderal / ephemeral</p>	<p>A small overgrown farmyard is present in the south of the Site comprising ruderal / ephemeral vegetation (see Figure 2). This area also appears to be used for storing farm machinery.</p> <p>Additionally, some of the more recently sown arable margins and areas under environmental stewardship schemes were mapped as tall ruderal vegetation during the Phase 1 survey in 2022, however upon reviewing the UK Hab criteria and information from the landowner about how these areas have been managed, they are now considered to be more accurately described as arable margins rather than ruderal / ephemeral vegetation (as described above).</p> <p>This habitat does not meet the description of any Habitat of Principal Importance (Maddock, 2011). It is of low ecological value and considered to be of importance at the Site level only.</p>

Vacant / derelict land / bare ground	There is a small area of vacant / derelict land / bare ground next to a site entrance in the north-east of the Site (see Figure 2). At the time of the UK Hab survey in 2023 this area had been converted into a site compound. It is considered to be of negligible ecological importance.
Developed land; sealed surface	There is a small area of developed land; sealed surface comprising a barn adjacent to the storage yard described above. This area is considered to be of negligible ecological importance.
Ponds	<p>There are no ponds on Site, however there are two within 250 m of the blue-line boundary: one approximately 40 m north-west of the Site within a private property on Mussenden Lane, and a second approximately 250 m north-east of the Site within an industrial asphalt and resurfacing facility. Both of these ponds are more than 250 m from the red line boundary proposed for solar arrays.</p> <p>Ponds are considered to be Habitats of Principal Importance (HPIs) if they contain great crested newts or other protected species, are in particularly good condition or support a diverse invertebrate assemblage (Maddock, 2011). These ponds may qualify as HPIs.</p>

Condition Assessment

4.16 Details of the condition assessment for each habitat parcel identified are provided in Table 5, below.

Table 5: Condition assessments for each habitat parcel

UK Habitat Classification	Habitat parcel(s)	Condition	Justification (see condition assessment criteria (Natural England, 2023))
Arable	F1, F4, F5, F7	N/A	Condition assessment not required for this habitat type.
Modified grassland	F2	Poor	Fails essential criterion A; passes criteria C, D, F, G; score = 4/7
	F3	Poor	Fails essential criterion A; passes criteria C, D, F, G; score = 4/7
	F6,	Poor	Fails essential criterion A; passes criteria C, D, F, G; score = 4/7
	F8	Poor	Fails essential criterion A; passes criteria C, D, E, F, G; score = 5/7
	F10	Poor	Fails essential criterion A; passes criteria B, C, F, G; score = 4/7
	F11	Poor	Fails essential criterion A; passes criteria C, D, E, F, G; score = 5/7
	F12, F13, F14	Good	Passes essential criterion A; passes criteria B, C, F, G; score = 5/7
	F15	Poor	Fails essential criterion A; passes criteria C, D, F, G; score = 4/7
Other neutral	F6C	Poor	Fails essential criterion A; passes criteria B, D, E;

grassland			score
	F9	Moderate	Passes essential criterion A; passes criteria C, D, E; score 4/6
Arable margins	N/A	N/A	Condition assessment not required for this habitat type.
Lowland mixed deciduous woodland	W1	Good	A=2, B=2, C=3, D=3, E=3, F=3, G=2, H=3, I=2, J=3, K=3 L=2, M=2 Total score = 33
Species-rich Hedgerow	H1	Moderate	Passes criteria A1, B1, C2, D1, D2; fails criteria A2, B2, C1.
	H3	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1.
	H9	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E1; fails E2
	H10	Good	Passes criteria A1, A2, B1, B2, C1, D1, D2, E1, E2; fails criteria C2.
	H12	Good	Passes criteria A1, A2, B1, C1, D1, D2, E1, E2; fails B2, C2
	H13	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E2; fails criterion E1
	H14	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
	H15	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
	H16	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E1; fails criterion E2
	H17	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2, E2; fails criteria C1, E1
	H18	Moderate	Passes criteria A1, A2, B1, B2, D1, D2, E1, E2; fails criteria C1, C2
	H20	Good	Passes criteria A1, A2, B1, B2, C1, D1, D2; fails criteria C2
	H21	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2
	H22	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E1; fails criteria E2
H23	Moderate	Passes criteria A1, A2, B1, B2, D1, D2, E1; fails criteria C1, C2, E2	

	H25	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2, E1; fails criteria C1, E2
	H26	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E1, E2
	H27	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
Species-poor hedgerow	H2	Good	Passes criteria A1, A2, B2, C2, D1, D2; fails criteria B1, C1
	H4	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
	H5	Moderate	Passes criteria A1, A2, B1, B2, D1, D2; fails criteria C1, C2
	H6	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
	H7	Good	Passes criteria A1, A2, B1, B2, C1, C2, D1, D2, E1; fails criterion E2
	H8	Moderate	Passes criteria A1, B1, C1, D1, D2; fails criteria A2, B2, C2
	H11	Good	Passes criteria A1, A2, B1, C1, D1, D2; fails criteria B2, C2
	H19	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2, E2; fails criteria C1, E1
	H24	Good	Passes criteria A1, A2, B1, C2, D1, D2; fails criteria B2, C1
	H28	Good	Passes criteria A1, A2, B1, B2, C2, D1, D2; fails criterion C1
H29	Moderate	Passes criteria A1, A2, B1, D1, D2; fails criteria B2, C1, C2	
Scrub	S1	Good	Passes all criteria A-E; score 5/5
Ruderal / ephemeral	T1	Moderate	Passes criteria A, C; fails criteria B
Vacant / derelict land / bare ground	B1	Poor	Passes criterion C; fails criteria A and B
Developed land; sealed surface	D1	N/A	Condition assessment not required for this habitat type.

Biodiversity net gain calculation

- 4.17 The input values used in the biodiversity net gain calculation are set out in Appendix 2. The total number of biodiversity units in the baseline are 286.6 units of area habitats and 75.21 units of hedgerow.

Protected and notable species

- 4.18 The Site comprises habitats suitable for a range of protected and notable species, which are described in the following sections. This includes Species of Principal importance (SPIs) as defined in the NERC Act 2006. A summary of relevant policy and legislation is provided in Appendix 1.

Badger

- 4.19 The desk study returned 42 records of badger within 2 km of the Site. These records are confidential and detailed locations are not included in this report, however some records were on land immediately adjacent to the Site, including within the woodland areas. There were no records from the Site itself.
- 4.20 Badger is protected under the Protection of Badgers Act 1992 (see Appendix 1).
- 4.21 The grassland, hedgerows, and woodland habitats on the Site provide suitable foraging and sett-building opportunities for badger. The results of the badger survey identified several badger setts on Site, as well other signs of badger activity such as, latrines, snuffle holes, and runs. Detailed results are included in CONFIDENTAIL Appendix 3: Badger survey results.
- 4.22 The population of badgers present on Site is considered to be of importance at the local level.

Bats

- 4.23 All bats are a European Protected Species (see Appendix 1). Several species are also SPIs.
- 4.24 The data search returned 386 records from Kent Bat Group of bats within 5 km of the Site, pertaining to the following species: 176 records of serotine bat *Eptesicus serotinus*, 11 records of Daubenton's bat *Myotis daubentonii*, 4 records of Natterer's bat *Myotis nattereri*, 4 records of Leisler's bat *Nyctalus leisleri*, 31 records of noctule bat *Nyctalus noctula*, 1 record of Nathusius' pipistrelle *Pipistrellus nathusii*, 93 records of common pipistrelle *Pipistrellus pipistrellus*, 33 records of soprano pipistrelle *Pipistrellus pygmaeus*, and 33 records of brown long-eared bat *Plecotus auritus*.
- 4.25 There are records of maternity roosts within 5 km of the Site for both pipistrelle species, noctule, serotine, and brown long-eared bats. There are also several records of hibernation roosts within 5 km of the Site, including one on the northern boundary of the blue line pertaining to a brown long-eared bat, recorded on 1 March 2000.
- 4.26 A search of the MAGIC database identified that two EPSM licences for bats have been granted within 2 km of the Site, both in Horton Kirkby just to the north-west of the Site.
- 4.27 The Site is dominated by arable land which is in itself a poor habitat for foraging bats, however the hedgerow network could provide commuting routes for bats, and woodland edges and grassland areas could provide a foraging habitat for bats. The Site is immediately adjacent to areas of ancient woodland that could provide important roosting habitat.
- 4.28 The Site is considered to be importance at the District level for bats based on the size of the area, adjacent features and the habitats in the wider area.

Hazel Dormouse

- 4.29 Hazel dormouse is a European Protected Species (see Appendix 1) and an SPI.
- 4.30 The desk study returned 366 records of hazel dormouse *Muscardinus avellanarius* within 2 km of the Site. The majority of these records relate to Church Woods, West Kingsdown, approximately 1.5 km from the Site, but on the other side of the M20 motorway. The species is usually under recorded and Kent is a County where this species is present in good numbers.
- 4.31 Hedgerows within the Site are well connected to the wider landscape and link to areas of ancient woodland adjacent to the Site. Many hedgerows on Site are species-rich, making them good habitat for hazel dormouse. It is possible therefore that the species is present on the Site.
- 4.32 The Site is considered to be of importance at the district level for dormice, but this value is limited to the hedgerows, woodland and scrub areas.

Other mammals

- 4.33 The data search returned several records of riparian mammals within 2 km of the Site, pertaining to the following species: five records of water vole *Arvicola amphibius*, two records of Eurasian otter *Lutra lutra*, and two records of Eurasian water shrew *Neomys fodiens*, however as there are no ponds or watercourses on Site, it has negligible potential to support these species.
- 4.34 The data search also returned records of terrestrial mammals including SPIs within 2 km of the Site, including: eight records of west European hedgehog *Erinaceus europaeus*, four records of brown hare *Lepus europaeus*, and four records of harvest mouse *Micromys minutus*. The grassland, hedgerows, and woodland habitats present on Site could provide habitat for all of these species. Overall, the Site is considered to be of importance at the local level for these species.
- 4.35 No incidental observations of other species of mammal were recorded during the surveys on Site.

Birds

- 4.36 All wild birds, their nests, eggs and young are protected under the Wildlife and Countryside Act 1981 (as amended; see Appendix 1). Several species are also SPIs.
- 4.37 The data search returned records of 131 species of birds within 2 km of the Site, including several which are listed on the data form for the Thames Estuary and Marshes SPA and Ramsar site, such as hen harrier, gadwall, grey plover, ringed plover. Records were also returned for little grebe, and shelduck, species which are included in the list of noteworthy fauna in the Thames Estuary and Marshes Ramsar information sheet. Another wader species for which records were returned is lapwing *Vanellus vanellus*.
- 4.38 The data search returned records of the following SPIs (some of which are also Red or Amber listed under the Birds of Conservation Concern (BoCC) – (Stanbury *et al.*, 2021): grey partridge *Perdix perdix*, lapwing, herring gull *Larus argentatus*, turtle dove *Streptopelia turtur*, lesser spotted woodpecker *Dryobates minor*, skylark *Alauda arvensis*, yellow wagtail *Motacilla flava*, dunnock *Prunella modularis*, ring ouzel *Turdus torquatus*, song thrush *Turdus philomelos*, grasshopper warbler *Locustella naevia*, wood warbler *Phylloscopus sibilatrix*, spotted flycatcher *Muscicapa striata*, marsh tit *Poecile palustris*, starling *Sturnus vulgaris*, house sparrow *Passer domesticus*, tree sparrow *Passer montanus*, linnets *Linaria cannabina*, lesser redpoll *Acanthis cabaret*, bullfinch *Pyrrhula pyrrhula*, yellowhammer *Emberiza citrinella*, corn bunting *Emberiza calandra*.
- 4.39 There are also records of several bird species on Schedule 1 of the Wildlife and Countryside Act, some of which may breed on or near the Site, such as: red kite *Milvus milvus*, hobby *Falco subbuteo*, quail *Coturnix coturnix*, barn owl *Tyto alba*, kingfisher *Alcedo atthis*, cetti's warbler *Cettia cetti*, firecrest *Regulus ignicapilla*, and common crossbill *Loxia curvirostra*.

Winter bird surveys

4.40 The results of the winter bird surveys did not record any of the species for which the SPA and Ramsar are designated. However, six species on the Red list were identified on Site during the winter bird surveys: fieldfare, herring gull, house sparrow, linnet, skylark, and starling:

- Fieldfare were commonly recorded across much of the Site, occasionally in large flocks. The peak count was of approximately a 250 strong flock.
- Skylark were also commonly recorded across much of the Site, with a peak count of 46.
- Herring Gull was only recorded rarely on Site, with a peak count of six.
- House sparrow were record rarely on Site, with a peak count of a 30-strong flock
- Linnet were commonly recorded on Site, with a peak count of 76.
- Starling was recorded rarely on Site, with a peak count of six.

4.41 The species mentioned above are largely still common nationally and locally and the numbers recorded suggest the Site is likely to be of importance at the Local level for wintering birds.

Breeding bird surveys

4.42 Species recorded during the breeding bird surveys as likely breeding on the Site, as well as the likely number of breeding territories on Site for each species, are shown in Table 6, below. Note that these results cover the whole of the area within the blue line. Figure 4 Shows indicative territory locations for these.

Table 6: Breeding bird species – number of territories and conservation status

Species	Number of territories	SPI – Red or Amber list
Blackbird	12	
Blackcap	7	
Blue Tit	4	
Bullfinch	1	SPI – Amber list
Chaffinch	17	
Chiffchaff	3	
Coal Tit	1	
Corn Bunting	17	SPI - Red list
Dunnock	3	SPI - Amber list
Garden Warbler	1	
Goldfinch	2	
Great Tit	2	
Greenfinch	1	Red list
Lesser Whitethroat	4	
Long-tailed Tit	1	

Magpie	1	
Robin	10	
Skylark	24	SPI - Red list
Song Thrush	4	SPI – Amber list
Starling	1	SPI -Red list
Whitethroat	13	Amber list
Wren	19	Amber list

4.43 The Site has been shown to support six SPIs (which are also either Red or Amber listed), one further red listed species and two amber listed species. The species present are typical of farmland with hedgerows and as such include farmland bird SPIs. The most numerous is skylark, with 24 territories across the areas surveyed of which 14 are within the red line area. Based on the above, the Site is considered to be of importance at the District level for breeding birds.

Reptiles

4.44 All reptiles are fully protected under the Wildlife and Countryside Act 1981 (as amended; see Appendix 1), two species are also European Protected Species and all six species are also SPIs.

4.45 The data search returned several records of protected species of reptile within 2 km of the Site, pertaining to the following species: 10 records of slow worm *Anguis fragilis*, 20 records of common lizard *Zootoca vivipara*, 3 records of adder *Vipera berus*, and 12 records of grass snake *Natrix natrix*.

4.46 Grassland areas, arable field margins, and hedgerow bases on Site could provide habitat for a range of reptile species, though the numbers present are unlikely to be high due to the limited size of the suitable habitats and the dominance of arable land in the Site and landscape, a habitat of poor value for reptile species.

4.47 The Site is considered to be of importance at the Site level only for reptiles.

Amphibians

4.48 Great crested newt is a European Protected Species and an SPI, and common toad is an SPI.

4.49 The data search returned eight records of common toad *Bufo bufo*. There are no records of great crested newt (GCN) within 2 km of the Site.

4.50 There are no ponds within the Site itself, but there are two within 250 m of the blue-line boundary. One is part of an active industrial plant and is not likely to be suitable for GCN. The second pond is closer to the Site within a residential property, and could be suitable for GCN. Even if GCN is present in this pond it is unlikely that it will occur on Site within the red line boundary, which is over 250m from this pond and separate from it by agricultural land.

4.51 The best terrestrial habitats within the Site are limited to hedgerow bases or rougher areas of grassland and scrub. Therefore the Site as a whole is considered to be of importance at the Site level only for amphibians.

Invertebrates

4.52 The data search returned several records of protected species of invertebrate within 2 km of the Site, pertaining to the following species: four records of Roman snail *Helix pomatia* (this species is

fully protected under the Wildlife and Countryside Act 1981 as amended), two records of white clawed crayfish *Austropotamobius pallipes*, 13 records of stag beetle *Lucanus cervus*, three records of small blue butterfly *Cupido minimus*, one record of adonis blue butterfly *Polyommatus bellargus*, four records of chalk hill blue butterfly *Polyommatus coridon*, and 23 records of jersey tiger moth *Euplagia quadripunctaria*.

- 4.53 Hedgerows, woodland, grassland areas and field margins on the Site could provide habitat for a range of invertebrate species. The records of Roman snail were provided with a low resolution only, but there are no areas of this species' typical habitats (limestone or chalk grassland) within the Site, therefore the presence of Roman snail is highly unlikely.
- 4.54 The Site is considered to be of importance at the Site level only for invertebrates.

Plants

- 4.55 The data search returned records of 35 different protect species of plant, including bluebell *Hyacinthoides non-scripta* and a variety of orchids Orchidaceae. The Site is dominated by agricultural land that is not likely to be suitable for rare species of plant, however rare plants may occur in grassy field margins and areas of woodland on Site. Bluebell may occur in the woodland on and immediately adjacent to the Site. Pyramidal orchid was observed in fields F6C and F9.
- 4.56 The Site is considered to be of importance at the Site level only for plants.

5 Potential Impacts and Recommendations

- 5.1 This section outlines the potential impacts on ecological features as a result of the proposed development, and makes recommendations for avoidance and mitigation measures where required. It also describes the proposed habitat creation and enhancement measures within the proposed development, including as necessary to meet the biodiversity net gain (BNG) requirements of the project.
- 5.2 The assessment of impacts is based upon the final Landscape Masterplan (Pegasus, 2023) provided by RES and discussions with the project team.

Designated Sites

- 5.3 The Site is highly unlikely to constitute Functionally Linked Land used by bird species from the Thames Estuary SSSI, SPA, and Ramsar sites due to the distance to these sites and the lack of observations of species from these sites within the Site. Therefore no impact on these designated sites is likely as a result of the proposed development, even indirectly.
- 5.4 The Site is located over 1.4 km from the Farningham Wood SSSI and is outside the impact risk zones (MAGIC, 2023) for the type of development proposed, and therefore it is unlikely that there will be any impact on these sites as a result of the proposed development.
- 5.5 Due to the nature of the proposed development, which is unlikely to lead to any increase in traffic or visitor pressure to the area, impacts on other designated sites, including LWS and LNR within the area but not adjacent to the Site are considered unlikely.
- 5.6 A 15 m stand-off between any designated Sites immediately adjacent to the Site and areas solar infrastructure have been included in the development at the design stage. The development will not affect the off site designated sites indirectly by altering drainage or in any other way.
- 5.7 In locations where access tracks are required through the woodland, these will make use of existing tracks and these will be reinforced with a cellular confinement system to limit soil compaction. Provided these measures are implemented, there is not likely to be any significant impacts on designated sites immediately adjacent to the Site as a result of the proposed development.
- 5.8 However, it is possible there could be impacts on the LWS immediately adjacent to the Site during construction due to direct damage from machinery or equipment, and from disturbance due to noise and light pollution. It is recommended that at least a 15 m stand-off is maintained from these sites during construction as well to limit these impacts.
- 5.9 A sensitive 'no dig' approach should also be employed in proximity to any ancient woodland. Current proposals indicate that the cable route connecting the north and south parts of the Site will be drilled underneath the LWS and ancient woodland present at Horton Wood. It is our understanding from discussions with RES that the target depth for the drill is 7.5 m, and this can be reached within 10 horizontal meters from launch of the drill. A depth of 7.5 m is sufficient to avoid impacts on the subterranean features of the woodland. Therefore, provided these parameters are met, and the drill is launched at least 10 m from the 15 m buffer around the woodland, there should be no significant impacts on the designated site as a result of this process. This is supported by the findings of the Arboricultural Impact Assessment prepared by Barton Hyett (Barton Hyett, 2023).

Habitats

- 5.10 Areas beneath solar arrays and within the security fencing indicated on the final Landscape Masterplan (Pegasus, 2023) will be lost during construction with modified grassland created in their place. The intention is for these areas to be managed via commercial grazing.

- 5.11 Areas outside of the security fencing indicated on the final Landscape Masterplan (Pegasus, 2023) will largely be retained or enhanced within the proposed development, including through creating diverse grassland, additional hedgerows and woodland parcels. Much of the Site comprises arable fields and modified grassland, which are of low ecological value, so there are not likely to be significant impacts on habitats across much of the Site. However, where there are existing areas of higher-value habitat on Site these may be impacted by the proposed development. These are considered further below.
- 5.12 A Landscape and Ecological Management Plan (LEMP) will also be provided which will set out the methods used for the habitat creation, their subsequent management and monitoring and how corrective action will be taken. A Construction Environmental Management Plan (CEMP) or similar document will also be prepared, setting out protective measures to be implemented during the construction phase.

Lowland mixed deciduous woodland

- 5.13 There are several areas of lowland mixed deciduous woodland either on or immediately adjacent to the Site. This is a Habitat of Principle Importance (HPI) and of high ecological value.
- 5.14 The Landscape Masterplan (Pegasus, 2023) shows that these areas will be retained with at least a 15 m buffer between them and any areas of solar infrastructure. In locations where access tracks are required to pass through the woodland, these will make use of existing tracks and these will be reinforced with a cellular confinement system to limit soil compaction. Provided these measures are implemented, there is not likely to be any significant impacts on this habitat as a result of the proposed development.
- 5.15 However, it is possible there could be impacts on the lowland mixed deciduous woodland on or immediately adjacent to the Site during construction due to direct damage from machinery or equipment, or from soil compaction as a result of heavy machinery and materials being stored near to the woodland. It is recommended that all retained habitats are either protected with temporary protective fencing or that security fencing is installed at the start of the Solar PV installation so that accidental damage is prevented. It is also recommended that access routes for construction purposes use existing tracks and that these are reinforced with a cellular confinement system to limit soil compaction. A sensitive 'no dig' approach should also be employed in proximity to any ancient woodland. These measures will be set out in detail in a CEMP.
- 5.16 The Landscape Masterplan (Pegasus, 2023) also includes the planting of new areas of native woodland for screening purposes along the security fence in field F3, and around the substation in the south of the Site. Overall, therefore it is anticipated that the proposals would have a beneficial effect on this habitat type by adding to its extent.

Hedgerows

- 5.17 Numerous hedgerows are present across the Site, many of which are species-rich. All hedgerows on Site are comprised predominantly by native species and are therefore considered HPIs.
- 5.18 The Landscape Masterplan (Pegasus, 2023) shows that the majority of hedgerows on Site will be retained with at least a 5 m buffer between them and any solar infrastructure. The proposals do include some small areas of hedgerow removal or trimming for access purposes or to create visibility splays; where possible these make use of existing gaps within the hedgerows. Any loss of hedgerows will be more than compensated for by additional hedgerow planting included within the development. Therefore, provided the above stipulation are adhered to, it is considered unlikely that there will be any significant impacts on hedgerows as a result of the proposed development. Overall, therefore it is anticipated that the proposals would have a beneficial effect on this habitat type by adding to its extent.
- 5.19 However, it is possible there could be impacts on retained hedgerows on Site during construction due to direct damage from machinery or equipment, or from soil compaction as a result of heavy machinery and materials being stored adjacent to hedgerows.

- 5.20 It is recommended that all retained habitats are either protected with temporary protective fencing or that security fencing is installed at the start of the Solar PV installation so that accidental damage is prevented. These measures will be set out in detail in a CEMP. The Landscape Masterplan (Pegasus, 2023) shows significant areas of additional native species rich hedgerow planting across the Site, and enhancement of 'gappy' retained hedgerows by addition planting to 'in fill' these. Overall, the proposed development is therefore likely to significantly increase the extent and quality of hedgerows on Site.
- 5.21 The LEMP will set out the management of the newly created and retained hedgerows, however this will be carried out on a rotational basis in order to allow fruiting and a more diverse structure to develop.

Other neutral grassland

- 5.22 There are two areas of other neutral grassland (F6C and F9, see Figure 2) present on Site that the Landscape Masterplan (Pegasus, 2023) shows will contain solar infrastructure. These areas are of higher ecological value than other fields and provide suitable habitat for a wide range of species including small mammals, birds, reptiles, and invertebrates. The diversity of grasses and abundance of wildflowers also provide an important nectar and seed resource. F6C also supports pyramidal orchids.
- 5.23 The majority of field F6C will be lost as a result of the proposed development as it lies within the security fence and therefore will contain solar arrays and be commercially grazed. The loss of this area constitutes a significant impact on this habitat at the Site level, however this will be offset by the creation of other neutral grassland in the areas outside of the security fencing (but within the red line) across the Site.
- 5.24 The grassland within Field F9 will be retained within the proposed development as this will include three small Solar PV Areas only and these will not be grazed. However, there is potential for impacts on this field during construction of the proposed development as this will require existing vegetation to be cut back and likely the presence of heavy machinery and vehicles in the area to install solar arrays. However, grasslands are generally resilient to temporary disturbance (in some cases this can actually be beneficial) and with appropriate management it is likely that the diversity and ecological value of this area can be retained during the long-term operation of the proposed development.
- 5.25 It is recommended that a phased cut of the vegetation in field F9 is carried out in late autumn such that it takes place outside of the nesting bird season and outside of the hibernation seasons for small mammals and reptiles. Cutting the vegetation in phases allows any animals present to move out of the area, thereby minimising the risk of unintended killing or injury. Field margins (i.e., along woodland edges) should be retained (as required by the buffers detailed in the sections above) and will provide refuge habitat for species to move into. These measures to reduce the impacts of works here will be set out in the CEMP.
- 5.26 During the operational phase F9 will be managed to promote floral and structural diversity. This could take the form of yearly rotational cutting with arising removed and used to create habitats piles adjacent to hedgerows.

Arable field margins

- 5.27 There are numerous arable field margins across the Site that are currently part of existing environmental stewardship schemes (currently running until December 2023). These provide a suitable habitat and an important foraging resource for a wide range of species including small mammals, birds, reptiles, and invertebrates.
- 5.28 In many cases these areas fall within the required buffers around hedgerows and woodland areas (detailed in the relevant sections above) and will therefore be absorbed into the management of the created other natural grassland around the solar arrays. As such the integrity of these margins and their ecological value will be maintained, and therefore it is unlikely there will be any significant impacts on the arable margins within these areas. (However, note that these arable margins must

be considered lost with other natural grassland created in their place in the biodiversity net gain (BNG) calculation, as the definition of arable margins requires that they be adjacent to a field in arable production, which will no longer be the case post-development.)

- 5.29 Some arable margins, particularly those not along hedgerow or woodland boundaries, are situated in areas proposed for solar arrays, and will therefore be lost due as a result of the proposed development. However, these impacts should be compensated for by the other neutral grassland created across the Site in the areas around the security fencing.

Biodiversity net gain calculation

- 5.30 The BNG calculation has been based on the proposed layouts as shown in the Landscape Masterplan (Pegasus, 2023). This may be refined in future, and a detailed Landscape Environmental Management Plan (LEMP) will be produced with input from an appropriately qualified ecologist that builds on this. However as assessed currently, the proposed development will deliver a significant increase in the biodiversity value of the Site. The delivered net gain is significantly more than the required net gain of 10%. The total number of biodiversity units in the proposed layout post development are 415.31 units of area habitats and 105.24 units of hedgerow. This equates to a 45.15% net gain in area habitats and a 39.93% net gain in hedgerow habitats, as a result of the proposed development.
- 5.31 Due to the loss of Arable field margins, the calculator indicates that certain 'trading rules' are not satisfied. This is because there is normally a need to replace Medium distinctiveness habitats with the same broad habitat or a higher distinctiveness habitat. However given the proposals for the Site, this cannot be achieved as arable field margins must be bordered by arable crops. These habitats will be replaced by diverse grassland habitats which will provide good foraging and shelter for invertebrates, birds, and small mammals, as well as nectar for pollinators, delivering essentially the same opportunities.
- 5.32 In order to ensure that the proposed development delivers on the above net gains for biodiversity, a detailed Landscape Environmental Management Plan will be produced with input from an appropriately qualified ecologist that builds on the Landscape Masterplan (Pegasus, 2023) and describes in detail the methods and responsibilities for creating, managing, and monitoring the habitats on Site.

Protected and notable species

- 5.33 The Site supports a range of protected and notable species which could be impacted by the proposed development. Each of these are considered below, and recommendations for avoidance and mitigation measures made where required.

Badger

- 5.34 Badgers are confirmed as being present on the Site, with active setts identified during the badger survey.
- 5.35 The current proposals include 30 m buffers around the main setts identified on Site. As such direct impacts on these setts from construction of the proposed development are unlikely. It is recommended that protective fencing is installed along this buffer during construction to ensure adherence to these buffers.
- 5.36 There are however no buffers included in the proposal around outlier setts identified on Site. There could therefore be impacts on these setts during construction through direct physical damage or disturbance due to noise and/ or vibrations. In order to avoid impacts to these or offences being committed, outlier or subsidiary setts could be temporarily closed during construction under licence, but this must be done between 1st of July to 30th November. Alternatively, due to the temporary nature of the disturbance, a licence from Natural England could be obtained to enable setts to be disturbed during construction as long as appropriate precautions are in place and the works are also carried out between 1st of July to 30th November.

- 5.37 As badgers regularly create new setts, it will be necessary to update the badger survey before construction begins or to inform a licence application.
- 5.38 Additionally, there is potential for the killing or injury of badgers during construction, for example if they get trapped in excavations or caught up in machinery. To mitigate this risk any deep or steep sided excavations should be covered overnight to avoid trapping badgers and other wildlife, or a means of egress provided (for example a scaffold plank, or sloped side to the excavation).
- 5.39 Impacts on badgers are possible during the operational stage if security fencing is impassable to badgers, thus reducing their territory and limiting access to resources. To avoid this impact any fencing installed on site should be permeable to badgers through the inclusion of suitable gaps. These can be 30 x 30 cm gaps cut from the fence at ground level and placed in order to render all discrete plots permeable. The new grassland, woodland and hedgerows are likely to offer a diverse range of foraging habitats for this species.

Dormouse

- 5.40 Due to the high number of records of hazel dormouse within 2 km of the Site, and the ample amount of suitable habitat, it is considered likely that dormouse are present on Site and potentially within adjacent woodland. No surveys for dormouse were conducted as proposals show that the majority of hedgerows and woodland areas present on Site will be retained with appropriate buffers within the development. As such there is not likely to be significant impacts on dormice across the majority of the Site.
- 5.41 It may be necessary to trim or remove small areas of hedgerow for access purposes or create visibility splays. In the absence of detailed survey information on the presence or absence of dormice, the removal or trimming of hedgerow carries the possibility of killing or injuring dormice. As such this should be avoided as much as possible. Alternatives to hedge removal such as hedge laying or trimming to create visibility splays will be explored. Where hedge removal is necessary, provided it is limited the small areas of hedgerow, this could proceed without a licence under a working method statement and supervised by an appropriately qualified ecologist. This would likely consist of a two stage cut with the first cut in winter (between November and February inclusive) and a second cut after mid-April.
- 5.42 The extensive planting of new hedgerows across the Site included within the proposed development will significantly increase the amount of suitable habitat for dormice on Site. Additionally, the creation of other natural grassland along hedgerows buffers will likely improve foraging opportunities for dormice across the Site.

Bats

- 5.43 Habitats on the Site and immediately adjacent, particularly ancient woodland and hedgerows are suitable for commuting and foraging bats. However, the proposals include the retention of the majority of features of value to bats (i.e., hedgerows, woodland) within the development with appropriate buffers. As such there will be limited impacts on bats from habitat loss across much of the Site.
- 5.44 It may be necessary to trim or remove small areas of hedgerow for access purposes or create visibility splays. Provided this is limited the small areas of hedgerow this is unlikely to have a significant impact on bats.
- 5.45 There is also the possibility of impacts on bats due to light pollution during both construction and operation of the proposed development. It is therefore recommended that a sensitive lighting scheme is used and any lighting faces downwards and away from any ecological features that might be used by bats (i.e., hedgerows, trees, woodland). This would be detailed in a CEMP with input from a suitably qualified ecologist.
- 5.46 Current proposals do not indicate that any mature trees will be felled, however if this becomes necessary there is potential for impacts on roosting bats. Therefore, should any mature trees need

to be felled they will need to be inspected by a licensed bat ecologist prior to felling, and further survey and / or mitigation may be required.

- 5.47 Habitat creation and enhancement across the Site as part of the proposed development, in particular the planting of extensive new species-rich hedgerow and the creation of other neutral grassland, are likely to improve the suitability of the Site for bats and increase foraging opportunities.
- 5.48 In order to enhance the roosting potential within the Site, ten bat boxes will be installed on retained mature trees. These will take the form of a mix of boxes designed for crevice dwelling and cavity dwelling species.

Other mammals

- 5.49 The habitat creation and retention measures are likely to create a more diverse habitat mosaic for use by SPIs such as harvest mouse, brown hare and hedgehog, resulting in a beneficial effect.

Birds

Winter Birds

- 5.50 The Site is approximately 12.6 km from the Thames Estuary and Marshes Special Protection Area (SPA) and 11.7 km from the Ramsar site, which are designated as having important populations of estuarine birds. As the Site is dominated by arable land, at these distances it is unlikely to provide important habitat for estuarine birds such as gadwall, little grebe, shelduck, grey plover, or ringed plover. Additionally, much of the Site is also unsuitable for estuarine birds due to its topography and the proximity of woodland or built structures. Habitats on Site are however suitable for a range of farmland birds, including several species of principle importance (SPIs).
- 5.51 The results of the winter bird surveys did not find any of the species for which the Thams Estuary sites are designated to be using the Site. A range of farmland birds including several SPIs were found to be using the Site in winter. However due to the nature of the proposed development, the presence of large, retained fields, margins, and hedgerows, and given the habitats in the surrounding area, there is not likely that the proposals will result in adverse effects to the winter bird community. The creation of permanent grassland with new hedgerows is likely to benefit certain species such as wintering thrushes and farmland passerines such as linnet.

Breeding birds (excluding Skylark)

- 5.52 The results of the breeding bird surveys confirmed several SPIs are breeding on Site. With the exception of skylark, which is considered separately below, these species generally nest and breed within boundary features such as hedgerows, woodland, scrub or field margins. Therefore, as the majority of these features will be retained, enhanced or added to across the Site, there is likely to be a beneficial effect for most breeding bird species.
- 5.53 There is a risk that clearance of small sections of hedgerow could result in accidental damage to active nests, therefore the cutting will be carried out in winter (between November and February inclusive) down to 150mm with the remainder cleared in the reptile and dormouse active season (mid-April to October inclusive).
- 5.54 In order to further enhance the nesting opportunities within the Site, ten bird nest boxes will be erected, on retained trees. These will be boxes of a sort known to be used by starling, an SPI.

Skylark

- 5.55 Skylark are considered separately to other breeding birds due to their unique nesting requirements; skylark require wide open fields not overlooked by hedgerows, trees, or built features, and research has shown conclusively that they do not nest within solar arrays (Solar Energy UK, 2023).

- 5.56 The results of the breeding bird surveys confirmed a total of 24 territories present, 14 of which occur within the redline areas proposed for solar arrays, and are likely therefore to be lost.
- 5.57 Some locations within the red line contain sufficient open space that the species may continue to nest (specifically Skylark Areas 1A and 1B, as indicated on the final Landscape Masterplan (Pegasus, 2023)). These areas will be managed differently to the other areas outside of the security fence to promote the establishment of the tussock grassland that it's the preferred habitat of skylark. Area 1A is likely to support two pairs under this management. Area 1B is likely to be able to support one pair, thereby maintaining the pair present here.
- 5.58 Additionally, the areas of field F3 that are outside the red line (identified as Skylark Area 2 on the Landscape Masterplan (Pegasus, 2023)) will be used for skylark mitigation. As this field will be retained under existing agricultural use the nature of this mitigation will depend upon the current management. If used for arable crops then skylark plots will be created according to standard RSPB guidance on this, with skylark plots created at 2 plots/ha, away from hedgerows and tramlines. This will increase the density of the current population of this field by up to a factor of three as found in Donald and Morris (2005). This would result in approximately six pairs being present (an additional four pairs). If it is rotated to grassland, this will be managed to create nesting opportunities for skylark by creating a rough sward with shorter areas. In this case, the field is likely to support four pairs (an additional two pairs).
- 5.59 On top of these specific mitigation areas, habitat creation and enhancement across the Site, particularly the new grassland, will improve foraging opportunities for skylark as research suggests that although they will not nest within solar arrays they will forage there (Solar Energy UK, 2023). Increased foraging opportunities may improve the success of the remaining broods reared either on or adjacent to the Site, meaning that more young are fledged. This may go some way to compensating of territories across the Site but this is challenging to quantify in exact terms.
- 5.60 Taken together, areas 1A, 1B and Area 2 are likely to provide compensation in the form of between five and seven pairs. Therefore the overall loss to the population would be between seven and nine pairs.
- 5.61 Given that this species continues to be common and widespread nationally and in Kent, with an estimated national population of 1.6 million territories, the overall loss of between seven and nine pairs is likely to constitute an adverse effect on this species of significance at a local level only.

Reptiles

- 5.62 Grassland, field margins, tall ruderal areas, and hedgerow bases on Site have the potential to support reptiles, and it is considered likely that commonly occurring species of reptile are present on Site. The majority of suitable habitat for reptiles will be retained within the development. Some areas of suitable habitat for reptiles will be lost within the proposed development; specifically fields F6C and F9 (see Figure 2) as well as some arable margins. However, these will be compensated for by the creation of other natural grassland outside the security fence and extensive new species rich hedgerow planting.
- 5.63 Additionally, there is the potential for killing or injuring reptiles during construction, particularly in fields F6C and F9 and arable margins. Due to the likely low numbers present, a precautionary approach will be implemented during construction to minimise the risk of killing or injuring reptiles.
- 5.64 It is recommended that a phased cut of the vegetation is carried out in late autumn such that it takes place outside of the nesting bird season and outside of the hibernation seasons for small mammals and reptiles. Cutting the vegetation in phases allows any animals present, including reptiles, to move out of the area, thereby minimising the risk of unintended killing or injury. Field margins (i.e., along woodland edges) will be retained (as required by the buffers detailed in the sections above) and will provide refuge habitat for species to move into. Panels should then be installed or grassland maintained as a short sward until panels can be installed. Where small sections of hedgerow need to be removed, a two-stage cut will also be implemented as set out above. These measures will be detailed in a CEMP.

- 5.65 In order to enhance new and created habitats further, log piles and hibernacula will be created close to hedgerows. Log piles will be created on the southern aspects of hedgerows to create basking opportunities for these species.

Amphibians

- 5.66 Some habitats on Site provide suitable terrestrial habitat for GCN and other amphibians, however given the distance from any ponds it is considered unlikely that they are present. The precautionary measures set out above undertaken during construction for other species, will further limit the risk of any impacts on GCN or other amphibians.

Invertebrates

- 5.67 The majority of the Site comprises intensive arable land and is not likely to support important invertebrate populations. Therefore, there is unlikely to be significant impacts on invertebrates across much of the Site, so no specific surveys for invertebrates were undertaken.
- 5.68 Some of the more diverse habitats on Site, including areas of other natural grassland and arable margins sown with nectar mixes, have the potential to support diverse invertebrate populations. The landscape masterplan shows that some of these areas will contain solar infrastructure and therefore will be lost as a result of the proposed development. However, any losses will be compensated for by habitat creation and enhancement measures across the Site. Overall, the proposals for the Site are likely to increase the extent of suitable habitat for invertebrates present on Site such as diverse grassland and hedgerow.

6 Conclusions

- 6.1 Overall, the proposed development is likely to have a net positive effect on the biodiversity and ecological value of the Site. The majority of the higher value ecological features on Site, such as woodland, hedgerows, other natural grassland and arable margins will be retained within the proposed development. Extensive habitat creation and enhancement will take place, including grassland creation as well as new hedgerow planting. These measures are likely to improve the extent and quality of the higher-value habitats on Site, increasing its value for a wide range of species.
- 6.2 There is potential for significant adverse effects on Skylark at the local level as a result of the proposed development, which will likely lead to a net loss of between seven and nine skylark territories.
- 6.3 There is potential for impacts on species and habitats on Site during construction of the proposed development, but these can be avoided or sufficiently mitigated by the implementation of appropriate measures during construction.
- 6.4 Bird species other than skylark (both wintering and breeding) and a range of other taxa such as bats, reptiles, invertebrates, are likely to benefit from the proposed development.

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¹ These documents have been superseded but at the time the survey work described in this report was conducted the previous versions referenced here were used.

8 Figures

(overleaf)

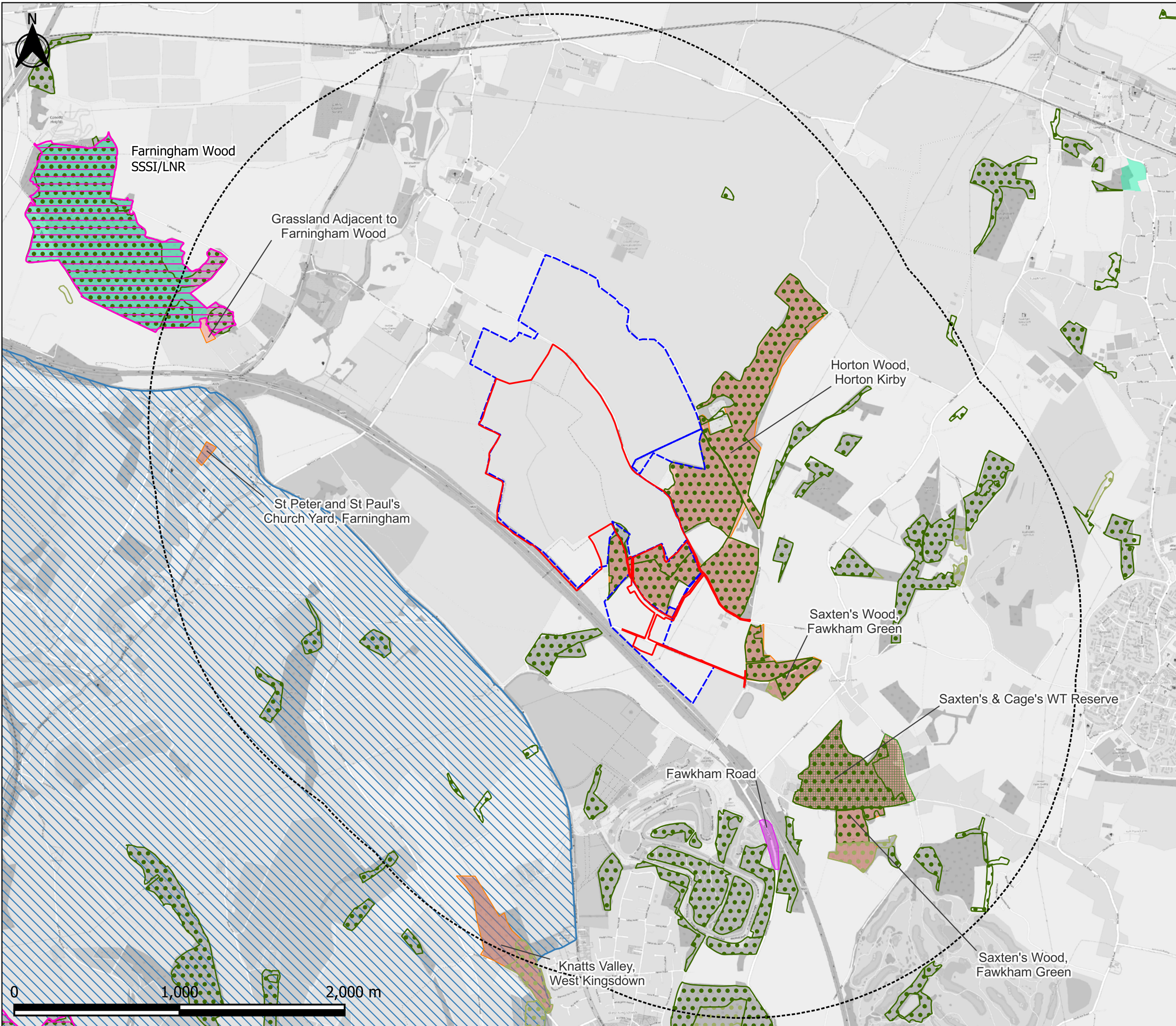
Figure 1: Site Boundary and Designated Sites

Figure 2: UK Habitat Classification Survey and Condition Assessment

Figure 3: Proposed Habitats Post-Development

Figure 4: Breeding Bird Survey Results

Included in CONFIDENTIAL Appendix 3 – Figure 5: Badger Survey Results (CONFIDENTIAL)



- Legend
- Site boundary
 - 2km from site boundary
 - Survey boundary
 - Local Nature Reserves
 - Local Wildlife Site
 - Roadside Nature Reserve
 - Woodland Trust Reserve
 - Kent Downs AONB
 - Ancient & Semi-Natural Woodland
 - Ancient Replanted Woodland
 - Sites of Special Scientific Interest

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PROJECT TITLE
CHIMMENS SOLAR FARM

DRAWING TITLE
Figure 1a: Statutory and non-statutory designated sites within 2km of the site

DATE: 20/10/2023 CHECKED: KH SCALE: 1:22,000
 DRAWN: SL APPROVED: KH VERSION: 1.0

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Sources: © Natural England





- Legend
- Ramsar
 - Special Areas of Conservation
 - Special Protection Areas
 - Site boundary
 - 15km from site boundary
 - Survey boundary

Thames Estuary & Marshes
SPA/RAMSAR

North Downs
Woodlands SAC

Peters Pit SAC

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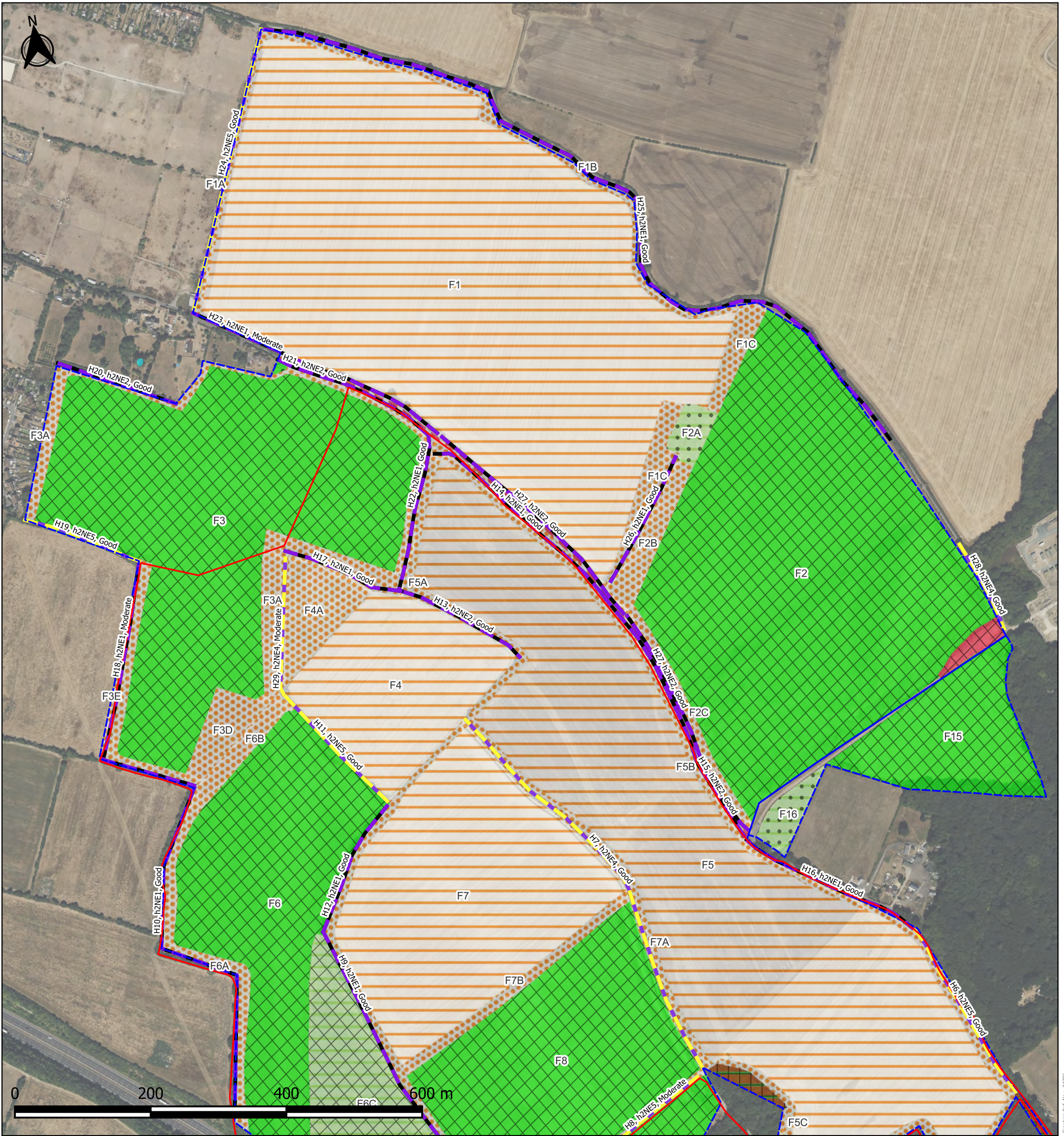
PROJECT TITLE
CHIMMENS SOLAR FARM

DRAWING TITLE
Figure 1b: Statutory designated sites within
15km of the site

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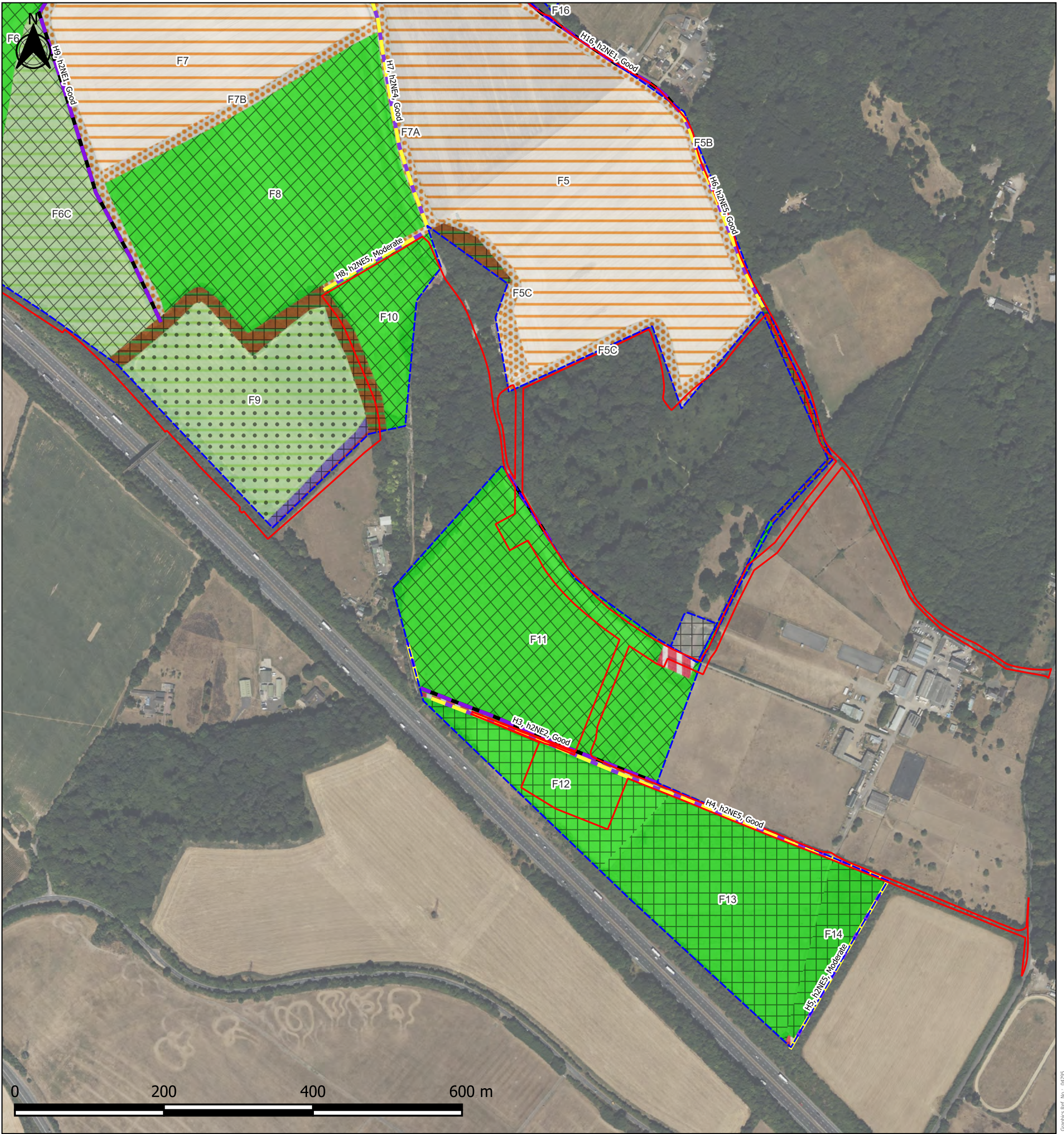


Legend

- Native Hedgerow (h2NE5)
- Native Hedgerow with trees (h2NE4)
- Native Species Rich Hedgerow (h2NE2)
- Native Species Rich Hedgerow with trees (h2NE1)
- Arable field margins game bird mix
- Arable field margins pollen & nectar
- Arable field margins tussocky
- Cereal crops
- Developed land; sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (Non- Priority Habitat)
- Bare ground

Habitats Surveyed Condition:

- Good
- Moderate
- Poor
- Survey boundary
- Site boundary

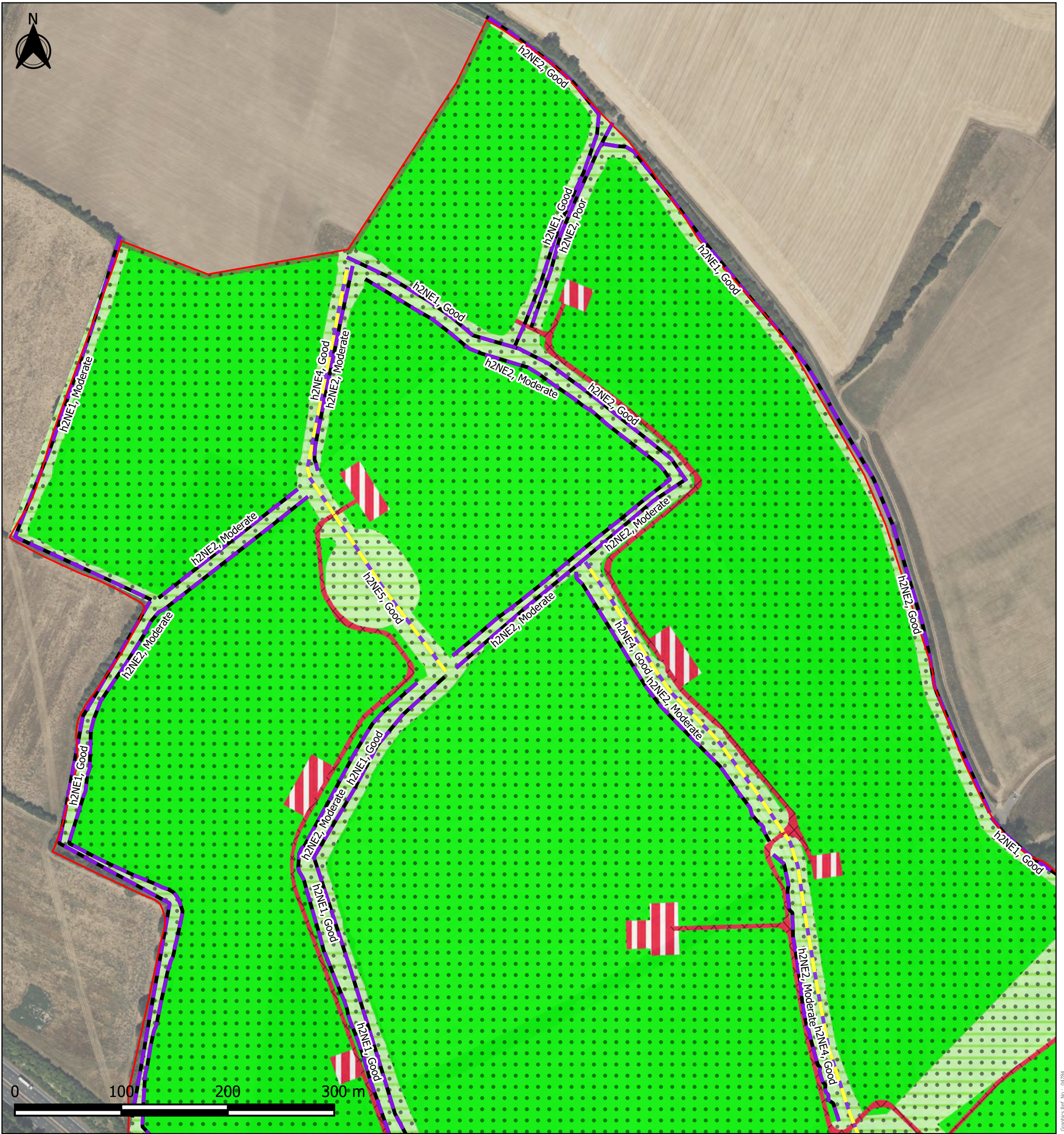


Legend

- Native Hedgerow (h2NE5)
- Native Hedgerow with trees (h2NE4)
- Native Species Rich Hedgerow (h2NE2)
- Native Species Rich Hedgerow with trees (h2NE1)
- Arable field margins game bird mix
- Arable field margins pollen & nectar
- Cereal crops
- Developed land; sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ruderal/Ephemeral

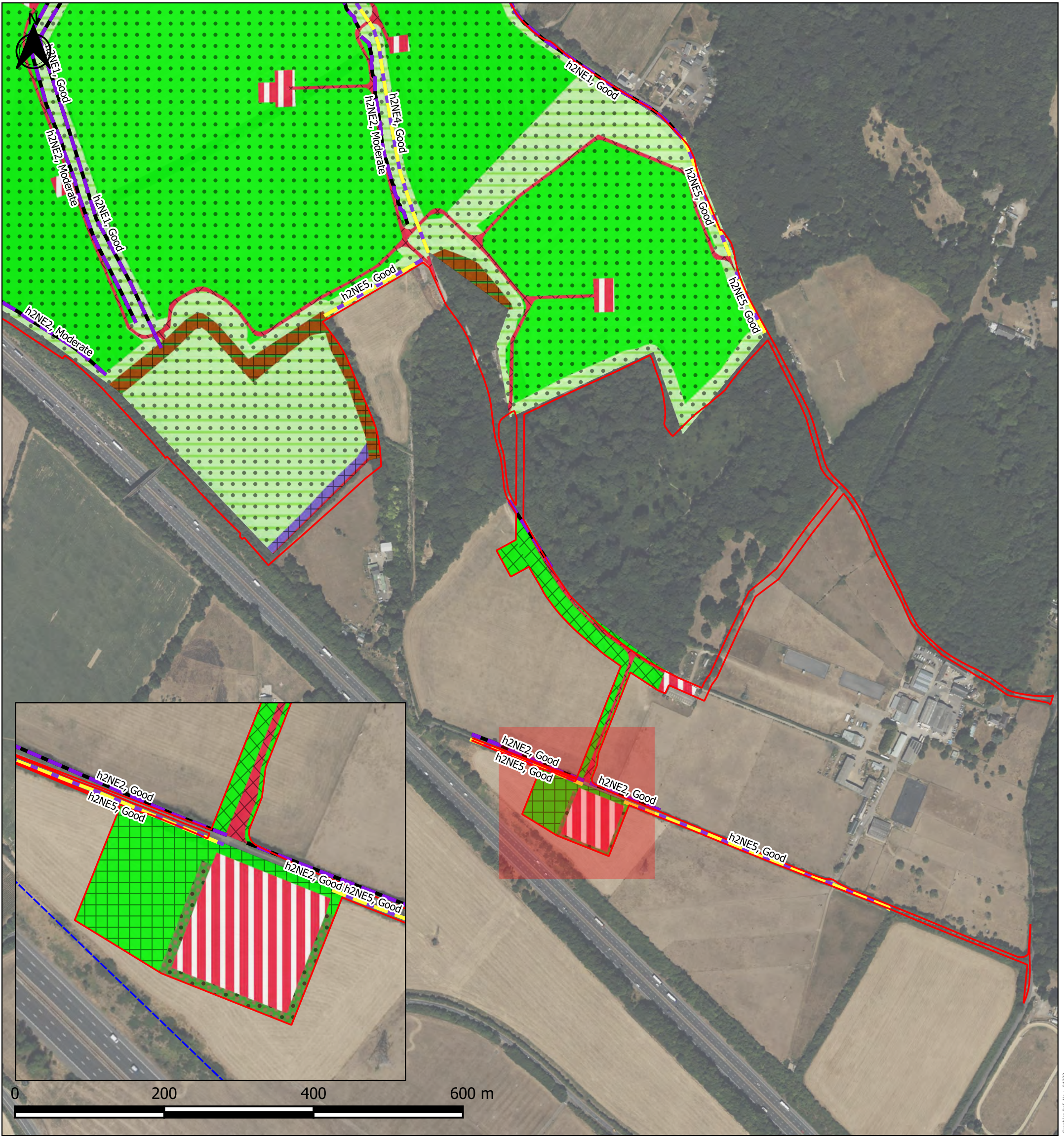
Habitats Surveyed Condition:

- Good
- Moderate
- Poor
- Survey boundary
- Site boundary


















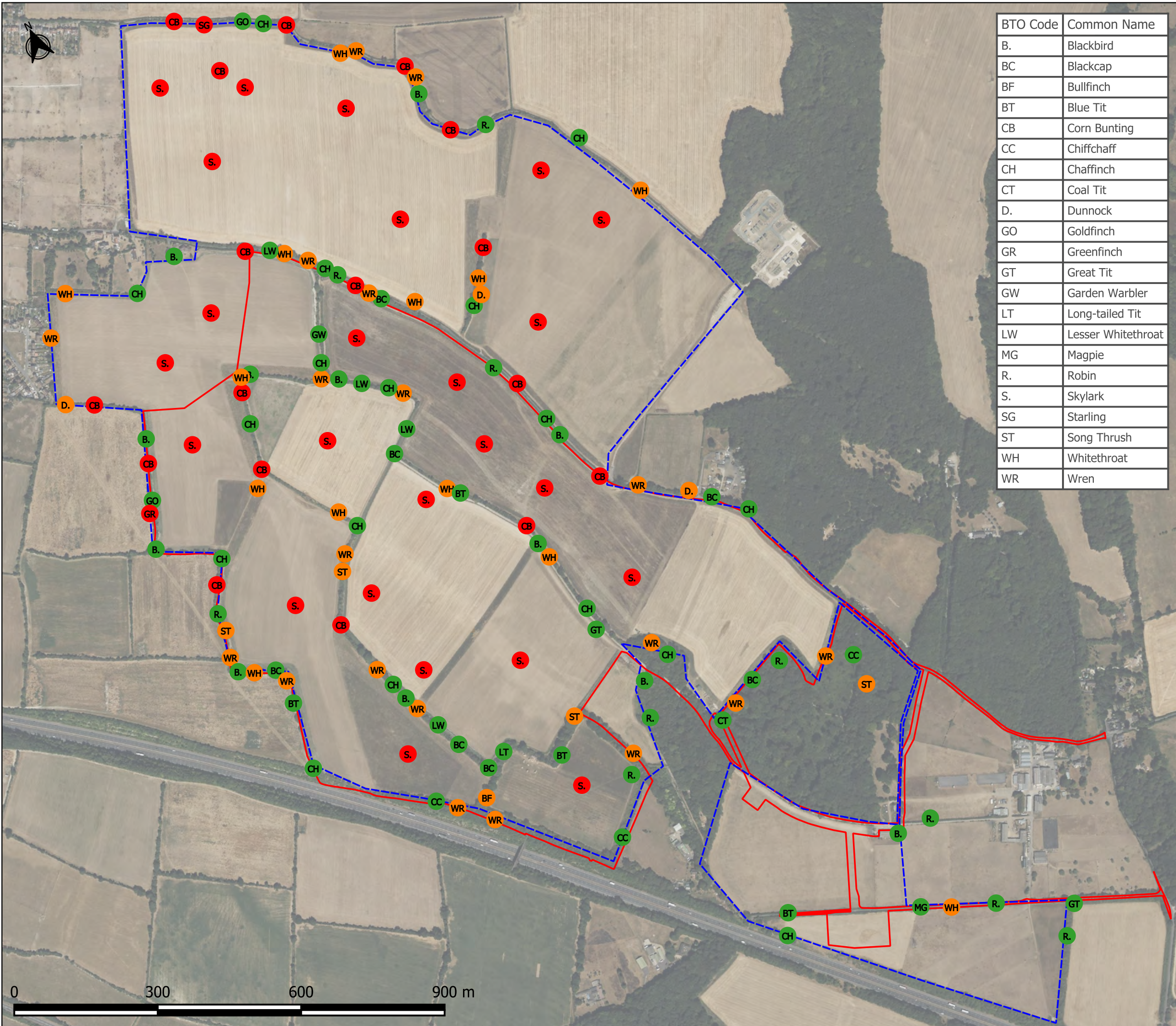
Legend

- Native Hedgerow (h2NE5)
 - Native Hedgerow with trees (h2NE4)
 - Native Species Rich Hedgerow (h2NE2)
 - Native Species Rich Hedgerow with trees (h2NE1)
 - Developed land; sealed surface
 - Modified grassland
 - Other neutral grassland
 - Other woodland; broadleaved
 - Bare ground
- Habitat Plan Condition:
- Moderate
 - Poor
 - Site boundary



Legend

-  Native Hedgerow (h2NE5)
 -  Native Hedgerow with trees (h2NE4)
 -  Native Species Rich Hedgerow (h2NE2)
 -  Native Species Rich Hedgerow with trees (h2NE1)
 -  Developed land; sealed surface
 -  Lowland mixed deciduous woodland
 -  Mixed scrub
 -  Modified grassland
 -  Other neutral grassland
 -  Other woodland; broadleaved
 -  Bare ground
-
- Habitat Plan Condition:
 -  Good
 -  Moderate
 -  Poor
 -  Site boundary



BTO Code	Common Name
B.	Blackbird
BC	Blackcap
BF	Bullfinch
BT	Blue Tit
CB	Corn Bunting
CC	Chiffchaff
CH	Chaffinch
CT	Coal Tit
D.	Dunnock
GO	Goldfinch
GR	Greenfinch
GT	Great Tit
GW	Garden Warbler
LT	Long-tailed Tit
LW	Lesser Whitethroat
MG	Magpie
R.	Robin
S.	Skylark
SG	Starling
ST	Song Thrush
WH	Whitethroat
WR	Wren

- Legend
- Red
 - Amber
 - Green
 - Survey boundary
 - Site boundary



9 Photographs



Photograph 1: Arable field (cropland)






Photograph 2: Modified grassland (lay / hay crop)



Photograph 3: Other neutral grassland



Photograph 4: Arable margin dominated by wildflowers and grasses

	
<p>Photograph 5: Arable margin dominated by ruderal vegetation</p>	<p>Photograph 6: Grazed horse paddock (on rotation)</p>
	
<p>Photograph 7: Un-grazed horse paddock (on rotation)</p>	

Appendix 1: Summaries of Relevant Policy, Legislation and Other Instruments

This section briefly summarises the legislation, policy and related issues that are relevant to the main text of the report. The following text does not constitute legal or planning advice.

National Planning Policy Framework (England)

The Government issued the National Planning Policy Framework (NPPF) in July 2021. Text excerpts from the NPPF are shown where they may be relevant to planning applications and biodiversity including protected sites, habitats and species.

The Government sets out the three objectives for sustainable development (economy, social and environmental) at paragraphs 8-10 to be delivered through the plan preparation and implementation level and 'are not criteria against which every decision can or should be judged' (paragraph 9). The planning system's environmental objective is 'to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity...' (paragraph 8c).

In conserving and enhancing the natural environment, the NPPF (Paragraph 174) states that 'planning policies and decisions should contribute to and enhance the natural and local environment' by:

- Protecting and enhancing...sites of biodiversity value... '(in a manner commensurate with their statutory status or identified quality in the development plan)'.
- Recognising the wider benefits from natural capital and ecosystem services including trees and woodland.
- Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.
- Preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability.

In respect of protected sites, at paragraph 175, the NPPF requires local planning authorities to distinguish, at the plan level, '...between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value...take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries.' A footnote to paragraph 175 refers to the preferred use of agricultural land of poorer quality if significant development of agricultural land is to take place.

Paragraph 179 refers to how plans should aim to protect and enhance biodiversity. Plans should: 'identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity [a footnote refers to ODPM Circular 06/2005 for further guidance in respect of statutory obligations for biodiversity in the planning system], wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;' and to 'promote the conservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.'

Paragraph 180 advises that, when determining planning applications, '...local planning authorities should apply the following principles:

- if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments) should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that

make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;

- development resulting in the loss or deterioration of irreplaceable habitats, (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.’

In paragraph 181, the following should be given the same protection as habitats sites:

- potential Special Protection Areas and possible Special Areas of Conservation;
- listed or proposed Ramsar sites; and
- sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.’

In paragraph 182 the NPPF refers back to sustainable development in relation to appropriate assessment and states: ‘the presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects), unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site’.

In paragraph 183, the NPPF refers to planning policies and decisions taking account of ground conditions and risks arising from land instability and contamination at sites. In relation to risks associated with land remediation account is to be taken of ‘potential impacts on the natural environment’ that arise from land remediation.

In paragraph 185 the NPPF states that planning policies and decisions should ensure that development is appropriate to the location and take into account likely effects (including cumulative) on the natural environment and, in doing so, they ‘should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation’ (paragraph 185c).

Government Circular ODPM 06/2005 Biodiversity and Geological Conservation (England only)

Paragraph 98 of Government Circular 06/2005 advises that “the presence of a protected species is a material consideration when a planning authority is considering a development proposal that, if carried out, would be likely to result in harm to the species or its habitat. Local authorities should consult Natural England before granting planning permission. They should consider attaching appropriate planning conditions or entering into planning obligations under which the developer would take steps to secure the long-term protection of the species. They should also advise developers that they must comply with any statutory species’ protection provisions affecting the site concerned...”

Paragraph 99 of Government Circular 06/2005² advises that “it is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted”.

Standing Advice (GOV.UK - England only)

The GOV.UK website provides information regarding protected species and sites in relation to development proposals: ‘Local planning authorities should take advice from Natural England or the Environment Agency about planning applications for developments that may affect protected species.’ GOV.UK advises that

² ODPM Circular 06/2005. *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

'some species have standing advice which you can use to help with planning decisions. For others you should contact Natural England or the Environment Agency for an individual response.'

The standing advice (originally from Natural England and now held and updated on GOV.UK³) provides advice to planners on deciding if there is a 'reasonable likelihood' of protected species being present. It also provides advice on survey and mitigation requirements.

When determining an application for development that is covered by standing advice, in accordance with guidance in Government Circular 06/2005, Local planning authorities are required to take the standing advice into account. In paragraph 82 of the aforementioned Circular, it is stated that: 'The standing advice will be a material consideration in the determination of the planning application in the same way as any advice received from a statutory consultee...it is up to the planning authority to decide the weight to be attached to the standing advice, in the same way as it would decide the weight to be attached to a response from a statutory consultee.'

The Environment Act 2021

The Environment Act includes the provision of mandatory biodiversity gain for developments in England; this will be mandated through an amendment to the Town and Country Planning Act 1990. The two-year transition period following Royal Assent (November 2021) means that mandatory biodiversity gain will become law in autumn 2023. This will require:

- The provision of a required percentage of biodiversity gain, currently set nationally to be at 10%
- The use of the national Defra Biodiversity Metric to calculate the biodiversity gain, currently Metric 3.1
- The provision of a biodiversity gain plan to demonstrate how biodiversity gain will be delivered on and or off-site; statutory instruments and regulations are in preparation by Defra and Natural England to provide templates for reporting
- Biodiversity gain will be secured for a fixed period, currently nationally set at 30 years
- Demonstration of how the biodiversity gain will be secured; conservation covenants will be used to deliver this which are in preparation by Defra and Natural England
- A national register of land used for biodiversity gain will be established; this will involve setting up a new biodiversity credits market, the approach for which is in preparation by Defra and Natural England

NB. The policy basis for net gain is already set out in the NPPF. During the transition period, we would expect local planning authorities to increasingly require the measures set out within the Environment Act as part of their development decision making process.

Species and habitats of principal importance

Section 1 of the Nature Conservation (Scotland) Act 2004 states that 'It is the duty of every public body and office-holder, in exercising any functions, to further the conservation of biodiversity so far as is consistent with the proper exercise of those functions'. To assist with this objective Section 2(4) of the Act sets out the requirement to publish a list of flora and fauna considered to be of principal importance in Scotland.

The list required under Section 2(4) of the Act has now been published and includes a diverse range of habitats and species⁴. The measures required to protect these species and habitats are set out in the document 'Scotland's Biodiversity: It's in Your Hands - A strategy for the conservation and enhancement of biodiversity in Scotland' (Scottish Executive, 2004). Biodiversity Targets are outlined in the 'Strategic Plan for Biodiversity 2011-2020' (Scottish Government, 2013). The two documents together comprise the Scottish Biodiversity Strategy.

Protection of Badgers Act 1992 (as amended)

The 1992 Act protects badgers and their setts. It has been amended by the Nature Conservation (Scotland) Act 2004 under Schedule 6 (26). In summary, offences under this legislation are:

³ <https://www.gov.uk/guidance/protected-species-how-to-review-planning-applications#standing-advice-for-protected-species>

⁴ The list is published at: <https://www.nature.scot/scottish-biodiversity-list>

- Wilfully taking, injuring or killing badgers
- Cruelty; selling and possession; marking and ringing
- Intentionally or recklessly interfering with a badger sett (interfering with a badger sett includes damaging or destroying a badger sett or any part of it, obstructing access to a sett, disturbing a badger whilst it is in a sett, or causing or allowing a dog to enter a badger sett)

Natural Environment and Rural Communities (NERC) Act 2006 – Habitats and species of principal importance (England)

The Natural Environment and Rural Communities (NERC) Act came into force on 1st October 2006. Section 41 (S41) of the Act require the Secretary of State to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in England. The list has been drawn up in consultation with Natural England as required by the Act. In accordance with the Act the Secretary of State keeps this list under review and will publish a revised list if necessary, in consultation with Natural England.

The S41 list is used to guide decision-makers such as public bodies, including local authorities and utilities companies, in implementing their duty under Section 40 of the NERC Act 2006, to have regard to the conservation of biodiversity in England, when carrying out their normal functions, including development control and planning. This is commonly referred to as the 'Biodiversity Duty.'

Guidance for public authorities on implementing the Biodiversity Duty⁵ has been published by Defra. One of the key messages in this document is that 'conserving biodiversity includes restoring and enhancing species populations and habitats, as well as protecting them.' In England the administration of the planning system and licensing schemes are highlighted as having a 'profound influence on biodiversity conservation.' Local authorities are required to take measures to "promote the preservation, restoration and re-creation of priority habitats, ecological networks and the protection and recovery of priority species. The guidance states that 'the duty aims to raise the profile and visibility of biodiversity, clarify existing commitments with regard to biodiversity, and to make it a natural and integral part of policy and decision making.'

In 2007, the UK Biodiversity Action Plan (BAP) Partnership published an updated list of priority UK species and habitats covering terrestrial, freshwater and marine biodiversity to focus conservation action for rarer species and habitats in the UK. The UK Post-2010 Biodiversity Framework⁶, which covers the period from 2011 to 2020, now succeeds the UK BAP. The UK priority list contained 1150 species and 65 habitats requiring special protection and has been used as a reference to draw up the lists of species and habitats of principal importance in England.

In England, there are 56 habitats of principal importance and 943 species of principal importance on the S41 list. These are all the habitats and species found in England that were identified as requiring action in the UK BAP and which continue to be regarded as conservation priorities in the subsequent UK Post-2010 Biodiversity Framework.

European protected species (Animals)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

"European protected species" (EPS) of animal are those which are shown on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 43 of those Regulations. All EPS are also protected under the Wildlife and Countryside Act 1981 (as amended). Taken together, these pieces of legislation make it an offence to:

⁵ Defra, 2007. *Guidance for Public Authorities on Implementing The Biodiversity Duty*. (<http://www.defra.gov.uk/publications/files/pb12585-pa-guid-english-070516.pdf>)

⁶ JNCC and Defra (on behalf of the Four Countries' Biodiversity Group). 2012. *UK Post-2010 Biodiversity Framework*. July 2012. (<http://jncc.defra.gov.uk/page-6189>)

- a. Intentionally or deliberately capture, injure or kill any wild animal included amongst these species
- b. Possess or control any live or dead specimens or any part of, or anything derived from a these species
- c. deliberately disturb wild animals of any such species
- d. deliberately take or destroy the eggs of such an animal, or
- e. intentionally, deliberately or recklessly damage or destroy a breeding site or resting place of such an animal, or obstruct access to such a place

For the purposes of paragraph (c), disturbance of animals includes in particular any disturbance which is likely—

- a. to impair their ability—
 - i. to survive, to breed or reproduce, or to rear or nurture their young, or
 - ii. in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- b. to affect significantly the local distribution or abundance of the species to which they belong.

Although the law provides strict protection to these species, it also allows this protection to be set aside (derogated) through the issuing of licences. The licences in England are currently determined by Natural England (NE) for development works and by Natural Resources Wales in Wales. In accordance with the requirements of the Regulations (2017, as amended), a licence can only be issued where the following requirements are satisfied:

- a. The proposal is necessary 'to preserve public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment'
- b. 'There is no satisfactory alternative'
- c. The proposals 'will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range.'

Definition of breeding sites and resting places

Guidance for all European Protected Species of animal, including bats and great crested newt, regarding the definition of breeding and of breeding and resting places is provided by The European Council (EC) which has prepared specific guidance in respect of the interpretation of various Articles of the EC Habitats Directive.⁷ Section II.3.4.b) provides definitions and examples of both breeding and resting places at paragraphs 57 and 59 respectively. This guidance states that 'The provision in Article 12(1)(d) [of the EC Habitats Directive] should therefore be understood as aiming to safeguard the ecological functionality of breeding sites and resting places.' Further the guidance states: 'It thus follows from Article 12(1)(d) that such breeding sites and resting places also need to be protected when they are not being used, but where there is a reasonably high probability that the species concerned will return to these sites and places. If for example a certain cave is used every year by a number of bats for hibernation (because the species has the habit of returning to the same winter roost every year), the functionality of this cave as a hibernating site should be protected in summer as well so that the bats can re-use it in winter. On the other hand, if a certain cave is used only occasionally for breeding or resting purposes, it is very likely that the site does not qualify as a breeding site or resting place.'

European protected species (Plants)

The Conservation of Habitats and Species Regulations 2017 (as amended) consolidates various amendments that have been made to the original (1994) Regulations which transposed the EC Habitats Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (Council Directive 92/43/EEC) into national law.

⁷ Guidance document on the strict protection of animal species of Community interest under the Habitats Directive 92/43/EEC. (February 2007), EC.

“European protected species” (EPS) of plant are those which are present on Schedule 5 of the Conservation of Habitats and Species Regulations 2017 (as amended). They are subject to the provisions of Regulation 46 of those Regulations.

Regulation 47 makes it an offence to deliberately pick, collect, cut, uproot or destroy a wild plant of an EPS. It also makes it an offence to have in possession or control any live or dead plant or part of plant which has been taken in the wild and which is an EPS (or listed in Annex II(b) or IV(b) of the Habitats Directive).

Competent authorities

Under Regulation 7 of the Conservation of Habitats and Species Regulations 2017 (as amended) a “competent authority” includes “any Minister of the Crown..., government department, statutory undertaker, public body of any description or person holding a public office.

In accordance with Regulation 9, “a competent authority must exercise their functions which are relevant to nature conservation, including marine conservation, so as to secure compliance with the requirements of the [Habitats and Birds] Directives. This means for instance that when considering development proposals a competent authority should consider whether EPS or European Protected Sites are to be affected by those works and, if so, must show that they have given consideration as to whether derogation requirements can be met.

Birds

All nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird or take, damage or destroy its nest whilst in use or being built, or take or destroy its eggs. In addition to this, for some rarer species (listed on Schedule 1 of the Act), it is an offence to disturb them whilst they are nest building or at or near a nest with eggs or young, or to disturb the dependent young of such a bird.

The Conservation of Habitats and Species Regulations 2017 (as amended) places duties on competent authorities (including Local Authorities and National Park Authorities) in relation to wild bird habitat. These provisions relate back to Articles 1, 2 and 3 of the EC Directive on the conservation of wild birds (2009/147/EC, ‘Birds Directive’⁸) (Regulation 10 (3)) requires that the objective is the ‘preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the United Kingdom, including by means of the upkeep, management and creation of such habitat, as appropriate, having regard to the requirements of Article 2 of the new Wild Birds Directive...’ Regulation 10 (7) states: ‘In considering which measures may be appropriate for the purpose of security or contributing to the objective in [Regulation 10 (3)] Paragraph 3, appropriate account must be taken of economic and recreational requirements’.

In relation to the duties placed on competent authorities under the 2017 Regulations, Regulation 10 (8) states: ‘So far as lies within their powers, a competent authority in exercising any function [including in relation to town and country planning] in or in relation to the United Kingdom must use all reasonable endeavours to avoid any pollution or deterioration of habitats of wild birds (except habitats beyond the outer limits of the area to which the new Wild Birds Directive applies).’

Badger

Badger is protected under the Protection of Badgers Act 1992. It is not permitted to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett. Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as “a structure or place, which displays signs indicating current use by a badger”.

ODPM Circular 06/2005⁹ provides further guidance on statutory obligations towards badger within the planning system. Of particular note is paragraph 124, which states that “The likelihood of disturbing a badger sett, or adversely affecting badgers’ foraging territory, or links between them, or significantly increasing the

⁸ 2009/147/EC Birds Directive (30 November 2009. European Parliament and the Council of the European Union.

⁹ ODPM Circular 06/2005. *Government Circular: Biodiversity and Geological Conservation – Statutory Obligations and their Impacts within the Planning System* (2005). HMSO Norwich.

likelihood of road or rail casualties amongst badger populations, are capable of being material considerations in planning decisions.”

Natural England provides Standing Advice¹⁰, which is capable of being a material consideration in planning decisions. Natural England recommends mitigation to avoid impacts on badger setts, which includes maintaining or creating new foraging areas and maintaining or creating access (commuting routes) between setts and foraging/watering areas.

Reptiles

All native reptile species receive legal protection in Great Britain under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). Viviparous lizard, slow-worm, grass snake and adder are protected against killing, injuring and unlicensed trade only. Sand lizard and smooth snake receive additional protection as “European Protected species” under the provisions of the Conservation of Habitats and Species Regulations 2017 (as amended) and are fully protected under the Wildlife and Countryside Act 1981 (as amended).

All six native species of reptile are included as ‘species of principal importance’ for the purpose of conserving biodiversity under Section 41 (England) of the NERC Act 2006 and Section 7 of the Environment (Wales) Act 2016.

Current Natural England Guidelines for Developers¹¹ states that ‘where it is predictable that reptiles are likely to be killed or injured by activities such as site clearance, this could legally constitute intentional killing or injuring.’ Further the guidance states: ‘Normally prohibited activities may not be illegal if ‘the act was the incidental result of a lawful operation and could not reasonably have been avoided’. Natural England ‘would expect reasonable avoidance to include measures such as altering development layouts to avoid key areas, as well as capture and exclusion of reptiles.’

The Natural England Guidelines for Developers state that ‘planning must incorporate two aims where reptiles are present:

- To protect reptiles from any harm that might arise during development work;
- To ensure that sufficient quality, quantity and connectivity of habitat is provided to accommodate the reptile population, either on-site or at an alternative site, with no net loss of local reptile conservation status.’

Water vole

Water vole is protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to kill, injure or take any water vole, damage, destroy or obstruct access to any place of shelter or protection that the animals are using, or disturb voles while they are using such a place. Water vole is listed as a Species of Principal Importance under the provisions of the NERC Act 2006 in England and under the provisions of the Environment (Wales) Act 2016.

White-clawed crayfish

The white-clawed crayfish is scheduled under the Wildlife and Countryside Act 1981 (as amended), listed under the EC Habitats Directive (Annexe II and V) and is on the IUCN Red Data List for endangered and threatened species. It is also a Species of Principal Importance under the provisions of the NERC Act 2006 and the provisions of the Environment (Wales) Act 2016.

Under the Wildlife and Countryside Act 1981 (as amended) it is illegal to take or sell white-clawed crayfish. Whilst it is not an offence under the Act to disturb or kill white-clawed crayfish or to damage or destroy their

¹⁰ <http://www.naturalengland.org.uk/ourwork/planningdevelopment/spatialplanning/standingadvice/specieslinks.aspx>

¹¹ English Nature, 2004. *Reptiles: guidelines for developers*. English Nature, Peterborough. <https://webarchive.nationalarchives.gov.uk/20150303064706/http://publications.naturalengland.org.uk/publication/76006>

habitat, both Natural England and the Environment Agency recommend that anyone carrying out any form of management or development work on suitable watercourses take into account the conservation of this species.

Signal crayfish and several other invasive non-native crayfish species are listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Strictly speaking, this makes it an offence to return to the wild any signal crayfish, even if inadvertently captured. Any signal crayfish or other non-native crayfish captured should be humanely destroyed (once their identification has been confirmed by a suitably qualified and experienced ecologist).

Wild mammals in general

The Wild Mammals (Protection) Act 1996 (as amended) makes provision for the protection of wild mammals from certain cruel acts, making it an offence for any person to intentionally cause suffering to any wild mammal. In the context of development sites, for example, this may apply to rabbits in their burrows.

Invasive non-native species

An invasive non-native species is any non-native animal or plant that has the ability to spread causing damage to the environment.

Under the Wildlife and Countryside Act 1981 (as amended) it is an offence to release, or to allow to escape into the wild, any animal which is not ordinarily resident in and is not a regular visitor to Great Britain in a wild state or is listed under Schedule 9 of the Act.

It is an offence to plant or otherwise cause to grow in the wild invasive non-native plants listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Hedgerows

Article 10 of the Habitats Directive¹² requires that 'Member States shall endeavour...to encourage the management of features of the landscape which are of major importance for wild fauna and flora. Such features are those which, by virtue of their linear and continuous structure...or their function as stepping stones...are essential for the migration, dispersal and genetic exchange of wild species'. Examples given in the Directive include traditional field boundary systems (such as hedgerows).

The aim of the Hedgerow Regulations 1997¹³, according to guidance produced by the Department of the Environment¹⁴, is "to protect important hedgerows in the countryside by controlling their removal through a system of notification. In summary, the guidance states that the system is concerned with the removal of hedgerows, either in whole or in part, and covers any act which results in the destruction of a hedgerow. The procedure in the Regulations is triggered only when land managers or utility operators want to remove a hedgerow. The system is in favour of protecting and retaining 'important' hedgerows.

The Hedgerow Regulations set out criteria that must be used by the local planning authority in determining which hedgerows are 'important'. The criteria relate to the value of hedgerows from an archaeological, historical, wildlife and landscape perspective.

Japanese knotweed

It is an offence to plant or cause the spread of Japanese knotweed in the wild under the Wildlife and Countryside Act 1981 (as amended). All waste containing Japanese knotweed comes under the control of Part II of the Environmental Protection Act 1990.

¹² Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

¹³ Statutory Instrument 1997 No. 1160 – The Hedgerow Regulations 1997. HMSO: London

¹⁴ The Hedgerow Regulations 1997: a guide to the law and good practice, HMSO: London

The Environment Agency has produced “The Knotweed Code of Practice”, which provides guidance on how to manage Japanese knotweed legally on development sites¹⁵. This document provides ecological information on Japanese knotweed, details of how to prevent its spread, how to manage Japanese knotweed and information on disposal. Natural Resources Wales refers to Environment Agency guidance in respect of landowners responsibilities in Wales and to the Wildlife and Countryside Act 1981 (as amended).

¹⁵ *Managing Japanese knotweed on development sites: the knotweed code of practice* (2006). Environment Agency. <https://www.gov.uk/government/publications/japanese-knotweed-managing-on-development-sites>. See also 2013 Code of Practice update.

Appendix 2: Inputs and results of the biodiversity net gain calculation

The input values used in the biodiversity net gain calculation are shown in the tables below. These are based on the results of the UK Habitat Classification Survey and condition assessment, as well as area measurements for different habitat features extracted from the GIS software.

Table i: Site habitat baseline

Ref	Broad habitat	Habitat type	Area (hectares)	Condition	Strategic significance	Area retained	Area enhanced
1	Cropland	Arable field margins game bird mix	6.6994	Condition Assessment N/A	Area/compensation not in local strategy/ no local strategy	0	0
2	Cropland	Arable field margins pollen and nectar	5.3609	Condition Assessment N/A	Area/compensation not in local strategy/ no local strategy	0	0
3	Cropland	Cereal crops	43.5337	Condition Assessment N/A	Area/compensation not in local strategy/ no local strategy	0	0
4	Grassland	Modified grassland	0.9626	Good	Area/compensation not in local strategy/ no local strategy	0	0
5	Grassland	Modified grassland	26.4167	Poor	Area/compensation not in local strategy/ no local strategy	0.8449	0
6	Grassland	Modified grassland	1.9314	Poor	Area/compensation not in local strategy/ no local strategy	0	1.9314
7	Grassland	Other neutral grassland	5.3112	Moderate	Area/compensation not in local strategy/ no local strategy	5.3112	0
8	Grassland	Other neutral grassland	4.1623	Poor	Area/compensation not in local strategy/ no local strategy	0	0
9	Grassland	Other neutral grassland	1.0125	Poor	Area/compensation not in local strategy/ no local strategy	0	1.0125
10	Heathland and shrub	Mixed scrub	0.2539	Good	Area/compensation not in local strategy/ no local strategy	0.2539	0
11	Urban	Developed land; sealed surface	0.0865	N/A - Other	Area/compensation not in local strategy/ no local strategy	0.0847	0
12	Woodland and forest	Lowland mixed deciduous woodland	1.2244	Good	Area/compensation not in local strategy/ no local strategy	1.2244	0

Table ii: Site habitat creation

Broad habitat	Proposed habitat	Area (hectares)	Condition	Strategic significance	Habitat created in advance (years)	Delay in starting habitat creation (years)
Grassland	Modified grassland	0.424	Good	Area/compensation not in local strategy/ no local strategy	0	0
Grassland	Modified grassland	71.6971	Moderate	Area/compensation not in local strategy/ no local strategy	0	0
Grassland	Modified grassland	0.1148	Poor	Area/compensation not in local strategy/ no local strategy	0	0
Grassland	Other neutral grassland	10.6575	Moderate	Area/compensation not in local strategy/ no local strategy	0	0
Urban	Bare ground	1.7758	Poor	Area/compensation not in local strategy/ no local strategy	0	0
Urban	Developed land; sealed surface	1.3026	N/A - Other	Area/compensation not in local strategy/ no local strategy	0	0

Woodland and forest	Other woodland; broadleaved	0.3207	Moderate	Area/compensation not in local strategy/ no local strategy	0	0
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Table iii: Site habitat enhancement

Baseline ref	Baseline habitat	Baseline condition	Baseline strategic significance	Proposed habitat	Area enhanced (hectares)	Proposed condition	Proposed strategic significance	Habitat enhanced in advance (years)	Delay in starting habitat enhancement (years)
6	Grassland - Modified grassland	Poor	Area/compensation not in local strategy/ no local strategy	Grassland - Other neutral grassland	1.9314	Moderate	Area/compensation not in local strategy/ no local strategy	0	0
9	Grassland - Other neutral grassland	Poor	Area/compensation not in local strategy/ no local strategy	Grassland - Other neutral grassland	1.0125	Moderate	Area/compensation not in local strategy/ no local strategy	0	0

Table iv: Site hedgerow baseline

Ref	Hedgerow type	Length (km)	Condition	Strategic significance	Lenth retained	Lenth enhanced
1	Native Hedgerow with trees	0.634	Good	Area/compensation not in local strategy/ no local strategy	0.624	0
2	Native Hedgerow with trees	0.201	Moderate	Area/compensation not in local strategy/ no local strategy	0	0.201
3	Native Hedgerow	1.104	Good	Area/compensation not in local strategy/ no local strategy	1.007	0
4	Native Hedgerow	0.001	Moderate	Area/compensation not in local strategy/ no local strategy	0.001	0
5	Native Hedgerow	0.146	Moderate	Area/compensation not in local strategy/ no local strategy	0	0.146
6	Species-rich native hedgerow with trees	2.248	Good	Area/compensation not in local strategy/ no local strategy	2.239	0
7	Species-rich native hedgerow with trees	0.437	Moderate	Area/compensation not in local strategy/ no local strategy	0.437	0
8	Species-rich native hedgerow	1.022	Good	Area/compensation not in local strategy/ no local strategy	1.009	0
9	Species-rich native hedgerow	0.101	Moderate	Area/compensation not in local strategy/ no local strategy	0.101	0

Table v: Site hedgerow creation

Hedgerow type	Length (km)	Condition	Strategic significance	Habitat created in advance (years)	Delay in starting habitat creation (years)
Species-rich native hedgerow with trees	3.486	Moderate	Area/compensation not in local strategy/ no local strategy	0	0
Species-rich native hedgerow	0.204	Poor	Area/compensation not in local strategy/ no local strategy	0	0

Table vi: Site hedgerow enhancement

Baseline ref	Baseline habitat	Baseline condition	Baseline strategic significance	Proposed habitat	Area enhanced (hectares)	Proposed condition	Proposed strategic significance	Habitat enhanced in advance (years)	Delay in starting habitat enhancement
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									(years)
2	Native Hedgerow with trees	Moderate	Area/compensation not in local strategy/ no local strategy	Native Hedgerow with trees	0.201	Good	Area/compensation not in local strategy/ no local strategy	0	0
5	Native Hedgerow	Moderate	Area/compensation not in local strategy/ no local strategy	Native Hedgerow	0.146	Good	Area/compensation not in local strategy/ no local strategy	0	0

Table vii: Detailed results of BNG calculation

Net project biodiversity units (Including all on-site & off-site habitat retention / creation)	Habitat units	129.2543		
	Hedgerow units	30.03078		
	Watercourse units	0		
Total project biodiversity % change (Including all on-site & off-site habitat creation + retained habitats)	Habitat units	45.1851%		
	Hedgerow units	39.9303%		
	Watercourse units	0%		
Combined habitat retention and enhancement				
	Habitats	Hedgerows	Watercourses	
Total on-site and off-site baseline area / length	96.9555	5.894	0	
Total on-site and off-site baseline units	286.0552	75.208	0	
Total on-site and off-site baseline area / length retained	7.7191	5.418	0	
Total on-site and off-site baseline units retained	69.2654	71.996	0	
Area / length proposed for enhancement	2.9439	0.347	0	
Baseline units proposed for enhancement	7.9128	2.192	0	
Total on-site and off-site baseline area / length lost	86.2925	0.129	0	
Total on-site and off-site baseline units lost	208.877	1.02	0	