Preliminary Ecological Appraisal

South Fambridge Hall Solar Park, Fambridge

Principal Author: Jack Morphet

Address:

RSK ADAS Ltd
Battlegate Rd,
Boxworth,
Cambridgeshire,
CB23 4NN

Date: August 2019

Commissioned For:

BSR Energy

Quality Assurance

Author	Checked	Approved
Jack Morphet BSc (Hons) GradCIEEM	Emma Mundy BSc (Hons) MSc MCIEEM MCIWEM CEnv CWEM	James Simpson BSc (Hons) MSc MCIEEM CEcol
		

The information which ADAS has prepared and provided is true, and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

Disclaimer

This report has been commissioned for the exclusive use of the commissioning party unless otherwise agreed in writing by RSK ADAS Ltd; no other party may use, make use of or rely on the contents of the report. No liability is accepted by RSK ADAS Ltd for any of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in this report are on basis of RSK ADAS Ltd using due skill, care and diligence in the preparation of this report and no explicit warranty is provided as to its accuracy. It should be noted that no independent verification of any of the documents supplied to RSK ADAS Ltd has been made.

Revision History

ADAS Ref (Revision number)	Date	Amendment
BXT69105-287 (00)	15th July 2019	INITIAL REPORT

BXT69105-287 (00)	30th July 2019	SECOND REPORT
BXT69105-287 (00)	6th August 2019	FINAL REPORT

Contents

Summary

ADAS was commissioned by BSR Energy to undertake a Preliminary Ecological Appraisal (PEA) of an area of agricultural land near South Fambridge. The client proposes to allocate the land for the development installation of a solar park in an area of predominantly arable farmland near the village of South Fambridge, Essex.

ADAS Ecological Consultant Jack Morphet undertook the survey of the site, including an assessment of any connected habitats on the 2nd and 3rd July 2019. A desk study of the area showed that located c. 80m north of the site is the Crouch and Roach Estuaries which is designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA) and Ramsar. It also forms part of the Essex Estuaries Special Area of Conservation (SAC) and Blackwater, Crouch, Roach and Colne Estuaries Marine Coastal Zone (MCZ).

The survey identified that the site is dominated by arable land, bordered by hedgerows and ditches, with trees and stretches of tall ruderal habitat in the field margins. Scattered scrub habitat is also present in certain parts of the site, present as stands on boundaries and localised as natural regeneration.

The majority of the site has limited ecological value due to its agricultural and managed nature. A pond was recorded in the west of the site which provides potential for amphibians including great crested newts. This pond is also close to another four ponds located outside the site boundary.

The arable farmland, hedgerows, trees, and scattered scrub all have the potential to support nesting birds as well as foraging/commuting bats. The field margins provide a network of suitable habitat for a variety of species, including reptiles. The field margins also provide ideal habitat for ground nesting bird species. A drain located at the northern boundary of the site has the potential to support water voles.

The impacts from the development during the construction phase are considered to have the potential to cause negative impacts on protected wildlife species without the implementation of appropriate mitigation measures. However, there is the opportunity for the proposed development to be designed in a way to avoid impacting ecological features. If great crested newts are confirmed using the pond on site, mitigation will need to be established and implemented prior to works so that this species is not negatively affected. There are proposed developmental works which will impact on hedgerows which could have a localised impact on nesting birds, if done during the nesting bird season.

Due to the current nature of the site being predominantly arable fields the proposed development provides a significant opportunity to enhance the local ecological value of the site through the inclusion of wildflower meadows, habitat for ground nesting birds and enhancement to existing features such as hedgerows and ponds. Such measures incorporated into the proposed design for the site will be in-

keeping with the National Planning Policy Framework (NPPF) and local policies in order that a net biodiversity gain can be achieved.

Summary of Further Survey or Actions

The table below provides information on further surveys, mitigation measures and enhancement measures to be undertaken on site.

Survey/Action	Rationale	When
Green infrastructure	Green infrastructure planting to support species associated with the site and enhance the sites biodiversity. Must be in accordance with the NPPF and Rochford District Council policy DM26 - works to promote a net-gain for biodiversity. The design of such green infrastructure should be incorporated into a management plan for the site.	Design phase
Habitats Regulations Assessment	The site is close to the internationally designated sites to the north.	Pre-development
Bird/bat box and log pile installation	To provide compensation for potential loss of habitat for birds, bats and reptiles on site, installation of; ten bird boxes, eight bat boxes and six log piles are required. Location and design to be incorporated in the management plan.	Design phase with installation during construction phase
Great crested newt survey	A pond and its surrounding habitat in the west of the site has potential for great crested newts. This is supported with evidence from Essex Wildlife Trust and Essex Field Club records.	Pre-development
Nesting bird check	Vegetation clearance of hedge sections and scrub required. A nesting bird check is required if this occurs with the nesting bird season (March to August inclusive).	Construction phase
Ground nesting bird check	The arable fields and field margin vegetation must be checked prior to vegetation clearance of both these habitats to enable solar farm installation if this occurs in the bird nesting season (March to August inclusive).	Construction phase
Reptile two stage cut (if required)	Reptiles recorded in the EWT and EFC report and suitable habitats observed during the survey.	Construction phase
Water vole survey (if scheme involves works within 10m of the drain)	The drain in the north of the site has the potential for water vole populations.	Pre-development

Survey/Action	Rationale	When
Soft felling of trees with low PRF (potential roost feature) if required.	A mature oak tree in the south of the site boundary. If works change from the proposed plans and the tree require removal, it will need to be soft felled due to its low PRF.	Pre-development

1 Introduction

1.1 Background and Survey Objectives

ADAS was commissioned by BSR Energy to undertake a Preliminary Ecological Appraisal (PEA) of an area of land (c. 151 ha) surrounding South Fambridge Hall, Fambridge, Essex, proposed for development of a solar park, covering 200 acres of the site. The land is located at grid reference TQ 86805 95628 (centre point) and is hereafter referred to as 'the site'.

The aim of the PEA is to identify ecological constraints to the proposed works and make recommendations for mitigation or opportunities for enhancement that can be incorporated into the restoration plan and design. The PEA also makes recommendations for further surveys, as required.

The report has been prepared in accordance with guidance produced by the Chartered Institute of Ecology and Environmental Management (CIEEM 2017) and the British Standard 42020:2013.

The objectives of this report are to:

- identify designated nature conservation sites within the vicinity of the site;
- identify any records and/or populations of protected, notable or scarce species in the vicinity of the site;
- record habitats or features of ecological interest within or in immediate proximity to the site;
- record the presence of, or potential for, protected or notable species;
- make an ecological assessment and highlight potential ecological constraints;
- outline any further survey work and potential protected species requirements if relevant; and
- make suggestions for avoidance, mitigation compensation and enhancements in line with planning policies where appropriate.

1.2 Site Description

The site was located to the east of South Fambridge. Fambridge Road transects the site in a north/south direction. The site comprises of nine separate fields, being predominantly arable crop land with a mosaic of dry ditches, small pockets of scrub, scattered trees and semi improved grassland. Hedgerows bordered a proportion of fields on the site. Grassland and tall ruderal strips were present in every field between the arable crops and the hedgerow or field boundary. A pond was present in the west of the site and a drain at the northern boundary of the site. The site was immediately surrounded by similar arable land in a west and east direction. A small rural village was located to the south of the site. The River Crouch lies to the north of the site, travelling in an easterly direction.

An approximate site boundary is provided within Figure 1 below.

Figure 1. Site location and wider landscape (site indicated by red line boundary)

Imagery taken from Microsoft Virtual Earth (Bing). July 2019.

1.3 Description of the Proposed Development

The proposed development will involve the construction of a Solar Park on the site. The works will include installation of a 49MW DC solar PV park across 200 acres of the site. A substation is proposed for installation in a field in the southern section of the site. An underground cable is proposed to route in a north easterly direction from this substation on site. It is assumed that the land (on site) around the proposed solar PV park will not be affected by the installation and development. Green infrastructure is planned as part of the recommended mitigation for the development.

The indicative proposed area of development is presented within Appendix 1.

2 Methodology

2.1 Desk Study

A desk study was carried out in July 2019 to identify statutory designated sites within a 5km radius and non-statutory designated sites of nature conservation importance, together with known records of protected and other notable species, within a 2km radius of the proposed development.

Multi-Agency Geographic Information for the Countryside (MAGIC) was used to derive information relating to the location of statutory designated sites and priority habitats.

Essex Field Club (EFC) and Essex Wildlife Trust (EWT) provided details of non-statutory designated sites of nature conservation importance and records of protected and other notable species (see Appendix 3).

It is important to note that most species are greatly under-recorded and therefore a lack of records for a location should not be taken as an absence of the species concerned. Furthermore, a record for a particular habitat or species does not necessarily confirm its current presence.

2.2 Field Survey

2.2.1 Extended Phase 1 Habitat Survey

A Phase 1 Habitat Survey was conducted on the 2nd and 3rd July 2019 by ADAS Ecological Consultant Jack Morphet (hons) gradCIEEM based on the techniques and methodologies described in the Handbook for Phase 1 Habitat Survey (JNCC 2010) and using standard nomenclature (Stace 2010). The habitats present were recorded on to a field map with written target notes providing supplementary information on, for example, species composition structure and management where relevant.

This was extended to include notes on fauna and habitats which could potentially support protected species, an approach commonly referred to as an Extended Phase 1 Habitat Survey. The presence of, or potential for, protected species was noted on the field map during the survey.

2.3 Assessment and Evaluation

The importance of the habitat features on site were assessed and defined in a geographical context (see Appendix 2). The frame of reference for the habitat features in terms of their geographical importance is in line with guidance set out in CIEEM, 2018.

Species have been assessed, where appropriate, against best practice guidelines.

As part of the evaluation further surveys have been recommended based on the suitability of habitats to support protected species, the habitats themselves and potential impacts posed by the proposed development and the legal protection afforded to both habitats and species.

2.4 Zone of Influence

The assessment conducted for this report has considered the area in which ecological features could be subject to significant effects from the proposed development. The area of the potential effects is often wider than the actual perimeter of the development site and is known as the Zone of Influence.

The Zone of Influence varies for different ecological features and each designated site, habitat and species has been considered in relation to their sensitivity to the proposed development (see Appendix 2).

The zone of influence for protected species were restricted to 250m from the site for great crested newts and 50m for other species.

2.5 Limitations

The survey was undertaken during an optimal time for Phase 1 Habitat surveys (April to September inclusive), providing no limitations to the assessment of the on-site habitats.

3 Baseline Ecological Conditions

3.1 Desk Study

Four Sites of Special Scientific Interest (SSSI), two Ramsar's, three Special Protection Areas (SPA's), a Special Areas of Conservation (SAC), a Nature Improvement Area (NIA), three Local Nature Reserves (LNR), a Country Park, a B-Line Network Area and a Marine Conservation Zone (MCZ) are located within a 5km radius of the site. One non-statutory LWS (local wildlife site) designation is situated within a 2km radius of the site as shown in table 1 below.

See Table 1 below and Appendix 3 for further details.

Table 1: Statutory and non-statutory designated sites within 5km and 2km of the survey site

Site Name	Description	Designations	Distance from site
Statutory Designated Site			
Crouch and Roach Estuaries	The rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brickearth and loams with patches of sand and gravel. The intertidal zone along the rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud in contrast with other estuaries in the county. This however is used by significant numbers of birds, and together with the saltmarsh and grazing marsh which comprise the Crouch and Roach Estuaries SSSI, Ramsar and SPA, regularly support internationally important numbers of one species, and nationally important numbers of three species of wader and wildfowl. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants.	SSSI, Ramsar, SPA	80m - north
Essex Estuaries	This is a large estuarine site in south-east England, and is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach rivers and is	SAC	80m - north

Site Name	Description	Designations	Distance from site
Statutory Designated Site			
	important as an extensive area of contiguous estuarine habitat. Essex Estuaries contains a very wide range of characteristic marine and estuarine sediment communities and some diverse and unusual marine communities in the lower reaches, including rich sponge communities on mixed, tide-swept substrates. Sublittoral areas have a very rich invertebrate fauna, including the reef-building worm *Sabellaria spinulosa*, the brittlestar *Ophiothrix fragilis*, crustaceans and ascidians. The site also has large areas of saltmarsh and other important coastal habitats.		
Black water, Crouch, Roach and Colne Estuaries	The site protects one of the largest estuaries in the East of England and includes the Blackwater, the largest tidal river in Essex. The MCZ will build upon the existing designations, by offering protection to features such as the native oyster which are not already protected.	MCZ	80m - north
Hockley Woods	Hockley Woods are a contiguous group of ancient coppice woods incorporating Great Bull wood, Great Hawkwell Wood, Beeches Wood and Parson's Snipe. They lie on the crest and slopes of a ridge of pre-glacial gravels and clay north-west of Southend-on-Sea. They form one of the most extensive areas of ancient woodland in South Essex, the dominant stand types comprising the sweet chestnut (*Castanea sativa*), variants of pedunculate oak (*Quercus robur*), hornbeam (*Carpinus betulus*), birch-hazel variant (*Betula/Corylus avellana*) and sessile oak (*Quercus petraea*). The population of sessile oak is probably the largest in eastern England.	SSSI, LNR	3.3km - south west
B-Lines network	B-Lines is a landscape scale initiative to enhance declining pollinator populations by connecting up the best remaining wildflower-rich habitats through the creation or restoration of wildflower habitats. B-Lines was identified as a method to reverse pollinator declines in the National Pollinator Strategy's Implementation Plan, by aiding their movement across the fragmented landscape.	B-Lines network	2.5km - south
Foulness	This is a large area which is a SSSI and SPA of land, water or sea which has been identified as being of international importance for the	SPA, Ramsar, SSSI	4.8km - south east

Site Name	Description	Designations	Distance from site
Statutory Designated Site			
	breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within the European Union. SPAs are European designated sites, classified under the European Wild Birds Directive which affords them enhanced protection. It is also a Ramsar site noted for its international importance of wetlands, designated under the Ramsar Convention. Wetlands are defined as areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres. Ramsar sites may also incorporate riparian (banks of a stream, river, pond or watercourse) and coastal zones adjacent to the wetlands, and islands or bodies of marine water deeper than six metres at low tide lying within the wetlands.		
Outer Thames Estuary	The Outer Thames Estuary SPA is located on the southeast coast of England, stretching from Caister-on-Sea in Norfolk down the Suffolk coast to Sheerness on the Kent coastline, and reaching as far as Canvey Island into the Thames Estuary. The SPA is divided into three discreet areas: the outer estuary of the Thames (including Kent and Essex coastal waters); the Suffolk and south Norfolk coastal waters; and an offshore area further northeast. The site crosses the 12 nautical mile boundary and therefore lies partly in territorial and partly in offshore waters. The site is designated for non-breeding red-throated diver (*Gavia stellata*), a diving seabird which overwinters in large numbers within the southern North Sea, feeding predominately on fish.	SPA	5km - east
The Cliff, Burnham-on-Crouch	The Cliff, Burnham-on-Crouch, is an interesting site which has yielded a fossil avifauna (birds) of the Lower Eocene age. This includes type material of two small species, *Coturnipes cooperi* (a game bird) and *Parvicuculus minor* (a protocuculid). The site is of considerable value in expanding the limited knowledge of small Eocene birds species and avian evolution.	SSSI	4.2km - east
Marsh Farm	A commercial Farm with livestock, consisting of 300 acres of land adjacent to the River Crouch.	Country Park	3.5km - west

Site Name	Description	Designations	Distance from site
Statutory Designated Site			
Magnolia Fields	A Local Nature Reserve (LNR) for both people and wildlife. Magnolia Nature Reserve on the Ashingdon/Hawkwell border is an area of habitat and can usually be found alive with bird life. One of the specialties that have been found most winters in good numbers is the increasingly rare bullfinch (*Pyrrhula pyrrhula*).	LNR	2.9km - south west
Marylands	A Local Nature Reserve with a mosaic of woodland and grassland habitats. It is managed to enhance local flora and fauna including butterflies and insects. It covers an area of 3.7 ha.	LNR	3.2km - south west
Greater Thames Marshes Nature Improvement Area	The Greater Thames Marshes Nature Improvement Area covers nearly 50,000ha of estuarine marshland in South East England, stretching from East London to Southend in Essex and Whitstable in Kent. It is one of the most important estuaries in Europe for some 300,000 wintering waterfowl and is home to endangered species such as the water vole (*Arvicola amphibious*), shrill carder bee (*Bombus sylvarum*), unique invertebrates of the Thames Terrace soils and many farmland birds.	NIA	5km - east
Non-statutory Designated Sites			
Hyde Woods	This small ancient wood, isolated on the plain east of Ashingdon, has much hawthorn (*Crataegus monogyna*) with scattered pedunculate oak (*Quercus robur*), ash (*Fraxinus excelsior*) and field maple (*Acer campestre*). Recorded flora of note includes spurge laurel (*Daphne laureola*), dogwood (*Cornus sanguinea*) and buckthorn (*Rhamnus cathartica*).	LWS	1.2km - south east

3.2 Field Survey

The habitats identified within the Extended Phase 1 Habitat Survey are listed and described below. All habitats are marked on the Phase 1 Habitat map in Appendix 4, marked out Target Notes in Appendix 5 and each habitat type is illustrated with a photograph in Appendix 6.

On site habitats:

- Arable;

- Ditch;
- Poor semi-improved grassland;
- Scattered scrub;
- Scattered trees;
- Species poor hedgerows;
- Standing water; and
- Tall ruderal.

3.2.1 Arable

The site is dominated by arable farmland (approximately 127 ha), with three arable species occupying 8 of the 9 fields on site (photograph 1). The arable crops were varieties of wheat, barley and oat species. The sward height of all the crops present within the site stood at approximately 40-50cm at the time of survey. The fields with the arable crop had an even distribution until they were met by the field margins or ditches.

3.2.2 Ditch

The site had 15 ditches dividing the sites fields. The ditches were all dry apart from one in the north of the site at grid reference TQ 87081 95659 (see target note 1). The ditches were heavily overgrown with vegetation and in some areas were bordered by hedgerows. The majority of vegetation within the ditches comprised of false oat grass (*Arrhenatherum elatius*) which was dominant in this habitat throughout the site. Common reed (*Phragmites australis*) was also dominant in localised sections of the ditches throughout this site (see photograph 2).

The ditch containing water in the north of the site had a low water level (approximately 10-20cm), with eutrophic water being present, with a high amount of algae.

3.2.3 Poor semi-improved grassland

In the south of the site was a small field of semi-improved grassland (see photograph 8). The grassland showed evidence of historic cattle grazing due to concentrated clumps of grass and forb species which thrive off localised soil enrichment from livestock nutrient waste. The sward height of grass species varied at approximately 30-100cm in height. Common grass species observed in this habitat were cocksfoot, perennial ryegrass (*Lolium perenne*), false oat grass, meadow foxtail (*Alopecurus pratensis*), wall barley (*Hordeum murinum*) and Yorkshire fog (*Holcus lanatus*). Stands of dock (Rumex spp.) and creeping thistle (*Cirsium arvense*) were concentrated in localised areas within this grassland area.

3.2.4 Scattered scrub

Stands of scattered hawthorn and blackthorn scrub were present in the middle and eastern parts of the site around the field margins (see photograph 4). The scrub in this section of the site was between arable land and the dry ditch boundaries.

Within the southern area of the site was an area of scattered goat willow (*Salix caprea*) scrub (see photograph 5). This habitat consists of regenerated willow scrub surrounded by tall ruderal habitat, with grass species including false oat grass, timothy grass (*Phleum pratense*) and cocksfoot (*Dactylis glomerata*) dominating the ground flora. Rosebay willowherb (*Chamaenerion angustifolium*) was also present within this habitat (see photograph 6).

3.2.5 Scattered trees

Trees of varying ages of maturity were present between gaps in hedgerows, predominately in the south of the site (see Appendix 3). English oak was the dominant species occurring in this habitat (see photograph 7). Field maple and ash (*Fraxinus excelsior*) were also frequent. Crack willow was observed in a localised section on the boundary of a field in the north of the site, adjacent to a pond located outside the site boundary.

3.2.6 Species-poor hedgerows

There were 19 hedgerows (H1 to H19) present, all bordering sections of four fields located in the southern and middle sections of the site. See Appendix 4 for their locations.

H13 had the highest number of hedgerow species, containing English elm (*Ulmus minor*), field maple (*Acer campestre*), common hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), English oak (*Quercus robur*), elder (*Sambucus nigra*) and bramble (*Rubus fruticosus*) within the hedgerow length (refer to target note 2).

All the hedgerows on site (H1-H19) were classed as species-poor hedgerows (see photograph 3). Dominant species recorded were English elm, common hawthorn and blackthorn, with English oak and field maple recorded as occasional. Other hedgerow species that were noted include crack willow (*Salix fragilis*) in H15.

Adjacent to all the hedgerows were tall ruderal or ditch habitats. The ground flora underneath all the hedgerows was poor, being predominately ivy (*Hedera helix*) or bare ground.

3.2.7 Standing water

On the western boundary of the site was a small pond approximately 14m in diameter (see photograph 9). This was surrounded by willow trees and marginal vegetation, with great reedmace (*Typha latifolia*) being the dominant species. The ponds banks were covered in tall ruderal habitat being predominately

nettles (*Urtica dioica*.). There were four other neighbouring ponds all within 250m of this pond but were located outside the site boundary and were not accessible at the time of survey.

At the northern boundary of the site, there was a drain approximately 12m in width (see photograph 10). This water body contained high levels of algae and on both bank edges had false oat grass. The northern bank contained a high sloped bank with grassland vegetation. The south bank was adjacent to the arable fields with a tall ruderal strip between the drain and arable habitat.

3.2.8 Tall ruderal

Adjacent to the boundary hedgerows and ditches of all the arable fields across the site was tall ruderal habitats. Species observed as abundant within this habitat were rosebay willowherb, thistles (*Cirsium spp.*), common hogweed (*Heracleum sphondylium*) and cow parsley (*Anthriscus sylvestris*) (photograph 11). Common wild oat grass (*Avena fatua*), cocksfoot grass (*Dactylis glomerata*) and false oat grass was also interspersed within this habitat.

3.3 Species

3.3.1 Amphibians

EWT provided 1 record of a great crested newt (*Triturus cristatus*) within the last ten years within 2km of the site. EFC provided 2 records of great crested newts and one record of a smooth newt (*Triturus vulgaris*) within the last ten years. The closest recording of the great crested newts was 0.3km from the centre point of the site. The pond at the western boundary of the site was observed as suitable habitat for great crested newts and other amphibians due to vegetative cover and having other ponds within close vicinity. The arable habitat on site was sub-optimal for great crested newts due to its managed agricultural nature, however the hedgerows, standing water and tall ruderal habitats would provide shelter and connectivity for this species.

3.3.2 Badgers

EWT provided no records of badgers (*Meles meles*) from the last ten years within 2km of the site. EFC provided one record of a badger within the site radius from data within the last ten years. The closest recording of the badger was 1.5km from the centre point of the site.No evidence of badgers was recorded during the Extended Phase 1 Habitat Survey on site. The site would be suitable for badgers to commute through, using the hedges and field margins to access more favourable habitats such as woodlands. Hyde Wood which is a local wildlife site (LWS) provides such a habitat and is located 1.2km from the site.

3.3.3 Bats

EWT returned 20 records of bats within 2km of the site, with 4 species observed, with the majority being common pipistrelle (*Pipistrellus pipistrellus*). EFC provided over 50 records of bats over the site with the same species as the EWT and a serotine (*Eptesicus serotinus*). The closest recording of the bat species was

1.5km from the centre point of the site. The site was considered suitable for supporting foraging and commuting bat species due to its hedgerows, trees and open nature. The hedgerows had the potential to provide some potential food sources for foraging bats. A mature oak at grid reference TQ 85875 94633 at the west of H3 contained a low potential roost feature (PRF) (see target note 3). The PRF had a large vertical crack down a north facing broken limb on the English oak. The crack widens slightly towards the bottom of the crack. No other PRFs were identified.

3.3.4 Birds

EWT and EFC provided records of Wildlife and Countryside Act 1982 (as amended) Schedule 1 species within 2km, including; kingfisher (*Alcedo atthis)*, red kite (*Milvus milvus*), goshawk (*Accipiter gentilis*), barn owl (*Tyto alba*), osprey (*Pandion haliaetus*), whimbrel (*Numenius phaeopus*), stone curlew (*Burhinus oedicnemus*), Lapland bunting (*Calcarius lapponicus*), ruff (*Philomachus pugnax*), marsh harrier (*Circus aeruginosus*), hen harrier (*Circus cyaneus*), merlin (*Falco columbarius*), hobby (*Falco subbuteo*) and common scoter (*Melanitta nigra*).

The habitats on site had the potential to support common and widespread bird species. Ground nesting bird habitats were also present in the arable, tall ruderal and marginal vegetation habitats. The arable grass species that covered the majority of the site also has potential to support ground nesting bird species such skylark (*Alauda arvensis*) which was observed on site during the survey.

3.3.5 Hazel dormouse

EWT and EFC provided no records of hazel dormice (*Muscardinus avellanarius*) within 2km of the site.

The hedgerow habitat was considered to have a limited potential to support hazel dormouse due to the lack of suitable foo sources and other suitable vegetative habitat.

3.3.6 Otter

EWT and EFC provided no records of otters (*Lutra lutra*) within 2km of the site.

The site had limited potential to support this species due to the predominately arable nature of the area. The pond in the west and dry ditches in the fields have potential to provide suitable and fresh water availability for this species. The site itself is unlikely to be used by otters due to the lack of water sources and more suitable areas to the north of the site such as the River Crouch.

3.3.7 Reptiles

There have been 3 records of reptiles provided by EWT within the last ten years. A grass snake (*Natrix helvetica),* adder (*Viper berus*) and common lizard (*Zootoca vivipara*). EFC recorded ten records of reptiles within the last ten years of data. This included the same species as recorded by EWT and slow worms (*Anguis fragilis*). The closest recording of the reptiles was a slow worm 0.7km from the centre point of the

site. The majority of the site had limited potential to support reptiles due to its open and managed nature. The ditches, hedgerows and field margins with tall ruderal species provided potential reptile habitats to forage and commute through. The pond within the site provides suitable habitat for grass snakes. However, given the wider intensively managed landscape, reptiles would have a limited potential to both access and commute through the site.

3.3.8 Water vole

EWT and EFC provided no records of water voles (*Arvicola amphibius*) within the last ten years.

The site did have suitable habitat to support water voles with the drain at the northern boundary. The ditches within the site (when water is present) provide a potential commuting network through the site. No water vole field signs were observed.

3.3.9 Non-native invasive plants

EWT have recorded least duckweed (*Lemna minuta*), New Zealand pigmy weed (*Crassula helmsii*) and common cord grass (*Spartina anglica*) with 2km of the site. No non-native invasive plant species were recorded on this site during the Phase 1 Habitat Survey.

.

4 Planning Policy and Legislation

4.1 Local Planning Policy

Table 2 details the policies within Rochford District Council's adopted plans which are relevant to the ecological features on site.

Table 2: Summary of relevant local planning policy – Rochford District Council

Policy	Description
DM26 – Other Important Landscape Features.	When considering proposals for development, it must be shown that consideration has been given to the landscape character of the area and the findings of the Rochford District Historic Environment Characterisation Project (2006). The Council will protect the following landscape features when considering proposals, where they are of importance for fauna and flora, from loss or damage: (i) Hedgerows; (ii) Semi-natural grasslands; (iii) Marshes; (iv) Watercourses; (v) Reservoirs; (vi) Lakes; (vii) Ponds; and (viii) Networks or patterns of other locally important habitats. Development which would adversely affect, directly or indirectly, the landscape features listed above will only be permitted if it can be proven that the reasons for the development outweigh the need to retain the feature and that mitigating measures can be provided, which would reinstate the nature conservation value of the features. Where a particular landscape feature is of ecological or landscape importance and should be retained, planning permission will be conditioned to ensure the retention and continued maintenance/management, where appropriate, of this landscape feature. On-site environmental enhancements including opportunities to create/enhance/restore habitats, and to contribute to Water Framework Directive objectives, will also be sought. Conditions will be attached to planning permissions to encourage the proper management of these important landscape features, where appropriate. In addition to, or instead of, the completion of a legal agreement will be required to secure the provision of a replacement landscape feature of equivalent value, and to ensure the future management of this feature
DM27 – Species and Habitat Protection.	Proposals should not cause harm to priority species and habitats identified under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006. Development will only be permitted where it can be demonstrated that the justification for the proposal clearly outweighs the need to safeguard the nature conservation value of the priority habitat, and/or the priority species or its habitat. In such cases the Local Planning Authority will impose conditions and/or seek the completion of a legal agreement in order to:

Policy	Description
	(i) secure the protection of individual members of the priority species and/or habitats; (ii) minimise the disturbance to the priority species and/or habitats; and (iii) provide adequate alternative habitats to sustain at least the current levels of population for protected species and/or provide a compensatory habitat to offset potential loss or disturbance of a priority habitat. In addition to the UK Biodiversity Action Plan, proposals for development should have regard to Local Biodiversity Action Plans, including those produced at District and County level.
ENV6 – Large Scale Renewable Energy Projects	Planning permission for large-scale renewable energy projects will be granted if: • the development is not within, or adjacent to, an area designated for its ecological or landscape value, such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar Sites, Sites of Special Scientific Interest (SSSI's), Ancient Woodlands, Local Nature Reserves (LNRs) or Local Wildlife Sites (LoWSs); or if it can be shown that the integrity of the sites would not be adversely affected; • there are no significant adverse visual impacts.

4.2 National Planning Policy Framework

The National Planning Policy Framework (NPPF) February 2019, is an update to the previous version issued in March 2012, and is a policy framework document which provide a range of important principles. Paragraph 170 of the NPPF states that decisions should contribute to and enhance the natural local environment by:

'*Minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.'*

Paragraph 171 goes on to state:

'… 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.'

When determining planning applications, local planning authorities should aim to conserve and enhance biodiversity by applying the following principles (paragraph 175):

'Development whose primary objective is to conserve or enhance biodiversity should be supported'

'Opportunities to incorporate biodiversity in and around developments should be encouraged.'

4.3 Relevant Legislation

4.3.1 National Legislation

4.3.1.1 The Wildlife and Countryside Act 1981

The Wildlife and Countryside Act 1981 (as amended) consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the conservation of wild birds (Birds Directive) in Great Britain.

4.3.1.2 Natural Environment & Rural Communities Act 2006

Section 40 of the NERC Act 2006 places a duty upon all local authorities in England to promote and enhance biodiversity in all of their functions. Section 41 lists habitats and species of principal importance to the conservation of biodiversity. Fifty-six habitats and 943 species of Principal Importance for Conservation are included on the Section 41 list and draws upon the UK BAP List of Priority Species and Habitats.

4.3.1.3 The Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law and transpose elements of the EU Wild Birds Directive in England and Wales. The Regulations provide for the designation and protection of 'European sites' (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)), the protection of 'European protected species', and the adaptation of planning and other controls for the protection of European Sites.

4.3.1.4 Ramsar Convention

Ramsar is an international treaty and was negotiated through the 1960s by countries and non - governmental organizations concerned about the increasing loss and degradation of wetland habitat for migratory waterbirds. It was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975. Ramsar sites are wetlands of international importance designated under the Ramsar Convention.

4.3.1.5 Sites of Special Scientific Interest (SSSI)

SSSI are areas notified under the Wildlife and Countryside Act, 1981 (as amended) by Natural England as being of special interest for nature conservation. Statutory undertakers are required to seek Natural England assent before any listed, potentially damaging operations, development or change in land use etc. can be carried out.

4.3.2 Species Specific Legislation

4.3.2.1 Bats

Bats are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017. Under the Wildlife and Countryside Act 1981 it is illegal to:

- Kill or injure bats;
- Cause disturbance at their resting places; or
- To block access to, damage or destroy their roost sites.

Under the Conservation of Habitats and Species Regulations 2017 it is an offence to:

- Deliberately capture or kill a bat;
- To damage or destroy a breeding site or resting place of any bat. (This is an absolute offence and intent or recklessness does not have to be proved); and
- Deliberately disturb a bat (this applies anywhere, not just at its roost).

4.3.2.2 Birds

Breeding wild birds are protected under the Wildlife and Countryside Act 1981 (as amended). Under the Wildlife and Countryside Act, a wild bird is defined as any bird of a species that is resident in or is a visitor to the European Territory of any member state in a wild state. Game birds however are not included in this definition (except for limited parts of the Act). They are covered by the Game Acts, which fully protect them during the close season. All birds, their nests and eggs are protected and it is thus an offence, with certain exceptions to:

- intentionally kill, injure or take any wild bird;
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built;
- intentionally take or destroy the egg of any wild bird;
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954;
    - have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954;
- use traps or similar items to kill, injure or take wild birds; and
- have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations.

Additionally for some species listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) it is an offence to intentionally or recklessly disturb the adults while they are in and around their nest or intentionally or recklessly disturb their dependent young.

4.3.2.3 Great crested newts

Great crested newts are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 where they are protected from intentional injuring or killing.

4.3.2.4 Reptiles

Adder (*Vipera berus*), slow-worm (*Anguis fragilis*), grass snake (*Natrix helvetica*) and common lizard (*Zootoca vivipara*) are protected under the Wildlife and Countryside Act 1981 (as amended). It is illegal to kill or injure them.

Smooth snake and sand lizard also receive legal protection under the Conservation of Habitats and Species Regulations 2017. It is not illegal to capture, disturb or to damage their habitats. However, the reptiles themselves are protected so any works to damage their habitat could risk causing harm to reptiles and hence could be illegal.

4.3.2.5 Water voles

Water voles are protected under the Wildlife and Countryside Act 1981 (as amended). Under the Wildlife and Countryside Act 1981 it is illegal to:

- intentionally kill, injure or take a water vole;
- possess or control water vole(s) (live or dead animal, part or derivative);
- damage to, destruction of, obstruction of access to any structure or place used by water vole for shelter or protection;
- disturb water voles using such a structure;
- sell, possess or transport a water vole for the purpose of sale; and
- advertise for buying or selling of water voles.

5 Evaluation of Ecological Features/Further Survey

Table 3 below provides an evaluation of the ecological features, identifying which are of sufficient value to be taken forward. Any ecological feature that is identified as negligible value will not be considered further, where there is insufficient evidence further surveys will be recommended to be able to assess the ecological value of that feature in relation to the site and the proposed development.

Table 3: Evaluation of ecological Feature/further survey

Ecological Feature	Summary of Value	Assessed value/further survey
Statutory designated sites – SSSI and LNR	Hockley Woods is an ancient deciduous woodland in south Essex. Due to the distance from the site and the design of the proposed development, no impact is predicted.	Negligible value
Statutory designated sites – B-Lines network	B-Lines network is a landscape scale initiative to enhance declining pollinator populations by connecting up the best remaining wildflower-rich habitats through the creation or restoration of wildflower habitats. Due to distance and no predicted loss of wildflower areas, no impact is predicted.	Negligible value
Statutory designated sites – SSSI, SPA and Ramsar	Foulness is a large area of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within the European Union. No impacts predicted due to distance from site.	Negligible value
Statutory designated sites - SPA	Outer Thames Estuary is a large area highlighted for its importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found within the European Union. No impacts predicted due to distance from site.	Negligible value
Statutory designated sites - SSSI	The Cliff, Burnham-on-Crouch is an interesting site which has yielded a fossil avifauna (birds) of the Lower Eocene age.	Negligible value
Statutory designated sites – Country park	Marsh Farm country park is a commercial farm that contributes to England's accessible natural greenspace.	Negligible value
Statutory designated sites - LNR	Marylands is an area for both people and wildlife, with wildlife or geological features that are of special interest locally.	Negligible value
Statutory designated sites - LNR	Magnolia Fields an area for both people and wildlife, with wildlife or geological features that are of special interest locally.	Negligible value

Statutory designated sites - NIA	The Greater Thames Marshes Nature Improvement Area is an area which covers nearly 50,000ha of estuarine marshland. It is one of the most important estuaries in Europe for some 300,000 wintering waterfowl and is home to endangered species such as the Water Vole, Shrill Carder Bee, unique invertebrates of the Thames Terrace soils and many farmland birds. Potential for impacts depending on nature of development.	National value
Statutory designated sites - SAC	Essex Estuaries is a large estuarine site in south-east England, and is a typical, undeveloped, coastal plain estuarine system. Potential for impacts depending on nature of development.	International value
Statutory designated sites - MCZ	Blackwater, Crouch, Roach and Colne Estuaries protects one of the largest estuaries in the East of England and includes the Blackwater, the largest tidal river in Essex. Potential for impacts depending on nature of development.	National value
Statutory designated sites – SSSI, SPA and Ramsar	Crouch and Roach Estuaries regularly support internationally important numbers of one species, and nationally important numbers of three species of wader and wildfowl. Potential for impacts depending on nature of development.	International and national value
Non-statutory designated sites - LWS	Hyde Woods is a small ancient mixed deciduous woodland. No negative impacts are predicted due to the nature of the works and distance from site.	Negligible value
Arable	The site was dominated by arable land at the time of survey which is a common and widespread habitat of the surrounding area.	Negligible value
Ditch	Dry ditches were numerous across the sight, being predominated by a few common grass species.	Negligible value
Hedgerows	Hedgerows provided important connectivity across the landscape and suitability for nesting birds. Hedgerows are also a habitat of principle importance under the NERC Act 2006 and listed under local policy DM26 – other important landscape features.	Local value
Scattered scrub	The site contained stands of scrub on field boundaries and an area of willow scrub in the south of the site. This habitat provided additional habitat structure and stepping stone habitats in otherwise ecologically poor environment.	Local value.

Scattered trees	Tree species border the fields on this site where the hedgerows stop. The trees are of varying maturity, with English oak the most common.	Local value.
Semi-improved grassland	A small field on site contains a semi-improved grassland. As the surrounding area is dominated by an arable landscape, this habitat provides biodiversity within the area.	Local value.
Standing water	A pond and drain are on site. There are numerous ponds within the area near the site. Ponds are listed as a habitat of principle importance under the NERC act and are listed under local policy DM26 – other important landscape features.	Local value.
Tall ruderal	Low diversity of tall ruderal habitat in the field margins. A habitat of species that are very common and widespread within the local countryside.	Negligible value.
Amphibians	The site was dominated by arable land, however there was a pond with suitability for amphibians with connectivity to other potential suitable ponds for amphibians.	Cannot be determined until further surveys are completed.
Badgers	No field signs or recordings of badgers from EWT.	Negligible value.
Bats	The site is open and lacks suitable habitat for foraging or roosting bats, with the exception of areas above the hedgerows. A mature oak tree may have potential to support bat species with a low potential roost feature. However this trees is not impacted by the proposed development.	Local value for commuting and foraging
Breeding birds	The site held potential to support nesting and ground nesting birds.	Local value.
Hazel dormice	The habitats within the site were considered sub-optimal and lacked in connectivity to woodland.	Negligible value
Otters	The site had limited suitability and connectivity for otters.	Negligible value.
Reptiles	Limited habitat within margins that could have potential to provide shelter for reptile species. The wider landscape was sub-optimal for this species group.	Local value.
Water voles	Suitable habitats were present on site for water voles in the form of the drain at the north boundary.	Local value
Invasive plants	No invasive plant species were recorded within the site, but invasive plant species were recorded in the wider area.	No further action required.

5.1 Ecological Constraints, Opportunities and Recommendations

5.1.1 Designated sites

The Crouch and Roach Estuaries SSSI, Ramsar, SPA, Essex Estuaries SAC and Blackwater, Crouch, Roach and Colne Estuaries MCZ are designated sites that are located north of the site (approximately 80m). The sites hold ecological importance due to bird species that use these areas and the habitats they hold. The proposed development of the solar panels will require a change of landscape in sections of the site. The landscape around the mentioned designated sites provide an environmental buffer. Specifically it provides further food availability, nesting opportunities and space availability when competition is high amongst species using the statutory sites. This is particularly important for the designated sites closer to the development site. The habitats on site that would be suitable for waders and wildfowl from the designated sites are standing water (pond and drain), arable land and tall ruderal habitats in field margins. The arable land and tall ruderal habitats provide ground nesting opportunities.

A Habitats Regulations Assessment screening is likely to be needed due to the proximity of the site to the internationally designated site, adhering to the local planning policy ENV6.

5.1.2 Habitats

The proposed development is considered unlikely to negatively impact the ecological value of the habitats on site. The underground cable route will transect three hedgerows, as well as the tall ruderal habitat in the field margins. Any hedgerow that is lost due to the proposed works will require re-planting. If this is not possible in the place of loss, then it is advised that the replanting is done where there are gaps between hedgerows around the site boundary. The compensation planting should be at a ratio of 4:1 in terms of amount of hedgerow area re-planted. Where there are appropriate gaps in hedgerows on site, tree planting is recommended, to provide potential nesting and roosting opportunities in the future for birds and bat species.

The vegetation surrounding the pond in the west of the site should be left intact regardless of any potential proposal changes. In order to enhance the site and provide a biodiversity net-gain, it is recommended that in accordance with Rochford District Development Management Plan Policy DM27, wildflower meadow areas are planted in the open spaces and around the areas used for solar panels. Tall ruderal field margins are recommended to be increased in width to a minimum of 2m, providing larger areas of suitable habitat for ground nesting birds and connectivity for any potential reptiles. This will create a buffer strip, providing a suitable habitat for wildlife.

In accordance with the RSPB advice note for solar farms, the following habitat measures are recommended in order to enhance biodiversity value:

- Sow a wildflower mix in the fields with the solar panels. Plants should be chosen that create good nectar sources such as black knapweed (*Centaurea nigra*), common bird's-foot trefoil (*Lotus corniculatus*) and oxeye daisy (*Leucanthemum vulgare*). All wildflower mixes should be established in accordance with an appropriate management plan that includes clear objectives for establishing a wildflower mix, a list of appropriate species and sowing rate, establishment prescriptions and aftercare.
- To provide potential nesting habitat for skylark fine grasses are recommended to be planted beside some of the solar panel rows. Grasses to include are common bent (*Agrostis capillaries*), creeping red fescue, hard fescue, smooth stalked meadow grass (*Poa pratensis*).
- The hedgerow planting should aim to create species rich hedgerows. This could be achieved by planting 5 woody plants/m in staggered rows 30cm apart. Plant hedgerow between September and February. Rabbit guards will be required. Planting to include 7 woody species to include hawthorn (70%), blackthorn (15%), field maple (5%), spindle (2%), oak (3%), dogwood (2%) and dog rose (3%).
- Create an area, to support a wild bird cover (or wild bird seed mixtures) suitable for such species as corn buntings and skylark. Species to include in the mixture are linseed, millet, kale, cereals and quinoa. The wild bird cover should be sown away from any boundary.

The listed recommendations above if implemented successfully would see biodiversity net-gain across the site.

5.2 Species and Species Groups

5.2.1 Amphibians

There is a possibility that great crested newts and other amphibians use the pond and other habitats on and around site. It is recommended that the pond in the west of the site is surveyed for newts prior to any works. The newt survey season is between mid-March and mid-June. Once results from these surveys are obtained, appropriate mitigation can be established in relation to the proposed development of the solar farm.

Regardless of the outcome of any amphibian survey it is recommended that the pond and area around the pond is improved for its biodiversity value as ponds are a habitat of principle importance. Such habitat measures should be incorporated into a site management plan.

5.2.2 Breeding Birds

Any works or disturbance to vegetation and arable land should take place outside of the breeding bird season (March to August) this will ensure minimal disturbance to birds nesting within proximity to the development. If this is not possible, a nesting bird and a ground nesting bird check by a suitably trained

ecologist should be undertaken a maximum of 48 hours prior to the development. This applies to H1, H12 and H14 which will need sections on vegetation clearance to allow for the underground cable.

All areas of arable farmland due for clearance to allow for solar panels should be checked for ground nesting birds prior to works if it occurs inside the bird nesting season. Ten bird boxes are recommended to be placed on mature trees on site to compensate for any lost nesting opportunities due to sections of hedgerow removal. Mature trees for bird box installation are located adjacent to H3, H13 and H17 (refer to Appendix 4). For nesting bird compensation, wildflower meadow creation and an increase of tall ruderal marginal vegetation has already been recommended in the habitats section which will provide suitable nesting opportunities for ground nesting birds.

5.2.3 Bats

The site had limited value to support foraging bats. As the proposed development does not impact upon the foraging and commuting habitat for bats, no survey is recommended. However, the one tree was recorded as having low potential, located at the west end of H3 (shown in Appendix 4). If works deviate from the proposed plans to affect this tree, then it will need to be soft felled.

There are records from EWT and EFC of bats using the area, therefore it is recommended that any external artificial lighting proposed should be designed to avoid lighting that will negatively impact bats, particularly near boundary features of the site, where bats are likely to forage. To achieve a biodiversity net gain, it is recommended that eight bat boxes are installed on the mature trees along the site boundaries.

5.2.4 Reptiles

The tall ruderal vegetation and semi-improved grassland on site is suitable habitat for reptiles. The EWT and EFC records provide evidence of reptile presence within a 2km radius of the site. Mitigation will be required if tall ruderal habitats or semi-improved grassland is cleared. A two stage cut will be required, with the initial cut at 10cm above the ground. A 24 hour interlude between the second cut must take place, allowing reptiles to disperse from the area safely. After the 24 hour period a second cut at ground level should take place. To compensate for potential loss of habitat, it is recommended that six log piles are created and placed evenly across the site.

5.2.5 Water Voles

The drain located north of the northern site boundary has the potential to contain water vole populations. EWT and EFC had no records of the species within the last ten years in a 2km radius of the site, however that does not confirm absence. Currently the plans for development do not impact on this habitat or bank side vegetation of the drain, therefore no water vole survey is required. However if the development plans change and impact the drain, then a water vole survey is recommended which would need to be

undertaken between April and September (inclusive). If water voles are identified as being present, then it is recommended that a buffer area of 3-5m is provided from works to the start of the bank.

6 Conclusions

The field survey of the site at Fambridge identified habitats, considered common within the local area. The main impact from the proposed development is the loss of arable farmland, scattered scrub and 3 sections from 3 separate hedgerows.

The site is located within proximity to the Crouch and Roach Estuaries (SSSI, Ramsar, SPA), Essex Estuaries (SAC) and Blackwater, Crouch, Roach and Colne Estuaries (MCZ) designated sites. Further assessment of the potential effects on these internationally designated sites will be needed.

Nesting bird checks will be necessary in both the arable land and hedgerows prior to any works if the development occurs during the bird nesting season.

The works will result in disturbance at the site. With the potential for GCN being present on site, mitigation stages will need to be developed if the results from the recommended surveys come back positive.

If works deviate from original plans and affect the drain along the north boundary of the site, water vole surveys will be required. Reptile mitigation will also be required if development plans require removal of tall ruderal habitats or semi-improved grassland.

Enhancement and compensation measures including the addition of bat boxes, bird boxes, planting of hedgerow species, installation of log piles and a wildflower meadow creation have been recommended which will provide the potential for the proposed development to achieve a biodiversity net-gain in line with national and local policy. All mitigation and enhancement measures are recommended to be brought together through a management plan for the site.

7 References

Bat Conservation Trust (2014). *Interim Guidance: Recommendations to help minimise the impact artificial lighting. London, UK.*

Chartered Institute of Ecology and Environmental Management (2017). *Guidelines for Ecological Preliminary Ecological Appraisal. Technical Guidance Series.* www.cieem.net

Chartered Institute of Ecology and Environmental Management (2018). *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine*. Technical Guidance Series www.cieem.net

Game & Wildlife Conservation Trust (2019). *Getting to grips with greening, agri-environment schemes and cross compliance.*

JNCC (2010). *Handbook for Phase 1 Habitat Survey. A technique for environmental audit (reprint).* Joint Nature Conservation Committee, Peterborough.

Mammal Society Mitigation Guidance Series (2016) *The Water Vole Mitigation Handbook*

RSPB (date unknown) *Mitigation and enhancement package for solar farms on former arable land*

Stace. C. (2010). *New British Flora of the British Isles.* 2nd Edition. Cambridge University Press.

Appendix 1: Proposed Area Plan

Key:

Pin = Substation location

Blue line = Site boundary

Green line = Proposed underground cable route

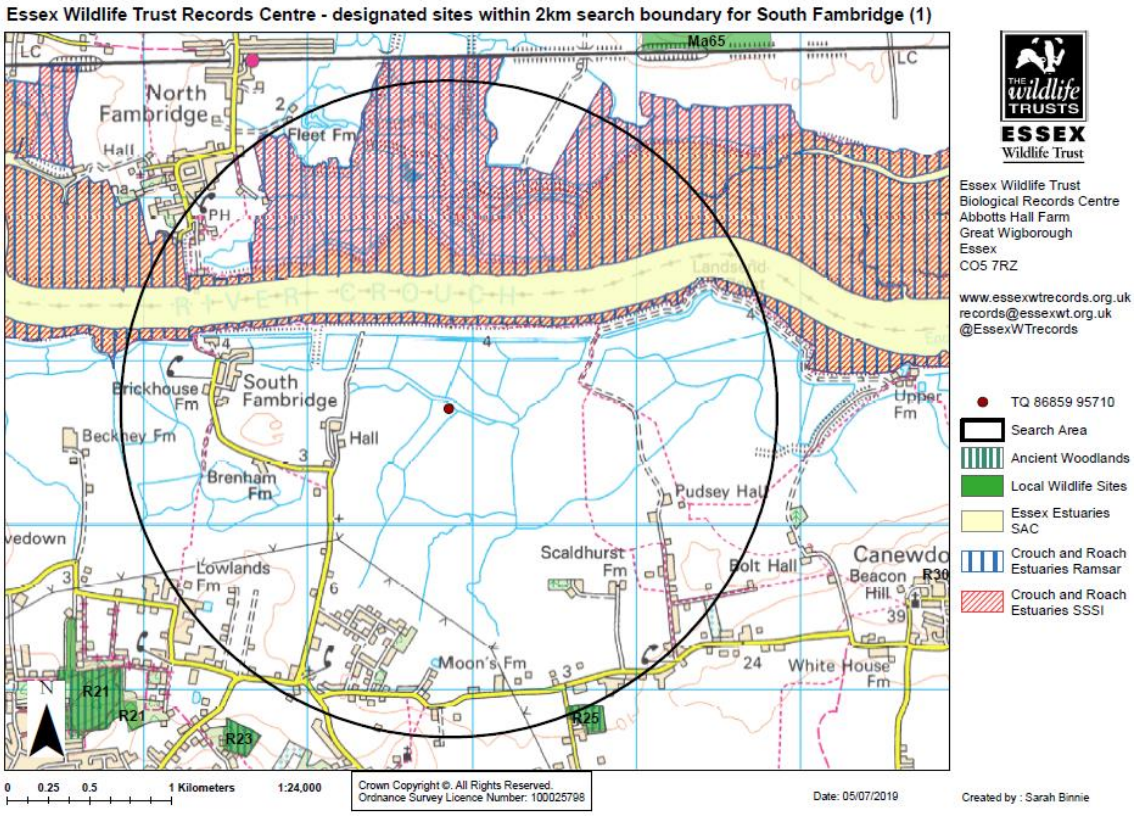
Pink line = Access to site

Appendix 2: Frame of Reference for Geographical Value

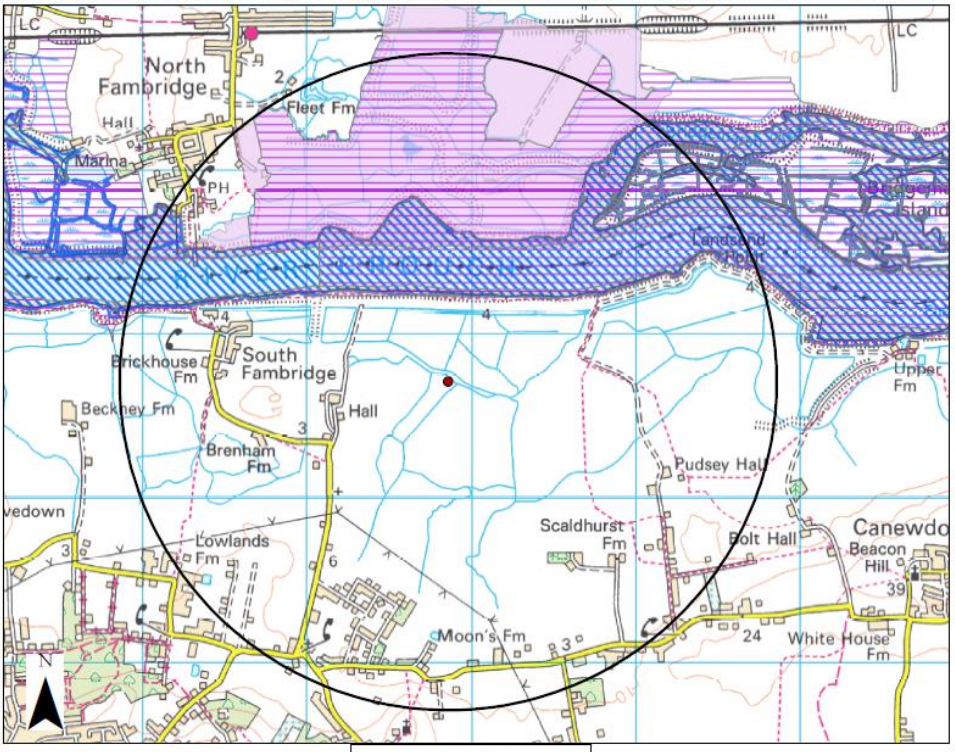
Geographical context	Examples
International and European value	Ramsar Sites, Special Protection Areas, Biosphere Reserves, Special Areas of Conservation. Sites supporting populations of internationally important species. Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. i.e. it is a UK Red Data Book species or listed as occurring in 15 or fewer 10km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. A regularly occurring, nationally significant population/number of any internationally important species.
National value	SSSIs or non-designated Sites meeting SSSI selection criteria, NNRs, Marine Nature Reserves, NCR Grade 1 Sites. Sites containing viable areas of key habitats identified in the UK Biodiversity Action Plan. Any regularly occurring population of a nationally important species which is threatened or rare in the region or county (see local BAP). A regularly occurring, regionally or county significant population/number of any nationally important species.
Regional value	Sites containing viable areas of threatened habitats listed in a Regional BAP (or some Natural Areas), comfortably exceeding SINC criteria, but not exceeding SSSI criteria. Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK or in a Regional BAP or relevant Natural Area on account of its regional rarity or localisation; A regularly occurring, locally significant number of a regionally important species.
County / Metropolitan	Sites meeting the criteria for county or metropolitan designation (SINC, CWS, etc.). Ancient semi-natural woodland, LNRs or viable areas of key habitat types listed in county BAPs/Natural Areas. Any regularly occurring, locally significant population of a species which is listed in a County/Metropolitan "red data book" or BAP on account of its regional rarity or localisation; A regularly occurring, locally significant number of a County/Metropolitan important species.
Local	Undesignated Sites or features considered to appreciably enrich the habitat resource in the District or Borough or within a zone of influence. A population of a species that is listed in a District/Borough BAP because of its rarity in the locality or in the relevant Natural Area profile because of its regional rarity or localisation;

	A regularly occurring, locally significant number of a District / Borough important species during a critical phase of its life cycle.

Appendix 3: Ecological Desk Study Maps



Essex Wildlife Trust Records Centre - designated sites within 2km search boundary for South Fambridge (2)



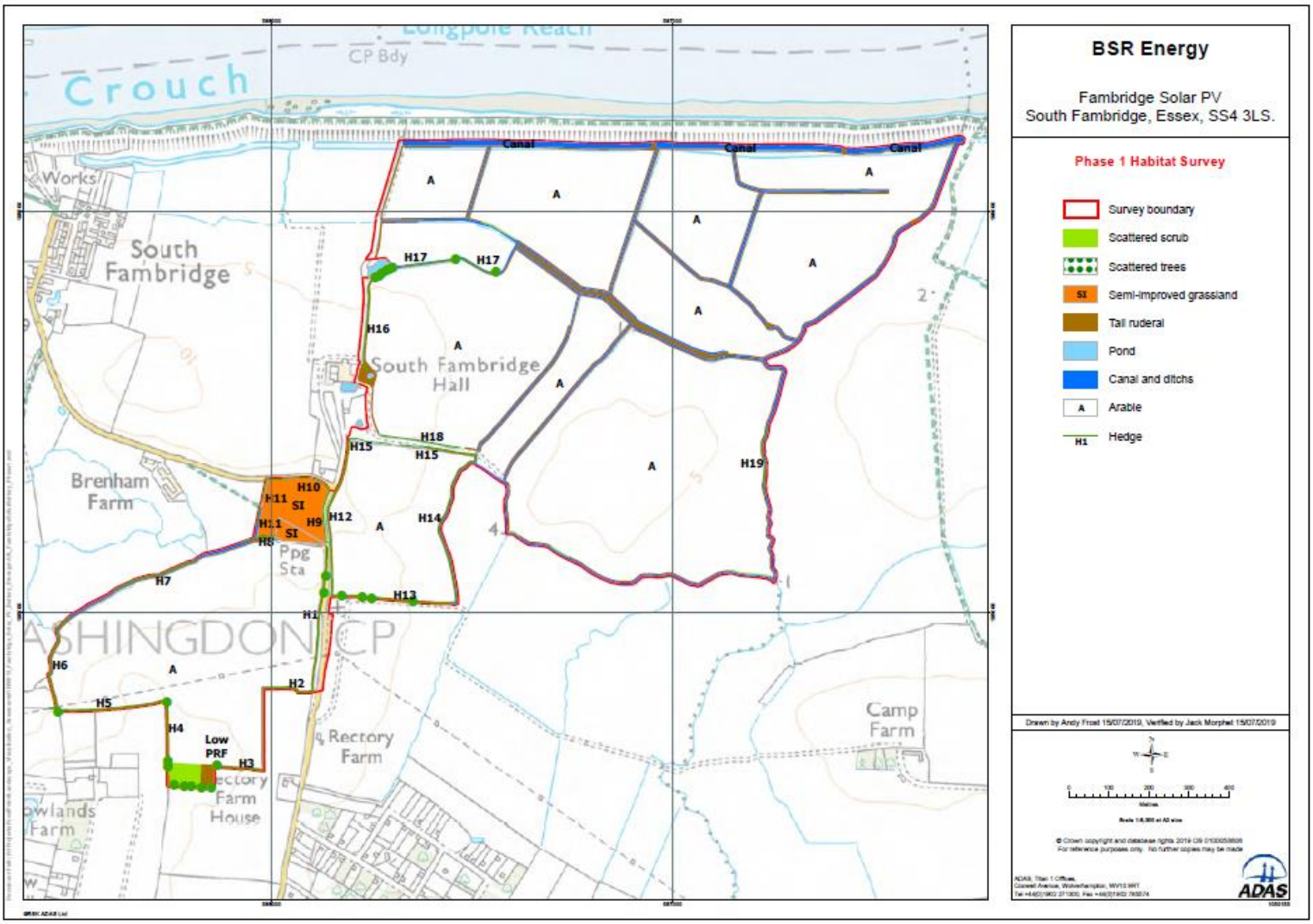
Essex Wildlife Trust
Biological Records Centre
Abbotts Hall Farm
Great Wigborough
Essex
CO5 7RZ

www.essexwtrecords.org.uk
records@essexwt.org.uk
@EssexWTrecords

TQ 86859 95710
Search Area
Blackwater, Crouch, Roach and Colne Estuaries MCZ
SPAs incl. Marine
Blue House Farm EWT

Created by : Sarah Binnie

Appendix 4: Phase 1 Habitat Survey Map



Appendix 5: Target Notes

Target Note 1: Ditch containing a low level of stagnant water on site.

Target Note 2: Hedgerow H13.

Target Note 3: Oak tree with low PRF in red circle.

Target Note 4: Pond with suitable GCN habitat.

Target Note 5: Drain with potential for water voles.

Appendix 6: Photographs

Photograph 1: Arable farmland

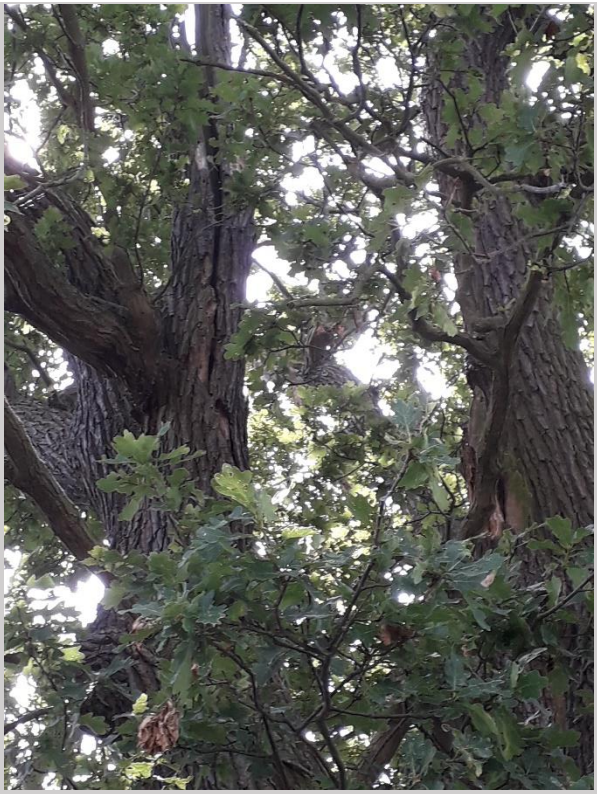
Photograph 2: Common reed and false oat grass in the ditches on site.

Photograph 3: Hedgerow bordering an arable field on site.

Photograph 4: Stands of blackthorn (left) and hawthorn (right) scrub.

Photograph 5: Goat willow scrub in the south of the site.

Photograph 6: Ground flora around the willow scrub.



Photograph 7: A mature English oak with the low PRF.

Photograph 8: Semi-improved grassland.

Photograph 9: The pond in the west of the site with surrounding habitat.

Photograph 10: The drain on the north boundary of the site.

Photograph 11: Typical tall ruderal habitat of the site between hedgerow and arable field.