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Preliminary Ecological Appraisal

Padbury Brook Solar Farm, Bicester, Oxfordshire

July 2022

A report by

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Report details

Site name:	Padbury Brook Solar Farm
Site address:	Land near Stratton Audley, Cherwell, Oxfordshire, OX27 9BE
Grid reference:	SP623272
Survey date:	14th January 2022
Report date:	22nd July 2022
Report author:	James Gilroy BSc (Hons), MSc
Report reviewer:	Colin Hicks BSc (Hons), MCIEEM

Report no: WOR-2672

Declaration of compliance

BS 42020:2013

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

Code of Professional Conduct

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

Validity of survey data and report

The findings of this report are valid for 12 months from the date of survey. If work has not commenced within this period, an updated survey by a suitably qualified ecologist will be required.

Revisions

Date	Report no:	Approved by:	Comment
15/03/2022	WOR-2672	CDH	Initial report
21/07/2022	WOR-2672.2	CDH	Updated report

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Non-technical summary

Western Ecology has been commissioned to complete a preliminary ecological appraisal of an area of agricultural land located near to Stratton Audley in Oxfordshire. A 44MW solar farm together with infrastructure and battery storage is proposed.

To ensure compliance with nature conservation legislation and planning policy, the following recommendations are made with regards to habitats:

Native hedgerow

All retained hedgerow habitat should be protected from accidental damage during the construction phase by a 5m buffer zone delineated by suitable fencing. This protection zone should be delineated by a suitable fence placed at the boundary between the hardstanding and natural ground and maintained for the duration of the works, and there should be no access, storage of materials, ground disturbance, burning or contamination within the fenced areas.

If the proposals result in any hedgerow habitat being lost to the development, an equal extent of hedgerow should be replanted using a mix of native shrubs of local provenance.

To ensure compliance with nature conservation legislation and planning policy, the following recommendations are made with regards to Species:

Amphibians

There is potential for Great Crested Newt to be utilise terrestrial and aquatic habitats contained within the Site during their aquatic, terrestrial and hibernation phases. Mitigation is recommended to prevent construction activities harming individual GCN.

Oxfordshire is covered by a Naturespace Partnership-led licensing scheme and it is recommended that the developer join this scheme to mitigate potential impacts to GCN associated with the proposed development. Further details are contained within *Section 5.3 - Amphibians*

Badgers and other mammals

Precautionary measures are recommended to prevent individual animals becoming trapped within the construction site and to allow mammals to continue to access the site during the operational phase. Further details are contained within *Section 5.3 – Badgers.*

Bats:

Roosting

Individual mature trees, mostly associated with hedgerows and Site boundaries, provide an unknown potential for roosting bats. If plans show these trees are to be impacted by the proposed development, an inspection of the trees/building by a suitably qualified and licensed ecologist will be required prior to the commencement of works. If any evidence of bats is found, further surveys may be required.

Birds

Breeding habitat

Hedgerow, scrub and tree habitats may support widespread and common nesting bird species, while arable habitats may support notable ground nesting species.

Breeding bird surveys should be completed to allow an informed assessment of likely impact to breeding bird populations at this Site.

Wintering habitat

Open arable field compartments provide suitability for winter foraging by notable farmland birds during the winter months. Surveys are recommended to inform a robust assessment of impact on birds of open habitats.

Reptiles

Semi-natural habitat (hedgerows, woodland, scrub, ditches & rough grassland) mostly associated with the field boundaries, provide some potential for common reptiles. Sympathetic site clearance involving RAMS should also be implemented to avoid killing or injuring individual reptiles. Further details are contained within *Section 5.3 – Reptiles.*

To ensure compliance with nature conservation legislation and planning policy, the following recommendations are made with regards to Non-statutory Nature Conservation Sites:

Oldfield proposed CDWS

There is potential for construction activities to adversely affect habitats and species associated with this site, through impacts such as pollution. These potential impacts should be mitigated through the implementation of the CEMP, as detailed in Section 5.4 – Running water, however it should be expanded to include a specific focus on protecting habitats within the proposed CDWS.

Further survey work

It is recommended that the following species/group specific surveys are completed to ensure compliance with wildlife legislation and relevant planning policy:

Great Crested Newt

Environmental DNA (eDNA) surveys should be completed on all suitable on ponds within 250 metres, if the Naturespace Partnership licencing route is not followed.

Bats

Roosting

If mature trees are to be impacted, they should be assessed for their potential to support roosting bats in line with Collins et al, 2016. This may include inspection from height and emergence surveys in the bat active period.

Birds

Breeding bird surveys

Breeding bird surveys should be undertaken to identify the use of the site by breeding birds. This should comprise a suitably experienced surveyor walking a predetermined transect and recording all birds seen or heard onto pre-printed maps

using BTO codes and symbols to describe species present and associated activity. Three early morning visits should be completed between April to June.

Wintering bird surveys

Wintering farmland bird surveys should be completed for both Area 1 & 2. This should comprise monthly transect surveys walked by an experienced ornithologist in the period December to March.

No other survey work is recommended for this site.

1. Introduction

Western Ecology has been commissioned to complete a preliminary ecological appraisal of an area of agricultural land located near to Stratton Audley in Oxfordshire. A solar farm with associated infrastructure is proposed.

1.1. Survey aims

The survey and this report identify features of conservation importance that could constitute a constraint to the proposals for this site. Where appropriate, recommendations for impact avoidance, mitigation and post-development enhancement are made to ensure compliance with wildlife legislation and relevant planning policy.

This survey has been prepared in accordance with the 'Guidelines for Preliminary Ecological Appraisal' produced by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017).

1.2. Site location

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

2. Survey methodology

2.1. Desktop survey

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

Consultees for the data search included:

- Thames Valley Environmental Records Centre (TVERC) provided biological records for protected/notable species and non-statutory sites within 2km of the site.
- Natural England - GIS dataset of SSSI Impact Risk Zones, statutory nature conservation sites, priority habitats and granted European Protected Species license applications.

Species data was examined for protected and notable species records. An assessment was then made, based on known habitat preferences, as to whether these species might be present within the site and how they might be affected by the proposal.

The location of nature conservation sites was examined to determine their ecological and landscape relationships with the proposed site. An assessment was then made of how the sites may be affected by the proposal, taking into account these relationships, and the species and/or habitat types for which the nature conservation site was chosen.

SSSI Impact Risk Zones are areas where the change to the environment could either create significant damage to a local SSSI, or might require additional planning and consultation in order to avoid impacting such sites. The assessments are made according to the particular sensitivities of the features for which the SSSI is notified, and specifies the types of development that have the potential for adverse impacts.

In compliance with the terms and conditions relating to its commercial use, the full desk study data is not provided within this report.

2.2. Field survey

A Preliminary Ecological Appraisal of the site was completed by James Gilroy BSc (Hons), MSc.

The survey was undertaken between 07:30 to 12:30 on 14th January 2022. Weather conditions during the survey were cold, dry and clear with a maximum air temperature of 4°C, light easterly breezes and 30% cloud cover.

Habitats were classified using the Phase 1 Habitat Survey methodology developed by the Joint Nature Conservation Committee (JNCC, 2010) and modified by the Institute of Environmental Assessment (IEA, 1995). The main plant species were recorded and broad habitat types mapped according to the UK Habitats Classification definitions (UK Habitat Classification Working Group, 2018). Habitats encountered are described within the Results

section, with a map included within the report. Plant species were identified according to Stace (1997).

All accessible waterbodies within the site were evaluated for their potential to support Great Crested Newt by calculating a habitat suitability index (HSI) as per ARG UK Advice Note 5.

2.3. Method for valuation of habitats

The ecological value of habitats present is provided in line with Guidelines for Ecological Impact Assessment (CIEEM, 2018), and those which are important in terms of legislation or policy are identified.

The nature conservation value, or potential value, of the habitat is determined within the following geographic context:

- International importance (e.g. internationally designated sites such as Special Areas of Conservation, Special Protection Areas, Ramsar sites);
- National importance (e.g. nationally designated sites such as Sites of Special Scientific Interest or species populations of importance in the UK context);
- County importance (e.g. SNCI, habitats and species populations of importance in the context of Oxfordshire);
- Local importance (e.g. important ecological features such as old hedges, woodlands, ponds);
- Site importance (e.g. habitat mosaic of grassland and scrub which may support a diversity of common wildlife species);
- Negligible importance. Usually applied to areas such as built development or areas of intensive agricultural land.

The examples are not exclusive and are subject to further professional ecological judgment.

2.4. Survey constraints

All areas of the site were readily accessible. Although some plant species would have not been visible during the survey period, within such a small, simple site comprising common and widespread habitat types, the timing of this survey is not a significant constraint to a robust initial site assessment.

It should be noted that habitats, and the species they may support, change over time due to natural processes and because of human influence. In line with current guidelines, the survey on which this report is based is valid for two years, after which time it will need updating. This report is valid until 14th January 2024.

2.5. Study area

The study area for the desktop survey is within 2km. The study area for the Preliminary Ecological Appraisal was the footprint of the proposed development, hereafter referred to as the ‘Site’, and its immediate boundaries. This is the area included within the line described as “Survey area” within the legend of Map 1.

3. Results

3.1. Site description

The Site concerns an area of agricultural land, comprised of field compartments under arable rotation. The fields are mostly enclosed by native hedgerows, with the north-western boundary comprising woodland edge. Other habitats contained within the Site include mixed scrub and modified grassland, generally located at field edges. A total of 3 ponds are located immediately adjacent to the site boundaries.

3.2. Phase 1 habitats

Habitats have been classified using the Phase 1 Habitat Survey methodology, and are described below and detailed in Map 1. Habitats which are important in terms of legislation or policy are identified. Plant species that characterise each of these habitats are identified, although this is for descriptive purposes, and comprehensive inventory is not provided.

Table 1: Habitat description, biodiversity value and extent.

Habitat	Description	Biodiversity value
Arable	Arable land accounted for most of the Site and comprised mostly autumn/winter sown cereal crops with occasional fields of unvegetated bare ground. Several fields in Area 1 contained large winter bird food plots at the margins which consisted of seed-bearing plants such as Millet sp., Quinoa, Mustard sp., Thistles spp., Bristly Ox-tongue, Mallow sp., Kale, Teasel, Groundsel, Charlock and Dandelion.	Site
Modified grassland	Managed grassland habitats were present along some field margins and were generally associated with public rights of way. These areas generally featured a uniformly short sward, consisting of several grasses with very few herbs. Species included Perennial Rye-grass, Cock's-foot, Dandelion and White Clover. These areas featured damage from footfall in places.	Site
Mixed scrub	Mixed scrub occurred across the Site generally as small pockets extending out from hedgerows. Species comprised native shrubs such as Willow sp., English Elm, Elder, Hawthorn, Blackthorn, Oak sp. Ground flora was mostly comprised of dense Bramble, Common Nettle, Cock's-foot, Hogweed and Rosebay Willowherb.	Site
Standing water: pond	A total of 3 ponds (P1-3) are located outside of the site but immediately adjacent the boundaries (as detailed in Map 1). P1 is a shallow basin, surrounded scrub and holding shallow water with no aquatic vegetation. P2 is a very small pond at a field corner, connected to a ditch and supporting floating grasses and Soft rush. P3 is a larger pond in a wide basin densely vegetated with mixed and Bramble scrub. It supports aquatic vegetation such as Fool's Watercress as well as a dense cover of duckweed spp.	Site
Native hedgerow	Hedgerows of native shrubs provided most boundaries to the field compartments across the Site. Hedgerows were comprised of mostly Hawthorn, Blackthorn and Field Maple with occasional other shrubs such as Hazel, Elder, Goat	Local: this habitat qualifies as a Habitat of Principal Important (JNCC & Defra, 2012)

	Willow and Elm. Several hedgerows contained frequent trees, some mature and included Pedunculate Oak, Ash and Willow sp. Ground flora generally comprised Bramble, Dog Rose, Ivy, Common Nettle, Hogweed, and common grasses. Hedgerows were mostly continuous with few gaps and exhibited some management. Most hedgerows featured narrow margins (<2m) of rough vegetation. Some hedgerows particularly in Area 1 had associated ditches which contained shallow water and were largely shaded by hedgerow vegetation.	and as a Local Biodiversity Action Plan priority habitat (Oxfordshire Biodiversity Action Plan, 2015).

3.3. Desktop survey

The biological records search returned records of notable species within the geographical parameters of the search (2km). Due to the broad scale of many records, it is not possible to determine if they relate to the Site. Details are contained in Tables 3 and 4 below.

Table 3. Notable species records within 2km

Taxon	Species	Number of records	UK Legislation
Amphibians	No records		
Bats	Unidentified bat	3	WCA Schedule 5 species
	Brown Long-eared Bat	3	Local BAP species. WCA Schedule 5 species
	Common Pipistrelle bat	2	Local BAP species. WCA Schedule 5 species
	Nathusius's Pipistrelle	1	UK and Local BAP species. WCA Schedule 5 species
	Soprano Pipistrelle bat	1	UK and Local BAP species. WCA Schedule 5 species
	Noctule bat	1	UK and Local BAP species. WCA Schedule 5 species
	Unidentified Myotis	1	WCA Schedule 5 species
Mammals	Eurasian Badger	2	The Protection of Badgers Act 1992
	European Otter	1	UK and Local BAP species. WCA Schedule 5 species
Reptiles	Grass Snake	1	UK and Local BAP species. WCA Schedule 5 species
	Barn Owl	2	WCA Schedule 1 species
Birds	Corn Bunting	1	NERC Section 41; Red conservation status
	Cuckoo	1	NERC Section 41; Red conservation status
	Grey Partridge	3	NERC Section 41; Red conservation status
	Hobby	2	WCA Schedule 1 species
	Kestrel	7	Amber conservation status
	Lapwing	2	NERC Section 41; Red conservation status
	Linnet	3	NERC Section 41; Red conservation status
	Reed Bunting	1	NERC Section 41; Amber conservation status
	Skylark	8	NERC Section 41; Red conservation status
	Song Thrush	2	NERC Section 41; Red conservation status
	Starling	2	NERC Section 41; Red conservation status
	Swift	21	Red conservation status
	Willow Warbler	2	Amber conservation status
	Yellowhammer	9	Amber conservation status
Invertebrates	No records		
Plants	Eyebright	1	Red List – post 2001
	Field Scabious	1	Red List – post 2001

	Hoary Plantain	1	Red List – post 2001
	Lesser Spearwort	2	Red List – post 2001
	Tormentil	1	Red list – post 2001

Statutory Nature Conservation Sites (SNCS)

There is one SNCS located within 2km of the Site, with details proved detailed below.

Stratton Audley Quarries Site of Special Scientific Interest (SSSI)

This area is designated for geological interest.

Non-statutory Nature Conservation Sites (NNCS)

There are two NNCS located within 2km of the Site; Poodle Gorse Cherwell District Wildlife Site (CDWS) and Oldfield Copse, a proposed CDWS.

Oldfields Copse proposed CDWS concerns an area of ancient woodland immediately adjacent to the northern boundary of the Site which supports a high botanical and insect diversity.

Poodle Gorse CDWS is located approximately 900m to the south of the Site. This area contains an even aged mature plantation woodland of predominantly Oak with a diverse shrub layer, as well as areas of remnant acid grassland, and which supports notable birds and insects.

SSSI Impact Risk Zones

The Site is not within an area identified as a SSSI Impact Risk Zone for this type of development.

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Legend

- Target note
- Survey area
- Native hedgerow with trees
- Native hedgerow

Habitats

- Species poor semi-improved grassland
- Arable
- Scrub
- Standing water
- Semi-naturtal broadleaved woodland
- Improved grassland

Title: Map 1. Phase 1 Habitat Survey

Project: Padbury Brook solar farm, Bicester, Oxfordshire

Checked by: CDH Version: 02
Date: 22nd August 2022

3.4. Potential for species of nature conservation importance

Habitats have been assessed from the results of the field survey for their potential to support protected species (Table 5). Where there is no potential for a species or species group to be present within the site, or where habitats with the potential to support this species or species group will not be impacted by the proposals, they may be scoped out at this stage.

Table 5. Potential for species of nature conservation importance

Species	Assessment	Likely value
Amphibians	There are no records for Great Crested Newt within 2km of the Site. There are five ponds located within the Site (P1-5). Great Crested Newt Habitat Suitability Index (HSI) has been calculated for the ponds within the Site, based on ARG UK Advice Note 5 and assessed from the field visit. Pond scores are as follows: P1 = 0.60 – average suitability P4 = 0.60 – average suitability P5 = 0.65 – average suitability There are ponds within 500m of the Site that have an unknown potential to support breeding GCN populations. The majority of the terrestrial habitat within the site is of very limited suitability for GCN. However, the hedgerows, scrub, and woodland located at the site boundaries provide some opportunities for foraging and shelter and also connectivity across the site and to the wider area beyond the development footprint. There is potential for GCN and other common amphibians to be present within the terrestrial and aquatic habitats associated with the Site.	Unknown
Badgers	There are two records for Badgers in the local area. No evidence of setts was recorded within the Site, although possible evidence of activity (such as mammal paths) were observed across the Site. Given the rural location, with connectivity to optimal habitat such as woodland, it is likely Badgers are active within the Site.	Moderate
Bats	Individual mature trees associated with hedgerows or boundaries may provide potential for roosting bats. The intensive agricultural habitats contained within the Site provide very little value for foraging and commuting bats. Semi-natural habitats such as scrub, waterbodies, woodland and hedgerows are likely to provide some opportunities for foraging and commuting and it is likely a variety of bat species utilise these areas, particularly at the margins of the Site.	Unknown Moderate
Birds	Given the extent of the site and its agricultural management, it is likely to support assemblages of farmland birds, with hedgerows and boundary scrub providing suitable nesting habitat. Arable habitats also provide some potential for ground nesting species such as Skylark. The large open nature of some of the arable fields within the Site also provide potential for winter foraging grounds for birds such as Lapwing.	Low Unknown
Brown Hare	Several individual animals were observed during the survey, and it is likely the arable and hedgerow habitats provide some foraging and sheltering opportunities.	Present
Common Dormice	There no records for Dormice within 1km of the Site.	Negligible

	Suitable potential habitat within the Site is limited to hedgerows, scrub and woodland. Dormice populations are not known to be in the local area and it is unlikely that they are present within the Site.	
Hedgehog	The intensive agricultural habitats provide limited potential. Semi-natural habitats around the margins of the Site (such as hedgerows, scrub, woodland and rough grassland) are likely to provide foraging and commuting opportunities, while the Site also features connectivity to suitable off-site habitat such as woodland. There is potential for Hedgehogs to be active across the Site.	Moderate
Reptiles	There is one record for Grass Snake within 1km of the Site. The intensive agricultural habitats provide negligible potential for reptiles. Hedgerows, scrub and ditches may provide some potential for common species such as Grass Snake and Slow Worm.	Low
Otter	There is one record for Otter within 1km of the Site. The Site lacks suitable habitat for Otter and they are unlikely to be active within the boundary.	Negligible
Water Vole	There are no records for Water Vole within 1km of the Site. There is no suitable habitat for Water Vole associated within the Site, they are unlikely to be present, and they do not need to be considered further.	Negligible
Notable invertebrates	The habitats associated with the Site provide limited potential for notable invertebrate species.	Negligible
Notable plants	Habitats within the Site provide little potential for notable or rare plants and they do not need to be considered further.	Negligible
Invasive non-native plants	No species listed under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) as invasive non-native with respect to England and Wales were recorded within the Site. Invasive, non-native species do not need to be considered further.	Absent

4. Evaluation of ecological features and potential impacts

4.1. Introduction

Ecological features that have the potential to be present have been assessed in light of current nature conservation policy, planning policy and wildlife legislation by an experienced ecologist (see Appendix 1). Where necessary, the ecological value of an ecological feature is given along with the potential effect of the proposed development.

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

4.2. Habitats of nature conservation importance

Protected habitats

Habitats are protected under international and national legislation including The Conservation of Habitats and Species Regulations 2017, and Wildlife and Countryside Act 1981 (as amended). These have been formulated into policy measures, with many examples protected under formal site designations such as SSSIs and SACs.

No habitats of European Community Importance as defined within The Conservation of Habitats and Species Regulations 2017 were present within this site. Protected habitats of this type are not a consideration for this project.

Notable habitats

Sixty five habitats are listed as being of principal importance, in the Secretary of State's opinion, for the purposes of conserving biodiversity. Under section 41 (England) of the NERC Act (2006) there is a need for these habitats to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity. These habitats are the subject of National and Local Biodiversity Action Plans.

Hedgerows are given particular protection under the Protection of Hedgerows Act 1997.

Native hedgerow

The native hedgerow habitat associated with the Site qualifies as a Habitat of Principal Importance and as a Local Biodiversity Action Plan.

Any loss in extent of native hedgerow habitat would be a material consideration to a planning application. If any hedgerow habitat is to be lost to the development, or adversely impacted, mitigation would be recommended.

4.3. Species of nature conservation importance

Overview

Many native wild plants and animals are protected by law with the two main legal instruments being the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017. The latter consolidates amendments to the Conservation (Natural Habitats, &c) Regulations 1994 which transposed into UK Law the EU Habitats Directive.

One thousand, one hundred and fifty species of fungi, plant or animal are listed as being of principal importance, in the Secretary of State's opinion, for the purposes of conserving biodiversity. Under section 41 (England) of the NERC Act (2006) there is a need for these species to be taken into consideration by a public body when performing any of its functions with a view to conserving biodiversity. These species are the subject of National and Local Biodiversity Action Plans.

Amphibians

The four native widespread amphibians (Common Frog, Common Toad, Common Newt and Palmate Newt) are given limited protection from trade under the Wildlife and Countryside Act 1981 (as amended).

Great Crested Newt and Natterjack Toad and their breeding sites and resting places (during all parts of their lifecycle) are fully protected under the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2017. They are identified as European Protected Species. Under these laws it is an offence to:

- capture, kill, disturb of injure Great Crested Newts and Natterjack Toads (on purpose, or by not taking enough care);
- damage or destroy a breeding or resting place (even accidentally);
- obstruct access to their resting or sheltering places (on purpose, or by not taking enough care);
- possess, sell, control or transport live or dead newts, or parts of them;
- take Great Crested Newt or Natterjack Toad eggs.

The very rare Pool Frog, only recently recognised as a native amphibian, is fully protected under the Wildlife and Countryside Act 1981 (as amended) from killing, injury, trade and disturbance, whilst their habitats are also protected.

Great Crested Newt, Natterjack Toad, Common Toad and Pool Frog are listed as species 'of principal importance for the purpose of conserving biodiversity'.

The ponds located immediately adjacent to the Site provide potential to support breeding GCN (HSI score >0.59). There are a number of ponds located within 500m that have an unknown potential to support breeding GCN. Suitable terrestrial habitat across the Site is largely limited to hedgerows, ditches and the fragmented areas of scrub and rough grassland.

The proposed development would be unlikely to result in the loss of any of the existing terrestrial and aquatic habitats, as these are located at field boundaries. The operation of the proposed development will not result in the loss of any terrestrial habitat or restriction of movement across the Site, while it also offers potential for enhancement of the Site for GCN through the increased extent of habitats such as rough grassland, which would be created underneath the solar arrays.

However, construction activities have potential to result in the capture, killing, disturbance or injury of a Great Crested Newt, and the loss/damage of resting places, which would be deemed an offence. Mitigation is therefore required if Great Crested Newt are present within ponds within 500m of this Site.

It is also likely that occasional common and widespread amphibians are associated with ponds and field boundaries. These areas should be protected during the construction and operational phases.

Badgers

Badgers are protected from persecution or ill-treatment under the Protection of Badgers Act 1992. Under the Act, it is an offence to:

- wilfully kill, injure or take, or attempt to kill, injure or take, a badger;
- damage a badger sett or any part of it;
- destroy a badger sett;
- obstruct access to, or any entrance of, a badger sett;
- cause a dog to enter a badger sett; or
- disturb a badger when it is occupying a badger sett.

Badger populations are likely to be present in the nearby surroundings.

Although the development will not result in any significant loss of habitat and no Badger sett will be impacted, the proposals have potential to impact local Badger populations by restricting movement across the Site during the operation. There is also potential for Badgers to get trapped within the Site during the construction and operation phase. Precautionary mitigation against this is recommended.

Bats

Bat species and their breeding or resting places (roosts) are protected under the Wildlife and Countryside Act 1981 (as amended), and The Conservation of Habitats and Species Regulations 2017. They are identified as European Protected Species. Under these laws it is an offence to:

- capture, kill, disturb or injure bats (on purpose or by not taking enough care);
- damage or destroy a breeding or resting place (even accidentally);
- obstruct access to their resting or sheltering places (on purpose or by not taking enough care); or
- possess, sell, control or transport live or dead bats, or parts of them.

Seven species of bat are listed as species “of principal importance for the purpose of conserving biodiversity”.

Roosting

Mature trees associated with the hedgerows and boundary habitats have an unknown potential to support roosting bats. If any mature trees are likely to be impacted by the proposals, mitigation may be required.

Foraging and commuting

The intensive agricultural habitats which account for the majority of the Site provides poor foraging habitat due to a lack of supported insect prey. Semi-natural habitats associated with the Site (such as scrub, hedgerows and woodland) which are mainly present at the boundaries are likely to provide some foraging and commuting opportunities. There are records for a variety of bats in the local area, including light-averse species (such as Long-eared) and it is likely that they are active around the Site margins.

There is currently little evidence to suggest either way whether solar farms can impact bat populations through land use changes such as habitat loss, fragmentation or barrier effect (Harrison *et al.* 2017; Taylor *et al.* 2019). However, the loss of very low value intensive agricultural habitats to this development is considered to be unlikely to impact local bat populations. The site will not be lit at night, whilst changes in land management are likely to improve retained habitats for bats. No mitigation for foraging and commuting bats is recommended.

Birds

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

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

Breeding habitat

It is likely that common birds nest within habitats along the Site boundaries (such as hedgerows, scrub and woodland). The arable farmland associated with the Site also provides some potential for notable ground nesting species such as Skylarks.

The operation of the proposed development has potential to reduce availability of nesting habitat for ground nesting species, which may impact local populations. Any clearance of boundary habitats (such as hedgerows), although unlikely to impact local bird populations, has potential to harm individual birds nests. Mitigation is therefore recommended.

Winter foraging

Arable habitats within the Site features an open and flat aspect which provides some potential for winter foraging by farmland birds such as Lapwing. The proposed development would result in a reduction in the suitability of these areas. Mitigation is therefore recommended.

The proposed development would also likely result in the loss of winter bird seed plots that are currently present. However, the operation of the proposed development would continue to provide a winter food source for species that utilise these areas (such as finches, thrushes and pigeons), through providing sympathetically managed grassland underneath the arrays. Mitigation for the loss of winter bird seed plots is therefore not required.

Brown Hare

Brown Hare are protected by a closed season for hunting under the Wildlife and Countryside Act 1981 (as amended). They are listed as species “of principal importance for the purpose of conserving biodiversity”.

Brown Hare are active across the Site. It is likely that changes in habitat management associated with the proposed solar PV farm (grassland creation under arrays) would benefit Brown Hare. Mitigation recommended for Badgers will serve to ensure the proposed development does not restrict movement across the Site. No other mitigation is recommended.

Hedgehog

Hedgehogs are partially protected under the Wildlife & Countryside Act and may not be trapped without a licence from Natural England. Hedgehogs are listed as a species “of principal importance for the purpose of conserving biodiversity”.

There is potential that Hedgehogs are active within semi-natural habitats contained within the Site. The proposed development has potential to fragment foraging habitat and create a barrier to dispersal across the Site. Mitigation recommended for Badgers will prevent impacts to Hedgehogs, and no other mitigation is required.

Reptiles

All native reptiles are protected to some degree under the Wildlife and Countryside Act 1981 (as amended), whilst our two rarest species, the Sand Lizard and Smooth Snake, are given full protection under the Act, and also identified as European Protected Species.

The four common species (Slow Worm, Adder, Grass Snake and Common (Viviparous) Lizard) are protected from deliberate killing, injury and trade.

All six native reptiles are listed as species “of principal importance for the purpose of conserving biodiversity”.

There is some low potential for common reptiles such as Slow Worm and Grass Snake to be active within hedgerow, scrub and pond habitat that are associated with the Site.

As these semi-natural habitats are generally in existence at the margins of the Site, it is considered unlikely that they would be lost to the development, which will occupy the open field compartments. The loss of agricultural habitats to the development is therefore unlikely to impact local reptile populations.

However, site clearance or construction activities could result in the killing or injury of individuals which may be deemed an offence under the Wildlife and Countryside Act 1981

(as amended). If clearance activities are to impact any hedgerows, ditches or rough vegetation, mitigation may be required.

4.4. Statutory Nature Conservation Sites

There is one SNCS located within 2km of the Site; Stratton Audley Quarries SSSI which is designated for geological interest. It is therefore very unlikely that the proposed development would lead to loss or damage of the interest features associated with this protected site. No mitigation is required.

Natural England has assessed the potential for various development types to impact nearby statutory nature conservation sites when they created SSSI Impact Risk Zones. The proposed development type is not of a type that Natural England judges to be a risk to statutory nature conservation sites. No mitigation is required and there is no requirement to consult Natural England on the potential impact on these sites.

4.5. Non-statutory Nature Conservation Sites

There are two NNCS located within 1km of the Site.

Oldfields Copse proposed CDWS
This site is located directly adjacent to the northern boundary of the Site. Construction activities have potential to cause accidental damage to this area through pollution. Precautionary mitigation is therefore recommended.

Poodle Gorse CDWS
Due to separation distance, it is very unlikely that the proposed development would adversely impact the species and habitats for which this site has been selected. No mitigation is required in respect to this site.

5. Recommendations for mitigation and further surveys

5.1. Mitigation

Where there is potential that the proposed development will have a significant[1] effect on a valued ecological feature of nature conservation interest, recommendations for mitigation are made based on the mitigation hierarchy suggested in Paragraph: 018 Reference ID: 8-018-20140306 of National Planning Practice Guidance;

> Avoidance –significant harm to wildlife species and habitats should be avoided through design.
> Mitigation – where significant harm cannot be wholly or partially avoided, it should be minimised by design, or by the use of effective mitigation measures that can be secured by, for example, conditions or planning obligations.
> Compensation – where, despite whatever mitigation would be effective, there would still be significant residual harm, as a last resort, this should be properly compensated for by measures to provide for an equivalent value of biodiversity.

Where the detail of a proposal is unknown, such as in outline planning applications, general mitigation will be suggested. This should be re-addressed once final plans are known.

Further survey work

Where further survey work is not recommended, this is because it is the professional judgement of the ecologist that adequate information is already available and further surveys would not make any material difference to the assessment provided.

Where the information within this report is insufficient to allow a full description of the nature conservation features of the site along with a robust assessment of the potential effects on these features, further survey work will be recommended.

5.2. Habitats of nature conservation importance

Native hedgerow

All retained hedgerow habitat should be protected from accidental damage during the construction phase by a 5m buffer zone delineated by suitable fencing. This protection zone should be delineated by a suitable fence placed at the boundary between the hardstanding and natural ground and maintained for the duration of the works, and there should be no access, storage of materials, ground disturbance, burning or contamination within the fenced areas.

If the proposals result in any hedgerow habitat being lost to the development, an equal extent of hedgerow should be replanted using a mix of native shrubs of local provenance.

[1] For the purposes of this report, a practical approach has been taken to define the term 'significant'. If an effect is sufficiently important to be given weight in the planning process or to warrant the imposition of a planning condition, it is likely to be 'significant' in the context of the level under consideration (BSI, 2013).

5.3. Protected species and species of nature conservation importance

To ensure compliance with nature conservation legislation and planning policy, the following recommendations are made with regards to species:

Amphibians

There is potential for Great Crested Newt to be utilise terrestrial and aquatic habitats contained within the Site during their aquatic, terrestrial and hibernation phases, and mitigation is recommended to prevent construction activities harming individual GCN.

Oxfordshire is covered by a Naturespace Partnership-led licensing scheme and it is recommended that the developer join this scheme to mitigate potential impacts to GCN associated with the proposed development.

A *Naturespace Partnership Enquiry Form*[1] should be completed and submitted in conjunction with required information (such as site plans) to Naturespace Partnership, prior to submission of the planning application. No further surveys are required if this route is adopted.

Badgers and other mammals

To prevent any restriction of movement and to prevent animals becoming trapped during the construction and operational phases, the following is recommended:

- Site security fencing along the boundaries should leave a gap of at least 2 metres wide between the fence and any woodland, hedgerow or scrub;
- Any trenches left open at night should have some means of escape for Badgers, such as the placement of a scaffolding board at one end;
- Any site security fences should have a gap at each corner sufficient to allow Badgers to exit the Site should they gain entry.
- Permanent security fencing should be fitted with suitable gates to allow Badgers to continue using the site through the operation of the proposed development.

Bats

Roosting

Individual mature trees, mostly associated with hedgerows and Site boundaries, provide an unknown potential for roosting bats.

Once design details are known they should be assessed to determine if these trees or features are likely to be impacted by the proposed development. If they are likely to be impacted, an inspection of the trees/building by a suitably qualified and licensed ecologist will be required prior to the commencement of works. If any evidence of bats is found, further surveys may be required.

[1] available at: https://naturespaceuk.com

Birds

Breeding habitat

Hedgerow, scrub and tree habitats may support widespread and common nesting bird species, while arable habitats may support notable ground nesting species.

Breeding bird surveys should be completed to allow an informed assessment of likely impact to breeding bird populations at this Site.

Wintering habitat

Open arable field compartments provide suitability for winter foraging by notable farmland birds during the winter months. Winter bird surveys are recommended to inform a robust assessment of impact on birds of open habitats.

Reptiles

There is some potential for common reptiles to be present in association with scrub and hedgerow habitat at the margins of the Site. Further survey work is not considered appropriate or proportionate, due to the temporary and limited impacts of the proposed development in and the potential to retain these animals within improved habitats within the site. This is preferable to translocation as it reduces stress, prevents the spread of disease and supports natural population dynamics.

There is also high potential for Reasonable Avoidance Measures (RAMs) to successfully ensure that no reptiles are killed or injured during development. By following simple mitigation, any adverse impact can be avoided.

RAMs should be undertaken during vegetation clearance at the margins. A Method statement for sensitive clearance of habitats is as follows:

Clearance in period late March to October

If scrub/grassland/hedgerow clearance is to occur during the active reptile season (late March to October) areas to be affected by construction activities, should first be checked for the presence of any active birds' nests, by a suitably qualified person. Areas which do not support any active birds should then be de-vegetated prior to any site activities under the supervision of a suitably qualified ecologist.

Vegetation should initially be cut to a height of no more than 10cm and work in a direction towards retained habitat. This will encourage any reptiles to disperse naturally. After at least 48hrs, a second cut will be made as close to ground level as possible. This should ensure that any reptiles, if present, are displaced from the construction site. Once cleared, vegetation within the works area should be maintained below 10cm for the duration of the works to prevent attracting reptiles back into the area.

Construction during the period November to mid-March:

Clearance of areas that may provide hibernacula (such as logs, wood piles, debris piles) should be avoided during these periods as there is unknown potential for hibernating reptiles to be present. If this is planned but unavoidable, it is recommended that surrounding vegetation is cut back to bank level during September and October and kept close-managed to deter hibernating reptiles.

If hibernacula removal is unavoidable and required during winter months, it should be completed under the direct guidance of a suitably experienced ecologist and in moderate weather conditions.

5.4. Non-statutory nature conservation sites

Oldfield proposed CDWS

There is potential for construction activities to adversely affect habitats and species associated with this site, through impacts such as pollution. These potential impacts should be mitigated through the implementation of the CEMP, as detailed in Section 5.2. However the CEMP should be expanded include an additional focus on protecting habitats within the proposed CDWS. This should include the following additional measures:

- No works should take place within the CDWS boundary;
- No storage of materials within the CDWS boundary;
- No vehicle movements within the CDWS boundary;
- Appropriate signage installed along CDWS boundary informing contractors of the environmentally sensitive areas;

6. Further survey work

Information within this report is sufficient to allow a robust assessment of the potential effects on the majority of ecological features associated, or potentially associated, with this site.

However, it is recommended that the following species/group specific surveys are completed to ensure compliance with wildlife legislation and relevant planning policy:

Great Crested Newt

Environmental DNA (eDNA) surveys should be completed on all suitable on ponds within 250 metres, if the Naturespace Partnership licencing route is not followed.

Bats

Roosting

If mature trees are to be impacted, they should be assessed for their potential to support roosting bats in line with Collins *et al*, 2016. This may include inspection from height and emergence surveys in the bat active period.

Birds

Breeding bird surveys

Breeding bird surveys should be undertaken to identify the use of the site by breeding birds. This should comprise a suitably experienced surveyor walking a predetermined transect and recording all birds seen or heard onto pre-printed maps using BTO codes and symbols to describe species present and associated activity. Three early morning visits should be completed between April to June.

Wintering bird surveys

Wintering farmland bird surveys should be completed for both Area 1 & 2. This should comprise monthly transect surveys walked by an experienced ornithologist in the period December to March.

No other survey work is recommended for this site.

7. Biodiversity enhancement

Creating new habitats, enhancing existing habitats or providing new features, can all contribute towards biodiversity enhancement, and helping to rebuild habitat networks in the wider area improves ecological resilience and adaptation to climate change.

There is good potential to maximise the value of the completed development for wildlife through careful plantings and good design, with, for example, opportunities to: increase biodiversity through the planting of native species-rich hedgerows and extending woodland areas; setting aside areas for wildlife; and using soft landscape design that endeavours to create new habitats suitable for native species. Enhancements are additional to any measures necessary to deal with potential impacts on site, as they are an opportunity to provide new benefits for biodiversity as a consequence of the proposals being implemented.

Further surveys are required to fully characterise the Site for GCN, roosting bats (depending on impact) and wintering birds, as such, biodiversity enhancements will be recommended once these surveys have been undertaken.

It should be noted that a biodiversity net gain of 10% is likely to be required for this development. Biodiversity net gain calculations should be completed at the earliest practicable stage in the development to avoid significant re-design costs in the latter stages of the planning process.

8. References

BSI, 2013. *British Standard 42020: 2013. Biodiversity – Code of practice for planning and development.* British Standards Institution, London.

CIEEM, 2016. *Guidelines for Ecological Impact Assessment: Terrestrial, Freshwater and Coastal. Technical Guidance Series.* Chartered Institute of Ecology and Environmental Management, 43 Southgate Street, Winchester, Hampshire.

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Collins, J. (ed.), 2016. Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). The Bat Survey Trust, London. ISBN-13 978-1-872745-96-1

Harrison, C., Lloyd, H. & Field, C. 2017. Evidence review of the impact of solar farms on birds, bats and general ecology. 10.13140/RG.2.2.24726.96325.

Institute of Environmental Assessment (IEA), 1995. *Guidelines for Baseline Ecological Assessment,* Institute of Environmental Assessment. E&FN Spon, aJn Imprint of Chapman and Hall. London.

Joint Nature Conservation Committee, 2010. . Reprinted by JNCC, Peterborough

JNCC and Defra (on behalf of the Four Countries' Biodiversity Group), 2012. *UK Post-2010 Biodiversity Framework*. July 2012.

Stace, C., 1997. *New Flora of the British Isles.* 2nd edition. Cambridge University Press, Cambridge.

Taylor, R., Conway. J., Gabb, O. & Gillespie, J. 2019. Potential Ecological impacts of ground mounted photovoltaic solar panels. [Online] Accessed: 22.04.2021

Woodfield Ecology. 2017. Trebarwith Road Quarry– Extended Phase I Habitat Survey Report. May 2017.

9. Appendix 1:

Legislation and Policy used to assess habitats and species:

European Habitats and Species Directive (CEC, 1992)

The main aim of the Habitats Directive is to promote the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species listed on the Annexes to the Directive at a favourable conservation status, introducing robust protection for those habitats and species of European importance.

European Red Data lists (IUCN, 2000)

International Union for Conservation of Nature (IUCN and the European Commission have been working together on an initiative to assess around 6,000 European species according to IUCN regional Red Listing Guidelines. Through this process they have produced a European Red List identifying those species which are threatened with extinction at the European level so that appropriate conservation action can be taken to improve their status.

European Council Birds Directive (CEC, 1979)

The Directive provides a framework for the conservation and management of, and human interactions with, wild birds in Europe. An important part of this Directive is the identification and classification of Special Protected Areas (SPAs) to protected vulnerable bird species listed in Annex 1 of the Directive and regularly occurring migrating species.

The Wildlife and Countryside Act (WCA) 1981 (as amended)

This Act is the primary legislation that protects animals, plants and certain habitats in the UK.

The Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 consolidate and update the Conservation of Habitats and Species Regulations 2010, and transpose Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora ("the Habitats Directive") and elements of Directive 2009/147/EC on the conservation of wild birds ("the Birds Directive") in England, Wales, and to limited extent, Scotland and Northern Ireland.

The objectives of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. The Directive lays down rules for the protection, management and exploitation of such habitats and species.

The Regulations place a duty on the Secretary of State to propose a list of sites which are important for either habitats or species. These sites form a network termed Natura 2000 and include Special Areas of Conservation and Special Protection Areas.

Protection of Badgers Act 1992

The Protection of Badgers Act 1992 consolidated and improved previous legislation. Under the Act it is an offence to kill, injure or take a Badger, or to damage or interfere with a sett used by a Badger unless a licence is obtained from a statutory authority.

The Hedgerow Regulations 1997

The Hedgerows Regulations 1997 protect certain hedgerows from being removed (uprooted or destroyed) if they meet certain criteria.

The Countryside and Rights of Way (CRoW) Act 2000

This Act increases measures for the management and protection for Sites of Special Scientific Interest (SSSI) and strengthens wildlife enforcement legislation.

Circular 06/2005 Biodiversity and geological conservation – statutory obligations and their impact within the planning system

This circular provides administrative guidance on the application of the law relating to planning and nature conservation as it applies in England. It complements the national planning policy in the National Planning Policy Framework and the Planning Practice Guidance.

Natural Environment and Rural Communities Act 2006

The Act made amendments to the both the Wildlife and Countryside Act 1981 and the Countryside and Rights of Way (CROW) Act 2000. For example, it extended the CROW biodiversity duty to public bodies and statutory undertakers.

UK Post-2010 Biodiversity Framework, 2012

The 'UK Post-2010 Biodiversity Framework', published in July 2012, succeeds the UK BAP and 'Conserving Biodiversity – the UK Approach', and is the result of a change in strategic thinking.

National Planning Policy Framework, 2019

The National Planning Policy Framework sets out the Government's planning policies for England and how these are expected to be applied. It contains a number of policies relating to ecology including "minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures".

The natural choice: securing the value of nature (2011) (Natural Environment White Paper)

This White Paper outlines the Governments vision for the future of landscape and ecosystem services.

Biodiversity 2020

This is a national strategy for England's wildlife and ecosystem services based on the White Paper.

10. Appendix 2:

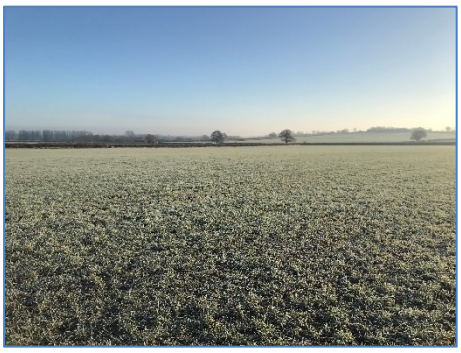

Image 1. Arable habitat within the Site

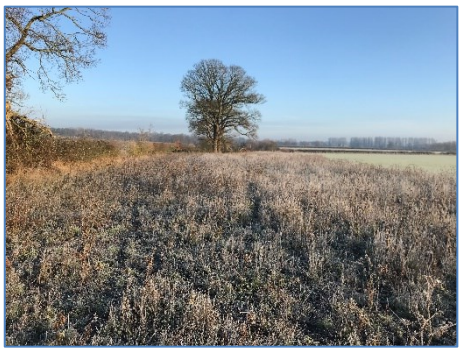

Image 2. Winter bird seed mix located within field compartment

Image 3. Pond 2

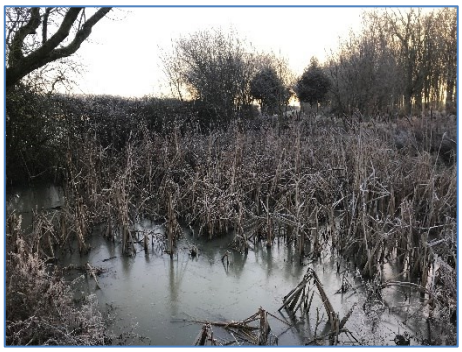

Image 4. Pond 3

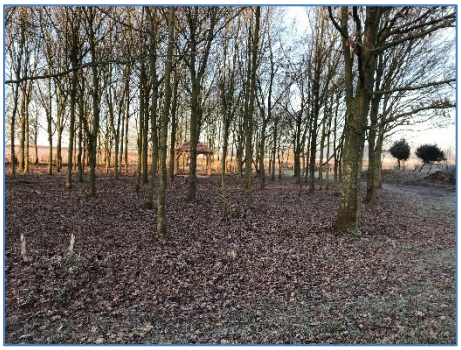

Image 5. Plantation woodland

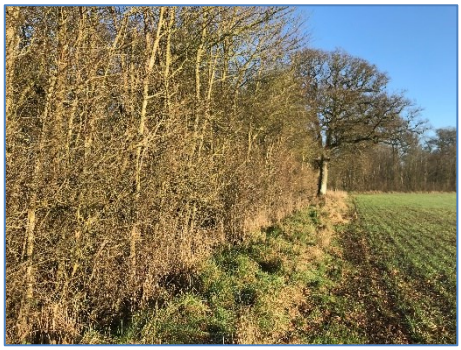

Image 6. Woodland edge associated with Oldfield Copse

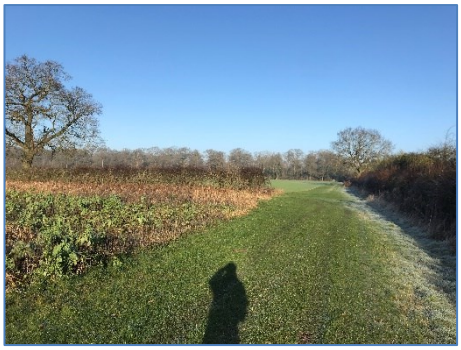

Image 11. Improved grassland habitat at edges fields

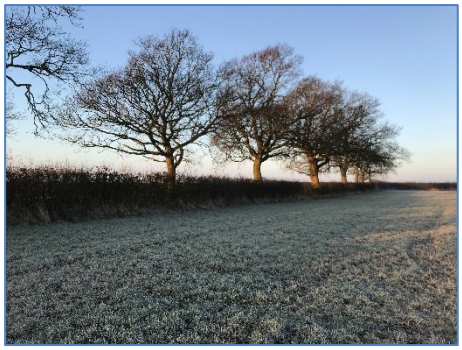

Image 12. Hedgerows were mostly comprised of managed shrubs with occasional mature trees in both areas.