avianecology
development - conservation

Avian Ecology Ltd., Ascot Court, 71-73 Middlewich Road, Northwich, Cheshire CW9 7BP

Yew Tree Cottage

On behalf of Lightsource Renewable Energy Ltd.

Report number: 12-LRE-035 Author: C Baldock

Date: 14th August 2012 Approved: G Quartly Bishop

Ecological Appraisal

Contents

1 SUMMARY

1.1.1 This report presents an Ecological Appraisal of land at Yew Tree Cottage, Halvasso, Cornwall on behalf of Lightsource Renewable Energy Ltd. The survey was commissioned in relation to the proposed installation of ground mounted photovoltaic panels on the site.

1.1.2 The aims of the study were to assess the conservation value of the survey area, the likely presence of rare or protected and notable species, and to identify any features, habitats or species which would constitute potential constraints to the development. Mitigation and enhancement measures are also discussed where relevant.

1.1.3 The Ecological Appraisal comprises two elements: an Extended Phase 1 habitat survey and a desk-based study.

1.1.4 An Extended Phase I habitat survey is an initial site walk-over that determines the baseline habitat of the study area, outlining the potential ecological value and significance of habitats for protected and notable flora and fauna. This was conducted on 6th July 2012 by Avian Ecology Ltd., and followed JNCC (2003) guidelines.

1.1.5 A desk-based study was undertaken in order to identify any nearby sites designated for nature conservation and potential features of nature conservation interest in the wider area. The desk study also identified any known records of protected and / or notable species within the vicinity of the application site. An overview of relevant legislation is presented.

1.1.6 The application site comprised 12 improved and semi-improved fields of low ecological value bordered by predominantly species-rich hedgerows.

1.1.7 The application site does not form part of any statutory or non-statutory designated sites. There are 2 statutory designated sites located within 5km, both of which lie approximately 4.2km south. The site is adjacent to the Halvasso Quarries CWS, which is situated to the east. This site comprises water-filled disused quarries surrounded by a mosaic of scrub, heath, wet woodland and purple moor grass habitats.

1.1.8 The potential for impacts on a range of protected species including birds, bats and badgers is considered. Overall, impacts are considered to be low. With appropriate mitigation and sensitive design measures, it is considered that impacts on protected and notable species can be avoided.

1.1.9 Protection measures are recommended in order to avoid impacts on nearby hedgerows and mature trees during the construction phase of the development. Measures are also recommended to prevent pollution through increased runoff and sedimentation to the nearby stream during construction and operational phases.

1.1.10 The improved habitats within the construction area provide low ecological interest. Habitat enhancement should be considered and include measures such as the enhancement of improved grassland habitats.

2 INTRODUCTION

2.1 BACKGROUND

2.1.1 Avian Ecology Ltd. was commissioned by Lightsource Renewable Energy Ltd. to undertake an Ecological Appraisal at Yew Tree Cottage, Halvasso, Penryn, Cornwall. The survey was commissioned in relation to the installation of ground mounted photovoltaic panels. The proposed development lies at grid reference SW 744 327.

2.1.2 The objectives of the study were to:

- Provide baseline information on the current habitats and ecological features both within the application site and in the immediate surrounding area;
- Identify the presence or potential presence of any protected species or habitats and provide an appraisal of any potential effects the proposed project may have on these;
- Identify the proximity of any sites designated for nature conservation interest and provide an appraisal of any potential effects the proposed project may have on these.
- Provide recommendations for further survey work and / or mitigation measures, if required and present opportunities for habitat enhancement.

2.1.3 The study comprised a field survey, in combination with a desk-based review of existing data and available online resources.

2.2 SITE DESCRIPTION

2.2.1 The site is on the edge of Halvasso, Penryn in Cornwall. The immediate area is rural land dominated by pastoral farmland and tracts of semi-natural broadleaved and woodland predominantly lining streams and valleys. Several old quarry sites in-filled with water and surrounded by disused quarries supporting a range of wetland and scrub habitats are located to the north and south. These comprise non-statutory County Wildlife Sites (CWS).

2.3 LEGISLATIVE FRAMEWORK

2.3.1 Wildlife, biodiversity and ecological networks are referred to in the National Planning Policy Framework (NPPF) 2012, Section 11 'Conserving and enhancing the natural environment'. The NPPF states that the planning system should contribute to and enhance the natural and local environment by; recognising the wider benefits of ecosystem services, minimising impacts on biodiversity and providing net gains in biodiversity where possible. Potential means to achieve this include the establishment of coherent ecological networks that enhance resilience to current and future pressures.

2.3.2 Species of European Importance receive additional protection under the Conservation of Habitats and Species Regulations 2010 (The 'Habitats Regulations') and others receive protection through specific legislation (e.g. the Protection of Badgers Act, 1992).

2.3.3 Any development which may have an impact upon the integrity of a statutory site designated for nature conservation purposes is also subject to the provisions of the Wildlife and Countryside Act 1981 (as amended) and the Habitats and Species Regulations 2010. Under

Regulation 21 of the latter, an Appropriate Assessment may be required in order for a Competent Authority to determine the significance of this impact, both from the proposed scheme and in combination with any other schemes.

2.3.4 Councils also have a statutory obligation under the Natural Environment and Rural Communities (NERC) Act 2006 to make material consideration to biodiversity conservation in the determination of all types of planning applications. Planners therefore require relevant information from wildlife surveys in order to assess the effects on biodiversity of a proposed development.

2.3.5 In 2007, the UK list of conservation priority species and habitats was fully revised taking into account emerging priorities, conservation successes, and information gathered in the past decade. The list now contains 1150 species and 65 habitats that have been listed as priorities for conservation action under the UK Biodiversity Action Plan (UKBAP). The framework for conserving biodiversity is currently laid out in '*Conserving Biodiversity - The UK Approach*' (Defra 2007).

2.3.6 As part of the action plan process, Local Biodiversity Action Plans (LBAPs) were also produced for every county in the UK, although other public bodies may also produce them. These LBAPs highlight local biodiversity issues, with specific action plans being implemented for priority habitats and species where they occur. The relevant scheme for the proposed development is the Cornwall Biodiversity Action Plan.

2.3.7 With legal responsibilities and planning implications it is therefore important that any ecological assessment of a proposed development site addresses the possibility of protected species being present within or around the site, along with any potential impacts of the proposed scheme on statutory designated sites.

2.3.8 Without such an assessment, a developer is unable to demonstrate due diligence in its responsibilities, with reference to both the legal protection and the possible information required in support of the planning application. It would, however, be unreasonable for an ecological assessment to survey for every protected species. Any such assessment should therefore be based upon the results of a habitat survey and the associated possibility or likelihood of protected species being present.

2.3.9 This study therefore seeks to establish the potential for protected species on the site and the potential effects of the proposed scheme on these species and statutory sites designated for nature conservation purposes.

2.3.10 Legal implications for species considered pertinent to the proposed development are discussed below:

<u>Birds</u>

2.3.11 All wild birds, their nests and eggs are, with few exceptions, protected under the Wildlife and Countryside Act 1981 (as amended). Over eighty species or groups of species are listed under Schedule 1 of the Act, which confers special protection with increased penalties for offences committed. Additional protection is provided to species listed under Directive 2009/147/EC on the conservation of wild bird (the 'Birds Directive') codified version. Following recent revisions, fifty-nine species are now listed on the UKBAP.

<u>Bats</u>

2.3.12 All species of British bat are listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and are therefore afforded special protection. It is an offence to:

- Intentionally kill, injure or take any wild bat;
- Intentionally damage, destroy or obstruct access to any place that a wild bat uses for shelter or protection; and
- Intentionally or recklessly disturb any wild bat while it is occupying a structure or place that it uses for shelter or protection.

2.3.13 Bats are further protected under the Conservation of Habitats and Species Regulations 2010 which make it an offence to:

- Capture or kill a bat;
- Significantly disturb a bat (in any location); and
- Damage or destroy a breeding site or resting place of any bat.

Badger

2.3.14 The badger *Meles meles* is widespread and common in many parts of the UK and as such is not considered a conservation priority in the UK, but animals are fully protected under animal cruelty legislation (the Protection of Badgers Act 1992), under which it is illegal to wilfully kill, injure or take a badger. Their setts are also protected against obstruction, destruction or damage and the animals inside cannot be disturbed without a licence from Natural England.

Otter

2.3.15 The otter *Lutra lutra* is protected under the Wildlife and Countryside Act 1981 (as amended). The otter is also listed on the Conservation of Habitats and Species Regulations 2010 and therefore receives further protection as a European Protected Species. These Regulations make it an offence to:

- Deliberately capture, injure or kill an otter;
- Deliberately disturb an otter;
- Damage or destroy a breeding site or resting place (otter holt).

2.3.16 An otter holt includes hovers and couches, which are otter resting places above ground. Artificial holts are not considered as holts under the legislation until they are known to be used by otters.

Water Vole

2.3.17 The water vole *Arvicola amphibius* is protected under the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to:

- Intentionally kill, injure or take a water vole;
- Possess or control any live or dead specimen or anything derived from a water vole;

- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a water vole; or
- Intentionally or recklessly disturb a water vole while it is occupying a structure or place which it uses for that purpose.

Hazel Dormouse

2.3.18 The hazel dormouse *Muscardinus avellanarius* is listed under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and are therefore afforded special protection. It is an offence to:

- Intentionally kill, injure or take a dormouse;
- Intentionally damage, destroy or obstruct access to any place that a wild dormouse uses for shelter or protection; and
- Intentionally or recklessly disturb any wild dormouse while it is occupying a structure or place that it uses for shelter or protection.

2.3.19 The dormouse is further protected under the Conservation of Habitats and Species Regulations 2010 which make it an offence to:

- Capture or kill a dormouse;
- Significantly disturb a dormouse (in any location); and
- Damage or destroy a breeding site or resting place of a dormouse.

Amphibians and Reptiles

2.3.20 All native amphibian and reptile species within the UK receive some legal protection through the Wildlife and Countryside Act 1981 (as amended). Certain species are also protected under the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations'); these species are often referred to as European Protected Species (EPS) and receive further stringent protection.

2.3.21 There are effectively three levels of protection for native amphibians and reptiles in the UK:

2.3.22 Full Protection – the great crested newt *Triturus cristatus*, natterjack toad *Epidalea calamita*, sand lizard *Lacerta agilis* and smooth snake *Coronella austriaca* are often referred to as *'fully protected',* all elements of Section 9 of the Wildlife and Countryside Act apply, as does Regulation 39 of the Habitats Regulations 2010. The Act and Regulations include provisions making it an offence to:

- Deliberately or intentionally kill, injure or take;
- Intentionally or recklessly damage or destroy and breeding site or place used for shelter or protection;
- Intentionally or recklessly obstruct access to a place used for shelter or protection;

- Deliberately or recklessly disturb an animal while occupying a structure or place which it uses for that purpose;
- Deliberately take or destroy eggs; and
- Keep, transport, sell or exchange. It is an offence to possess or control any live or dead specimen or anything derived from such an animal.

2.3.23 Protection against killing, injuring and sale etc. only – This applies to common lizard *Zootoca vivipara*, slow worm *Anguis fragilis*, grass snake *Natrix natrix* and adder *Viper berus*. These species are only afforded protection under the Wildlife and Countryside Act 1981 (as amended). Part of sub-section 9(1) and all of sub-section 9(5) apply; these prohibit the intentional killing and injuring as well as trade. There is no protection afforded to the resting places of these species.

2.3.24 Protection against sale only – This applies to smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus*, common frog *Rana temporaria* and common toad *Bufo bufo*. These species are only afforded protection under Section 9(5) of the Wildlife and Countryside Act 1981 (as amended), prohibiting the sale, barter, exchange, transporting for sale or advertising to sell or buy.

2.3.25 The provisions of both the Wildlife and Countryside Act 1981 and the Habitat Regulations 2010 apply to all life stages of the protected species; eggs, juveniles and adults.

White-clawed Crayfish

2.3.26 The white-clawed crayfish *Austropotamobius pallipes* is listed under Annex II of the Habitats Directive and therefore member states are required to designate Special Areas of Conservation (SAC) to protect important populations of this species.

2.3.27 Outside designated sites, white-clawed crayfish receive partial protection under the Wildlife and Countryside Act 1981. It is offence to capture or sell a white-clawed crayfish without a licence from the appropriate nature conservation authority. The legislation does not provide strict protection for individual crayfish or their habitats specifically (although their habitat is usually indirectly protected through other legislation such as the Water Framework Directive).

2.3.28 The white clawed crayfish is also a Priority species under the UK Biodiversity Action Plan and is a Species of Principal Importance in England under Section 41 of the NERC Act 2006. It is government policy that local authorities conserve and enhance of such species when determining planning applications.

3 METHODOLOGY

3.1 DESK STUDY

3.1.1 The desk study identified statutorily designated sites of nature conservation interest through a review of the Multi Agency Geographic Information for the Countryside (MAGIC) and Natural England (NE) websites.

3.1.2 Biological data was requested from the Environmental Records Centre for Cornwall and the Isles of Scilly (ERCCIS).

3.1.3 The following minimum data search parameters were used:

- All statutory designated sites within a 5km radius;
- Non-statutorily designated sites within a 3km radius;
- Records for all protected, notable or BAP species within a 2km radius.

3.1.4 Reference was also made to Ordnance Survey maps of the wider area and online aerial images (www.google.co.uk/maps) in order to determine any features of nature conservation interest in the wider area.

3.1.5 The following key reference documents were utilised:

- Natural England Technical Information Note TIN101 (2011). *Solar Parks:* maximising *environmental benefits.* Joint Agencies Interim Guidance.
- RSPB (2011). *Solar power RSPB Briefing, March 2011.* RSPB UK.
- Cornwall Biodiversity Action Plans (accessed via http://www.cornwallwildlifetrust.org.uk/conservation/Biodiversity_and_Geodiversity_Action_Plans/Cornwall_Wildlife_Trust_Biodiversity_Action_Plan_BAP)

3.2 FIELD SURVEYS

3.2.1 The field survey was undertaken on 4th August 2012 by Andre Robinson, an experienced field ecologist with many years of relevant survey experience. The extent of the survey area comprises the application site (**Figure 1**) and habitats immediately adjacent to this.

Extended Phase I Habitat Survey

3.2.2 The methodology employed was based upon that outlined in the '*Handbook for Phase 1 Habitat Survey*' (JNCC, 2003) whereby all habitats within the study area are mapped and described using a series of 'target notes' (TN) to provide an overview of the site. This habitat survey method was extended through the additional recording of specific features indicating the presence, or likely presence, of protected species such as bats, birds, great crested newt, badger and water vole and other species of conservation significance.

3.2.3 This survey does not constitute a full protected species survey but enables experienced ecologists to obtain an understanding of the site such that it is possible to either:

- Confirm the conservation significance of the site and assess the potential for impacts on habitats/species likely to represent a material consideration in planning terms; or
- Establish the scope and extent of any additional specialist ecological surveys that will be required before such confirmation can be made.

3.3 SURVEY LIMITATIONS

3.3.1 Habitats and features of interest outside of the application site were observed and recorded from within the survey area or from public access areas, using binoculars where necessary. Therefore, habitats outside of this were not subject to a full habitat survey, although broad habitat types were recorded.

4 RESULTS

4.1 DESK STUDY

Statutory Designated Sites

4.1.1 Two statutory designated sites were identified within a 5km radius of the center of the application site (approximate grid reference SW744327), which overlap in extent. These are detailed in Table 4.1, below.

Site Name	Status	Distance and direction from site	Description
Fal & Helford	SAC	4.2km south	Habitats: Sandbanks, mudflats and shallow inlets and bays and Atlantic salt meadows Species: Shore dock *Rumex rupestris*
Lower Fall and Helford Intertidal	SSSI	4.2km south	Habitats: Estuarine habitats, rocky shores and tidal streams with associated shore communities.

Table 4.1: Statutory designated sites within 5km of SW744327.

Non-Statutory Designated Sites

4.1.2 ERCCIS provided details of 12 County Wildlife Sites (CWS), 1 Cornwall Roadside Verge Inventory (CRVI) site and 1 Cornwall Ancient Woodland Inventory (CAWI) site within a 3km radius of the application site. Details of the CWS sites are presented in Table 4.2. No detailed information was provided on the CRVI and CAWI sites.

Site Name	Grid Reference	Description	Status
Falmouth Reservoirs	SW765329	Reservoirs bordered by mixed broadleaved woodland and wet willow *Salix spp*. woodland supporting diverse fen and bryophyte communities. BAP priority species include marsh tit *Poecile palustris*, song thrush *Turdus philomelos*, otter *Lutra lutra* and a number of bat species including brown long-eared bat *Plecotus auritus*.	CWS
Budock Water	SW775319	A reservoir set within a valley bottom. Habitats include wet woodland, rush pasture, open water	CWS

Site Name	Grid Reference	Description	Status
		and reedbed. BAP priority species include common lizard *Zootoca vivipara* and long-eared bat.	
Treneere Wood	SW764302	Valley woodland dominated by wet willow with pedunculate oak *Quercus robr* woodland in drier areas. Notable species include otter and natterers *Myotis nattereri*	CWS
Bosvathick Wood & Croft Plantation	SW748303	Wooded valley dominated by sessile oak *Quercus petraea*.	CWS
Treglidgwith Wood	SW738298	Oak woodland and willow woodland.	CWS
Calamansack Wood to Gweek	SW727277	Part of the Helford River System, including creeks and deep wooded valleys. BAP priority species include otter *Lutra lutra* and lesser horseshoe bat *Rhinolophus hipposideros*	CWS
Maen Pearne Quarries	SW731311	Steam valley with wet willow woodland and purple moorgrass *Molina caerulea*.	CWS
Nancrossa Moor	SW728325	Extensive fen habitat with strips of broadleaved woodland.	CWS
Lestraines Moor	SW736326	Purple moor grass and rush pasture and wet woodland. Notable species include otter and brown long-eared bat.	CWS
Halvasso Quarries	SW747325	Large disused quarries with a range of wetland and drier scrub habitats and an area of wet woodland.	CWS
Rame Common	SW722345	Heathland comprising western gorse *Ulex gallii* and heather *Ericaeae spp*. Species include pale dog-violet *Viola lactea* and song thrush.	CWS

Site Name	Grid Reference	Description	Status
Rosemanowas Quarries	SW39346	Polkanuggo Quarry and surrounding spoil tips with dominated by mixed scrub and bracken *Pteridium aquilinum* with gorse *Ulex spp.* and wet woodland.	CWS

Table 4.2: Non-Statutory designated sites within 3km of SW744327.

4.1.3 Halvasso Quaries CWS is the nearest non-statutory site and this is situated to the south and east of the application boundary. At its closest, this site lies directly adjacent to the eastern border of the application site.

4.1.4 Lestraines Moor is also located in close proximity to the application site, less than 1km west.

Protected and Notable Species

4.1.5 ERCCIS provided records for protected and notable species within 2km of SW744327. This information is summarised below.

Birds

4.1.6 Wildlife and Countryside Act (1981) Schedule 1 (as amended) and UK and Cornwall Biodiversity Action Plan (BAP) species records returned by the ERCCIS are summarised in Table 4.2. Species records dated pre 2000 have been omitted.

Species		Summary
Whooper swan	*Cygnus cygnus*	Sch1
Garganey	*Turdus pilaris*	Sch1
Scaup	*Aythya marila*	Sch1, CBAP
Purple heron	*Ardea purpurea*	Sch1
Osprey	*Falco peregrinus*	Sch1
Black-necked grebe	*Podiceps nigricollis*	Sch1
Merlin	*Falco columbarius*	Sch1
Hobby	*Falco subbuteo*	Sch1
Peregrine	*Falco peregrinus*	Sch1
Curlew	*Numenius arquata*	CBAP
Green sandpiper	*Anas querquedula*	Sch1
Mediterranean gull	*Larus melanocephalus*	Sch1
Herring gull	*Larus argentatus*	CBAP
Black tern	*Chlidonias niger*	Sch1
Roseate tern	*Sterna dougallii*	Sch1, CBAP
Cuckoo	*Cuculus canorus*	CBAP
Barn owl	*Tyto alba*	Sch1
Common kingfisher	*Alcedo atthis*	Sch1
Skylark	*Alauda arvensis*	CBAP

Species		Summary
Grasshopper warbler	*Locustella naevia*	CBAP
Common starling	*Sturnus vulgaris*	CBAP
Fieldfare	*Turdus pilaris*	Sch1
Song thrush	Turdus philomelos	CBAP
Redwing	*Turdus iliacus*	Sch1
Spotted flycatcher	*Muscicapa striata*	CBAP
Black redstart	*Phoenicurus ochruros*	Sch1
House sparrow	*Passer domesticus*	CBAP
Dunnock	*Prunella modularis*	CBAP
Yellow wagtail	*Motacilla flava*	CBAP
Brambling	*Fringilla montifringilla*	Sch1
Linnet	*Carduelis cannabina*	CBAP
Bullfinch	*Pyrrhula pyrrhula*	CBAP
Yellowhammer	*Emberiza citrinella*	CBAP
Reed bunting	*Emberiza schoeniclus*	CBAP

Table 4.2: Bird species records returned from ERCCIS within 2km of SW744327.

Bats

4.1.7 The dataset provided by ERCCIS included records of the following species:

- Brown long-eared bat *Plecotus auritus*
- Common pipistrelle *Pipistrellus pipistrellus*
- Pipistrellus species – this is likely to refer to common pipistrelle and soprano pipistrelle *Pipistrellus pygmaeus* species
- Lesser horseshoe bat *Rhinolophus hipposideros*
- Noctule *Nyctalus noctula*

4.1.8 No information was provided in relation whether these results comprised casual sightings or roost records.

Badger

4.1.9 A number of records of badger *Meles meles* were returned from within the search area, including one from Halvasso.

Otter

4.1.10 ERCCIS provided a number of records of otter *Lutra lutra* within the 2km search area. These included records relating to the River Argal which is c. 800m west of the Application site at its nearest point, and Argal Reservoir to the east.

Amphibians

4.1.11 Records of common frog *Rana temporaria* and common toad *Bufo bufo* were returned by ERCCIS within the search area. No other amphibian species were recorded.

4.2 FIELD SURVEY

4.2.1 A Phase I habitat map is presented in **Figure 1**. A summary of habitats and species considered pertinent to the project is presented below. Information on the legal implications of the presence of such habitats and/or species is discussed in Section 5 where appropriate, along with an assessment of possible impacts on these features.

Habitats

4.2.2 The application site occupies twelve fields totalling approximately 16ha. The fields comprise improved grassland to the south and semi-improved agricultural grassland to the north and east. The survey area extends just beyond this into adjacent habitats which include the Halvasso Quarries CWS, with habitats including large water-filled disused quarries surrounded by wet woodland including willow *Salix spp*. and drier scrub habitats comprising a mosaic of bracken *Pteridium aquilinum*, scrub and heathland. Areas of purple moor grass *Molinia caerulea* are also present to the south.

4.2.3 The improved and semi-improved fields were predominantly bordered by species-rich hedgerows, some of which contained trees. Species present comprised 40% blackthorn *Prunus spinosa* and 40% gorse *Ulex spp*., with ash *Fraxinus excelsior*, hazel *Corylus avellana* and alder *Alnus glutinosa* also present. Nearly all of these hedgerows had not been cut recently and were between 6-8m high.

4.2.4 No ponds were identified within the application site boundary, but approximately 5 waterbodies were located within 500m of the application site centre. These waterbodies are predominantly to the south and south east of the application site and comprised water-filled disused quarries. The nearest is in close proximity to the southern section of the application site boundary; however this was not surveyed due to access constraints. From aerial photos and photos taken during survey these waterbodies appear to comprise relatively substantial bodies of open water supporting limited aquatic vegetation.

4.2.5 No buildings were present within the application site, however several clusters of farm buildings are present just beyond the boundary; Boundis Farm to the northwest and Goodagrane to the south.

4.2.6 The habitats within the application site were classified as of low ecological value, with the species-rich field boundaries considered to offer greater potential value to wildlife.

4.2.7 Table 4.3 details the main habitat types within the application site boundary.

JNCC Habitat Code	Habitat Name	Area (15.69ha)	% cover of study area
B4	Improved grassland	7.39	47
B6	Poor semi-improved grassland	8.3	53

Table 4.3: Main habitat types identified within the survey area.

4.2.8 Table 4.4 details target notes from the field survey, and should be viewed in conjunction with Figure 1.

Target Note Number	Comment
1	Old disused quarry now overgrown with willow Salix spp. Large open waterbody with limited aquatic vegetation. Some tall mature trees were identified of high value for wildlife. These may also provide potential for roosting bats.
2	Badger run

Table 4.4: Target notes

Protected Species

4.2.9 The application site and adjacent land is potentially suitable for a range of protected species and the wider area offers foraging and roosting opportunities for bats and birds, as described below.

Birds

4.2.10 The improved grassland habitats, together with the species rich hedgerows, are likely to support a suite of breeding birds typical of farmland and woodland habitats in the region.

4.2.11 The improved grassland is considered unlikely to provide sufficient cover for ground nesting birds; however the longer grassland within the semi-improved fields may provide some opportunities. The nearby scrub and heathland mosaic, together with wet woodland within the Halvasso Quarries CWS are considered to offer the greatest opportunities for breeding birds.

4.2.12 Records of barn owl *Tyto alba* were returned from the data search. The fields do not currently offer particularly suitable habitat for foraging barn owl, although the longer grass within the semi-improved fields may provide some low quality foraging potential. No evidence of suitable nesting habitat in the form of mature trees or other structures was noted within the application site boundary.

Bats

4.2.13 Habitats within the application site boundary predominantly comprise improved grassland and species poor semi-improved grassland, which offers limited opportunities for most foraging bat species. The mature species-rich hedges that border these fields provide greater opportunities for foraging and commuting.

4.2.14 Mature trees within the Halvasso Quarries CWS are likely to provide some roost potential. And the nearby buildings of Boundis Farm and Goodagrane may also provide opportunities for roosting bats; however these were not assessed during survey due to access constraints.

Badgers

4.2.15 Several badger records were returned within the 2km search area and evidence of the presence of badger on site was identified in the form of a probable badger track along the application site boundary (TN2).

4.2.16 The hedgerow, scrub and improved and semi-improved fields provide foraging opportunities and the hedgerows provide some cover for sett creation.

Otter

4.2.17 Several records of otter were returned, relating to nearby watercourses and reservoirs. Whist there is some potential for otter to pass through the site occasionally, no wetland habitats are present within the application site boundary and therefore no constraints are anticipated in relation to this species.

Hazel dormouse

4.2.18 The species-rich hedgerows and trees within the field boundaries provide suitable habitat for this species; however the site is to the west of the UK distribution of this species and it is therefore considered highly unlikely that it will be present.

Amphibians

4.2.19 The only records of amphibians returned within 2km of the site by ERCCIS were for common frog and common toad.

4.2.20 No waterbodies were present within the application site. Roughly 5 waterbodies were identified within a 500m radius, comprising in-filled quarries. These waterbodies appear to support limited aquatic vegetation and therefore are likely to offer low quality habitat for amphibians.

4.2.21 The hedgerow provides potential terrestrial habitat for amphibians.

4.2.22 The application site lies outside of the UK range of great crested newt *Triturus cristatus*.

Reptiles

4.2.23 The following reptile species were returned during the data search:

- Adder *Vipera berus*
- Common lizard *Zootoca vivipara*
- Slow-worm *Anguis fragilis*

4.2.24 The hedgerows and tall semi-improved grassland on site provides suitable cover for a range of commoner UK reptiles.

Invertebrates

4.2.25 The following butterfly species were returned during the data search:

- Small heath *Coenonympha pamphilus*
- Wall butterfly *Lasiommata megera*

4.2.26 There is some potential for the wall butterfly to be present within the disused quarries and surrounding heathland and scrub habitat to the immediate south and east of the site; however habitats within the application site are not considered optimal for either species.

5 DISCUSSION

5.1.1 Natural England Guidance TIN101 (Natural England, 2011) states '*like any type of development, solar parks have the potential to affect the landscape, natural habitats, soils and geological and archaeological features'.* TIN101 discusses the potential for damage as a result of operation or when the panels are being erected or decommissioned and highlights the potential for cumulative impacts to occur when parks are sited in close proximity. However, it also notes that a well located and designed park cannot only avoid negative environmental impacts but deliver a net gain for biodiversity as well as contributing positively towards low carbon energy production.

5.1.2 In view of the above, this section seeks to identify potential effects on protected and notable species. The proximity of statutory and non-statutory designated sites and potential effects on their qualifying interests is discussed. To this extent, recommendations are made for further survey work and mitigation, if required. Measures are proposed for the protection of on-site habitats throughout the construction phase of development.

5.1.3 This section also introduces opportunities for post-development habitat enhancement on the application site for the benefit of local biodiversity.

5.2 DESIGNATED SITES AND GENERAL HABITATS

5.2.1 Natural England guidance TIN101 (Natural England, 2011) highlights the potential for adverse impacts where a solar park is proposed on or adjacent to a designated site or near sites of high wildlife value. Any solar park close to a designated site or site of high wildlife value will need to demonstrate that the development would not compromise the objectives of the designation.

5.2.2 The application site does not form part of any statutory or non-statutory designated site for nature conservation. The nearest statutory designated sites are approximately 4.2km south and no direct or indirect effects are anticipated on these sites. The nearest non-statutory designated site is the Halvasso Quarries CWS, located adjacent to the eastern boundary of the application site. This site is notified for habitat interests including water-filled quarries, scrub heath and wet woodland. In the absence of mitigation there is some potential for indirect impacts from overland surface water flows etc. due to the proximity of this CWS to the application site.

5.2.3 The application site comprises improved and semi-improved grassland generally considered to be of low value for wildlife. The main features of interest for wildlife comprise the species-hedgerows bordering the fields.

5.2.4 There may be a requirement for the removal of small sections of hedgerow in order to enable access. It is recommended that existing gateways are used where possible.

5.2.5 Consideration should be given to any potential for pollution run-off to occur during the construction and operational phases of the development, particularly in relation to the Halvasso Quarries CWS located to the east and the stream running through this. Standard pollution prevention measures should be employed during the construction phase of the development, following Environment Agency guidance. Consideration should be given to the construction of swales, in order to intercept overland surface water flows and reduce agricultural run-off potentially associated with site operation.

5.2.6 Habitat enhancement measures should be considered within the application. Management to enhance the diversity of grassland habitats around the panels is likely to offer most benefits for plant and animal communities, as recommended in TIN101 (Natural England 2011). Further planting of species-rich native hedgerow with scattered trees would provide enhanced nesting, roosting, foraging and commuting opportunities for a range of species including birds, bats, dormice and insects.

5.3 BIRDS

5.3.1 The potential operational effects of solar parks on birds are not well documented. NE guidance TIN101 (2011) mentions that some birds are likely to be affected by solar parks developed close to statutory sites designated for their ornithological value, due to the potential for loss of habitat and displacement to impact on qualifying interest species. In the absence of specific guidance or research into the effects of solar parks on birds, professional judgement has been applied.

5.3.2 No statutory designated sites with identified ornithological interests were noted within 5km of the application site and therefore no impacts on the mobile interest features of such sites will occur.

5.3.3 There is potential for birds to be displaced by the construction phase of the development. Land beneath the footprint of the development comprises improved and semi-improved grassland. Whilst some level of displacement is likely to occur, the impacts are considered to be negligible, given the small scale of the development and the temporary nature of the associated disturbance. The construction period for solar developments is also considered to be shorter than conventional construction projects and therefore any impacts are expected to be minimised.

5.3.4 Species-rich hedgerows around the site provide suitable habitat for nesting birds. Additionally, the semi-improved grassland may provide opportunities for ground nesting birds such as sky lark *Alauda arvensis*. As a precaution, it is therefore recommended that construction and any associated vegetation removal takes place outside of the bird breeding season (March-August inclusive) in order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Birds Directive and the Wildlife and Countryside Act 1981 (as amended). If works cannot be avoided within this season, potential nesting habitat should be hand-searched by a suitably experienced ecologist prior to works commencing.

5.3.5 Enhancement of improved grassland habitats by reduction of grazing pressure and retention of semi-improved grassland habitat will provide opportunities for prey species to thrive and provide enhanced cover for ground nesting birds.

5.4 BATS

5.4.1 Two possible mechanisms have been identified (Natural England, 2011) whereby operational solar parks may impact on bats;

- Loss of commuting and foraging habitat; and,
- Injury through interaction with solar panels, either through occasional collision as a result of bats attempting to drink from the panels, or collision into panels when they are vertically aligned and bats attempt to fly through them (Bjoern Siemers and Stefan Grief (2010)).

5.4.2 Natural England (2011) Guidance TIN101 states that there is some evidence from a laboratory-based study that bats can collide with solar panels, however further field-based research is required in order to comprehensively assess the likelihood of impacts.

5.4.3 The ERCCIS desk study returned records for brown long-eared bat, noctule, common pipistrelle, *Pipistrellus* species, and lesser horseshoe.

5.4.4 The improved and semi-improved grassland within the application site was classified as of negligible value for bats, however the species-rich hedgerows within the application site and scrub and wetland habitats to the east and south of the application site are considered to be of moderate value for commuting and foraging bats. These habitats will not be affected by the proposed works.

5.4.5 There may be a requirement for the removal of sections of hedgerow; however no severance of flight lines is anticipated due the small length of removal required.

5.4.6 No buildings or mature trees providing bat roost potential were identified within the application site. Several farm building complexes and mature trees were identified just beyond the boundaries of the application site and these may provide suitable opportunities for roosting bats. No trees or buildings are likely to be affected as part of the proposed works and therefore no impact on bat roost sites are anticipated.

5.4.7 Negligible impacts upon bats are expected as a result of the development due to the short-duration and low intensity of proposed construction works and the limited bat interest value of habitat beneath the footprint of the development.

5.4.8 Any habitat enhancement undertaken as part of the development will likely improve bat foraging opportunities within the application site and result in a minor positive outcome.

5.5 BADGERS

5.5.1 Badger activity was identified on the boundary of the application site (see TN2, **Figure 1**). No other signs of badger or badger setts were identified within the application site.

5.5.2 Due to the presence of badgers on site, it is recommended that a pre-construction badger survey is carried out to ensure that the baseline conditions remain the same and that no new setts have been excavated in the interim period.

5.5.3 Any ground excavation made during the construction phase, should be covered overnight or fitted with a means of escape should a badger become trapped. All materials should be stored in secured compounds or raised off the ground.

5.6 REPTILES AND AMPHIBIANS

5.6.1 A watching brief be employed by site operatives during construction activities to avoid risks of inadvertently killing or injuring reptiles, amphibians and hedgehogs that could potentially be present within hedgerows and taller improved grassland.

5.7 OTHER NOTABLE SPECIES

5.7.1 No other species are considered pertinent in relation to the proposed development.

5.8 SUMMARY – ECOLOGY PRIORITY MATRIX

	Status / Legal Protection	Potential for Impacts	Recommended Further Survey Effort	Recommended Mitigation / Enhancement Measures	Likely Residual Impact
Designated Sites	CWS	Unlikely	n/a	Implementation of standard pollution prevention measures during the construction phase of the development, following Environment Agency guidance. Construction of swales to minimise overland flow of water.	None
General Habitat	n/a	Negligible	n/a	Protection of trees and hedgerows; Pollution prevention of watercourses; enhancement of grassland habitats around the panels.	Neutral/ minor positive
Birds	WCA 1981	Unlikely	Nest searches if works are proposed during breeding/nesting season (March to August inclusive).	Protection of trees and hedgerows; vegetation clearance to avoid breeding season (March to August inclusive).	Neutral / minor positive
Bats	WCA 1981, Habitat Regs. 2010	Unlikely	Precautionary inspection for bat roost potential by competent / experienced ecologist if removal of trees is required.	Protection of trees to safeguard potential roost sites and hedgerows to maintain foraging and commuting opportunities. Enhancement of grassland habitats around the panels.	Neutral / minor positive
Badger	Protection of Badgers Act 1992	Possible	Pre-construction badger survey	Precautionary measures to include covering open excavations and safe storage of materials overnight.	Neutral
Otter	WCA 1981, Habitat Regs. 2010	Unlikely	n/a	General habitat protection measures - pollution prevention of freshwater habitats.	Neutral
Amphibians and reptiles	WCA 1981	Unlikely	n/a	Watching brief to be employed during works to avoid impact on individuals. Grassland enhancement around the panels.	Neutral

Ecology Priority Matrix Key

Status

CWS – County Wildlife Site

Legal Protection

WCA 1981 - Wildlife and Countryside Act 1981

Habitat Regs. 2010 - The Conservation of Habitats and Species Regulations 2010

6 REFERENCES

Hundt L (2012) *Bat Surveys: Good Practice Guidelines, 2nd Edition*, Bat Conservation Trust.

Defra (2007). *Conserving Biodiversity – The UK Approach*. HMSO.

JNCC (2003). *Handbook for Phase I Habitat Survey – a Technique for Environmental Audit.* JNCC, Peterborough.

Natural England (2011). *Technical Information Note TIN101 - Solar Parks: maximising environmental benefits.* Natural England, Peterborough.

RSPB (2011). *Solar power RSPB Briefing, March 2011.* RSPB UK.

Figure 1: Phase 1 Habitat Survey Map