

Skylark Mitigation and Management Plan



Land South of Berrington, Shrewsbury

Principal Author: Daniel Watson

Project Code/ADAS Ref:

Address:

RSK ADAS Ltd
Portview Road,
Avonmouth,
Bristol,
BS11 9DE

Date: 1 May 2023

Version: 1

Commissioned For:

Jacques Carboni,
ADAS Planning,
4205 Park Approach,
Leeds,
LS15 8GB



Quality Assurance

Revision	Date	Author	Checked	Approved
00	1 May 2023	Daniel Watson BSc (Hons) 	Joseph Dyson BSc (Hons) MCIEEM 	James Packer BSc(Hons) CEcol MCIEEM 

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

Disclaimer

RSK ADAS Ltd (ADAS) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and ADAS. No other warranty, expressed or implied, is made as to the professional advice included in this report.

Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by ADAS for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.

No part of this report may be copied or duplicated without the express permission of ADAS and the party for whom it was prepared.

Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.

This work has been undertaken in accordance with the quality management system of RSK ADAS Ltd.

Revision History

ADAS Ref (Revision number)	Date	Amendment
00	25/04/2023	INITIAL REPORT

Contents

Summary	1
1 Introduction	2
1.1 <i>Strategy Objectives</i>	2
1.2 <i>Site Description</i>	2
1.3 <i>Description of the Proposed Development</i>	3
1.4 <i>Summary of prior ecological and planning authority input</i>	3
2 Eurasian Skylark – species context	4
2.1 <i>Overview of Skylark ecology</i>	4
2.2 <i>Conservation Status</i>	4
2.3 <i>Legislation</i>	5
2.4 <i>Habitat requirements</i>	5
2.5 <i>Population and distribution on site</i>	6
3 Mitigation	7
3.1 <i>Prior to and during works</i>	7
3.2 <i>Identification of suitable compensation areas</i>	7
4 Compensation	8
4.1 <i>Proposed Compensation areas</i>	8
4.2 <i>Habitat Management requirements (pasture)</i>	9
4.3 <i>Habitat Management requirements (arable)</i>	10
4.4 <i>Population Monitoring</i>	11
5 Conservation Objectives	12
6 Conclusions	13
7 References	14
Appendix 1: Proposed Plans	I
Appendix 2: Proposed Mitigation areas	VI

Summary

ADAS was commissioned to provide a Skylark Mitigation Strategy and recommendations for management following consultation with Shropshire Council Local Planning Authority (LPA) in relation to a proposed solar PV development at land to the southwest of Berrington, Shropshire (central grid ref: SJ 52741 07125).

The strategy was to include some analysis of existing best practices and research, and to identify an appropriate approach to ensure the long-term persistence of Skylark at the site, during and following the development.

The following mitigation measures were considered integral to the strategy:

- Timing of the works as not to impact breeding bird assemblages on site (greatest impacts likely between March – August)
- Ecological supervision / safeguarding of nests if works take place within the breeding season (March – August inclusive)
- Identifying suitable areas off site for compensation measures to be implemented
- Practical management strategies required for successful persistence of Skylark populations on site.

In addition to the mitigation measures proposed above, liaison with the landowner and LPA led to the identification of areas immediately adjacent to the development site which could be utilised for compensation. It was proposed that, pending confirmation of long-term land use; either (i) the entire area earmarked as the compensation area would be managed in totality following conservation grazing practices or (ii) if the land was used for arable crop production, a total of 6 ha was required for the compensation area, and that a total of 12 Skylark plots be created within this area. Some consideration of habitat management, including the timing of harvesting and hedgerow management, was included in the strategy.

It was recommended that a long-term monitoring effort (of no less than five years) be undertaken both within the compensation and operational areas of the site to obtain baseline data to inform the success of the strategy.

1 Introduction

1.1 Strategy Objectives

The aim of the Skylark Mitigation and Management Plan is to identify the requirements of the known population of Skylark *Alauda arvensis* on site, to identify an appropriate mitigation and compensation strategy and to provide signposting for conservation objections that will allow for the strategy to be successfully deployed.

Consideration of the requirements of Skylark at both the population and individual level will be discussed, with the most up-to date research utilised to ensure a deliverable, bespoke strategy which can be successfully implemented to secure the long-term persistence of the species at the site. Ecological constraints to the proposed works and make recommendations for mitigation or opportunities for enhancement that can be incorporated into the design.

1.2 Site Description

The site was located on the land to the southwest of Berrington, Shrewsbury, SY5 6HQ (Central Grid Reference: SJ 52312 06495). The site was comprised of large arable and grassland fields approximately 44.06 ha, within one of these fields was a large lagoon. The site was bound by narrow single-track roads along the eastern, northern, and western boundary which led to arable fields in the east, livestock fields to the north. A small woodland to the south concealed Cound Brook which is approximately 3 m wide and relatively fast flowing. The wider area generally consists of arable farmland with small residential areas to the north-east, west, and south. To the north of the site is Berrington Pool Site of Special Scientific Interest (SSSI). Figure 1 below shows the site boundary.



Figure 1. Site location and wider landscape (site indicated by white line boundary) Imagery taken from ADAS Mapping Tool. © 2023 Microsoft Corporation, © 2023 Maxar, © CNES (2023) Distribution Airbus DS

1.3 Description of the Proposed Development

The proposal is for the erection of a solar photovoltaic (PV) array, with a total export capacity of up to 30 MW (Drawing:1051487-ADAS-XX-XX-DR-PL-8000). Each of the solar panels will be mounted on a fixed panel system. The panels are covered by high transparency solar glass with an anti-reflective coating which minimises glare and glint, whilst also aiding in the maximum absorption of the available sunlight. The panels are dark grey/blue in colour. All internal aspects (including ponds) are to be retained within a minimum of a 5 m buffer around these aspects. The hedgerows surrounding the site are also to be retained however, a small section at each access point may need to be removed to improve the access for plant. At this time there is no plans for any vegetation clearance to take place as part of the works. An outline of the proposed development is given in Appendix 1.

1.4 Summary of prior ecological and planning authority input

A range of ecological surveys have been undertaken on site since 2021, most pertinent to this report were breeding bird surveys undertaken during 2022. The breeding bird survey flagged the presence of a number of Birds of Conservation Concern (BoCC) which included 11 Skylark territories within the development area (ADAS, 2023).

Following data provided in support of the planning application (reference: 22/04355/FUL) a number of objections were raised, including “The loss of skylark habitat on the site is not acceptable. Replacement nesting habitat needs to be provided on the site as part of the site design.” from Sophie Milburn (Shropshire Council Planning Ecologist).

Consultation with the LPA, Shropshire Council and the landowner was on-going throughout March and April 2023, before an agreement with Suzanne Wykes (Specialist Practitioner (Ecology) at Shropshire Council) was reached on 20 April 2023 that a bespoke Skylark mitigation strategy would be required to discharge the planning condition in line with policy CS17 of the Shropshire Local Development Framework Adopted Core Strategy 2006-2026.

2 Eurasian Skylark – species context

2.1 Overview of Skylark ecology

The Skylark is a bird of open countryside in the UK, inhabiting open habitats in both upland and lowland areas. The species is sedentary or partially migratory, with populations in upland areas moving to lower altitudes or coastal areas for the winter. The species begins to establish territories as early as February, with the main nesting period between 20 April and 06 July, with the mean first date that clutches are laid being 19 May (BTO, 2023). Skylark is capable of producing up to four broods due to this extended breeding season, typically laying three or four eggs per clutch. The incubation period of the Skylark is typically 12 to 14 days, with the fledglings remaining in the nest for a further 11 to 15 days.

The species is best described as a generalist in terms of diet; during the winter Skylarks form groups and are frequently found foraging in set-aside or stubble for grain (Gillings *et al.*, 2005). Studies have shown that large cereal stubble fields (<4.3 ha) with no or very low boundary features are the optimal habitat for winter foraging particularly for grains (Geiger *et al.*, 2013), whilst winter cereal crops provided sustenance via cereal leaves (Donald *et al.*, 2001).

During the breeding season the availability of invertebrate prey is a key factor in site selection, with Coleoptera, Diptera, Lepidoptera, Hymenoptera and Araneae accounting for 91% of the nestling diet in some areas (Ottens *et al.*, 2014), Foraging areas such as field margins (Ottens *et al.*, 2014) and undrilled or wide spaced rows support higher density of prey items (Smith *et al.*, 2009). Access to areas where levels of invertebrate prey are consistent throughout the breeding season has been shown to be a core driver in breeding locations at the site level (Puttmanns *et al.*, 2022).

Factors other than dietary requirements have been proven to affect the population density of the species, with mean vegetation height and size of site two key indicators as to whether a location is suitable for breeding (Rahman *et al.*, 2012), with historic research showing a preference of crop height of between 20 cm – 50 cm, particularly in areas where no or low boundary features were present (Wilson *et al.*, 1997).

2.2 Conservation Status

In the UK, the Skylark was once considered an integral part of the countryside, however, the species status as a common farmland bird has changed significantly since the 1970's. In the UK the breeding population decreased between 1970 and 2013 by 60% (Hayhow *et al.*, 2015), with a further decrease of 15% between 1995 and 2020, with an estimated 1.6 million territories remaining in the UK (Harris *et al.*, 2022) – for comparison, the population between 1988 – 1991 was estimated to be approximately 2 million territories (Browne *et al.*, 2000).

As a consequence of these dramatic declines, the species is included on the Red List of Birds of Conservation Concern (BoCC). The Red list is the category for those species which are considered to be the most urgent conservation priority and where the breeding population has declined by at least 50% over the last 25 years. These species may also be globally threatened or have suffered an historic decline in the period 1800 to 1995.

Skylark is also listed under Annex 1 of the Birds Directive (2009 as amended) and is a UK Biodiversity Action Plan (BAP) species as it is one of a number of species identified as being threatened and therefore requiring targeted conservation action to reverse the species declines.

2.3 Legislation

All breeding wild birds, including Skylark, are protected under the Wildlife and Countryside Act 1981 (as amended). Under the Wildlife and Countryside Act, a wild bird is defined as any bird of a species that is resident in or is a visitor to the European Territory of any member state in a wild state.

All birds, their nests and eggs are protected and it is thus an offence, with certain exceptions to:

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

2.4 Habitat requirements

Skylark is a widespread species in the UK, occurring across England, Wales and Scotland, though in Ireland the species is less frequent. Populations can broadly be split on the basis of two discrete habitat preferences; upland and lowland. The population density is highest in upland areas, where it occurs on moorland and bogs. In lowland areas, arable farmland is the most important habitat for the species, with lower numbers occurring in heathland, marsh, coastal and pasture (Harris *et al.*, 2023). Lowland cereal crops are considered to be the most important habitat for the species in the UK in terms of the overall numbers of breeding pairs supported, however population density in these areas is lower due to a shorter

breeding season as a result of harvesting (Donald and Vickery, 2000). The presence of field margins is considered integral to the habitat requirements for the species, as studies have shown that margins are preferred above all other habitats for foraging purposes, particularly during the breeding season (Kuiper *et al.*, 2013). Availability of suitable invertebrate prey items (Ottens *et al.*, 2014), site size (Rahman *et al.*, 2012) and low or no boundary features (Wilson *et al.*, 1997) are the primary factors influencing the presence or absence of Skylark in lowland habitats. Studies have also shown that the presence of Skylark plots and additional tramlines in winter cereals increased the number of breeding territories (Schmidt *et al.*, 2017), highlighting the value of such conservation measures.

2.5 Population and distribution on site

A total of four breeding bird surveys were undertaken on site in the spring of 2022 by ADAS Ecologist Daniel Watson BSc (Hons). The results of the surveys found a total of 11 occupied territories within the survey area across all surveyed land parcels. A maximum of seven territories were in Land Parcel 1 (LP1, OS Grid Reference centroid SJ 52120 06489), with four in LP2 (OS Grid Reference centroid SJ 52603 06353). A particularly high density was noted around the fringes of the farmland reservoir in LP1 (OS Grid Reference centroid SJ 52026 06662), with a minimum of five territories in this area alone. At the time of the survey both LP1 and LP2 were arable.

3 Mitigation

3.1 Prior to and during works

Ahead of and during the construction phase of the development, the following considerations will be adopted to reduce impacts to Skylarks and other birds breeding on site.

3.1.1 Timings of works

It is recommended that works are undertaken outside of the breeding season (March – August inclusive) to avoid the risk of committing an offence by damaging or destroying nests or young of birds actively breeding on site. Where groundworks cannot be undertaken outside of the breeding season, works should be subject to supervision or a nesting bird check (see 3.1.2).

3.1.2 Requirement for ECoW

If works are to be undertaken within the breeding season (March – August inclusive), a suitably experienced person will undertake a nesting bird check of all areas to be impacted – this includes areas suitable for ground-nesting birds such as Skylark. If any nests are located at this point, it is recommended that the position of these are made known to all on site, and that a suitable exclusion zone so as to safeguard the nest is installed.

3.2 Identification of suitable compensation areas

Following consultation with the client and the landowner, the nearest suitable land for compensation was immediately north of the site boundary in four parcels currently used for arable or grazing/silage production. The identified area amounted to a total of approximately 25 ha and will easily accommodate the minimum required area of 6 ha. The use of the land for compensation and mitigation purposes has been agreed with the landowner and client at the time of writing. This area is shown within Appendix 2.

4 Compensation

4.1 Proposed Compensation areas

Following consultation with the client, landowner and LPA, land to the north of the development was earmarked as the proposed compensation area. The current land use within these areas is for grazing, with the current land use likely to persist following development. It should be noted that at present, the LPA is being asked to pre-empt that current Higher Level Stewardship (HLS) land will revert to arable as the stewardship scheme ends. However, some current HLS land may not be suitable for arable reversion due to its grade, or to its proximity to the Berrington Pool Site of Scientific Special Interest.

As a result of this potential change of land use, proposals for compensation have been considered for both grazing on pasture (current land use) and conversion to arable.

4.1.1 Proposal if land maintained as pasture

At present the main land use is pasture for grazing, with a different method of management required to provide suitable compensation areas for Skylark. The area will be grazed in a less intensive manner, with low stocking density to create a matrix of shorter and tussocky grassland suitable for nesting and foraging Skylark. The stocking densities are provided in Table 1. Livestock must not be present on the land between April – June to avoid impacts to ground nesting birds such as trampling and/or predation. Detailed requirements for conservation grazing are detailed in Section 4.2.

Table 1: Livestock stocking rates for conservation grazing (FAS, 2017; KWT, 2012; DEFRA, 2022; EU 2009)

Livestock Type	Livestock units per ha
Cow and suckling calf	1.0
Cattle >24 months	1.0
Cattle 6 – 24 months	0.6
Ewe (including lamb)	0.15

4.1.2 Proposal if land use changes to arable

The proposed mitigation will be carried out with the proposed specification of two territories/plots per/ha (the minimum density as identified in RSPB, 2023). A total of 11 territories were present on site at the time of surveying, therefore a total area of 6 ha is required to accommodate the 11 territories/plots. It should be noted that 5.5 ha is the agreed minimum in line with the RSPB guidance however, in the

interests of providing sufficient compensation area, the population size has been rounded up to 12 territories.

Each plot must be a minimum of 16 m square in area and 3 m wide (eg 4x4 m, or 3x6 m) and must remain fallow over the autumn/winter, and undrilled (or left bare) during the spring period. Plots should be cut/cleared in the autumn (after 01 August) to avoid impacts to birds nesting within the vicinity.

The proposed design and location of the Skylark Plots are shown in Appendix 2.

4.2 Habitat Management requirements (pasture)

The following requirements are needed to ensure that the compensation area of the site remains suitable for breeding Skylark for the duration of the solar scheme if maintained as pasture:

- All land identified within the compensation area retained as grazing pasture must be managed for conservation purposes (Appendix 2).
- Stocking density will be determined by the livestock type used, and the stock rate must not exceed the unit per ha ratios set out in Table 1.
- Livestock must not be present within the compensation area between 01 April and 01 June to maximise Skylark breeding success
- Adjustments to the number of livestock present must be reviewed on an annual basis to avoid over or under grazing of areas. A matrix of short sward, longer grasses and areas of tussocky grassland provide the best opportunities for breeding and foraging birds including Skylark.
- Wherever possible, mechanical operations (eg muck spreading, harrowing, topping) should be timed before or after the breeding season in fields with ground-nesting birds.
- If any areas within the compensation area is used for a silage crop, it must not be cut between April June and any subsequent cuts must be at least seven weeks apart to enable success of later nests.
- Hedgerows will be managed around the boundaries of the compensation area to ensure that the skyline remains mostly unbroken. Hedges will be cut between January and March to ensure that winter foraging opportunities for other species are not lost, and impacts to breeding birds utilising the hedges are avoided.
- A commitment to provision of the mitigation area and management for the 40-year duration of the solar scheme is anticipated.

4.3 Habitat Management requirements (arable)

The following requirements are recommended to ensure that the compensation area of the site remains suitable for breeding Skylark for the duration of the solar scheme if converted to arable:

- A total of 6 ha of land will be managed for Skylark to compensate for the loss of habitat following the development at Berrington.
- A total of 12 Skylark plots will be created within the mitigation area at a density of 1 plot per 0.5 ha.
- Each Skylark plot will cover an area of 16 m² as a minimum, and will not be located within existing trackways within the field (i.e. created away from any area where vehicles regularly pass).
- Within the compensation area, 16 m² undrilled plots will be created by either (i) not being drilled during the winter and therefore creating a matrix of low vegetation and bare ground suitable for foraging; or (ii) leaving the 16 m² plots fallow over the winter period, and then retaining the 16 m² plots as undrilled during the spring. The option of sowing the crop as normal and spraying with herbicide to create the plot by 31 December was not considered as appropriate due to the environmental impacts of using herbicides such as glyphosate.
- Harvesting of any crop sown within the mitigation areas will not take place before 01 August to avoid any risk of destroying nests, or killing or injuring fledglings or adults breeding within the mitigation area. It is considered that this measure will increase fecundity, and improve the genetic diversity and resilience of local Skylark populations.
- Hedgerows will be managed around the boundaries of the compensation area to ensure that the skyline remains mostly unbroken. Hedges will be cut between January and March to ensure that winter foraging opportunities for other species are not lost, and impacts to breeding birds utilising the hedges are avoided.
- A commitment to provision of the mitigation area and management for the 40-year duration of the solar scheme is required.

4.4 Population Monitoring

Due to a lack of data surrounding the persistence of Skylarks in mitigation/compensation areas post development, an annual follow up breeding bird survey will be conducted to establish the number and location of territories on site. Data on the persistence of Skylarks within solar arrays and mitigation areas is contrary at best, with the sole study conducted by a consultancy and not peer-reviewed (Montag *et al.*, 2016).

It is anticipated that if sufficient compensatory areas are provided on the basis of current available best practice and are managed in an appropriate and sympathetic manner, Skylark populations will be static or increasing on site. However, without follow up surveys, this outcome remains hypothetical and arguably unsubstantiated. One annual survey will be undertaken in peak breeding season for Skylark (early – mid May) which will record the number and location of territories on site, along with any evidence of breeding (such as carrying food, nesting materials or faecal sacs) within both the compensation area and within the solar arrays. The visits should be undertaken every year for a period of five years to provide a suitable basis for some analysis of the population dynamics on site. If the population on site declines, corrective measures to ensure the longevity of the population must be undertaken. These will be bespoke in nature pending the cause of any decline, and may include the following options; signage for public awareness to reduce disturbance, supplementary winter feeding, changing location of plots, predator management or other measures.

5 Conservation Objectives

Table 2 below provides an overview of the conservation objectives for the Skylark mitigation and management strategy. It should be noted that although the measures set out below cover only a period of five years post development, the measures are considered sufficient to enable the longevity of the Skylark population on site for the duration of the operational lifespan of the Solar PV arrays.

Table 2: Conservation objectives

Action	Objective	Goal	Outcome
Arable			
Creation of habitat	To set aside a minimum of 6 ha of suitable habitat suitable for breeding and foraging Skylark	To provide long term suitable habitat to mitigate the loss of breeding areas of the current population of Skylark on site	To safeguard the population at the site and local level
Management of habitat	To create a total of 12 Skylark plots within the compensation areas	To provide long term suitable habitat to mitigate the loss of breeding areas of the current population of Skylark on site	To safeguard the population at the site and local level
Monitoring of population	To monitor the population of Skylark both within the mitigation area and within the development area for a period of five years	To establish baseline data to inform the success or otherwise of the proposed strategy, and enable a dynamic approach to site management as required	To inform viable mitigation approaches for the species at this and similar sites in the future
Pasture			
Creation of habitat	To create habitat within the compensation area suitable for breeding and foraging Skylark	To provide long term suitable habitat to mitigate the loss of breeding areas of the current population of Skylark on site	To safeguard the population at the site and local level
Management of habitat	To utilize conservation grazing methods to create a grassland with a variation in vegetation height and structure suitable for Skylark	To provide long term suitable habitat to mitigate the loss of breeding areas of the current population of Skylark on site	To safeguard the population at the site and local level
Monitoring of habitat and population	To monitor both the population and habitat structure to ensure that conservation grazing is delivering the most optimal habitat for Skylark	To establish baseline data to inform the success or otherwise of the proposed strategy, and enable a dynamic approach to site management as required	To inform viable mitigation approaches for the species at this and similar sites in the future

6 Conclusions

It is proposed that a compensation area is required for either (i) a conservation grazing strategy to create a suitably varied grassland ideal for breeding and foraging Skylark or (ii) the creation of 12 Skylark plots in a 6 ha area, as per the findings of the breeding bird survey undertaken by ADAS in 2020. A total of four parcels of land have been identified as being suitable for compensation immediately north of the development area.

If the area is used for grazing, conservation grazing using low stocking densities will be implemented, and will follow stocking rates set out within this document. Grazing will cease between 01 April and 01 June to avoid impacts to ground nesting birds. Habitat structure and Skylark population monitoring will be utilised to ensure that adjustments to stocking rate (depending on over/under grazing) are made to optimize habitats.

If the area is used for arable crop production, Skylark plots will be created covering an area of 16 m² to provide suitable foraging areas for the species during the breeding season. The plots will be created by either (i) not being drilled during the during the winter, or (ii) leaving the plots fallow over the winter period, and then being retained as undrilled areas in the following spring.

Additional habitat management should include the annual trimming of hedgerows around the boundaries of the compensation area in the late winter period (January – March) to ensure that habitat within the compensation area are suitable for Skylark, whilst avoiding impacts to nesting birds, or opportunities for winter foraging.

Long term monitoring of the site will take place for a minimum of five years to gather baseline data on the population dynamics and distribution of Skylarks both within the mitigation area and also within the solar arrays themselves. This data should be collected annually, and a report with analysis of the findings and any further recommendations for management techniques be submitted at the end of the five year period.

7 References

- ADAS (2023)** MPT69105-679(00) *Ecological Impact Assessment: Land south of Berrington, Shrewsbury*
- Browne, S. Vickery, J. and Chamberlain, D. (2000)** *Densities and population estimates of breeding Skylarks Alauda arvensis in Britain in 1997*. *Bird Study* (2000) 47, 52–65
- British Trust for Ornithology (2023)** *Birdfacts: Skylark*. Available online at: <https://www.bto.org/understanding-birds/birdfacts/skylark> date accessed 14/04/2023
- Department for Environment, Food and Rural Affairs (2022)** *Graze with Livestock to maintain and improve habitats*. Available online at: <https://defrafarming.blog.gov.uk/graze-with-livestock-to-maintain-and-improve-habitats/>
- Donald, P.F., Buckingham, D.L., Moorcroft, D., Muirhead, L.B. Evans, A.D. and Kirby, W.B. (2001)** Habitat use and diet of skylarks *Alauda arvensis* wintering on lowland farmland in southern Britain. *Journal of Applied Ecology* 38 (3) 536-547
- Donald, P.F and Vickery, J.A. (2000)** *The importance of cereal fields to breeding and wintering skylarks Alauda arvensis in UK*. *British Ornithologists Union Proceedings: Ecology and Conservation of Lowland Farmland Birds*. Available online at: <https://bou.org.uk/wp-content/uploads/2020/06/LFB-1-14-Donald-Vickery.pdf> date accessed 14/04/2023
- European Union (2009)** *Natura 2000 species factsheet: Skylark Alauda arvensis*. Available online at: <https://ec.europa.eu/environment/nature/natura2000/management/docs/Alauda%20arvensis%20factsheet%20-%20SWIFI.pdf>
- Farm Advisory Service (2017)** *Technical Note TN686: Conservation Grazing for Semi-Natural Habitats*. Available online at: <https://www.fas.scot/downloads/tn686-conservation-grazing-semi-natural-habitats/>
- Gieger, F., Hegemann, A., Gleichman, M., and Flinks, H. (2013)** *Habitat use and diet of Skylarks (Alauda arvensis) wintering in an intensive agricultural landscape of the Netherlands*. *Journal of Ornithology* 155(2)
- Gillings, S., Newson, S.E., Noble, D.G. & Vickery, J.A. (2005)** *Winter availability of cereal stubbles attracts declining farmland birds and positively influences breeding population trends*. *Proceedings of the Royal Society B* 272: 733–739.
- Kuiper, M.W., Ottens, H.J., Cenin, L., Schaffers, A.P., van Ruijven, J., Koks, B.J., Berendse, F., & de Snoo, G.R. (2013)** *Field margins as foraging habitat for skylarks (Alauda arvensis) in the breeding season*. *Agriculture, Ecosystems & Environment* 170 (15) 10-15.

Harris, S.J., Massimino, D., Balmer, D.E., Kelly, L., Noble, D.G., Pearce-Higgins, J.W., Woodcock, P., Wotton, S. & Gillings, S. (2022) *The Breeding Bird Survey 2021*. BTO Research Report 745. British Trust for Ornithology, Thetford.

Hayhow, D.B., Bond, A.L., Eaton, M.A., Grice, P.V., Hall, C., Hall, J., Harris, S.J., Hearn, R.D., Holt, C.A., Noble, D.G., Stroud, D.A. & Wotton, S. (2015) *The State of the UK's Birds 2015*. RSPB, BTO, WWT, JNCC, NE, NIEA, NRW and SNH, Bedfordshire.

Kent Wildlife Trust (2012) *Kent Wildlife Trust Land Management Advice Series (05): A brief guide to choosing livestock for conservation grazing*. Available online at: https://www.kentwildlifetrust.org.uk/sites/default/files/2018-06/KWT%20Land%20Mgt%20Advice_Sheet%205%20-%20Choosing%20livestock%20for%20conservation%20grazing.pdf

Montag, H., Parker, G., & Clarkson, T. (2016) *The effects of solar farms on local biodiversity: a comparative study*. Unpublished report, available online at: https://www.clarksonwoods.co.uk/wp-content/uploads/PDF/Solar_Farms_Biodiversity_Study.pdf date accessed 14/04/2013

Ottens, H.J., Kuiper, M.J., Flinks, H., van Ruijven, J., Siepel, H., Koks, B.J., Berendse, F., & de Snoo, G.R. (2014) Do Field Margins Enrich the Diet of the Eurasian Skylark *Alauda arvensis* on Intensive Farmland? *Ardea*, 102(2):161-174

Puttmanns, M., Bottges, L., Filla, T., Lehmann, F., Martens, A.S., Siegel, F., Sippel, A., van Bassi, M., Balkenhol, N., Waltert, M., & Gottschalk, E. (2022) *Habitat use and foraging parameters of breeding Skylarks indicate no seasonal decrease in food availability in heterogeneous farmland* *Ecology and Evolution* 12 (1)

Rahman, M. L., Tarrant, S. McCollin, D. & Ollerton, J. (2012) *Influence of habitat quality, landscape structure and food resources on breeding skylark (Alauda arvensis) territory distribution on restored landfill sites*. *Landscape and Urban Planning* 105 (3) 281-287

Royal Society for the Protection of Birds (2023) *Skylark Plots*. Available online at: <https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/farming/advice/managing-habitats/skylark-plots/> date accessed 14/04/2023

Schmidt, J.U., Eilers, A., Schimkat, M., Krause-Heiber, J., Timm, A., Nachtigall W., & Kleber, A. (2017) *Effect of Sky Lark plots and additional tramlines on territory densities of the Skylark Alauda arvensis in an intensively managed agricultural landscape* *Bird Study*, 64:1, 1-11

Smith, B., Holland, J., Jones, N., Moreby, S., Morris, A.J., & Southway, S. (2009) *Enhancing invertebrate food resources for skylarks in cereal ecosystems: how useful are in-crop agri-environment scheme management options?* *Journal of Applied Ecology* 2009, 46, 692–702

Wilson, J.D., Evans, J., Browne, S.J., & King, J.R. (1997) *Territory Distribution and Breeding Success of Skylarks *Alauda arvensis* on Organic and Intensive Farmland in Southern England. Journal of Applied Ecology 34 (6) 1462-1478*

Appendix 1: Proposed Plans



- LEGEND**
- Existing hedgerow retained
 - Grassland under solar panels
 - Existing trees retained
 - Proposed hedgerow
 - Proposed tree planting
 - Existing pond
 - Existing bird cover crop
 - Public Right of Way (PRow)
 - Beehive opportunity points

1. Proposed hedgerow to the property boundary to screen views from Cliff Hollow Road.
2. Proposed tree planting to filter views from the north of the site.
3. Proposed tree planting and hedgerow planting to filter views from the houses to the south.
4. Proposed Beehive Nesting Areas
5. Existing bird cover crop.

Notes: Please note this plan does not include the proposed solar array extent.

11	Minor Amendments	09/01/2023
10	Text Amendments	09/01/2023
09	Layout Amendments	09/01/2023
08	Layout Amendments	21/12/2022
07	Amendments	17/08/2022
06	Amendments	01/07/2022
05	Amendments	23/05/2022
04	Layout Amendments	17/05/2022
03	Layout Amendments	14/05/2022
02	Boundary Amendments	13/03/2022
01	-	13/01/2022
Rev	Issue Details	Date

Client:
Ecoenergy International LTD

Project:
Berrington Solar Farm

Drawing Title:
Landscape Masterplan

Drawing No. 10514837-ADAS-XI-XX-DR-L-8001

Scale: 1:2,500 at A1

Drawn by: IH Date: 12/01/2023

Checked by: DH Date: 12/01/2023

© All rights reserved. All other trademarks are the property of their respective owners. For reference purposes only. No liability is accepted for reuse.

ADAS, 15th Park Square, Harrogate, North Yorkshire, YO10 1AA, UK. Tel: 01430 250000

Appendix 2: Proposed Mitigation areas

