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Steeple Renewables Project

Appendix 7.13: Draft Skylark Mitigation Strategy

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Issuing office

3 Brunel House | Hathersage Park | Station Approach | Hathersage | Derbyshire | S32 1DP
T: 01433 651869 | W: www.bsg-ecology.com | E: info@bsg-ecology.com

Client	RES Ltd
Project	Steeples Renewables Project
Version	FINAL
Project number	P22-761 Steeple Renewable Project - Appendix 3 to consultation documents-draft Skylark Mitigation Strategy

	Name	**Position**	**Date**
Originated	Daniel Foster	Principal Ecologist	30 September 2024
Reviewed	Jim Gillespie	Director	30 September 2024
Approved for issue to client	Daniel Foster	Principal Ecologist	01 October 2024
Issued to client	Jim Gillespie	Director	01 October 2024

Disclaimer

Contents

1 Introduction

Background to commission

1.1 BSG Ecology was commissioned by RES Limited in March 2023 to carry out a series of ecological surveys to support an application for a solar farm with all associated works, equipment, necessary infrastructure and landscaping and biodiversity improvements (the 'Proposed Development') on land at Sturton-Le-Steeple, Nottinghamshire (the 'Site').

1.2 Two periods of breeding bird surveys have been undertaken: March to July 2023 and March to July 2024. This work identified populations of skylark *Alauda arvensis* nesting in the agricultural fields within the Site. Subsequent assessment has identified that skylark would be deterred from nesting within development areas following the construction of the Proposed Development, and to mitigate this impact, options are being explored for habitat enhancements to increase the potential of the Site to support increased densities of skylark territories.

1.3 Other ground-nesting bird species were also recorded in low numbers in the Proposed Solar Areas (the areas of the Site in which construction is planned). These include eight yellow wagtail *Motacilla flava*, and four grey partridge *Perdix perdix* territories. The skylark mitigation measures are likely to be appropriate for yellow wagtail and grey partridge and these species are not specifically considered further within this document. See Figure 1 for the locations of the Proposed Solar Areas and the Biodiversity Mitigation Areas.

1.4 This draft Skylark Mitigation Strategy describes how the scale of the mitigation was determined and how it could be implemented. At this stage this document is intended to inform initial consultation with relevant ecology consultees and invite their comment on the strategy.

Site description

1.5 The Site is located around the village of Sturton le Steeple in a rural landscape characterised by agricultural land with occasional villages and individual properties. West Burton Power Station is adjacent to the north of the Site and the River Trent is to the east. Agricultural land otherwise surrounds the Site.

1.6 The Site extends to approximately 892 hectares and comprises primarily large arable fields with boundary hedgerows and individual trees. There is a network of ditches and drains present and several ponds and waterbodies. There are occasional small woodland blocks, grassland pasture fields, and agricultural buildings.

Project description

1.7 RES Ltd is seeking to secure permission through the Development Consent Order (DCO) process for the installation and operation of a solar farm with a capacity of up to 400 MW of solar energy generation and a 200 MW of Battery Energy Storage System (BESS) with associated infrastructure and equipment.

1.8 For ease of reference the following terms are used within the Ecology documents to define areas within the Site (see Figure 1):

- Proposed Solar Areas: areas within the Site which have been provisionally identified for locating the solar panels, battery storage and other associated infrastructure.
- Biodiversity Mitigation Areas (Eastern and Western): areas of the Site that would not be used for development, and are provisionally identified for use as biodiversity mitigation and enhancement.
- The Site: collectively including the Proposed Solar Areas and Biodiversity Mitigation Areas.

2 Skylark ecology and the population on the Site

Skylark ecology

2.1 Skylarks are birds of open habitats occurring on heathland, moorland, meadows, grassland, edges of marshes and dunes. They have a particularly strong association with farmland which, because of its large area, supports the majority of the skylark population in western Europe (despite the sometimes low densities found in some cropping systems). Breeding occurs from late March or early April to July or August. Skylarks are monogamous. The female builds the nest alone, creating a thick layer of grass lined with finer vegetation in an excavated scrape or natural depression on the ground. The clutch is normally three to five eggs. Adult skylarks feed on invertebrates, seeds and leafy plant material, but nestlings are fed almost exclusively on invertebrates.

2.2 In optimal circumstances, skylarks can have up to four broods per year but in winter-sown cereal crops the rapid spring extension growth of the crop means that the crop height exceeds the maximum of 60 cm sought by skylark (Donald and Vickery, 2000) and at most sites two broods are raised. The response of skylarks in such circumstances is to cease breeding, or seek out another field with a lower height and/or more open structure (where they will be competing against skylarks already occupying territories there) or persist in the field and enter the crop and locate their nest at its most open points - along the 'tramlines' - parallel pairs of thin strips of unsown crop at regular intervals across the field created for farm machinery to move through and spray or fertilise the crop. Those skylarks opting to persist in the taller crop and nest on, or adjacent to, a tramline are subject to high levels of predation, particularly by foxes (Donald *et al*., 2002).

Skylark conservation status and relevant policy

2.3 The widespread decline in the skylark population has led it to it being given the following conservation status in England:

- Species of Principal Importance (SPI) for the Conservation of Biodiversity in England as listed in accordance with Section 41 of the Natural Environment and Rural Communities Act 2006.
- Species of high conservation concern (listed as a 'Red' category species) in Birds of Conservation Concern (BOCC) 5 (Eaton *et al*., 2021).

2.4 At a county level:

- Nottinghamshire Local Biodiversity Action Plan (NLBAP) lists skylark as 'species of conservation concern'.
- POLICY ST38: Biodiversity and Geodiversity of the Bassetlaw Local Plan 2020-2038 (adopted May 2024) does not specifically mention skylark but does state: *'Habitats and Species of Principal Importance identified under the Natural Environment and Rural Communities Act 2006 include legally protected species such as great crested newts and badgers, as well as local priority habitats and species. Proposals that will potentially affect these species will be required to submit information to enable an assessment of their impact, in accordance with relevant national legislation.'*

The population on the Site

2.5 The size and distribution of the population of skylark nesting on the Site was determined by two breeding bird community characterisation surveys undertaken from March to July 2023 and from March to July 2024 with one survey per month and with reference to methods suggested by the Bird Survey & Assessment Steering Group (2023).

2.6 The data collected on the presence and behaviour of skylark on the Site was analysed to determine the number of skylark territories present. The principle behind the analysis of the survey data is that over the course of the programme of survey visits a skylark that is displaying its presence by singing over its nesting territory is likely to be recorded there over several visits, either singing or showing other territorial behaviour (nests are not searched for in this method). The observation of a singing

skylark in suitable habitat, or clusters of observations of skylarks showing other breeding behaviour such as carrying food or alarm calling, were identified as a single territory.

2.7 This territory analysis identified that within the Proposed Solar Areas there were:

- 90 skylark territories in 2024.
- 105 skylark territories in 2023.
- A mean of 97.5 skylark territories from the 2023 and 2024 surveys.

2.8 Skylarks nest at a density of approximately 0.15 - 0.2 territories per hectare (i.e., a typical skylark territory covers 5 to 6 ha) within the Proposed Solar Areas, which is typical of intensive winter-sown-dominant arable systems.

2.9 Skylark territories were also recorded within the Eastern and Western Biological Mitigation Areas and at similar densities to those in the Proposed Solar Areas. These territories are beyond the areas that will be impacted by development so will be unaffected by the development either during construction or operation.

3 Preliminary impact assessment and the required scale of mitigation

Effects on skylark

3.1 The construction of the solar array on arable and grassland pasture farmland will reduce the available nesting habitat for skylark. Skylark are deterred from locating their nest in areas that are overlooked by tall structures, both natural ones such as woods, mature trees and tall hedges and man-made ones such as buildings and, in this case, arrays of solar panels. This arises from their predator avoidance behaviour – such tall structures can either conceal ground predators or provide perches for avian predators (Donald *et al*., 2001). The evidence available on the use of solar farms by breeding skylark is that while they may be deterred from nesting beneath solar arrays (Solar Energy UK, 2023) they will continue to forage there amongst the sown grassland (Shotton, 2018).

3.2 As a result of the nesting deterrence effect of structures, it is predicted that all of the skylark territories within the Proposed Solar Areas identified from the field survey will be lost. To mitigate this impact, options are being explored for habitat enhancements within parts of the Site to increase the local potential of such habitats to support increased densities of nesting territories and the number of broods an individual pair can raise each year.

4 Skylark Mitigation Strategy

4.1 The following work has been undertaken in identifying fields within the Site that will contribute to the skylark mitigation strategy:

- The results of the habitat surveys within the Site were reviewed to identify those fields of suitable size, with few deterrent boundary features and evidence of a current use by a low density of skylark (i.e., with best potential for improvement) and that are outside of the development areas.
- Consideration of field locations in relation to tracks and other access infrastructure. To assist tenant farmers in the practical delivery of the mitigation, fields were targeted that could be grouped together and that are near access points to ensure the fields can be accessed easily.
- Identification of (a) the mitigation areas that are primarily for skylark; and separately (b) those other habitat creation / management areas that may / will also be suitable for skylark but have not been created specifically for skylark. For example, there are likely to be large areas of meadow grassland and wetland habitats created for Biodiversity Net Gain (BNG) purposes which would have wider biodiversity benefits for other species including nesting skylark.

4.2 A total of nine fields have been identified within the Site that are considered to be suitable for prioritising the delivery of skylark mitigation measures on the basis of the above points. These are large arable fields that support low densities of skylark and which have few deterrent boundary features (see Figure 2). Several other fields which will not be utilised for solar development are not proposed specifically for skylark mitigation because of their small size. Other fields are likely to be required for delivery of other biodiversity measures (Figure 3) but are also likely to contribute to the overall extent of land that will provide opportunities for nesting skylark, albeit this would be likely to be at low densities than the targeted skylark land.

Method for the delivery of suitable habitat features

4.3 The method to be applied to increase the ability of the nine arable fields to support nesting territories of skylark is the inclusion of 'skylark plots'. These are small undrilled patches within cereal fields that provide access for skylark into tall, dense, winter cereal crops to nest and forage. The published evidence is that skylark plots at a density of 2 plots/ha in winter cereal crops will increase the population of skylark in each field with plots by a factor of three (Donald & Morris, 2005).

4.4 These plots will be created following the RSPB promoted guidance to farmers[1] and in a manner that has been delivered by farmers across lowland England as Countryside Stewardship AB4 Skylark Plots[2]. Each plot will be located at least 50 m from a field boundary with a hedge or tree (open farm tracks acting as boundaries are discounted as there will be no deterrent effect from these) and at least 50 m from any adjacent woodland. Each plot will be at least 3 m wide, will have a minimum area of 16 square metres, will not be connected to the tramlines and will be created by turning off the drill during sowing.

4.5 The maximum potential enhancement in skylark territories on skylark-priority land by the application of this prescription is quantified in Table 1 below, with the individual fields identified on Figure 1. At this stage, this does not include any land that is targeted for other biodiversity reasons but that is nonetheless also likely to provide skylark nesting opportunities. These other areas will be factored in appropriately later in the process but are excluded for simplicity at this stage.

[1] https://farmwildlife.info/how-to-do-it/farmed-area/skylark-plots/
[2] https://www.gov.uk/countryside-stewardship-grants/skylark-plots-ab4

Table 1: Delivery of skylark territories on skylark-targeted mitigation land (refer to Figure 2a and 2b showing field numbers)

Field number	Field size (h)	Existing territories (peak count)	Territories after enhancement	Contribution to mitigation
Western Biological Mitigation Area				
F26	7	2	6	4
F36	22	4	12	8
F51	8	2	6	4
F65	24	6	18	12
Eastern Biological Mitigation Area (not including the areas likely needed for delivery of Rivers BNG)				
F73/74	25	5	15	10
F85	7	1	3	2
F90	8	2	6	4
F105	3	1	3	2
F111	7	2	6	4
Total				**50**
% against 2024 total (90) likely to be displaced from Solar Areas				55%
% against 2023 total (105) likely to be displaced from Solar Areas				48%
% against mean total (97.5) likely to be displaced from Solar Areas				51%

4.6 In addition to the skylark plots, the grassland margins around the skylark mitigation fields and within the Proposed Solar Areas will be enhanced to create wildflower grassland and be increased in width. The creation of wildflower rich grassland on the Site will also offer significantly improved foraging opportunities for skylark nesting within the Site and in nearby off-site arable fields, as the grassland habitats will support a larger biomass of insect prey items than the arable land they will replace.

4.7 Further areas of habitat creation that would not be impacted by solar development are likely to present at the Site during the operational phase. It is not proposed to create these specifically for skylark nesting mitigation but they may provide secondary biodiversity benefits such as to nesting skylark. The extent or habitat type to be created has not yet been determined within the project team but could include:

- Several areas that would be suitable for meadow grassland. This habitat would receive low intensity cutting / grazing and would be suitable for nesting skylark. See purple shaded areas on Figure 3.
- The area shaded in blue on Figure 3 in the Eastern Biodiversity Mitigation Area is likely to be utilised to create wetland and ditch habitats with areas of grassland that would be suitable for nesting skylark.
- There is a proposed corridor through the Proposed Solar Areas that forms an exclusion zone for an underground gas pipeline within which no solar development can occur. The corridor may be up to 60 m wide and extends over 1 km through the Site. If this corridor is sown with grassland and managed as wildflower meadow (as above) it will be used by skylark for foraging (benefiting the pairs breeding around the Proposed Development) and it is possible given its dimensions (up to 60 m wide) that skylark will use this area for nesting, thereby increasing the total number of post-development territory opportunities.

5 Supporting evidence base for the Skylark Mitigation Strategy

5.1 There is strong, peer reviewed, published evidence that skylark plots are a practical, sustainable and cost-effective means to increase the territory holding capacity of cereal fields and to increase the breeding productivity of those territory holding skylark. Initial proof of this technique came from research started by the RSPB in 1999 at their Hope Farm[3] site in Cambridgeshire and the testing of the technique has extended to the multi-farm level and also internationally. A summary of the evidence for the effectiveness of skylark plots is provide below.

Author(s)	**Summary of reports key findings**
Morris A.J., Holland J.M., Smith B. & Jones N.E. (2004) Sustainable Arable Farming For an Improved Environment (SAFFIE): managing winter wheat sward structure for Skylarks Alauda arvensis. *Ibis*, 146, s155-162.	A replicated, controlled study from April-August in 2002 to 2003 in 15 sites in northern, eastern and southern England found that Eurasian skylark *Alauda arvensis* breeding density, duration and success were higher in winter wheat fields with undrilled patches (4 x 4 m) than in fields with widely-spaced (25 cm apart) rows or under conventional management (0.3 nests/ha in fields with undrilled plots vs 0.2 for the other treatments). Fields with undrilled patches also lost fewer territorial and nesting birds over the breeding season and by the end of the breeding season nests in these fields produced an average of one more chick than control nests. Body condition of nestlings decreased in control nests over the breeding season but increased in experimental fields. The proportion of within-treatment foraging flights remained constant in fields with undrilled patches but decreased over time in other treatments. Three treatments were surveyed: winter wheat sown in wide-spaced rows, undrilled patches with a density of 2 patches/ha, and conventional control winter wheat fields.
Key findings	Skylark plots can help to increase breeding densities in crop.
Donald P.F. & Morris T.J. (2005) Saving the sky lark: new solutions for a declining farmland bird. *British Birds*, 98, 570-578.	A before-and-after study from 2000 to 2005 in Cambridgeshire, England, found that the population of Eurasian skylarks *Alauda arvensis* on an arable farm increased from 10 territorial males in 2000 to 34 in 2005, following the introduction of skylark plots in 2001. Nests were also aggregated in fields with skylark plots. The paper also reports that fields on 15 experimental farms with skylark plots had 30% more skylarks than control fields. In addition, nests in fields with skylark plots produced 0.5 more chicks/breeding attempt. This study was part of the SAFFIE – Sustainable Arable Farming For an Improved Environment research project [summarised above].
Key findings	Skylark plots can have a positive and significant impact on skylark nesting densities.
Ogilvy S.E., Clarke J.H., Wiltshire J.J.J., Harris D., Morris A. & Jones N. (2006) SAFFIE - research into practice and policy. Proceedings of the HGCA Conference, Arable crop protection in the balance: Profit and the environment, 14.1-14.12.	A replicated, controlled study in 2002 to 2003 on ten farms in England of skylark plots placed in winter wheat fields. At the start of the breeding season there was little difference in success between treatments, but by June fields with plots compared to controls had a greater density of nests - 1 nest/ha compared to 0.4 nest/ha - and more chicks per nest - 1.75 chicks/nest compared to 0.9 chicks/nest. Over the whole season nests in fields with skylark plots raised 0.5 more chicks per breeding attempt and considering just the later part of the breeding season, raised 1.5 more chicks per breeding attempt. This study was part of the SAFFIE – Sustainable Arable Farming For an Improved Environment research project [summarised above].
Key findings	Skylark plots deliver their benefit in winter cereal crops mostly later in the growing season.

[3] https://www.rspb.org.uk/our-work/conservation/projects/hope-farm/

Author(s)	Summary of reports key findings
Stoate C. & Moorcroft D. (2007) Research-based conservation at the farm scale: development and assessment of agri-environment scheme options. *Aspects of Applied Biology*, 81, 161-168.	A 2007 study and literature review that found that Eurasian skylarks *Alauda arvensis* were able to raise 49% more young in fields with skylark plots, compared to fields without plots, by prolonging the length of the breeding season.
Key findings	Skylark plots can increase the ability of skylark to raise greater numbers of young.
Fischer J., Jenny M. & Jenni L. (2009) Suitability of patches and in-field strips for sky larks Alauda arvensis in a small-parcelled mixed farming area. *Bird Study*, 56, 34-42.	A replicated, controlled study from March-July 2006 in mixed farmland near Berne, Switzerland found that Eurasian skylarks *Alauda arvensis* with territories that included undrilled patches were significantly less likely to abandon their territory than birds without patches, and more likely to use the undrilled patches as nesting and foraging sites. Use of winter wheat fields by skylarks changed through the breeding season; from June to July, the percentage of control fields (without undrilled plots) in skylark territories decreased from 60% to 38%, whilst the percentage of undrilled patches in skylark territories remained approximately 55% from May to July.
Key findings	Skylark plots may lead to a reduced risk of nest abandonment and an increase in breeding success.
Defra (2021). Enhancing Arable Biodiversity. Six practical solutions for farmers.	In the first two years of testing skylark plots, average number of skylark chicks reared increased by up to 50%. Improvement resulted mainly from increased foraging access for adult birds. The plots provided a landing space and improved access to nesting and feeding areas. Wider testing confirmed this benefit, but there was increased nest predation in fields with margins. Therefore, where practical, plots should be placed at least 50 m from the field margin.
Key findings	Skylark plots can help to increase the number of chicks reared at each nest.

6 References

Bird Survey & Assessment Steering Group. (2023). 'Bird Survey Guidelines for assessing ecological impacts, v.1.1.1'. Available at https://birdsurveyguidelines.org

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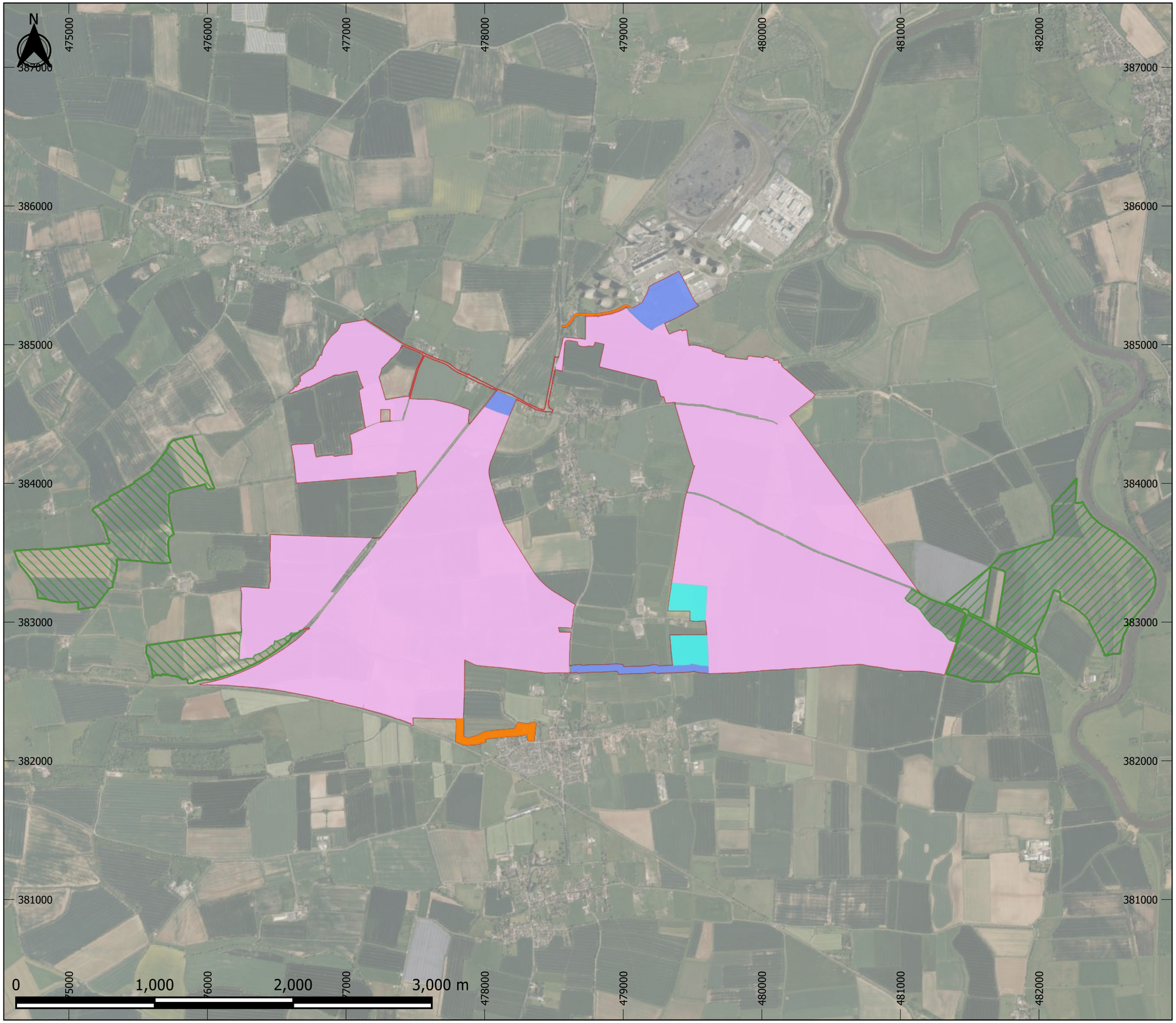
Figures



Legend

- Site boundary
- Proposed Solar Areas
- Cable Infrastructure
- Site Access Corridor
- Biodiversity Mitigation and Cable Infrastructure Area
- Eastern Biodiversity Mitigation Area
- Western Biodiversity Mitigation Area

Note: indicative areas on which the preliminary skylark strategy was assessed - for the latest parameters, refer to Figure 2.2 pf the PEIR

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Figure 7.13.1: Site Overview

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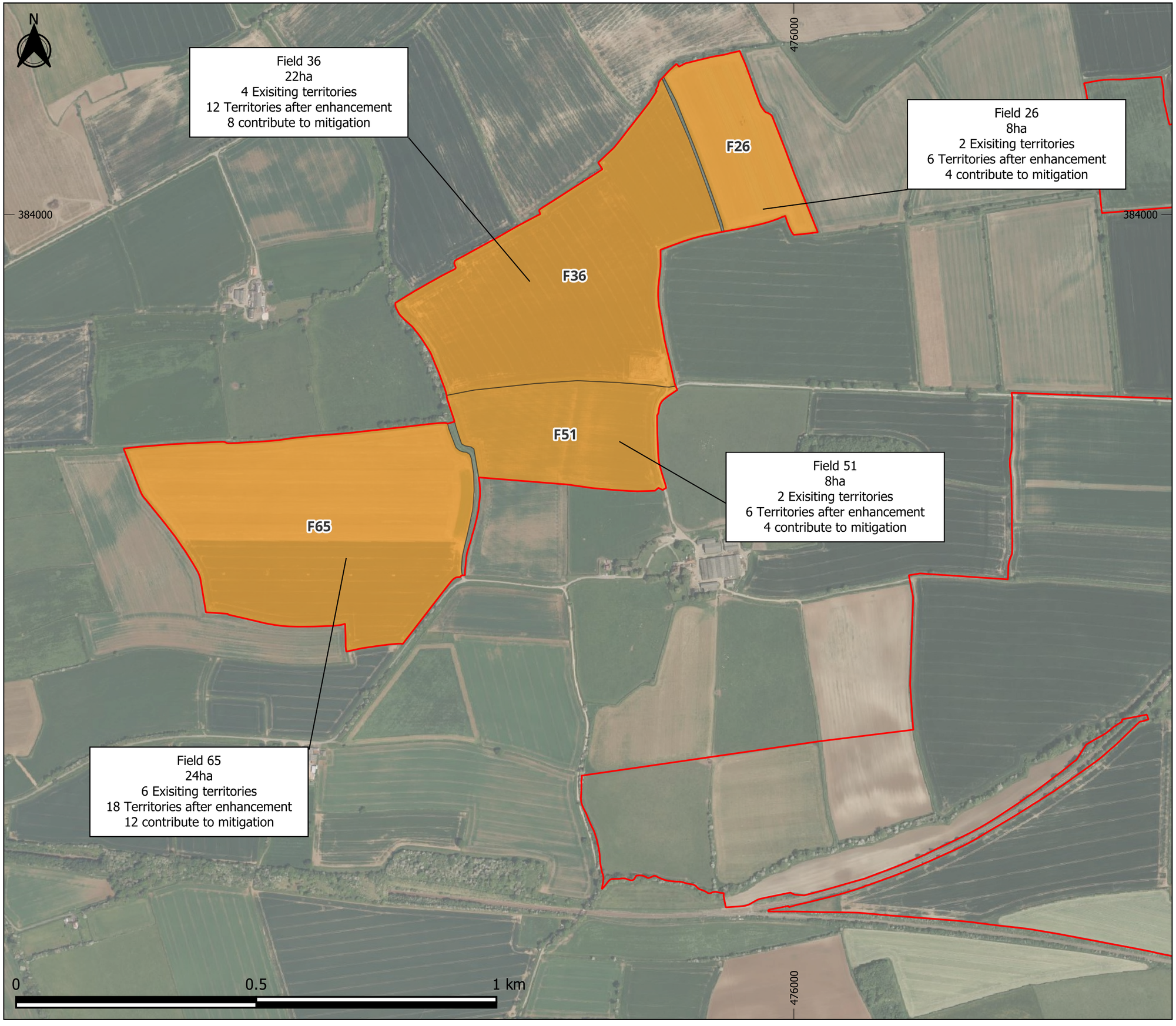
Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

Graphics Ref. No.: 06143



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- Site boundary
- Skylark Mitigation Areas

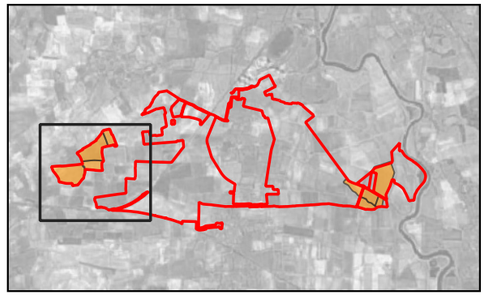

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Figure 7.13.2a: Skylark Mitigation Areas

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Projection: OSGB 1936/British National Grid - EPSG 27700

Sources: BSG Ecology survey data

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N

384000

482000

Field 90
8ha
2 Exisiting territories
6 Territories after enhancement
4 contribute to mitigation

Field 73/74
25ha
5 Exisiting territories
15 Territories after enhancement
10 contribute to mitigation

F73/F74

F85

Field 85
7ha
1 Exisiting territory
3 Territories after enhancement
2 contribute to mitigation

F90

F105

F111

Field 105
3ha
1 Exisiting territory
3 Territories after enhancement
2 contribute to mitigation

Field 111
7ha
2 Exisiting territories
6 Territories after enhancement
4 contribute to mitigation

0 0.5 1 km

482000

382000

Legend

Site boundary

Skylark Mitigation Areas

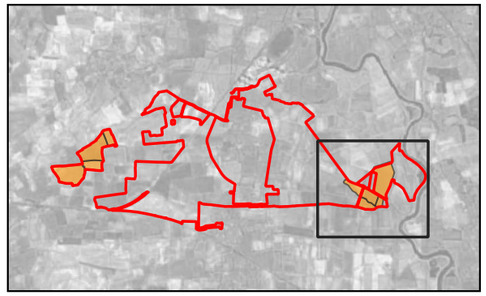

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Figure 7.13.2b: Skylark Mitigation Areas

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Sources: BSG Ecology survey data

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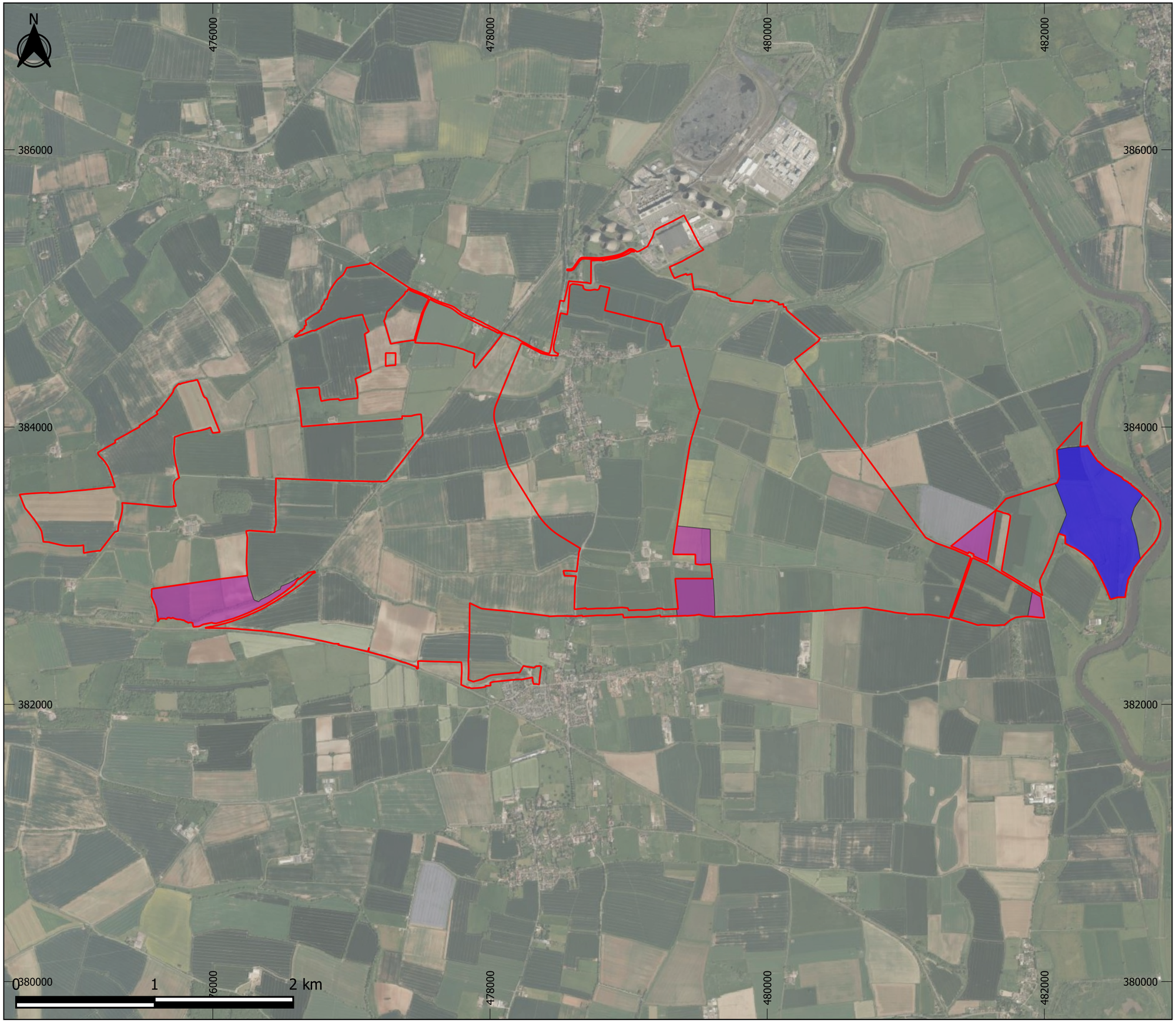

Legend

- Site boundary
- Potential area of meadow grassland creation
- Potential area used for wetland / ditch creation for Rivers BNG, but may also include grassland areas

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Figure 7.13.3: Areas of habitat creation

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