

Intended for
Equans Services Ltd

Document type
Report

Date
October 2024

Project no.
1620016920

BARKHAM SOLAR LANDSCAPE AND ECOLOGICAL MANAGEMENT PLAN

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Project name **Barkham Solar Farm**
Project no. **1620016920**
Recipient **Equans Service Limited**
Document type **Landscape Ecological Management Plan**
Version **P05**
Date **21/10/2024**
Prepared by **Dan Stewart**
Checked by **Laura Sanderson**
Approved by **Tom Landell Mills**
Description **Landscape Ecological Management Plan**
Document no. **BFSF-RAMB-XX-RP-L-3202**

Revision	Date	Prepared by	Checked by	Approved by	Description
1	28/05/2024	Dan Stewart	Laura Sanderson	Tom Landell Mills	First Version to Client
2	21/10/2024	Dan Stewart	Laura Sanderson	Tom Landell Mills	Second Iteration Following Comments

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1. INTRODUCTION

1.1 Background

- 1.1.1 Ramboll UK Ltd ("Ramboll") was commissioned by EQUANS Energy & Solution (EQUANS E&S) in partnership with Wokingham Borough Council (the "Client") to advise and report on enhancing and protecting the landscape and ecological value of Barkham Solar Farm, Wokingham, RG40 4EU (the "Site") through the preparation of a Landscape and Ecological Management Plan (LEMP).
- 1.1.2 This LEMP is a management plan that outlines measures for monitoring and for on-going and reactive management for the Site for an initial period of up to ten years post-construction and covers the operational phase of development up to 30 years.
- 1.1.3 The LEMP includes the Landscape Management Plan to provide a single co-ordinated document to address landscape and ecological requirements and the Planting Calendar is provided in Chapter 10 Work Schedule, Table 10.1: Annual Management and Maintenance Work for First 5 Years.
- 1.1.4 Further details of the proposed landscape and ecological scheme and its delivery are shown on the general arrangement landscape drawings, planting plans and landscape detailed drawings, and the NBS specification. The planting calendar, and as a standalone document, a Arboricultural Method Statement, tree survey and tree protection plan are included referenced fully within the Appendix

1.2 Site Location

- 1.2.1 The Site is located south of the village of Barkham, Berkshire, Nation Grid Ref SU784660 and postcode of RG40 4EU, as shown in Figure 1.1. It is located across four farmsteads (Rook's Nest Farm, High Barn Farm, Brook Farm and Mortimer Lodge Farm).

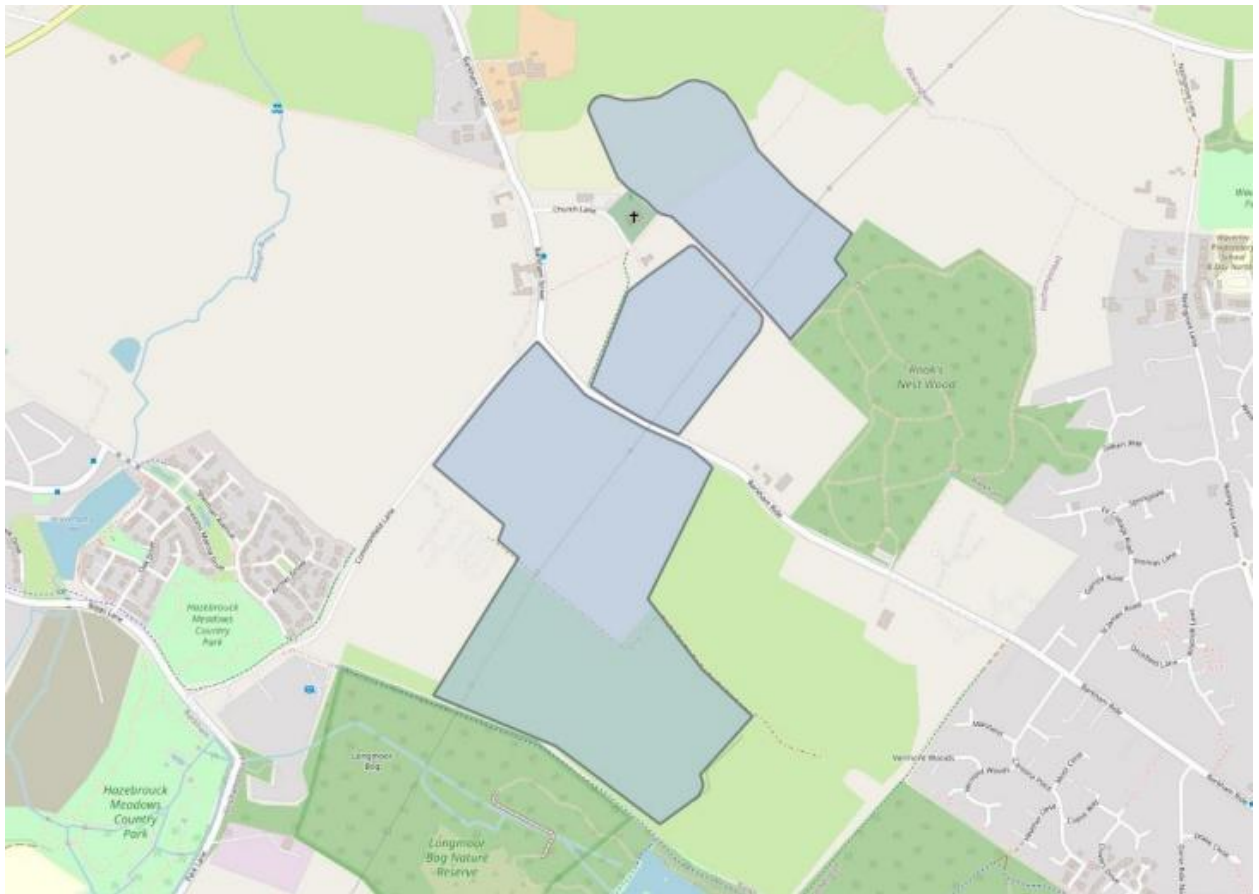


Figure 1.1: Site Location

1.3 Planning Status

- 1.3.1 Barkham Solar Farm (the “approved development”) received planning permission from Wokingham Borough Council on 21 January 2022 (Planning reference: 211081). The Client is now applying for the discharge of planning conditions in respect of the permitted development for the site: Planning Condition 6 is for a Landscape Management Plan and Planning Conditions 15 and 16 relate to ecology and are addressed in this report.
- 1.0.2 Planning Condition 6 requires the following:
- 1.0.3 Condition 6 Landscape management
- 1.0.4 *Prior to the commencement of the development hereby permitted (excluding archaeological investigation and formation of accesses), a landscape management plan, including long term design objectives, management responsibilities, timescales, and maintenance schedules for all landscape areas, shall be submitted to and approved in writing by the local planning authority. The landscape management plan shall be carried out as approved for the 25-year lifespan of the development.*
- 1.0.5 *Reason: To ensure that provision is made to allow satisfactory maintenance of the landscaping hereby approved.*
- 1.0.6 *Relevant policy: Core Strategy policy CP3 and Managing Development Delivery Local Plan policies CC03 and TB21*
- 1.3.2 Planning Condition 15 requires the following:

- 1.3.3 *Prior to the commencement of the development hereby permitted (excluding archaeological investigation and formation of accesses), a landscape and ecological management plan (LEMP) shall be submitted to and approved in writing by the local planning authority. The content of the LEMP shall accord with the aims and objectives of management with the provision of biodiversity net gain for a minimum period of 30 years, as per the submitted Biodiversity Net Gain Assessment. More specifically, it shall include the following:*
- a) Description and evaluation of features to be managed.*
 - b) Ecological trends and constraints on site that might influence management.*
 - c) Aims and objectives of management.*
 - d) Appropriate management options for achieving aims and objectives.*
 - e) Prescriptions for management actions.*
 - f) Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period).*
 - g) Details of the body or organization responsible for implementation of the plan.*
 - h) Ongoing monitoring and remedial measures.*
 - i) The Council own the site and will ensure the ongoing implementation of the LEMP. The management regime set out within the LEMP will be instructed as part of the ongoing management and maintenance contract for the Solar Farm and will be funded from the revenue generation of the facility. Alternatively, maintenance responsibility of all or some parts of the site may be transferred to the Council's Countryside Services Team.*
 - j) Where the results from monitoring show that conservation aims and objectives of the LEMP are not being met), how contingencies and/or remedial action will be identified, agreed, and implemented so that the development still delivers the fully functioning biodiversity objectives of the originally approved scheme.*
- The approved plan will be implemented in accordance with the approved details.*
- 1.3.4 Planning Condition 16 requires the following:
- 1.3.5 *Prior to the commencement of any above ground works, a detailed scheme to maintain the ecological permeability of the site (especially with regard to badgers, brown hare, and hedgehogs) shall be submitted to and approved in writing by the local planning authority.*
- 1.3.6 *The mitigation and contingency measures contained within the plan shall be implemented in accordance with the approved plan unless otherwise approved in writing by the local planning Authority.*
- 1.3.7 A Preliminary Ecological Appraisal (PEA)¹, Biodiversity Net Gain Assessment² and Environmental Statement Biodiversity Chapter³ were produced for the Site by WSP Ltd in 2021 to support the planning application. These reports have been used to inform this LEMP, with mitigation goals outlined below:
- Protection of retained hedgerows in accordance with BS5837:2012
 - Provision of extensive tree planting creates numerous opportunities to enhance the diversity of habitats present across the Site
 - Careful selection of tree planting areas to create new ecological corridors
 - Careful selection of the tree species assemblage to be planted e.g., selecting native species such as pedunculate oak and ash, which typically develop crevices and cavities as they mature to provide long term roosting opportunities for bats

¹ WSP. Ltd (2021). Preliminary Ecological Appraisal.

² WSP, Ltd (2021) Biodiversity Net Gain Assessment.

³ WSP. Ltd (2021). Environmental Statement Volume I Chapter 6 - Biodiversity

- Careful management of the successional habitat as the woodland develops, to enable the formation of rough grassland and shrub layers which can provide enhanced habitat suitability for invertebrates, reptiles and foraging barn owl.

1.3.8 Table 1.1. signposts where in this LEMP each of the sub-clauses of Planning Conditions 6, 15 and 16 have been addressed.

Table 1.1: Planning Condition Requirements and Location they are Addressed Within this LEMP		
Planning Condition Sub-clause	Planning Condition Wording	Location of Information within the LEMP
6	Long term design objectives,	Sections 1.37, 6 and 8
6	Management responsibilities,	Section 4 and 6
6	timescales, and maintenance schedules for all landscape areas,	Section 10
15 a	Description and evaluation of features to be managed	Sections 5 and 6
15 b	Ecological trends and constraints on site that might influence management.	Sections 7 and 9
15 c	Aims and objectives of management	Section 2
15 d	Appropriate management options for achieving aims and objectives.	Section 5
15 e	Prescriptions for management actions.	Section 8
15 f	Preparation of a work schedule (including an annual work plan capable of being rolled forward over a five-year period)	Sections 8 and 10
15 g	Details of the body or organization responsible for implementation of the plan.	Section 2 and 9.4
15 h	Ongoing monitoring and remedial measures	Section 7.3 and 8
15 i	The Council own the site and will ensure the ongoing implementation of the LEMP over the 30 year period. The management regime set out within the LEMP will be instructed as part of the ongoing management and maintenance contract for the Solar Farm and will be funded from the revenue generation of the facility. Alternatively, maintenance responsibility of all or some parts of the site may be transferred to the Council's Countryside Services Team where there are demonstrable operational benefits of doing so. The Council will, at the relevant time, explore opportunities of registering Biodiversity Net Gain credits and retailing those to establish a potential further income to contribute to the costs of ongoing maintenance.	Section 9.3 and 9.4
15 j	Where the results from monitoring show that conservation aims and objectives of the LEMP are not being met), how contingencies and/or remedial action will be identified, agreed, and implemented so that the development still	Section 4.2.2

	delivers the fully functioning biodiversity objectives of the originally approved scheme	
16	A detailed scheme to maintain the ecological permeability of the site (especially with regard to badgers, brown hare, and hedgehogs)	Section 8.2

2. AIMS AND OBJECTIVES OF PLAN

- 2.1.1 The principal aim of the LEMP is to provide guidance on the adoption of a coherent, strategic and integrated approach to on-going and reactive management and monitoring of landscape and ecological features on the Site to protect and enhance nature conservation interests in line with UK and local biodiversity targets; and protect and enhance landscape character and visual amenity including for, but not limited to, local residents and people using the public rights of way including the Greenway. It is intended to be used for an initial period of up to 5 years post-construction and thereafter rolled over, with adjustments as needed, to satisfy the planning consent conditions of 25 years as well as the operational phase of development of up to 30 years, covering the expected lifetime of the solar farm.
- 2.1.2 It is the intention that this plan integrates the landscape management plan and the details and objectives into one document within the LEMP.
- 2.1.3 The purpose of the LEMP is to define and facilitate management regimes for both existing and new habitat created as part of the development so as to maintain them in a favourable state to support their associated flora and fauna and meet ecological objectives for the scheme, i.e., to provide appropriate habitat of wildlife value in the long-term and also meet landscape objectives. Long-term active management is necessary in some habitats, for example to prevent their loss from natural succession to a habitat of lower conservation value, details of which are provide in Section 6.

3. LEGAL

- 3.1.1 This report has been prepared by Ramboll exclusively for the intended use by the Client in accordance with the agreement (Environmental Surveys and assessment Support: LHR-21, Park Royal, proposal reference number BFSF-EQNS-XX-RFQ-Z-0001, dated 19th February 2024) between Ramboll and the Client defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.
- 3.1.2 In preparation of this document and performance of any other ecological services, Ramboll has relied upon publicly available information, information provided by the Client and information provided by third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within this document production and reporting schedule.
- 3.1.3 Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the Client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

- 3.1.4 Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the Site will continue to be used for its current purpose and end-use without significant changes either on-site or off-site.

4. ROLES, RESPONSIBILITIES AND REVIEW

4.1 Summary of Roles

- 4.1.1 Table 4.1 summarises the key roles required to be fulfilled by the Client, Contractors, the Site Manager, Ecological Clerk of Works (ECoW) and Environmental Manager, and outlines the responsibilities associated with each role.

Table 4.1: LEMP Roles and Responsibilities	
Role	Responsibilities
The Client	Ensure the LEMP is prepared in accordance with the principles outlined in the Planning Condition and secure Wokingham Borough Council approval of this document; Responsible for ensuring the Principal Contractor complies with the LEMP; and Ensure compliance with environmental legislation, as well as Health and Safety Requirements.
Contractors	Implement LEMP; If a protected species is found or suspected to have been found or if there are any queries regarding ecology and working method, stop work and contact ECoW; and Ensure compliance with environmental legislation, as well as Health and Safety Requirements.
Site Manager	Site management, oversight of operations, deliveries and general housekeeping; Appointment of site ECoW and ensure that construction staff and ECoW have sufficient time, resource and training to discharge responsibilities; Review implementation of corrective actions; Ensure all contractors and site workers are aware that any variation to working practices or working areas must be agreed prior to any change with the Site Manager and ECoW; The Site Manager will provide the ECoW with a programme of scheduled works and will advise the ECoW in the event this programme has to be altered; and The Site Manager will provide the ECoW with regular updates of works to be undertaken and areas where works are to take place.
Ecological Clerk of Works (ECoW)	Responsible for guiding and advising on all ecological matters which arise during the construction phase, including vegetation clearance in ecologically sensitive areas; Deliver toolbox talk training to site workers on specific ecological issues and ensure implementation of good practice; Required for work in areas with potential reptile presence; Required for nesting bird checks if vegetation cleared during nesting bird season (end of February to end of August inclusive);

	To be informed by staff of any breaches of ecological conformity and responsible for flagging these. The ECoW also has the authority to stop works where an ecological non-conformance is identified and prescribe emergency remedial measures as required; and The role can be performed by a different Suitability Qualified Ecologist (SQE) on different days, depending on availability of staff and appropriate qualifications or experience for specific tasks.
Environmental Officer	Conduct and log environmental inspections and take and record any mitigation actions necessary; Deliver toolbox talk training to site workers on general ecological and environmental issues and ensure implementation of good practice; Liaise and coordinate with the ECoW on ecological issues as necessary. Contact the ECoW for advice directly in any situations where protected or notable species are recorded or suspected on the site; and Report environmental activity to the Site Manager.

4.2 Documentation and Lines of Communication

- 4.2.1 This LEMP should be reviewed by the Site Manager on an annual basis for compliance and to ensure that the management is being undertaken according to the plan and remains effective and appropriate. If necessary, advice should be sought from an ecologist or landscape architect who will be able to advise if additional works or a revision to the LEMP are required.
- 4.2.2 This LEMP covers years 1-5 as part on the initial phase, following completion of the solar farm construction. After this time, it is anticipated that the LEMP be rolled over, with adjustments as needed, to satisfy the planning consent conditions of 25 years as well as the operational phase of development of up to 30 years, covering the expected lifetime of the solar farm, It would be prudent at that point for the project manager to appoint an ecologist to review the condition of the habitat features considered, in order to validate and update the LEMP as necessary to maximise the value of the Site for wildlife.

5. PRE-DEVELOPMENT ECOLOGICAL BASELINE

- 5.1.1 This section describes the habitats and species present on the site prior to development, as described in the Biodiversity ES Chapter.

5.2 Habitats

- 5.2.1 Prior to the development, the Site predominantly supported typical agricultural habitats, including improved grassland, hedgerows and arable fields, with a wet drainage ditch network, running water and isolated areas of woodland also present throughout. Several of these habitats are considered Habitats of Principal Importance (HPI)⁴. Habitats include:
- Dense scrub;
 - Scattered scrub;
 - Scattered scrub;
 - Parkland/scattered trees (HPI);
 - Semi-improved natural grassland (HPI);

⁴ <https://jncc.gov.uk/our-work/uk-bap-priority-habitats/>

- Plantation broadleaved woodland;
- Improved grassland;
- Marshy grassland
- Bracken/dense scrub
- Standing water;
- Running water(HPI);
- Arable (HPI);
- Intact species-rich hedgerow (HPI);
- Intact species-poor hedgerow;
- Species-rich hedgerow with trees (HPI);
- Species-poor hedgerow with trees;
- Fences;
- Dry ditches;
- Bare ground; and,
- Buildings;

5.3 Species

Birds

- 5.3.1 Based on the assemblage of breeding birds recorded within the Site, which included common and widespread species as well as more notable species, the Site was considered to be of up to District level nature conservation importance for breeding birds. Two species as listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), including barn owl *Tyto alba* and red kite *Milvus milvus*. Barn owl have been confirmed as breeding within a pole-mounted nest box installed in a field in Brook Farm, and red kite may be nesting within the Site due to the presence of suitable, albeit isolated, woodland habitat and mature trees. Amphibians
- 5.3.2 No great crested newt (GCN) *Triturus cristatus* were recorded within the Site. However, GCN were confirmed in a waterbody outside of the Site boundary at National Grid Reference: SU782665. A Great Crested Newt Mitigation Plan as seen in Figure 6-3 of the Environmental Statement was created, since site clearance activities within 500m of these waterbodies, may result in potential killing or injury of individuals. Due to the proximity of the waterbody to the Site, as well as there being limited suitable terrestrial habitat within the Site, the Site was considered Local level nature conservation importance for amphibians.

Bats

- 5.3.3 A Preliminary Roost Assessment (PRA) was completed as part of the PEA, which identified 33 trees with suitability to support roosting bats. In addition to this, further bat activity surveys were undertaken in 2020 identified eight bat species using the Site. Given the potential for the Site to support roosting bats, and the prevalence of bat roosts within the wider area identified during the desk study, the Site was considered to be of up to District level nature conservation importance for commuting and foraging bats, and Local level nature conservation importance for roosting bats.

Badger

- 5.3.4 Multiple badger *Meles meles* setts are present throughout the woodland and scrub habitat at the Site. In addition to this, there is multiple evidence of badger activity including commuting and foraging throughout the Site. The Site was considered to be of up to Local level nature conservation importance for badgers.

Hedgehogs

- 5.3.5 The mosaic of arable and grazed fields, connected to woodland areas within and outside the Site is considered suitable to support local populations of hedgehog *Erinaceus europaeus*. The expanse of grassland and hedgerows are likely to provide invertebrate foraging resources for hedgehog. The plantation broadleaved woodland in High Barn Farm and hedgerows throughout the Site may also provide suitable leaf piles for hibernating hedgehog. The Site was considered to be of up to Local level nature conservation importance for hedgehogs.

Brown Hare

- 5.3.6 Shrub and scrub vegetation along field boundaries may provide feeding opportunities for brown hare *Lepus europaeus*. The Site was considered to be of up to Local level nature conservation importance for brown hare, based on the suitability of the Site to support brown hare.

Reptiles

- 5.3.7 Across the Site, habitat suitability for reptiles was limited to areas of dense scrub, hedgerows and standing water. Based on low suitability of habitat present, the Site was considered to be of up to Site level nature conservation importance for reptiles.

Hazel dormice

- 5.3.8 Although suitable habitat to support suitable hazel dormouse *Muscardinus avellanarius* was identified at the Site, no evidence of presence was identified during surveys.

Invertebrates

- 5.3.9 The Site was considered to be of up to Site level nature conservation importance for terrestrial invertebrates.

6. POST-DEVELOPMENT DESCRIPTION OF LANDSCAPE AND ECOLOGICAL FEATURES

- 6.1.1 This section describes the landscape and habitats proposed to be retained, enhanced and created at the Site. The species described in Section 5.3 are expected to continue to make use of the habitats at the Site.
- 6.1.2 A previous Biodiversity Net Gain Assessment was undertaken for the Site in 2021. The significant biodiversity unit gains are achieved through grassland enhancement and woodland creation, as well as riverine enhancement zones. The Proposed Development is also considered to achieve a net gain, for example through application of the mitigation hierarchy retaining valuable woodland and hedgerow, and through efforts to ensure additionality when interpreting the LEMP. This assessment was based on habitats being suitably managed to ensure target condition can be reached and maintained (for a period of at least 30 years).
- 6.1.3 General arrangement plans show the location of the existing and proposed landscape and habitat; the planting plans show the proposed planting areas and planting quantities and landscape details provide cross section, plan and elevation details of the planting and hard landscape details :

• Landscape General Arrangement Plan (Sheet 1)	BFSF-RAMB-XX-DR-L-3001
• Landscape General Arrangement Plan (Sheet 2)	BFSF-RAMB-XX-DR-L-3002
• Planting Plan (Sheet 1)	BFSF-RAMB-XX-DR-L-3011
• Planting Plan (Sheet 2)	BFSF-RAMB-XX-DR-L-3012
• Planting Schedule	BFSF-RAMB-XX-SH-L-3013
• Landscape Detail (Sheet 1)	BFSF-RAMB-XX-DR-L-3021
• Landscape Detail (Sheet 2)	BFSF-RAMB-XX-DR-L-3022
• Landscape Detail (Sheet 3)	BFSF-RAMB-XX-DR-L-3023
• Landscape Detail (Sheet 4)	BFSF-RAMB-XX-DR-L-3024
• Landscape Detail (Sheet 5)	BFSF-RAMB-XX-DR-L-3025
• Landscape Detail (Sheet 6)	BFSF-RAMB-XX-DR-L-3026
• Landscape Detail (Sheet 7)	BFSF-RAMB-XX-DR-L-3027
• Landscape Detail (Sheet 8)	BFSF-RAMB-XX-DR-L-3028
• Landscape Detail (Sheet 9)	BFSF-RAMB-XX-DR-L-3029

6.2 Hedgerows

- 6.2.1 Several new hedgerows will be planted throughout the Site. These are proposed to be planted around the Site boundary and between the different land parcels. The plant species within the hedgerow hedgerows are shown in Table 6.1. In addition, existing hedgerows will be enhanced with additional planting to improve quality, species diversity and to remove gaps.
- 6.2.2

Table 6.2 Hedgerow Species Planting List

Common name	Plant species	Hedgerow type	% of habitat composition
Field maple	<i>Acer campestre</i>	Hedgerow mix	10
Hazel	<i>Corylus avellana</i>	Hedgerow mix	10
Hawthorn	<i>Crataegus monogyna</i>	Hedgerow mix	30
Holly	<i>Ilex aquifolium</i>	Hedgerow mix	10
Common honeysuckle	<i>Lonicera periclymenum</i>	Hedgerow mix	5
Blackthorn	<i>Prunus spinosa</i>	Hedgerow mix	10
Dog rose	<i>Rosa canina</i>	Hedgerow mix	10
Gorse	<i>Ulex europaeus</i>	Hedgerow mix	5
Wayfaring tree	<i>Viburnum lantana</i>	Hedgerow mix	10
Field maple	<i>Acer campestre</i>	Native planting buffer	10
Holly	<i>Ilex aquifolium</i>	Native planting buffer	15
Hazel	<i>Corylus avellana</i>	Native planting buffer	15
Blackthorn	<i>Prunus spinosa</i>	Native planting buffer	15
Dog rose	<i>Rosa canina</i>	Native planting buffer	5
Common honeysuckle	<i>Lonicera periclymenum</i>	Native planting buffer	5
English oak	<i>Quercus robur</i>	Native planting buffer	10
Common hawthorn	<i>Crataegus monogyna</i>	Native planting buffer	15
Hornbeam	<i>Carpinus Betulus</i>	Native planting buffer	5
Rowan	<i>Sorbus aucuparia</i>	Native planting buffer	5

6.3 Wildflower Grassland

- 6.3.1 Wildflower grassland will be created in the north, north-east and centre of the Site. The target UKHab⁵ habitat for the grassland is Other Neutral Grassland, and it will be established using EM2 Standard General Purpose Meadow Mixture and EM4F Wild Flowers for Clay Soils from Emorsgate Seeds⁶ or similar, with species as shown in Table 6.2.

Table 6.3 Grassland Species Planting List

Common name	Plant species	Grassland type
Agrimony	<i>Agrimonia eupatoria</i>	EM2 Standard General Purpose Meadow Mixture
Common knapweed	<i>Centurea nigra</i>	EM2 Standard General Purpose Meadow Mixture
Wild carrot	<i>Daucus carota</i>	EM2 Standard General Purpose Meadow Mixture
Lady bedstraw	<i>Galium verum</i>	EM2 Standard General Purpose Meadow Mixture
Field scabious	<i>Knautia arvensis</i>	EM2 Standard General Purpose Meadow Mixture
Meadow vetchling	<i>Lathyrus pratensis</i>	EM2 Standard General Purpose Meadow Mixture
Rough hawkbit	<i>Leontodon hispidus</i>	EM2 Standard General Purpose Meadow Mixture
Oxeye daisy	<i>Leucanthemum vulgare</i>	EM2 Standard General Purpose Meadow Mixture
Musk mallow	<i>Malva moschata</i>	EM2 Standard General Purpose Meadow Mixture
Ribwort plantain	<i>Plantago lanceolata</i>	EM2 Standard General Purpose Meadow Mixture
Salad burnet	<i>Poterium sanguisorba ssp sanguisorba</i>	EM2 Standard General Purpose Meadow Mixture
Cowslip	<i>Primula veris</i>	EM2 Standard General Purpose Meadow Mixture

⁵ Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J., 2023. The UK Habitat Classification User Manual Version 2.1 at <http://www.ukhab.org/>.

⁶ Emorsgate Seeds. <https://wildseed.co.uk/>

Table 6.3 Grassland Species Planting List

Common name	Plant species	Grassland type
Selfheal	<i>Prunella vulgaris</i>	EM2 Standard General Purpose Meadow Mixture
Bulbous buttercup	<i>Ranunculus bulbosus</i>	EM2 Standard General Purpose Meadow Mixture
Tufted vetch	<i>Vicia cracca</i>	EM2 Standard General Purpose Meadow Mixture
Common bent	<i>Agrostis capillaris</i> –	EM2 Standard General Purpose Meadow Mixture
Crested dogtail	<i>Cynosurus cristatus</i>	EM2 Standard General Purpose Meadow Mixture
Red fescue	<i>Festuca rubra</i>	EM2 Standard General Purpose Meadow Mixture
Smaller Cat's-tail	<i>Phleum bertolonii</i>	EM2 Standard General Purpose Meadow Mixture
Smooth-stalked meadow grass	<i>Poa pratensis</i>	EM2 Standard General Purpose Meadow Mixture
Yarrow	<i>Achillea millefolium</i>	EM4F Wild Flowers for Clay Soils
Agrimony	<i>Agrimonia eupatoria</i>	EM4F Wild Flowers for Clay Soils
Betony	<i>Betonica officinalis</i>	EM4F Wild Flowers for Clay Soils
Common knapweed	<i>Centurea nigra</i>	EM4F Wild Flowers for Clay Soils
Lady bedstraw	<i>Galium verum</i>	EM4F Wild Flowers for Clay Soils
Meadow crane's-bill	<i>Geranium pratense</i>	EM4F Wild Flowers for Clay Soils
Meadow vetchling	<i>Lathyrus pratensis</i>	EM4F Wild Flowers for Clay Soils
Rough hawkbit	<i>Leontodon hispidus</i>	EM4F Wild Flowers for Clay Soils
Oxeye daisy	<i>Leucanthemum vulgare</i>	EM4F Wild Flowers for Clay Soils
Bird's foot trefoil	<i>Lotus corniculatus</i>	EM4F Wild Flowers for Clay Soils
Musk mallow	<i>Malva moschata</i>	EM4F Wild Flowers for Clay Soils
Black medick	<i>Medicago lupulina</i>	EM4F Wild Flowers for Clay Soils
Ribwort plantain	<i>Plantago lanceolata</i>	EM4F Wild Flowers for Clay Soils
Cowslip	<i>Primula veris</i>	EM4F Wild Flowers for Clay Soils
Selfheal	<i>Prunella vulgaris</i>	EM4F Wild Flowers for Clay Soils
Meadow buttercup	<i>Ranunculus acris</i>	EM4F Wild Flowers for Clay Soils
Great burnet	<i>Sanguisorba officinalis</i>	EM4F Wild Flowers for Clay Soils
Pepper-saxifrage	<i>Silaum silaus</i>	EM4F Wild Flowers for Clay Soils
Ragged robin	<i>Silene flos-cuculi</i>	EM4F Wild Flowers for Clay Soils
Tufted vetch	<i>Vicia cracca</i>	EM4F Wild Flowers for Clay Soils

6.4 Woodland

- 6.4.1 Two main areas of new woodland will be created. The first being woodland mix of largely wet woodland specific plants in the north of the Site adjacent to the Barkham Brook river, to support riverine enhancement, and the second being broad-leaved woodland habitats to be planted in the south of the Site. Woodland planting creates numerous opportunities to enhance biodiversity of habitat across the Site. These woodland corridors would contribute to the target set for “wildlife corridors” set out in Policy TB23 of the Wokingham Local plan⁷, through provision of enhanced habitat suitability for commuting and foraging bats, hedgehogs and badgers. The plant species within the woodland are shown in Table 6.3.

⁷ Wokingham Borough Council (2014). Wokingham Borough Development Plan: Adopted Managing Development Delivery Local Plan

Table 6.4: Woodland Species Planting List

	Plant species	% of habitat composition
Wet Woodland Canopy		
Black alder	<i>Alnus glutinosa</i>	30
Downy birch	<i>Betula pubescens</i>	25
English oak	<i>Quercus robur</i>	30
Grey willow	<i>Salix cinerea</i>	15
Wet Woodland Understory Layer		
Holly	<i>Ilex aquifolium</i>	20
Bird cherry	<i>Prunus padus</i>	20
Sessile oak	<i>Quercus petraea</i>	20
Grey willow	<i>Salix cinerea</i>	10
Rowan	<i>Sorbus aucuparia</i>	20
Crab apple	<i>Malus sylvestris</i>	10
Wet Woodland Shrub Layer		
Hazel	<i>Corylus avellana</i>	15
Hawthorn	<i>Crataegus monogyna</i>	15
Blackthorn	<i>Prunus spinosa</i>	15
Eared willow	<i>Salix aurita</i>	15
Grey willow	<i>Salix cinera</i>	10
Dogwood	<i>Cornus sanguinea</i>	15
Guelder-rose	<i>Viburnum opulus</i>	15
Semi Natural Broadleaved Woodland		
Field maple	<i>Acer campestre</i>	15
Alder	<i>Alnus glutinosa</i>	10
Hornbeam	<i>Carpinus betulus</i>	15
Common hazel	<i>Coryllus avellana</i>	15
English oak	<i>Quercus sorbur</i>	15
Service tree	<i>Sorbus torminalis</i>	5
Rowan	<i>Sorbus aucuparia</i>	10
Small-leaved linden	<i>Tilia cordata</i>	15
Woodland edge		20
Field maple	<i>Acer campestre</i>	10
Common hazel	<i>Coryllus avellana</i>	15
Hawthorn	<i>Crataegus monogyna</i>	20
Spindle	<i>Euonymus europaeus</i>	5
Holly	<i>Ilex aquifolium</i>	5
European wild apple	<i>Malus sylvestris</i>	5
Blackthorn	<i>Prunus spinosa</i>	25
Edlerberry	<i>Sambucus nigra</i>	10
European Cranberrybush	<i>Viburnum opulus</i>	5

6.5 Retained Trees

- 6.5.1 There are several existing trees scattered across the Site, mainly along the border boundaries and hedgerow separating features, which will be retained. These include potential veteran trees.
- 6.5.2 A Tree Survey and Arboricultural Method Statement - Arboricultural Method Statement and Scheme of Works for Protection of Trees at Barkham Solar Farm Workingham, SJA Trees (April 2024)⁸ has been produced which identifies the trees and describes work to protect them.
- 6.5.3 The plan shall be referred to ensure the construction of the solar farm and its associated infrastructure at Barkham Farms does not cause any unacceptable damage to the trees to be retained within this site and in the adjacent properties.
- 6.5.4 Figure 1: Proposed LEMP Plan and the Tree Protection Plan (SJA TPP 24126-04)⁸ shows which trees and hedgerows can and cannot be retained. Where there is a discrepancy between the two plans in regards to trees/hedgerows to be retained, the Proposed LEMP Plan shall take precedence.

7. ECOLOGICAL FACTORS, CONSTRAINTS AND MANAGEMENT RATIONALE

7.1 Sensitive Timing of Site Works

- 7.1.1 Site vegetation clearance and maintenance will be undertaken outside of the breeding bird season of March to August inclusive, in order to avoid disturbing or destroying any bird's nests. Should works to clear the Site need to be undertaken during the breeding bird season, a suitably qualified ecologist will carry out a check of the vegetation in advance to ensure that no nests will be destroyed, with work being delayed in the event that nests are found. Nesting birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended).

7.2 Training and Communication

- 7.2.1 During the Site induction and during routine toolbox talks, site workers would be instructed to ensure that all deep trenches and pits are constructed with ramps at one end, to allow animals which might become trapped in a trench to escape. If site workers are working near an excavation, they would be aware of the possibility of wildlife, and inspect the excavation prior to commencing work.

7.3 Monitoring and Review of Ecological Issues

- 7.3.1 Actions taken to protect biodiversity would be recorded by the Site Manager or an appointed representative. The effectiveness of these actions would be monitored throughout the construction process. By ensuring that ecological features are protected, and the works are appropriately timed, the Environmental Officer would ensure that construction activities do not have a detrimental effect on the environment or on biodiversity at the Site. If the annual monitoring visits identify any areas requiring remedial actions these will be identified and detailed within the Annual Monitoring Report, and the necessary actions taken.

⁸ SJA Trees Arboricultural Planning Consultants (April 2024). Arboricultural Method Statement and Scheme of Works: For Protection of Trees at Barkham Solar Farm Wokingham.

8. MANAGEMENT OBJECTIVES AND PRESCRIPTIONS

8.1 Objectives summary

- 8.1.1 The Management Objectives (MO) for the habitats provided by the Proposed Development on-site are:
- MO1-Species enhancement;
 - MO2- Maintenance of ecological diversity; and
 - MO3- Additional enhancement of ecological diversity.
 - MO4 – Maintenance and enhancement of landscape character and visual amenity
- 8.1.2 Each MO has a number of associated Management Prescriptions (MP), in order to achieve the objectives for the habitats at the Site. The MO and associated MP are detailed in the following sections.
- 8.1.3 Scheduled maintenance or other activities should be undertaken on a twice-annual basis, in early spring and autumn. This is to avoid the bird breeding season and prevent unnecessary damage to plants during the active growing season. The management and maintenance refers to the years 1-5 and the initial phase of management. Following from this, management and maintenance will be rolled over, with adjustments as needed, to satisfy the planning consent conditions of 25 years as well as the operational phase of development of up to 30 years, covering the expected lifetime of the solar farm.
- 8.1.4 The majority of maintenance activities can be undertaken by grounds maintenance staff , trained landscape gardeners and or the District's Countryside Management Service.
- 8.1.5 The use of chemical herbicides and fertilisers should be avoided wherever possible, and should not be used within a 5 m radius of trees or within 10m of watercourses and waterbodies unless absolutely necessary. If necessary, the use of chemicals within 10m proximity to water bodies and water courses needs to be undertaken in accordance with guidance from Environment Agency.

8.2 M01-Species Enhancement

- 8.2.1 Mitigation measures set out within the Barn Owl Mitigation Plan within Figure 6-2 of the Environmental Statement with regards to barn owl include the avoidance of construction activities within 50m of the confirmed barn owl nest site during the main breeding season (March to August inclusive).
- 8.2.2 As barn owls have been known to nest outside the main breeding season, a suitably experienced and licenced ecologist will regularly attend Site to identify if barn owl are actively nesting within 50m from works. Should barn owl nesting be confirmed, the ecologist will monitor the nest from an appropriate distance to observe any potential repeated fly-away behaviour and to advise the construction operatives on activities which can or cannot proceed while the nest is active. At the first instance, any works likely to cause a disturbance to barn owl will be halted while the nest is considered to be active (i.e., until the young have fledged).
- 8.2.3 Any habitat removal will also include a careful check of the soil around any deadwood in hedgerows to check for stag beetle larvae, which will be safely translocated to the retained plantation woodland if found.

Ecological Permeability

- 8.2.4 To enhance the Site's suitability for badgers, hares and hedgehogs, hedgerows will be connected via new hedgerow and scrub planting. The linking of these parcels via hedgerows allows permeable wildlife corridors. As such connectivity of hedgerows including hedgerow planting and gaps between hedgerows will be monitored and management recommendations implemented as detailed in section 8.4.18- 8.4.28. Fencing to be included within the Site must have a holes and/or gaps within them to allow hedgehogs and other mammals to freely move between green spaces and will not be buried into the ground. A EcoW will evaluate fence specification to include minimum hedgehog sized gaps (minimum 13x13cm access hole) at the ground level into fences⁹, along with assessing habitat enhancement for species.
- 8.2.5 *MP1. Hedgerows will be managed and enhanced as detailed in 8.4.17- 8.4.25.and mammal species friendly fencing assessed by EcoW will be included to allow greater habitat connectivity and wildlife accessibility. Routine inspections by EcoW to ensure connectivity within the Site is maintained for wildlife corridors.*

Bird habitat enhancement

- 8.2.6 As part of potential onsite species enhancement, it is recommended for two bird boxes within the Site for breeding bird habitat enhancement, in suitable locations in agreement with a ECoW .
- 8.2.7 Each bird box will be placed at a height of approximately 2 to 4 m above the ground.
- 8.2.8 The location of the boxes should be facing between north and east, to avoid strong sunlight and the wet winds, unless the box is shaded by trees during the day; and avoiding areas of potential disturbance (e.g., from human interference, placement above windows, noise and lighting).
- 8.2.9 Bird boxes will be inspected every two years, between September and February, to ensure they remain fit for purpose.
- 8.2.10 Where possible and practical the maintenance works will be undertaken to replaced damaged boxes.
- 8.2.11 All used nesting materials will be removed, and the boxes will be cleaned using boiling water to kill any parasites. A light disinfectant may also be used. Insecticides and flea powders should not be used. The boxes will be allowed to dry out throughout the day before replacing the lid. A handful of dry leaves may be placed in the boxes after cleaning to provide a warm roost space for overwintering birds.

Bat habitat enhancement

- 8.2.12 As part of potential onsite species enhancement, it is recommended two bat boxes (e.g., Schwegler 1FQ bat roost boxes and Schwegler 1WQ winter bat roost boxes) would be installed on existing trees in suitable locations, in agreement with a ECoW.
- 8.2.13 As per the Bat Conservation Trust recommendations, the location for each bat box will be selected based on its proximity to suitable foraging habitat and connectivity to the surrounding area, as well as in areas that will be warmed by sunlight and placed at a height of approximately 4 or 5 m above the ground. The box locations will avoid areas of potential disturbance (e.g., from human interference, placement above windows, noise and lighting).
- 8.2.14 All species of bat are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (as amended) making all species of bat European Protected Species. This legislation also protects the

⁹ Bunnell, T. (2014) The disappearing Hedgehog. United Kingdom: Independent Publishing Network.

resting places of bats including roost sites and it is an offence to intentionally disturb bats occupying places used for shelter or protection.

- 8.2.15 Checks of bat boxes will be made every two years by a licensed bat ecologist to determine their use by bats. Any bat boxes that are damaged or that are in a poor condition will be replaced.

Invertebrate enhancement

- 8.2.16 As part of potential onsite species enhancement, log pile management and maintenances for invertebrate habitat will take place at the location of the an already felled tree at National grid reference: SU783665.
- 8.2.17 The proposed log pile will provide shelter. It would include drilled tubes of timber hardwood such as oak, ash or beech for solitary bee nesting. It will be supplemented with additional removed debris/branches produced by felling trees following remedial work onsite outlined in section 8.3 and 8.4. Chemically treated timber would be avoided.
- 8.2.18 *MP2: Proposed species-specific habitat on site will be managed and maintained under ECoW guidance to allow species enhancement on site by creating shelter and breeding opportunities.*

8.3 M02- Maintenance of Existing Ecology, Landscape Character and Visual Amenity

Retained Trees

Management and maintenance

- 8.3.1 Retained trees will require maintenance schedule primarily undertaken by an arboriculturist.
- 8.3.2 Checks on safety and condition of trees would be undertaken at least annually and additionally after periods of strong winds.
- 8.3.3 Work would be undertaken as recommended by Arboriculturist to ensure the continued healthy and safety of trees, set out in both branches or entire trees that are deemed potentially hazardous band will be promptly and safely removed. All works to be in accordance with relevant industry standards and BS 3998:2010 Tree Works¹⁰. Removed wood would be cut into logs and added into piles to create features suitable for use by invertebrates.
- 8.3.4 Fencing will be used to create 'Biodiversity Protection Zones' around the retained trees, maintained for the duration of the construction period. Fencing will be labelled with appropriate warning signs to ensure site workers do not access them. Working areas and haulage routes will be located to avoid root zones of all retained trees.

Monitoring

- 8.3.5 A yearly maintenance inspection of the retained species will be carried out to assess the general condition. Any vegetation failures would be replaced at this time in line with supplier guidance. Regular monitoring for pests and diseases, apply necessary control measures as soon as possible.
- 8.3.6 Monitoring visits should be undertaken between May- September. One visit will be undertaken between years 1-3 and another visit in year 5. One visit will be undertaken between years 6-15 and one visit every 2 years between years 16- 30.
- 8.3.7 *MP3. Tree maintenance and checks will be undertaken by arboriculturist in accordance with industry standards.*

¹⁰ British Standards Institution. (2010). BS 3998: 2010 Tree Work - Recommendations

Existing meadows

Management and maintenance

- 8.3.8 Existing grassland meadow present underneath solar panels will require a maintenance schedule primarily undertaken by contractors.
- 8.3.9 The grassland will be cut annually and timed to late summer or early autumn to enable wild flowers to set.
- 8.3.10 Arisings would then be removed to limit nutrient enrichment and prevent build-up of thatch, which would otherwise allow more dominant, coarse species to out-compete finer wildflowers or smother germinating seeds. If suitable, cut vegetation can be left in habitat piles on the edge of grassland boundaries to provide basking and hibernacula features for reptiles present within the Site.
- 8.3.11 Litter removal and weed control to take place throughout the year, and as needed.

Monitoring

- 8.0.2 A yearly maintenance inspection of the retained species will be carried out to assess the general condition. Regular monitoring for pests and diseases, apply necessary control measures as soon as possible
- 8.0.3 Monitoring checks will take place annually by a ECoW in years 1- 10, and once in years 15, 20 and 30.
- 8.0.4 *MP4. Grassland maintenance and checks will be undertaken to ensure not inhabiting solar panels.*

8.4 MO3. Additional Enhancement of Ecological Diversity, Landscape character and visual amenity

Proposed Woodland

Management and maintenance

- 8.4.1 Trees should be planted in autumn / winter so that they have time to establish throughout the wetter winter months. The use of plastic stakes, guards and ties would be minimised, with alternative material sought where possible. Any guards and stakes inputted will be routinely inspected every for the first 2-4 years in January, April and October by the Site management to ensure that guards are secure, not too tight and identify if any guards need replacement
- 8.4.2 Trees should be inspected at each maintenance visit and any trees which have died or are excessively damaged will be removed from site, in addition to any associated stakes or supporting features, and replaced with like for like trees.
- 8.4.3 At the start and end of each growing season all stakes, ties and guying systems will be inspected. Any looseness, constriction or abrasion will be corrected by adjustment or replacement as necessary. Where the support of a stake is no longer required the stake will be removed from site.
- 8.4.4 The base of new trees and shrubs would be watered during prolonged periods of dry hot weather, particularly in the first year whilst establishing. Water as required during prolonged dry periods in the first 2-3 years after planting, to ensure healthy root establishment.
- 8.4.5 After three years all stakes, guards and ties are to be removed and planting should be thinned by 25% or as advised by the Environmental Manager . During this operation, certain woody species, such as hazel, should be coppiced where appropriate. Coppicing involves cutting each stem to the

stump as close to the ground as possible. Longer term, this would then be repeated every 10 years depending on the species. Coppicing would be undertaken late autumn/winter (November to February). Dead or dying trees will be left standing to benefit a range of wildlife and will only be removed if it poses a health and safety risk. In subsequent years, thinning, to remove poor, weak, diseased or overcrowded trees to make the remaining trees stronger and sturdier will be undertaken to prevent dense shading of the underlying ground flora.

- 8.4.6 Trimming of trees such as oak and holly should be kept to a minimum to encourage a varied structure, which provides a greater availability of habitats, food and refuge. This is to maximise the wildlife value of trees and scrub, including for birds and invertebrates. Over-pruning can remove the flowering limbs from the plant and would reduce the plants wildlife value.
- 8.4.7 After approximately 10 years, the desired condition of the new tree and shrub planting would include a canopy cover of native species with an absence of non-native species. In the longer term, an uneven aged woodland would be sought but this would not occur until many years after the end of this plan. An assessment of the condition of the woodland would be undertaken by an ecologist and landscape architect on an annual basis.
- 8.4.8 Mulch is to be topped up annually in late February and in early June if needed to provide a depth of 100mm, for the first five years, when its continued use can be reviewed and inspections to determine if aeration of compacted soils is required.
- 8.4.9 Weed Control will be undertaken using bark mulch in combination ,with hand weeding as required on each site visit. Use of herbicide may only be undertaken with prior written approval of the Ecological Clerk of Works or Contract Administrator.
- 8.4.10 Any trees that do not establish effectively and die as a result should be replaced as soon as possible in the next planting season from November to March for bare root nursery stock to ensure the landscape benefits are achieved.
- 8.4.11 Once established, new trees will be managed in accordance with British Standard for Tree Work BS 3998:2010¹¹.
- 8.4.12 Maintenance works to trees should be undertaken outside of the breeding bird season (March to August inclusive) where possible. The use of chemicals herbicides and fertilisers should be avoided within a 5 m radius of trees and within 10m of watercourses.

Monitoring

- 8.4.13 Annual checks for Schedule 9 plants the Wildlife and Countryside Act 1981 will be undertaken in summer months (May- August). Occurrence of such invasive plant species will be recorded, and a ECoW or invasive weeds specialist consulted for advice on the best course of action to address their presence.
- 8.4.14 Litter removal and weed control to take places throughout the year, and as needed.
- 8.4.15 Monitoring of the ecological diversity of the Site by a ECoW would help determine if the prescribed management strategies are having the desired effects. The monitoring results would inform the evaluation of the maintenance plan and help to identify whether an amendment to the plan is required. Monitoring will be undertaken after five years by a ECoW to determine whether the management regime delivers the desired outcomes. If the annual monitoring visits identify any areas requiring remedial actions these will be identified and detailed within the Annual Monitoring Report, and the necessary actions taken.
- 8.4.16 Monitoring visits will occur in years 3, 5, 7, 10, 12, 15, 20, 25 and 30.

¹¹ <http://www.londonisi.org.uk/tackling-inns/lisp/#implement>

- 8.4.17 *MP5. Woodland species to be planted, managed to establishment, and then maintained using traditional management techniques where possible. Any necessary maintenance would be carried out outside of the bird breeding season where possible.*

Proposed and Existing Hedgerow

Management and maintenance

- 8.4.18 Hedgerows will be planted in autumn / winter so that they have time to establish throughout the wetter winter months.
- 8.4.19 Traditional management techniques will be used where possible, and trimming will be kept to a minimum to encourage a varied structure, which provides a greater availability of habitats, food and refuge. Sections of flowering hedgerows will be allowed to flower on a rotational basis before being pruned in January or February, whereby 50% of hedgerows are pruned in year one and 50% of hedgerows are pruned in year two. This is to maximise their wildlife value, including for birds and invertebrates. Over-pruning can remove the flowering limbs from the plant and would reduce the plants wildlife value. If possible, flails will not be used to manage hedgerows. Coppicing or, preferably, 'conservation' type laying will be used to manage hedgerows that become gappy or lack dense branches at their base.
- 8.4.20 Maintenance works to trees should be undertaken outside of the breeding bird season (March to August inclusive) where possible. The use of chemicals herbicides and fertilisers should be avoided within a 5 m radius of trees and within 10m of watercourses.
- 8.4.21 Existing and new hedgerows are to be mulched annually in late February and in early June if needed to provide a depth of 100mm, for the first five years, when its continued use can be reviewed.
- 8.4.22 Weed Control will be undertaken using bark mulch in combination with hand weeding as required on each site visit. Use of herbicide may only be undertaken with prior written approval of the Ecological Clerk of Works or Contract Administrator.
- 8.4.23 The width of new hedgerows will be maximised to inhibit edge effects such as disturbance and increased predation e.g., a minimum height of 1 to 2 m and minimum width of 1 to 1.5 m. Wider hedges would also support more species and function more effectively as habitat corridors.
- 8.4.24 To enhance the Site's suitability for hedgehogs, hedgerows are to be connected to ensure linking of parcels of habitat. The linking of these parcels via hedgerows will allow greater connectivity and wildlife corridors which will increase accessibility to wildlife.

Monitoring

- 8.4.25 Monitoring of the ecological diversity of the Site by a ECoW would help determine if the prescribed management strategies are having the desired effects. The ECoW would undertake a structured walk along the habitat creation/enhancement area, with the aim of monitoring quality, species composition, pests and disease.
- 8.4.26 The use of plastic stakes, guards and ties would be minimised, with alternative material sought where possible. Any guards and stakes inputted will be routinely inspected every for the first 2-4 years in January, April and October by the Site management to ensure that guards are secure, not too tight and identify if any guards need replacement. Where guards are used, canes should be used for support. If trees have successfully been established, protection will be removed in year 5, and responsibly disposed of.

- 8.4.27 Monitoring visit will occur between May-September and undertaken in years 1-3, with one visit in year 5. One visit every 2 years between year 6-15, and one visit every 5 years between years 16 – 30.
- 8.4.28 *MP6. Hedgerows to be planted, managed to establishment and with the combination of retained hedgerows will be maintained using traditional management techniques where possible Any necessary maintenance would be carried out outside of the bird breeding season where possible.*

Proposed Wildflower Grassland Wildflower mixes

Management and maintenance

- 8.4.29 Seeding should be carried out according to the seed companies 's recommendations, which highlight that good preparation of soil is essential to successful establishment. It is proposed to remove the turf and top 50mm of topsoil to reduce soil fertility and sow into existing soil . Soil should be harrowed or raked to produce a medium tilth and rolled or tread to produce a firm surface prior to sowing. However, the suitability of the existing soil for sowing onto will be assessed prior to seeding and based on topsoil specific properties fertility.
- 8.4.30 The optimal time for sowing wildflower seed is in autumn or spring, although it can be sown at other times of the year if there is sufficient warmth and moisture. Seed should be surface sown and evenly distributed, either by hand or machine. Seed should not be covered with soil but should be firmed in with a roller, or by treading, to give good soil/ seed contact.
- 8.4.31 It should be noted that wild flowers often take two to three years to establish, with some species taking five years or more.
- 8.4.32 In the first year, a summer cut will be carried out between late June and the end of August. Further autumn late cuts carried out between the end of August and November can also be undertaken, to help to keep vigorous grasses from dominating wildflower growth. An initial flush of weeds from the seed bank is expected, which should be allowed to remain until mid to late summer, to provide shelter for establishing wildflower seedlings. From early August through to March of the following year, regular cutting to a height of 40-60 mm is recommended.
- 8.4.33 Arisings will be left on the ground for a week to allow seeds to drop to the ground. Arisings would then be removed to limit nutrient enrichment and prevent build-up of thatch, which would otherwise allow more dominant, coarse species to out-compete finer wildflowers or smother germinating seeds. If suitable, cut vegetation can be left in habitat piles on the edge of grassland boundaries to provide basking and hibernacula features for reptiles present within the Site. If grasses become too dominant, consider seeding consider seeding yellow rattle *Rhinanthus minor* to suppress grass species. This to be combined with reseeding with additional native wildflower seeds to maintain diversity and replenish the meadow.
- 8.4.34 In the second and subsequent years, a main summer hay cut is recommended in July or August after flowering, where vegetation is cut back to 50 mm and the 'hay' is left in situ for no more than one week, to dry and shed seed, after which it is removed. This can be combined with mowing back to 50 mm in late autumn and again in spring if needed. Alternatively, light sheep grazing can be undertaken.
- 8.4.35 Litter removal to take place throughout the year as needed.
- 8.4.36 Weed control should generally be managed by normal cutting regime . In the event of significant issue with specific options may be considered to be discussed with the ECOW based on nature of problem: including increased localised cutting regime, for two to three years or localised spot spraying or use of weed wipe. Note that herbicide use may only be considered with the written approval of ECOW or Contract Administrator.

8.4.37

Monitoring

- 8.4.38 Inspection of the grass will be undertaken to ensure botanical diversity, with weeds kept to a minimum, and no scrub encroachment. Re-seeding will be undertaken as required.
- 8.4.39 Monitoring checks will take place annually by a ECoW in years 1- 10, and once in years 15, 20 and 30.
- 8.4.40 *MP7. Wildflower grassland areas to be sown and maintained to ensure species diversity*

Scrub

Management and maintenance

- 8.4.41 Plants should be planted in autumn / winter so that they have time to establish throughout the wetter winter months.
- 8.4.42 The use of chemicals herbicides and fertilisers should be avoided within a 5 m radius of trees and within 10m of watercourses.
- 8.4.43 Any removed branches following pruning should be left within the Site for their invertebrate values. Small piles can be piled adjacent to the hedgerow or grassland to provide sheltering opportunities for wildlife e.g., hedgehogs and invertebrates.
- 8.4.44 Any specimens which fail to establish should be replanted with consideration given to species selection in terms of ground conditions.
- 8.4.45 Scrub is to be mulched after planting. Mulch is to be topped up annually in late February and in early June if needed to provide a depth of 100mm, for the first five years, when its continued use can be reviewed and inspections to determine if aeration of compacted soils is required.
- 8.4.46 Weed Control will be undertaken using bark mulch in combination with hand weeding as required on each site visit. Use of herbicide may only be undertaken with prior written approval of the Ecological Clerk of Works or Contract Administrator.

Monitoring

- 8.4.47 Monitoring of the ecological diversity of the Site by a ECoW would help determine if the prescribed management strategies are having the desired effects. A structured walk would be undertaken along the habitat creation/enhancement area, with the aim of monitoring quality and species composition.
- 8.4.48 Monitoring will take place in years 1, 2, 5 and 10, 15, 20, 25 and 30.
- 8.4.49 *MP8. Scrub species to be planted, managed to establishment and then maintained using traditional management techniques where possible and monthly inspections. Any necessary maintenance would be carried out outside of the bird breeding season where possible.*

8.5 Summary of Management Prescriptions and Timeline

- 8.5.1 Table 8.1 illustrates how the management prescriptions relate to the management objectives (outlined above).

8.5.2

Table 8.1: Relationship between Management Objectives and Prescriptions

Management Objective	Relevant Management Prescriptions
MO1: Species Enhancement	MP1, MP2
MO2 Maintenance of Ecological Diversity	MP3, MP4
MO3 Additional Enhancement of Ecological Diversity	MP5, MP6, MP7, MP8

9. FACTORS INFLUENCING MANAGEMENT

9.1 Natural Trends

9.1.1 The main natural trends likely to influence the management of the Site are:

- Ecological succession – the natural progression from one habitat type to another. Certain vigorous species may outgrow other shrubs, reducing the diversity of the planting; and
- Pests and diseases – natural outbreaks can potentially alter species composition within an ecosystem. While this is unlikely to be an important factor within the site, it would be prudent for maintenance workers to be observant for such outbreaks so that they can take appropriate action where necessary.

9.2 Anthropogenic Trends

9.2.1 The main anthropogenic trends likely to influence the management of the Site are:

- Management resources – the funding, personnel and equipment available to manage the Site may change over time, thus affecting the feasibility of undertaking the MP described in Section 7 - 8;
- Pollution – air and water-borne pollutants can potentially alter species composition within an ecosystem, usually resulting in a decrease in biodiversity although this is unlikely at the Site following construction due to the absence of material pollution sources; and
- Introduced species – species introduced to the area by humans may alter species composition if they are pests or diseases or if they have a competitive advantage over the species already present on-site. It would be prudent for maintenance workers and gardeners to be observant for such introduced species (e.g., butterfly bush *Buddleia davidii*) so that they can take appropriate action where necessary.

9.3 Legal Constraints

9.3.1 Under the Conservation of Habitats and Species Regulations 2017, it is an offence to carry out any activity which would kill or disturb any species listed under Schedule 2 of the Regulations or damage or destroy a breeding site or resting place of such a species.

9.3.2 Under the Wildlife and Countryside Act 1981 (as amended), it is an offence to:

- Intentionally kill, injure or take any wild bird or their eggs or nests (with exception to species listed under Schedule 2 of the Act); and
- Intentionally kill, injure or take any wild animal listed under Schedule 5 of the Act (these species include all native bats and all native reptiles).

- 9.3.3 The Act also contains measures to prevent the establishment of non-native species by prohibiting the release or planting of animals and plants listed under Schedule 9.

9.4 Legal and Financial Responsibility

- 9.4.1 The Council own the site and will ensure the ongoing implementation of the LEMP over the 30 year period. The management regime set out within the LEMP will be instructed as part of the ongoing management and maintenance contract for the Solar Farm and will be funded from the revenue generation of the facility. Alternatively, maintenance responsibility of all or some parts of the site may be transferred to the Council's Countryside Services Team where there are demonstrable operational benefits of doing so. The Council will, at the relevant time, explore opportunities of registering Biodiversity Net Gain credits and retailing those to establish a potential further income to contribute to the costs of ongoing maintenance.

10. WORK SCHEDULE

- 10.1.1 Table 10.1 outlines the times of year (in blue) and what year (in green) that the management and maintenance regimes identified in Chapter 7 and 8 may be undertaken for the first 5 years. After this time, it is anticipated that management requirements will be reviewed and rolled over with adjustments as needed, to satisfy the planning consent conditions of 25 years as well as the operational phase of development of up to 30 years, covering the expected lifetime of the solar farm.

Table 10.1: Annual Management and Maintenance Work for First 5 Years

It is anticipated that the management and maintenance prescriptions beyond the initial establishment period would be reviewed and rolled over, with adjustments as needed, at the end of the 5-year period for the following 30 years to satisfy both planning consent conditions of 25 years and operational phase of development of up to 30 years

Work Schedule	Month												Year				
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	1	2	3	4	5
Proposed Grassland																	
Sowing wildflower seeds (Year 1)																	
Regular cutting and vegetation maintenance (Year 1)																	
Main summer hay cut																	
Reseeding with additional native wildflower seeds to maintain diversity and replenish the meadow.																	
Additional localised mowing for weed control if needed for two / three years Frequency of mowing to be confirmed																	
Existing meadows																	

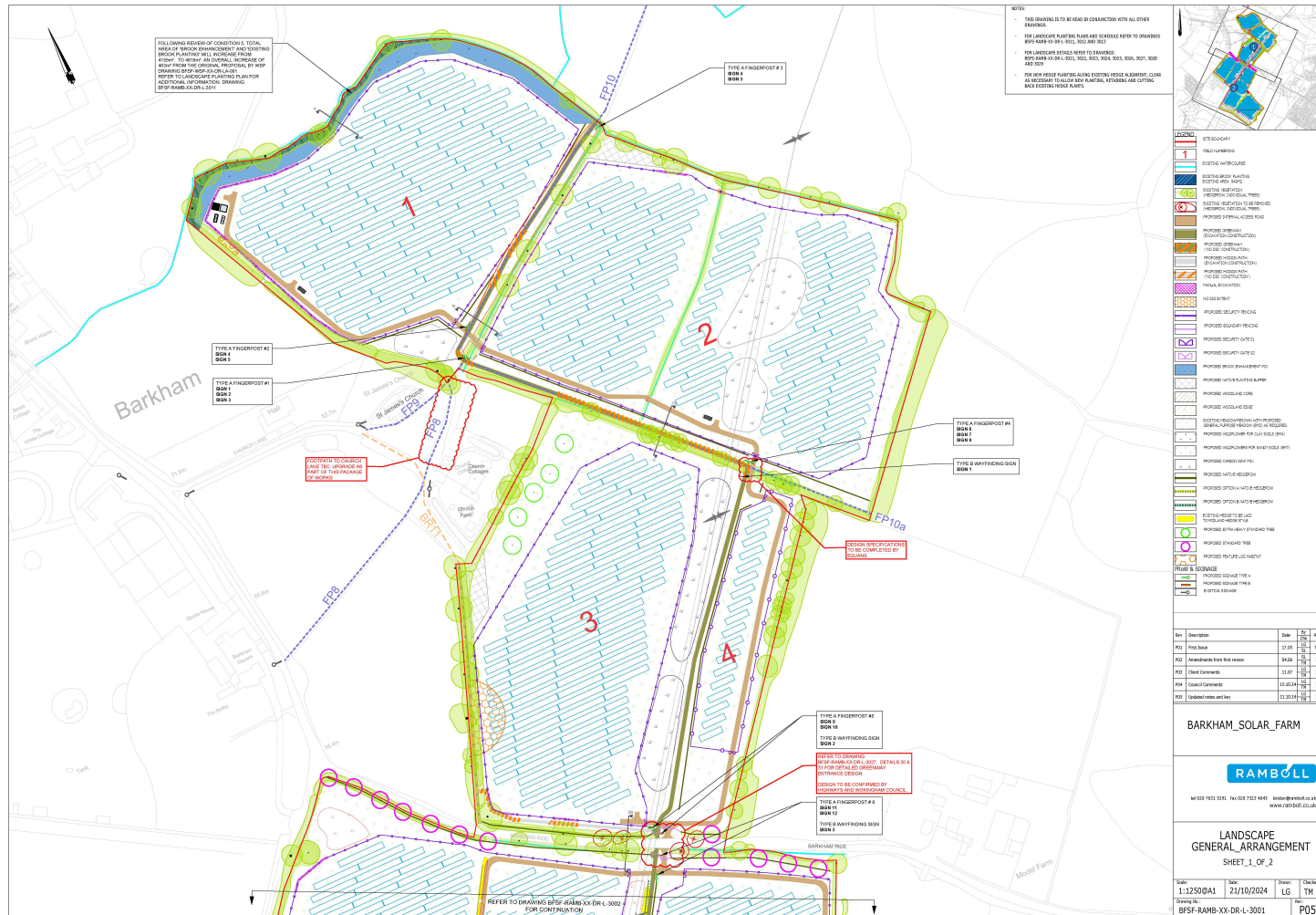
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Work Schedule	Month												Year				
	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	1	2	3	4	5
Proposed Scrub																	
Scrub planting during dormancy																	
Replanting of tree species which have failed to establish																	
Regular monitoring for pests and diseases, apply necessary control measures as soon as possible.																	
Mulch is to be topped up annually in spring and mid-summer if needed and inspections to determine if aeration of in compacted soils is required.																	
Weed control involving hand removal of weeds growing through mulch.																	
Bird box																	
Installation and maintenance																	
Bat Box																	
Bat box installation and maintenance																	
Invertebrate hibernacula																	

[illegible]

Figure 1: Proposed LEMP Map



Ramboll - Barkham Solar
Landscape AND Ecological MANAGEMENT PLAN



APPENDIX

• Landscape General Arrangement Plan (Sheet 1)	BFSF-RAMB-XX-DR-L-3001
• Landscape General Arrangement Plan (Sheet 2)	BFSF-RAMB-XX-DR-L-3002
• Planting Plan (Sheet 1)	BFSF-RAMB-XX-DR-L-3011
• Planting Plan (Sheet 2)	BFSF-RAMB-XX-DR-L-3012
• Planting Schedule	BFSF-RAMB-XX-SH-L-3013
• Landscape Detail (Sheet 1)	BFSF-RAMB-XX-DR-L-3021
• Landscape Detail (Sheet 2)	BFSF-RAMB-XX-DR-L-3022
• Landscape Detail (Sheet 3)	BFSF-RAMB-XX-DR-L-3023
• Landscape Detail (Sheet 4)	BFSF-RAMB-XX-DR-L-3024
• Landscape Detail (Sheet 5)	BFSF-RAMB-XX-DR-L-3025
• Landscape Detail (Sheet 6)	BFSF-RAMB-XX-DR-L-3026
• Landscape Detail (Sheet 7)	BFSF-RAMB-XX-DR-L-3027
• Landscape Detail (Sheet 8)	BFSF-RAMB-XX-DR-L-3028
• Landscape Detail (Sheet 9)	BFSF-RAMB-XX-DR-L-3029