

# WEST SPRINGFIELD SOLAR & BESS

## Biodiversity Enhancement Report



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Springfield Solar &  
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Biodiversity  
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REPORT

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## Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	Purpose and Scope of this Report .....	1
1.2	The Proposed Development .....	1
1.3	Legal Context for Biodiversity Enhancement .....	1
<b>2</b>	<b>METHODOLOGY .....</b>	<b>4</b>
2.1	Field Survey .....	4
2.2	Condition Assessment .....	4
2.3	Habitat Enhancement Calculations .....	4
<b>3</b>	<b>CURRENT BASELINE.....</b>	<b>5</b>
3.2	Cropland – Cereal crops .....	5
3.3	Grassland – Other neutral grassland .....	5
3.4	Grassland – Modified grassland.....	6
3.5	Wetland – Purple moor grass and rush pastures.....	6
3.6	Wetland – Reedbeds.....	6
3.7	Heathland and shrub – Gorse scrub .....	6
3.8	Woodland and forest – Other woodland; mixed.....	6
3.9	Woodland – Other woodland; broadleaved.....	7
3.10	Urban - Artificial unvegetated unsealed surface .....	7
3.11	Native hedgerow .....	7
3.12	Watercourses .....	7
<b>4</b>	<b>BIODIVERSITY ENHANCEMENT .....</b>	<b>8</b>
4.1	Habitat Loss and Retention.....	8
4.2	Habitat Creation .....	8
4.3	Existing Habitat Enhancement.....	10
	<b>CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>11</b>
<b>5</b>	<b>REFERENCES .....</b>	<b>12</b>

## Tables

Table 1: Baseline Habitat Type, Area and Condition .....	5
Table 2: Habitat Loss and Retention under Proposed Development .....	8

## Appendices

Appendix A Landscape Mitigation Plan (LMP)

# 1 INTRODUCTION

## 1.1 Purpose and Scope of this Report

- 1.1.1 RPS Consulting Ltd UK ('RPS') was commissioned by TRIO West Springfield Solar LLP to produce a Biodiversity Enhancement Plan for the proposed West Springfield Solar Farm ('the Proposed Development').
- 1.1.2 The Biodiversity Enhancement Report aims to:
- quantify and assess baseline ecological status and condition of current habitats identified at the Proposed Development site; and
  - provide recommendations of habitat enhancements designed to achieve significant biodiversity enhancements.

## 1.2 The Proposed Development

- 1.2.1 The Proposed Development (also referred to as the 'Site') lies between the settlements of Springfield (located approximately 0.4km east), and Ladybank (located approximately 2.1km southwest), and is 1.2km south of the hamlet of Bow of Fife. The land under consideration comprises c.103ha of agricultural farmland within the Rankeilour Estate.
- 1.2.2 The Proposed Development will consist of the following permanent elements:
- solar photovoltaic (PV) panels,
  - 24 battery units housed in containers;
  - inverters;
  - transformers;
  - high voltage (HV) switch gear and control equipment;
  - cabling and interconnectors;
  - onsite substations and control building;
  - one communications container; and two spares containers;
  - site access and onsite tracks of 4m width;
  - security fencing (2.4 m in height) and CCTV;
  - a replacement bridge over Rankeilour Burn; and
  - temporary construction compound and two welfare containers.
- 1.2.3 A temporary construction compound will be required that will include a lay down area and parking area, formed of approximately 1ha of formed hardcore and/or aggregate. The temporary construction compound will be situated near the Site entrance of the BESS area. Following construction, all hardcore will be removed and the land will be reinstated.
- ## 1.3 Legal Context for Biodiversity Enhancement
- 1.3.1 The Fourth National Planning Policy (NPF4) was adopted in February 2023 (Scottish Government, 2023a). This framework sets out the Scottish Government's long-term vision for land use and development in Scotland, guiding spatial planning and addressing key issues such as climate

change, biodiversity, and sustainable development. Under NPF4, specifically Policies 3 and 6, biodiversity enhancement and protection and expansion of forests, woodland and trees, are addressed.

- 1.3.2 Policy 3 highlights the need to protect and enhance Scotland's natural environment, including habitats that are under threat. In particular, Policy 3(b) states that *“development proposals for national or major development...will only be supported where it can be demonstrated that the proposal will conserve, restore and enhance biodiversity, including nature networks so they are in a demonstrable better state than without intervention.”*
- 1.3.3 To be in line with Policy 3(b), proposals must demonstrate that they have met all of the following criteria:
- 1) The proposal is based on an understanding of the existing characteristics of the Site and its local, regional and national ecological context prior to development, including the presence of any irreplaceable habitats.
  - 2) Wherever feasible, nature-based solutions have been integrated and made best use of.
  - 3) An assessment of potential negative effects which should be fully mitigated in line with the mitigation hierarchy prior to identifying enhancements.
  - 4) Significant biodiversity enhancements are provided, in addition to any proposed mitigation. This should include nature networks, linking to and strengthening habitat connectivity within and beyond the development, secured within a reasonable timescale and with reasonable certainty. Management arrangements for their long-term retention and monitoring should be included, wherever appropriate.
  - 5) Local community benefits of the biodiversity and/or nature networks have been considered.
- 1.3.4 Criteria 1 and 3 are addressed in detail in Chapter 6 – Ecological Impact Assessment (SLR, 2025) and the Shadow Habitats Regulations Appraisal (RPS, 2025) for the Proposed Development, and Criterion 2 was considered in the design of the Proposed Development.
- 1.3.5 This report addresses Criteria 4 and 5 of Policy 3(b), which specifically relates to biodiversity enhancement and strengthening nature networks.
- 1.3.6 Policy 6(a) highlights the need for developments to enhance woodland and tree cover to avoid habitat fragmentation and improve ecological connectivity and helping to support and expand nature networks through expansion of woodland.

## 1.3.2 Delivering Biodiversity Enhancement

- 1.3.1 At present, there is no threshold for what is considered significant biodiversity enhancements (apart from developments on peatlands; NatureScot, 2023c) nor is there prescribed methodology for measuring biodiversity loss or gain in Scotland (such as use of a metric, as required in England).
- 1.3.2 NatureScot (2024) advise that:
- development proposals should clearly set out the type and scale of enhancement they will deliver, ensuring that applications clearly distinguish between those elements mitigating or compensating for adverse effects and those delivering enhancement.
  - developers should prioritise on-site enhancement before off-site delivery.
  - applications should demonstrate that the enhancement is to be secured within a reasonable timescale and with reasonable certainty, including appropriate management and monitoring arrangements, and sustained for the future (preferably in perpetuity) in order to deliver a lasting legacy.

## REPORT

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- enhancement should consider biodiversity (including birds and other protected species), not just the significant effects that are the focus of EIA.



## 2 METHODOLOGY

### 2.1 Field Survey

- 2.1.1 Habitats within the Site boundary at West Springfield were mapped using UKHab classification (UK Hab, 2023).
- 2.1.2 All areas within the Site were assessed for the habitats, and floral species were recorded using the DAFOR scale (Dominant, Abundant, Frequent, Occasional and Rare). Botanical nomenclature in this report follows that of Stace (2010).

### 2.2 Condition Assessment

- 2.2.1 Policy 3(b) of NPF4 states that best practice assessment methodology should be used to demonstrate that biodiversity enhancements are being delivered. NPF4 does not specify which assessment methodology should be undertaken, and in its Draft Planning Guidance for Biodiversity, the Scottish Government asserts that it is at the discretion of the applicant to determine what type of assessment methodology is appropriate to demonstrate that significant biodiversity enhancements are being delivered (Scottish Government, 2023b).
- 2.2.2 The Statutory Biodiversity Metric is used for quantifying biodiversity enhancement in England and to accomplish this, all habitats are mapped and many are also assigned a condition score which is a measure of the observed habitat against an ecological optimum state (Department for Environment, Food and Rural Affairs, 2024). Assigning condition is a way to account for variability in the quality of different areas of the same habitat type. Not all habitat types are assigned a condition by the SBM. For example, croplands, some habitats grouped under the broad grassland habitat type and some habitats grouped under the heathland and scrub habitat type, are not assigned a condition. The habitats that are not assigned a condition are those generally considered to be of lower ecological value.
- 2.2.3 Habitat condition assessments for terrestrial habitats and linear features (e.g., hedgerows) were undertaken according to standard methodology for the SBM (UK Government, 2024). For each habitat that receives condition assessment, the appropriate Condition Sheet was identified within the Statutory Biodiversity Assessment Condition Assessment spreadsheet, which was then used to assess individual habitats by comparing how they scored against condition assessment criteria.
- 2.2.4 Where applicable, each habitat was assigned one of the following condition scores:
- 1 – Poor;
  - 2 – Moderate; and
  - 3 – Good.

### 2.3 Habitat Enhancement Calculations

- 2.3.1 The total area of habitat lost was calculated using the Proposed Development footprint. A conservative approach has been adopted, and it has been assumed that the entire area under the solar arrays will be lost.

### 3 CURRENT BASELINE

- 3.1.1 The habitats on Site were predominantly comprised of arable cropland which has low ecological value. There are scattered areas of neutral grassland, located in field margins and there is an area of modified grassland in the west of the Site.
- 3.1.2 Rankeilour Burn runs through the centre of the Site, with broadleaved woodland habitat bordering it, providing an ecological corridor through the Site, connecting the woodland in the north and south.
- 3.1.3 Table 1 details the baseline habitats, their total area within the Site and their condition as per the SBM guidance.

**Table 1: Baseline Habitat Type, Area and Condition**

UKHab Type	Area (ha)/ Length (km)	Condition
c1c7 Other cereal crops	91.5	N/A
g3c Other neutral grassland	3.36	Moderate
g4 Modified grassland	1.78	Poor
f2b Purple-moor grass and rush pastures	0.13	Moderate
f2e Reedbeds	1.11	Poor
h3e Gorse scrub	0.10	Good
w1h Other woodland mixed	0.56	Poor
w1g Other broadleaved woodland	1.21	Moderate
u1c Artificial unvegetated unsealed surface	0.29	N/A
h2a Native hedgerow	0.028	Poor
r2a River (priority habitat)/r1g other standing water	0.72	N/A
<b>Total (area habitats only, ha)</b>	<b>100.04</b>	<b>-</b>

#### 3.2 Cropland – Cereal crops

- 3.2.1 The Site consisted predominantly of arable fields, the majority of which had been recently ploughed and consisted of bare ground. There were very few species present here. In some areas of the Site, crop had been planted in the fields.
- 3.2.2 This habitat is of low ecological value and a condition assessment is not required.

#### 3.3 Grassland – Other neutral grassland

- 3.3.1 This habitat was scattered throughout the Site, predominantly in between fields or on fields that had been previously managed but had been left and recolonised with neutral grassland species. The majority of areas of this habitat were dominated by Yorkshire fog *Holcus lanatus*, cocksfoot grass *Dactylis glomerata* and wavy hair grass *Deschampsia flexuosa*.
- 3.3.2 An area of this habitat was also present in the centre of the Site along Rankeilour Burn on previously disturbed ground which was potentially used as a small sand quarry. The habitat was dominated by oil seed rape *Brassica napus* sp. which had likely escaped from the nearby arable fields. A dirt track was present through the centre of this habitat. Other species indicative of disturbed ground included yarrow *Achillea millefolium*, dandelion *Taraxacum* sp., chickweed *Stellaria media*, broad-leaved dock *Rumex obtusifolius* and birds foot trefoil *Lotus corniculatus*.
- 3.3.3 Another area of this habitat type was present in the eastern area of the Site adjacent to woodland and arable fields (NO 33516 11704). This area was species poor and dominated by Yorkshire fog with scattered common dock and ribwort plantain. Numerous vehicle tracks were evident across this area in aerial imagery and the land appeared to be highly disturbed during the field survey.



- 3.3.4 Collectively across the Site, this habitat was assessed as of moderate condition due to its moderate diversity of plant species, lack of bare ground cover and absence of bracken or INNS.

### 3.4 Grassland – Modified grassland

- 3.4.1 An area of modified grassland was present in the south-west corner of the Site. The grassland was species poor and was dominated by Yorkshire fog and wavy hair grass with some scattered rush. The grassland had previously undergone heavy grazing and mowing regimes.
- 3.4.2 This habitat was assessed as of poor condition due to the lack of variation in sward height and low diversity of plant species.

### 3.5 Wetland – Purple moor grass and rush pastures

- 3.5.1 An area of rush pasture was present bordering Rankeilour Burn that runs through the centre of the Site. The habitat was dominated by sharp flowered rush *Juncus aquitflorus*. Other species present included hogweed *Heracleum sphondylium*, tufted hair grass *Deschampsia cespitosa*, cleavers *Galium aparine*, meadowsweet *Filipendula ulmaria*, lesser celandine *Ficaria verna*, marsh thistle *Cirsium palustre* and soft rush *Juncus effusus*.
- 3.5.2 This habitat was assessed as of moderate condition due to the absence of bare ground cover, scrub or trees and INNS. However, the water table was not near the surface and the water supply was likely of poor to moderate quality due to management and activities in the area.

### 3.6 Wetland – Reedbeds

- 3.6.1 An area of reedbed was present in the south-west corner of the Site. The habitat bordered a small stream making it waterlogged and dominated by common reed *Phragmites australis*. Other species present included sharp-flowered rush, broad-leaved dock and meadowsweet.
- 3.6.2 This habitat was assessed as of poor condition due to the presence of bare ground and the water table was not at the surface. Furthermore, there were no areas of open water and the reedbed was dominated by reeds.

### 3.7 Heathland and shrub – Gorse scrub

- 3.7.1 This habitat was present in the centre of the Site in the area of disused sand quarry. The habitat was dominated by gorse *Ulex europaeus*. The gorse was scattered with distinct edges and glades in between gorse bushes. Other species present were similar to the grassland surrounding this habitat.
- 3.7.2 This habitat was assessed as of good condition due to its well-developed edge, the presence of clearings and glades and the absence of INNS.

### 3.8 Woodland and forest – Other woodland; mixed

- 3.8.1 An area of this habitats, predominantly comprising of Scot's pine *Pinus sylvestris* was present in the centre of the Site. Some beech and oak trees were also present. The woodland was surrounded by a broken fence and looked to have previously been used as a pheasant enclosure. As such, the ground flora was scarce and included species such as, wavy hair grass, rose-bay willowherb *Chamaenerion angustifolium*, bittercress *Cardamine sp.*, chickweed, Yorkshire fog, and patches of gorse scrub around the edges. The majority of trees were mature, however, there was a substantial amount of windblow within the area. The habitat lacked story structures.

- 3.8.2 This habitat was assessed as being of poor condition, predominantly due to a lack of diversity in age of trees, a lack of ground flora and evidence of management.

### 3.9 Woodland – Other woodland; broadleaved

- 3.9.1 This habitat was present bordering Rankeilour Burn in the centre of the Site. The habitat was dominated by ash *Fraxinus excelsior*, alder *Alnus glutinosa* and willow *Salix sp.*. Other tree and scrub species present included wych elm *Ulmus glabra*, dog rose *Rose canina*, cherry *Prunus avium*, and hawthorn *Crataegus monogyna*.
- 3.9.2 An area of this habitat was also present within the Site as a birch plantation. Species present in the ground story included bracken *Pteridium aquilinum*, cocks foot, yorkshire fog, dandelion *sp.* *Taraxacum sp.*, clevers, and bramble *Rubus fruticosus*.
- 3.9.3 This habitat was assessed as being of moderate condition due to the lack in diversity in age of trees, lack of ground flora and lack of vertical structure. However, there were no invasive non-native species, and there was a significant amount of deadwood present.

### 3.10 Urban - Artificial unvegetated unsealed surface

- 3.10.1 One stretch of gravel track was present within the Site leading to Peterhead Farm. The track is completely urban and has no ecological value. As such, no condition assessment is required.

### 3.11 Native hedgerow

- 3.11.1 Several hedgerows were present throughout the Site, bordering arable fields. The majority of the hedgerows were comprised of hawthorn *Crataegus monogyna*. Several of the hedgerows had trees present within them including horse chestnut *Aesculus hippocastanum*, oak *Quercus sp.*, holly *Ilex aquifolium* and silver birch *Betula pendula*.
- 3.11.2 The hedgerows were assessed as of poor condition due to intensive management including strimming and likely some grazing, gaps within the hedgerows and disturbed ground bordering the hedgerow.

### 3.12 Watercourses

- 3.12.1 Rankeilour Burn was present through the centre of the Site. The burn is between 1-4m wide and has fairly fast flowing water, apart from upstream of the weir and sluice, where flow is slow for several hundred metres. It is predominantly bordered by woodland of mixed broadleaved and conifer.
- 3.12.2 Agricultural ditches were present within the Site bordering fields. The ditches had little to no water in them and were often under 1m in width.
- 3.12.3 A condition assessment was not undertaken for Rankeilour Burn or the ditches on Site.

## 4 BIODIVERSITY ENHANCEMENT

### 4.1 Habitat Loss and Retention

- 4.1.1 Under the Proposed Development, the land use of majority of the Site will be converted from arable cropland to fields hosting solar panels. This will result in a loss of 57.02 ha of habitat (Table 2), which assumes that all of the land beneath the panels will be lost. Solar PV panels will be situated in a small area of other neutral grassland in the eastern area of the Site, which will result in a loss of 0.24ha beneath the solar PV panels (Table 2). However the fields hosting solar PV panels will all be planted with a species-rich grassland mix and it is likely that if left undisturbed, shade tolerant species will grow beneath the solar array, which will provide additional enhancement not captured in Table 2.
- 4.1.2 Habitats that were identified as potential GWDTE (f2b, f2e, Table 2) or that are hydrologically connected will not be lost during the Proposed Development.
- 4.1.3 There will be no loss of woodland habitat as part of the Proposed Development.
- 4.1.4 There will be no loss of hedgerow habitats as part of the Proposed Development.

**Table 2: Habitat Loss and Retention under Proposed Development**

UKHab Type	Area Lost (ha)	Area Retained (ha)	Area Enhanced (ha)	Total Area (ha)
c1c7 Other cereal crops	56.00	-	35.50	91.5
g3c Other neutral grassland	0.24	2.85	0.27	3.36
g4 modified grassland	0.78	1.0	-	1.78
f2b Purple-moor grass and rush pastures	-	0.13	-	0.13
f2e Reedbeds	-	1.11	-	1.11
h3e Gorse scrub	-	0.10	-	0.1
w1h Other woodland mixed	-	0.56	-	0.56
w1g Other broadleaved woodland	-	1.21	-	1.21
u1c artificial unvegetated unsealed surface	-	0.29	-	0.29
<b>Total</b>	<b>57.02</b>	<b>7.52</b>	<b>35.50</b>	<b>100.04</b>

### 4.2 Habitat Creation

#### Species-rich grassland/grazing mix

- 4.2.1 71.63 ha of species-rich grassland will be planted under and between the solar panels. The majority of the planting mix is dominated by grass species such as crested dogstail *Cynosurus cristatus*, red fescue *Festuca rubra*, and smooth-stalked meadow grass *Poa pratensis*. The planting mix is diverse and includes several indicator species of lowland meadow including meadowsweet, agrimony *Agrimonia eupatoria*, betony *Betonica officinalis*, lady's bedstraw *Galium verum*, rough hawkbit *Leontodon hispidus*, ox-eye daisy *Leucantemum vulgare*, birds foot trefoil *Lotus corniculatus*, salad burnet *Poterium sanguisorba*, cowslip *Primula veris*, yellow rattle *Rhinanthus minor*, and pepper saxifrage *Salium silaus*.
- 4.2.2 The species-rich grassland is expected to provide habitat for invertebrates which is an improvement over the existing arable fields. The invertebrate prey will provide enhanced foraging opportunities for farmland birds and bats as well as enhanced foraging and commuting opportunities for badger between the solar arrays. The grassland is also expected to provide

additional habitat for small mammals, which provides an additional prey resource for owls or other raptors using the Site.

- 4.2.3 It is proposed that sheep will be grazed on this grassland. A conservation grazing plan should be produced which will outline the measures to maximise biodiversity value. Measures include recommendations on stock density, grazing rotation and regime and the nature of non-grazing management of the grassland.

### Species-rich meadow grassland

- 4.2.4 7.96 ha of species-rich meadow grassland will be created in the fields in the east of the Site to provide biodiversity enhancement. This habitat will be predominantly comprised of grass species including perennial ryegrass *Lolium perenne*, creeping red fescue *Festuca rubra*, crested dogtail and meadow fescue *Lolium pratense*. Other species present within the planting mix include sainfoin *Ononbrychis vicifolia*, sheeps parsley *Petroselinum* and ribwort plantain *Plantago lanceolata*. The grassland will provide additional habitat for invertebrates and small mammals, which will in turn provide foraging opportunities for farmland birds, badger and raptors.
- 4.2.5 This grassland is not expected to be grazed by livestock which, combined with a management plan to promote biodiversity, will further enhance habitats for farmland birds (Copping, *et. al.*, 2024).

### Woodland and Scrub

- 4.2.6 0.36 ha of broadleaved woodland will be created along the eastern boundary of the Site, bordering the grassland habitat. The woodland canopy will be comprised of field maple *Acer campestre*, beech *Fagus sylvatica*, aspen *Populus tremula*, cherry *Prunus avium* and oak *Quercus robur*. The ground floor will be dominated by scrub species such as hawthorn *Crataegus monogyna*, hazel *Corylus avellana*, Holly *Ilex aquifolium*, wild privet *Ligustrum vulgare*, blackthorn *Prunus spinosa*, goat willow *Salix caprea* and Guelder rose *Viburnum opulus*.
- 4.2.7 0.37 ha of mixed scrub habitat will be created along the eastern boundary of the Site, between the grassland and woodland to naturalise the edge of the woodland planting. This habitat will be predominantly comprised of hawthorn, blackthorn and guelder rose. Other species present will include hazel, holly, and elder *Sambucus nigra*.
- 4.2.8 The woodland and scrub habitat will provide new commuting corridors for bats to use when moving between woodland in the north and south of the Site, and to woodland in the surrounding area. It will also provide nesting and foraging opportunities for birds, in particular the hawthorn and holly trees provide valuable food sources for birds.

### Hedgerows and Lines of Trees

- 4.2.9 1.76 km of native hedgerows, maintained to a minimum 3m height, will be planted as part of the Proposed Development. Species to be planted will include field maple, cherry, oak, hawthorn, hazel, blackthorn, holly, elder, and crab apple *Malus sylvestris*.
- 4.2.10 These hedgerows would provide areas of cover, suitable nesting sites and additional foraging opportunities, increasing the range of food sources available to farmland bird species on Site. The hedgerows and lines of trees will be maintained to a minimum 3m in height, in line with guidance for creation of hedgerows for bats (Reason and Wray, 2023), which will create new commuting paths and enhance existing paths (where existing hedgerows are filled in) for bats to use when moving within the Site.

- 4.2.11 92 trees are proposed to be planted creating several lines of trees around the Site. Species to be planted include field maple, alder, birch *Betula sylvatica*, aspen, cherry, walnut *Juglans regia*, oak and rowan *Sorbus aucuparia*.

### 4.3 Existing Habitat Enhancement

- 4.3.1 1.49 km of hedgerow in the west of the Site bordering the track to Peterhead Farm will be enhancement to create an improved commuting corridor for bats potentially roosting in Peterhead Farm. Additional native species will be planted, and there will be reduced strimming of the hedge, to allow it to grow taller and wider. The hedgerow will be trimmed to a height of 3.5m.
- 4.3.2 The boundaries of fields with solar panels will be left to create rough grassland edges with taller sward. This will increase insect prey for bats and badger. It will also benefit ground nesting birds such a skylark by providing suitable nesting habitat as well as invertebrate prey for their chicks. It will also increase habitat for small mammal prey for raptors, in particular barn owl. The vegetation will be maintained at no more than 50cm in height as this is the optimum vegetation height for skylark.

## CONCLUSIONS AND RECOMMENDATIONS

- 4.3.3 The Proposed Development will result primarily in the loss of arable fields which provide limited ecological value. The proposed grassland, woodland, scrub and hedgerow creation and enhancement will deliver the biodiversity enhancements summarised below:
- Species rich grassland will be created under and between the solar panels, which will enhance the habitat currently present, increasing invertebrate diversity and providing foraging opportunities for bats, badger and birds.
  - Grassland created in the fields in the east of the Site will enhance the current arable habitat present and will provide additional habitat for invertebrates and small mammals, which will in turn provide foraging opportunities for farmland birds, badger and raptors.
  - Woodland and scrub habitat created along the eastern boundary of the Site and the lines of trees and hedgerows will create additional commuting corridors for bats and will provide additional nesting and foraging opportunities for farmland birds.
  - Hedgerows currently on Site will be enhanced with additional native species planting and reduced trimming creating an enhanced commuting corridor for bats potentially roosting in Peterhead Farm.
  - The field boundaries will be left to create tall grassland which will be maintained at 50cm to promote invertebrate prey diversity for bats and increase habitat for small mammal prey for raptor, in particular barn owl.
- 4.3.4 A detailed management plan should be developed which outlines the planting and maintenance regime to maximise biodiversity benefits at the Site. It is the intention to graze sheep within the Site when it is in operation. A conservation grazing plan should be produced which will outline the measures to maximise biodiversity value. Measures may include recommendations on stock density, grazing rotation and regime and the nature non-grazing management of the grassland.
- 4.3.5 The detailed management plan should be developed following best practice guidance. Examples of guidance documents that may be used include:
- Best Practice Guidance. Grassland and Wild Flower Management on Solar Farms (Everatt *et al.*, 2024);
  - Realising the Biodiversity Potential of Solar Farms (Parker and Monkhouse, 2022);
  - Natural Capital Best Practice Guidance. Increasing Biodiversity at all Stages of a Solar Farm's Lifecycle (Solar Energy UK, 2022).



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# APPENDICES

**Appendix A**

**Landscape Plan**