# Decoy Farm Solar Farm
## BIODIVERSITY MANAGEMENT PLAN

**Decoy Farm**
**Spalding Road**
**Crowland**
**Peterborough**
**PE6 0LX**

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# 1. Introduction

The following Biodiversity and Habitat Management Plan will detail how the proposed development at Decoy Farm Solar Farm will enhance and protect habitats and species on site. It will include detailed habitat management with the aim of maintaining and enhancing wildlife habitats to provide a biodiversity gain for locally occurring species.

## 1.1. Site location

The site is located to the north east of the village of Crowland, approximately 12km north east of Peterborough in Lincolnshire. The development will occupy three fields totalling approximately 24.5ha bordering the farm to the south and west. Pre-development, the three fields are under arable management and are bounded by arable land to the north, south and west and horse-grazed meadows on the south eastern boundary of the development. The approximate central grid reference of the site is TF 256 127.

An area of woodland occurs within the development boundary and includes approximately 2ha of plantation on the western boundary of the site between two of the development fields. Wet ditches bound each of the arable fields, with the exception of the southern arable field bounded only two thirds of the way along its length on the northern boundary. All of the ditches contained flowing water and were dominated by common reed *(Phragmites australis*).

## 1.2. Ecological baseline

The arable land is considered to be of low ecological value. The site does however, offer nesting and foraging opportunities for arable bird species including snipe, grey partridge, skylark, corn bunting, lapwing and yellow wagtail.

Small areas of woodland are likely to be used by more common species of birds. The ditch habitat is also likely to support reed bunting.

The Ecological Assessment found no evidence of any protected plant or animal species. However, this survey was carried out in November when many animals and plants could not be observed and no information from the Lincolnshire Environmental Records Centre was provided to support the assessment.

The fields to the west have been both been used for windrow composting and then arable activity is resumed once this process is completed. The land is not subject to any existing management agreements.

## 1.3. Management principals

The purpose of this Biodiversity Monitoring and Management Plan is to set out the site management requirements to minimise the ecological impact during construction and operation of the solar farm. It also details enhancement measures and the management practices to be adopted to help develop and maintain those habitats for wildlife. The key objectives are:

1. Retain the area of woodland and manage to benefit wildlife.
2. New hedges and existing woodland should be buffered from development by a minimum of 12m grass buffer strip.

3. The area within the solar arrays will be sown with a wildflower mix. To ensure plant species longevity for the lifetime of the scheme seed should be of UK native local provenance. The seed mix should include plant species that are beneficial to bumblebees and other pollinating insects (detailed below).
4. Areas within and adjacent to the ditches should be managed to benefit locally occurring wildlife such as reed bunting and birds that may nest in the tussocky grass margins adjacent to them.
5. No fertiliser will be used within the development area.
6. No pesticides will be used on the site except for spot spraying of injurious weeds.
7. Perimeter fencing will allow species such as hares and grey partridge to access the field but will exclude access to predators, for example foxes, directly through the fencing. Foxes are significant predators of ground nesting species including birds such as grey partridge and hares. Any attempt to exclude foxes will help to increase the breeding success of ground nesting species that attempt to breed here.
8. Other species will be safeguarded during the construction period and are likely to benefit from the creation of new wildlife habitat.

## 2. Ecological implementation

The management practices that are proposed will maintain and enhance key habitats (e.g. grassland, ditches, hedgerows and young woodland) for the benefit of wildlife. The design and long-term management of the land seeks to maintain and improve its function through protecting and enhancing habitats on the farm.

### 2.1. Grassland creation within the PV solar arrays.

A significant enhancement measure will be the creation of species rich grassland within the 24.5ha of PV solar arrays. This should be targeted at pollinating insects to increase the available habitat for these important species which includes some species of bumblebees, solitary bees, hoverflies, butterflies, moths, beetles and flies.

- Sow the site using a mixture of grasses and UK native wildflowers of local provenance, specifically designed to provide a lengthy foraging season for pollinators, in particular bumblebees. It is recommended that a mix in line with Emorsgate Seeds meadow mix EM4 is used (www.wildseed.co.uk/mixtures/view/5) or Charles Flower Wildflowers Mix 2 (www.charlesflower-wildflowers.co.uk/seed_mix_2_ClayAcid_Meadow.html.
- The clear objectives of the site is to manage the flowering plants to provide the greatest benefit to pollinators and a wide range of invertebrates which in turn will benefit some birds present.

### Establishment and management

1. Prepare a good quality seed bed and make sure that any compaction following the installation of the solar panels is addressed.
2. Seed is best sown in the autumn or spring when the ground is warm and has moisture. The seed should be surface sown and firmed in with a roll to give good soil/seed contact.
3. In the first year allow annual plants such as yellow rattle to flower and set seed. Then graze in mid-summer so that the slower growing perennials have space to develop and annual weeds are kept in check.
4. Sheep grazing is considered to be the most practical and effective method of grassland management within the solar panels. Graze with sheep between October and April which will allow plants to flower, and set seed, and help to manage the sward to provide an optimum habitat for invertebrates.
5. Subsequent management should include grazing throughout the autumn and winter. However, this should be monitored annually by an ecologist as plant diversity may start to decline over time if grasses start to dominate. The management regime may need to be adjusted to include a summer grazing to avoid the loss of plant diversity.
6. A bumblebee survey should be carried out by a specialist in July/August to monitor bumblebee populations. This will also inform the success of the mitigation measures and any management changes that may be required.

## 2.2. Hedgerow planting

It is proposed to plant a native hedgerow along the southern boundary of the field to mitigate the visual impact from the south. In order to maintain the open landscape character of the area the planting needs to be sensitive, adjacent and linking to already existing landscape elements, i.e. the farmstead and woodland habitats. Native species of local provenance to be planted are shown in the following table.

| Species | Species |
|---|---|
| Hawthorn | *Crataegous monogyna* |
| Dogwood | *Cornus sanguineum* |
| Blackthorn | *Prunus spinosa* |
| Guelder rose | *Viburnum opulus* |
| Hazel | *Croylus avellana* |
| Goat willow | *Salix caprea* |
| Honeysuckle | *Lonicera periclymenum* |

Goat willow should be planted at either end of the hedgerow as this can then be allowed to grow into a big bushy shrub. This will provide a vital early nectar source for many early emerging pollinating insects.

Bare-root stock can be planted between the end of October and the end of March. Generally it's best to plant early in the season, before January, however, if planting into waterlogged soils it may be best to wait until the beginning of March as heavy frosts can cause frost heave and expose roots and there is a risk that roots will rot in poorly-draining soil if planted early.

Never plant during freezing weather or if the ground is waterlogged.

It is recommended that you buy plants grown from indigenous, preferably local, root stocks. Hedgerows planted in a double staggered row tend to be better for wildlife than single rows as they are wider and provide more shelter and habitat. As a guide, it is recommended that at least 40cm is left between each row and that 4-6 plants are planted per metre. Use biodegradable plant guards.

In the first twelve months the planting strip should be kept weed-free using approved herbicides. Light, regular, trimming of the hedgerow in its early 3-4 years will encourage dense, bushy growth and is recommended. After this period the hedgerow will be maintained on a two or three year cycle to approximate height 3m. A hedge cannot, however, be maintained at this height indefinitely as it is going through a natural ageing process. In the longer term the hedge should be allowed to slowly increase in height and then be coppiced to allow a thick dense hedge to regrow. The hedge should be assessed prior to the cessation of the solar park scheme to determine any further management recommendations.

Cutting will take place between January and February so that wildlife can take advantage of the berries and nuts produced in the autumn. This management of hedgerows should be effective in maintaining a dense hedgerow. However, where gaps appear in the hedge from dieback or other damage, they will be re-planted and subject to normal establishment management until they have filled the gap they are planted in.

## 2.3. Tree planting

Tree planting shall be undertaken in the horse-grazed paddock to the south east of the development site and to the north of the proposed surface water lagoon.

- All plants to be healthy, hardened-off and with good fibrous root systems and to comply with the requirements of BS3936 Specification for Nursery Stock.
- All planting to be undertaken in accordance with BS4428 Code of Practice for General Landscape Operations. All plants to be protected from wind exposure at all times.
- All plants to be soaked in water for several hours prior to planting and to be well watered in.
- No planting to be carried out during poor weather conditions, i.e. when ground is frozen, waterlogged, or during droughts, hot sunshine or persistent dry or cold winds.
- All plant material to receive enough water to ensure healthy establishment.
- Time of year for planting: November to March, inclusive.
- Watering and weed control: Provide as necessary. Planted areas are to be kept weed free to aid establishment.
- Trees shall be secured in position using round pressure impregnated round timber stakes (top diameter of 50-75 mm), secure tree firmly but not rigidly to stake. The stake shall be positioned off centre on the prevailing windward side of the tree as near to the tree as possible but shall not interfere with the free movement of the branches and shall cause no rubbing.

- Trees to be planted should include; silver birch (*betula pendula*), field maple (*acer campestre*), alder (*Alnus glutinosa*), sessile oak (*quercus petraea*) and hawthorn (*crataegus monogyna*)

## 2.4. Seed rich habitat

The development is proposed in an area important for a number of target farmland birds as described in section 1.2. Wild bird seed mixture should be sown around the installation where access dictates and should be managed on an annual basis. This provides vital food for farmland birds and small mammals.

This could include the following plants; fodder radish, mustard, reed millet, quinoa, white millet, triticale, barley and wheat. These can be autumn or spring sown. At least 4 of these species should be included.

## 2.5. Breeding birds

It is recommended that any ground work to the solar site and cable route, and associated vegetation removal required to facilitate the development or habitat enhancement, is completed before the end of February 2015. If works after 1st March is unavoidable then it should be preceded by a site survey by an experienced ecologist or ornithologist prior to any further work commencing.

Should any nesting birds be identified then a suitable buffer area will be created around the nest site to avoid disturbance until the young have fledged.

## 2.6. Mammals

Brown hare are likely to use the area set aside for development. It is recommended that when the perimeter fencing is erected that the larger mesh diameter is at the bottom and the smaller mesh diameter at the top. This will allow for the movement of these mammals in and out of the development area but help prevent easy access from larger predators such as foxes.

## 3. Management timetable

| Subject | Action required | Species concerned | Timing |
|---|---|---|---|
| Species rich grassland within solar arrays | Following panel installation sow the site using a mixture of grasses and UK native wildflowers of local provenance, specifically designed to provide a lengthy foraging season for pollinators, in particular bumblebees. | Pollinators | Spring/summer 2015 |
| Species rich grassland within solar arrays | Annual walkover survey to monitor wildflower establishment and management. Update site management if advised by ecologist. | Wildflowers | June/July |
| Species rich grassland within solar arrays | Annual walkover survey to monitor bumblebee populations. Update site management if advised by ecologist. | Bumblebees | July/August |
| Hedgerow planting | Plant a native hedge along the southern boundary of the development. | Pollinators and birds | Winter 2015/2016 |
| Hedgerow management | • Keep weed free in the first twelve months.<br>• Light regular incremental cutting in the first 3-4 years.<br>• Allow to grow to approximately 3m.<br>• Replant any gaps.<br>• Trim hedge every 2 or 3 years during January/February.<br>• Assess hedge prior to the cessation of the solar park development to inform future management. | | 2015/2016<br>2015 – 2019<br>Ongoing<br>2019 onwards<br>2038 |
| Tree planting | Plant native trees along western boundary of the horse-grazed paddock to the south east of the development site and to the north of the proposed surface water lagoon. | | Winter 2015 |
| Tree management | An initial management period will involve checks by the landscape contractor. This | | |

| | | | |
|---|---|---|---|
| | will include weed clearance, watering, checking stakes and ties. Any tree that is considered to be dead or dying of disease will be replaced during the following planting season. | | |

Every effort should be taken to keep habitats and features free of the significant plastic debris that arises from the composting business. Ditches, hedgerows and trees should be routinely cleared of this and disposed of responsibly. This management will enhance the habitats on and around the site and reduce the impact on local wildlife and water quality. It will also enhance the visual aspect of the farm.