

Biodiversity Management Plan

Millar Farm

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1 EXECUTIVE SUMMARY

1.1 Ecological objectives have been developed to enhance and maintain the biodiversity of the land at Millar Farm to compliment the proposed solar farm development. These include enhancing the existing species poor hedgerows to provide a plentiful source of food and shelter for a range of fauna species. Other enhancement measures include developing species rich grassland across the site, creating a herptile hibernaculum and assembling a log pile.

1.2 Action tasks have been set out within this document to enable the objectives to be met and gain maximum potential for the site to support wildlife.

1.3 A phase 1 habitat survey was conducted in February 2015 in order to assess the current state of the proposed development site. An ecological appraisal was then conducted to assess the local area and its ability to support a range of wildlife, as part of the full planning application.

The enhancements and mitigation measures set out in this document have been developed in accordance with the findings of the extended phase 1 habitat survey.

2 INTRODUCTION

1.4 Biodiversity is declining across the UK, however, recent agri-environment schemes indicate that through appropriate management of the land, biodiversity can significantly increase. Solar farm developments have the potential to support wildlife and increase biodiversity when located on agricultural land through appropriate management.

1.5 Due to the nature of solar farm developments, a large proportion of the site is accessible for plant growth and potential wildlife enhancements. Each solar farm development requires a Biodiversity Management Plan (BMP), the purpose of which is to identify objectives for biodiversity and the means in which these objectives will be achieved. This can include the protection of existing species and habitats and the establishment of new habitats, their maintenance and monitoring.

1.6 According to 'Biodiversity Guidance for Solar Developments' the BMP should:

- "*identify key elements of biodiversity on site, including legally protected species, species and habitats of high conservation value such as those listed on Section 41 of NERC Act 2006, and designated areas in close proximity to the proposed site;*
- *identify any potential impacts arising from the site's development, and outline mitigations to address these;*

- *detail specific objectives for the site to benefit key elements of biodiversity and the habitat enhancements that are planned to achieve these;*
- *contribute to biodiversity in the wider landscape and local ecological network by improving connectivity between existing habitats;*
- *identify species for planting and suitable sources for seed and plants;*
- *consider wider enhancements such as nesting and roosting boxes;*
- *summarise a management regime for habitats for the entire life of the site;*
- *provide a plan for monitoring the site; and adapting management as appropriate to the findings of this monitoring; and,*
- *set out how the site will be decommissioned.*[1]"

1.7 The BMP has also been informed by the Phase 1 habitat survey conducted in February 2015.

OBJECTIVE OF THE BIODIVERSITY MANAGEMENT PLAN

2.1 The objective of this BMP is to minimise any potential negative impacts, arising from the development, while increasing the habitat diversity. The enhancement of the land within the development boundary will increase the sites capability of supporting wildlife, through generation of renewable energy.

SITE DESCRIPTION

2.2 The proposed solar farm development site on land at Millar Farm consists of approximately 17.79 hectares of agricultural land which is currently utilised for livestock grazing. Each of the fields within the development are bound by hedgerow and treelines. The land adjacent to the development site offers similar habitat, along with hedgerows, and scattered pockets of woodland.

[1] BRE (2014) Biodiversity Guidance for Solar Developments. Eds G E Parker and L Greene.

3 CURRENT CONSERVATION & BIODIVERSITY

LOCAL CONSERVATION

3.1 The proposed development site at Millar Farm does not lie within or adjacent to any statutory or non-statutory designated environmental sites. Within 5km of the development boundary at Millar Farm there is: one Special Area of Conservation (SAC), one RAMSAR site, one Special Protection Area (SPA), two Areas of Special Scientific Interest (ASSIs) and three National Nature Reserves (NNRs).

3.2 The closest designated site to the proposed development is Shanes Castle ASSI, which lies approximately 1.4km from the proposed development boundary, this site is of special scientific interest for its parkland habitat and associated species. Shanes Castle provides important roosting sites and feeding habitat for Daubenton's and Nathusius' pipistrelle as well as a number of other bat species including Leisler's, common pipistrelle and soprano pipistrelle.

3.3 Loch Neagh and Lough Beg RAMSAR/SPA/ASSI lies approximately 1.5km from the development boundary. The site qualifies as a RAMSAR site and SPA for a number of biological features including important assemblages of breeding birds and wintering wildfowl. These species include tundra swan *Cygnus columbianus bewickii,* whooper swan *Cygnus Cygnus and* common tern *Sterna hirundo.*

3.4 The remaining features are all of ornithological interest, mainly wildfowl species including whooper swan and tundra swan. These species can have a core foraging area of up to 5km. As Millar Farm lies approximately 1.5km from the boundary of the RAMSAR/SPA, it is possible that the proposed development could potentially fall within the foraging areas of these species. However, the data search did not return any records of these species within 2km of the proposed development boundary.

3.5 Rea`s Wood and Farr`s Bay qualifies as a SAC for its Alluvial forests with alder *Alnus glutinosa* and ash *Fraxinus excelsior*.

3.6 Rea's Wood Forest NNR supports several rare invertebrate species. The remaining two NNRs including: Randalstown Forest and Farrs Bay and Lough Neagh Islands are of interest for their habitats which support a range of breeding and wintering bird species.

4 HABITATS & SPECIES PRESENT

4.1 The site is currently grazing pasture, comprised of several fields bound to all sides by hedgerow and treelines. A phase 1 habitat survey was completed as part of the ecological appraisal in February 2015, which highlighted the presence of the following habitat types:

- Improved grassland B4,
- Species-rich intact hedgerow J2.1.1,
- Species-poor intact hedgerow J2,1,2,
- Broad-leaved woodland A1.1,
- Marshy grassland B5,
- Farm house and associated agricultural buildings J3.6,
- Railway line and motorway J5.

RECORDED SPECIES

4.2 A list of flora species present onsite was compiled as part of the extended phase 1 habitat survey which was carried out on the 14th of February, 2015. The list of species can be found in Table 4-1 below. The proposed development area is currently grazed grassland with few flora species present, with most flora species recorded around the site boundary.

4.3 Although the survey was undertaken in winter, and a number of flora species may not have been present, given the habitats on site it is considered that a sufficient species list was recorded to adequately classify these habitats. Therefore the timing of the survey is not considered to be a significant constraint.

TABLE 4-1: FLORA SPECIES PRESENT WITHIN THE STUDY AREA AT MILLAR FARM

COMMON NAME	SCIENTIFIC NAME
Hawthorn	*Crataegus monogyna*
Holly	*Ilex aquifolium*
White alder	*Alnus glutinosa*
Ash	*Fraxinus excelsior*

Scot's pine	*Pinus sylvestris*
Willow species	*Salix spp.*
Ivy	*Hedera helix*
Bramble	*Rubus fruticosus*
Gorse	*Ulex europaeus*
Hard fern	*Blechnum spicant*
Cuckoo flower	*Cardamine pratensis*
Mouse-eared chickweed	*Cerastium fontanum*
Marsh thistle	*Cirsium palustre*
Spear thistle	*Cirsium vulgare*
Herb-robert	*Geranium robertianum*
Broad-leaved dock	*Rumex obtusifolius*
Creeping buttercup	*Ranunculus repens*
Primrose	*Primula vulgaris*
White Clover	*Trifolium repens*
Common rush	*Juncus effusus*
Yorkshire Fog	*Holcus lanatus*
Perennial Ryegrass	*Lolium perenne*

FAUNA

4.4 A data search conducted through the Centre for Environmental Data and Recording (CEDaR) returned records of protected / notable species within 2km of the proposed solar farm boundary. Species records identified through the data search include: tree sparrow *Passer montanus*, irish hare *Lepus timidus*, irish stoat *Mustela erminea hibernica* and hedgehog *Erinaceus europaeus*.

4.5 During the site walk-over a number of species were observed, along with evidence of the presence of others. These species include fox *Vulpes vulpes*, rabbit *Oryctolagus cuniculus*, Irish hare *Lepus timidus*, great tit *Parus major*, wren *Troglodytes troglodytes*, jackdaw *Corvus monedula*, blue tit *Cyanistes caeruleus*, robin *Erithacus rubecula*, blackbird *Turdus merula*,

chaffinch *Fringilla coelebs*, woodpigeon *Columba palumbus*, rook *Corvus frugilegus*, magpie *Pica pica*, pheasant *Phasianus colchicus* and bullfinch *Pyrrhula pyrrhula*.

4.6 Irish hare and all bat species are priority species within the Antrim Borough Biodiversity Action Plan. Priority habitats within this LBAP include species rich hedgerows.

4.7 These species of note, along with herptiles, badger and farmland birds are all considered during management of the site as the development of the solar farm has potential to support a variety of local wildlife.

5 POTENTIAL IMPACTS

5.1 Potential impacts which could arise from the development of a solar farm include:

- Potential habitat loss and fragmentation;
- Disturbance during construction and decommissioning; and
- Compaction of soil and other impermeable surfaces which could lead to increased surface run-off and soil erosion (during the construction phase).

5.2 The area of habitat to be constructed upon at Millar Farm is currently improved grassland, with a section of marshy grassland. These habitat types currently offer limited potential to support wildlife, and therefore the loss of this small area is not considered significant.

5.3 The solar panels are pile driven into the ground, with no foundations, therefore the actual land area lost is very small. As the surrounding landscape if of a similar nature, the alteration of this habitat will not result in fragmentation.

5.4 Measures will be in place prior to construction and decommissioning work taking place to minimise any potential disturbance to wildlife. During the operational phase the disturbance to local wildlife will be lower than the levels of disturbance the land is currently subject to from the current farming practice.

5.5 With the creation of new species rich grassland, along with the enhancement of existing hedgerows and suitable management, the sites potential for supporting local wildlife could be greatly increased at the post construction stage.

6 MANAGEMENT & RECOMMENDATIONS

6.1 The following management recommendations have been made:

- to maintain and improve the biodiversity of species within the site;
- to enhance the quality of habitats present;
- increase the sites potential for supporting wildlife; and
- to avoid any potential negative impacts arising from the development of the site.

6.2 Recommendations of management actions required to achieve the desired condition of the site are summarised within Table 6-1. The table also provides a brief summary of the rationale and possible constraints on being able to adopt the recommended management.

RECOMMENDED MANAGEMENT

6.3 Currently the improved grassland fields offer limited benefit to wildlife. The potential of the site to support wildlife will be significantly increased by the habitat creation measures set out in Table 6.1 below.

HABITAT ENHANCEMENT

6.4 Various options exist to enhance the biodiversity value of a solar farm site, including the creation of different habitats, such as: hedgerows, field margins, wild flower meadows, nectar rich areas and winter bird crops.

6.5 Habitats that will be created at the proposed solar farm development will include: sections of species rich grass, wild bird seed mixture and nectar flowers, a hibernaculum, bird, bat and insect boxes and a log pile. These habitats individually offer shelter and a food source for supporting a variety of wildlife. The mosaic of these new habitats combined with the existing hedgerows, will support the existing wildlife within the site. They also have excellent potential to allow the biodiversity of the site to increase, by offering a wider range of habitats that benefit local wildlife.

6.6 Creating hedgerows will benefit a range of local species including Biodiversity Action Plan Priority Species, such as terrestrial mammals, herptiles, invertebrates and birds.

6.7 There are 21 priority UK BAP bird species associated with hedgerows, and 13 of these use hedgerows as a primary habitat. All bat species, Irish hare, tree sparrow, and species rich hedgerows are all given priority within the Antrim Borough Biodiversity Action Plan.

GENERAL CONSIDERATIONS

OBLIGATIONS

During each of the development phases there are a few legal obligations that should be considered:

- Ensure obligations of the European Communities (Birds and Natural Habitats) Regulations 2011 are met by all involved with the site.
- Ensure obligations of the Wildlife Act 1976 and Wildlife (Amendment) Act 2000 are met by all involved with the site.
- Ensure all relevant Health & Safety at Work Act obligations are met.

GOOD ECOLOGICAL PRACTICE

6.8 Whilst management practices should only be altered if there is a good ecological reason for doing so, they should not be rigidly adhered to if they are obviously detrimental.

INVASIVE NON-NATIVE SPECIES

6.9 During the extended phase 1 habitat survey carried out on the 14th February 2015 no invasive, non-native species were identified.

TABLE 6-1: RECOMMENDED MANAGEMENT

OBJECTIVE	ACTION PLAN TASK	TIME SCALE	NOTES
To enhance the quality of habitats present	Create a diverse grassland with varied sward structure After the development of the solar farm, sections of wildflower, fine grasses and wild bird seed mix will be sown across the site. It is recommended that the area of marshy grassland B5, marked on the extended phase 1 habitat survey map should remain as marshy grassland. Wildflower mix to contain: birdsfoot trefoil, common vetch, meadow vetchling, ragged robin, meadow buttercup, self heal, red clover, white clover and yellow yattle. Fine grass mix to contain: common bent, creeping red fescue, hard fescue and smooth stalked meadow grass. Wild bird seed mix to contain: mustard, spring wheat, white/red milet, triticale and barley.	Year 1	Wildflower mix will provide an insect rich habitat. Fine grasses create an ideal nesting habitat for ground nesting birds such as skylarks. This will also provide habitat for small mammals and larvae of pollinating insects, including butterflies and moths. Wild bird seed mix provides a seed rich habitat, providing a further food source for farmland birds and small mammals.
To enhance the quality of habitats present	Enhance existing hedgerow boundary Gap existing hedgerows with blackthorn, buckthorn, ash, alder, holly and hawthorn. These corridors will allow the movement of small mammals and herptile species.	Year 1	Currently the hedgerows are a mixture of species-rich and species-poor. A hedgerow provides shelter and a source of food for a variety of species including birds, small mammals, reptiles and butterflies.

	To ensure a diverse hedgerow with a good structure it is important to plant and maintain ground flora along the hedgerow.		If the correct species are planted and maintained correctly, a hedgerow's potential can be maximised, providing food and shelter throughout the year.
Ensuring fencing does not inhibit the movement of wildlife	To allow movement of badgers across the development area mammal gates shall be incorporated within the security fence.	Year 1 (during construction phase)	The structure of the fence will allow herptiles and small mammals' to freely pass through.
Creating a diversity of habitats within the site	<u>Creation of hibernaculum and log piles</u>	Year 1	See appendix A The hibernacula comprises of log, rock and stone piles, which are aimed at providing shelter for reptiles and amphibians to hibernate. However, the hibernaculum and log pile may also be used by a variety of amphibians, insects and small mammals.
Creating a diversity of habitats within the site	<u>Creation of bat roosting habitat</u> Bat boxes will be placed on a few of the mature trees within the site	Year 1	The creation of roosting habitat, along with the creation of species rich habitat that will encourage an abundance of invertebrate life (a potential food source) will be beneficial to local bats.
Maintaining the species	<u>Low intensity sheep grazing</u>	Each year	Low intensity sheep grazing will ensure that the areas of shorter swards and scrub will be managed and

rich ground flora around solar PV installation			maintained. This will result in an overall increase in biodiversity within the site.
Maintaining the hedgerows	Section of hedgerow to be cut	Each year between January and February	Cutting on a rotational basis, following standard advice, to ensure the optimal availability of berry and blossom for wildlife throughout the year, as a potential food source. Management will also ensure a good base is maintained within the hedgerow, to provide suitable habitat for a range of wildlife.

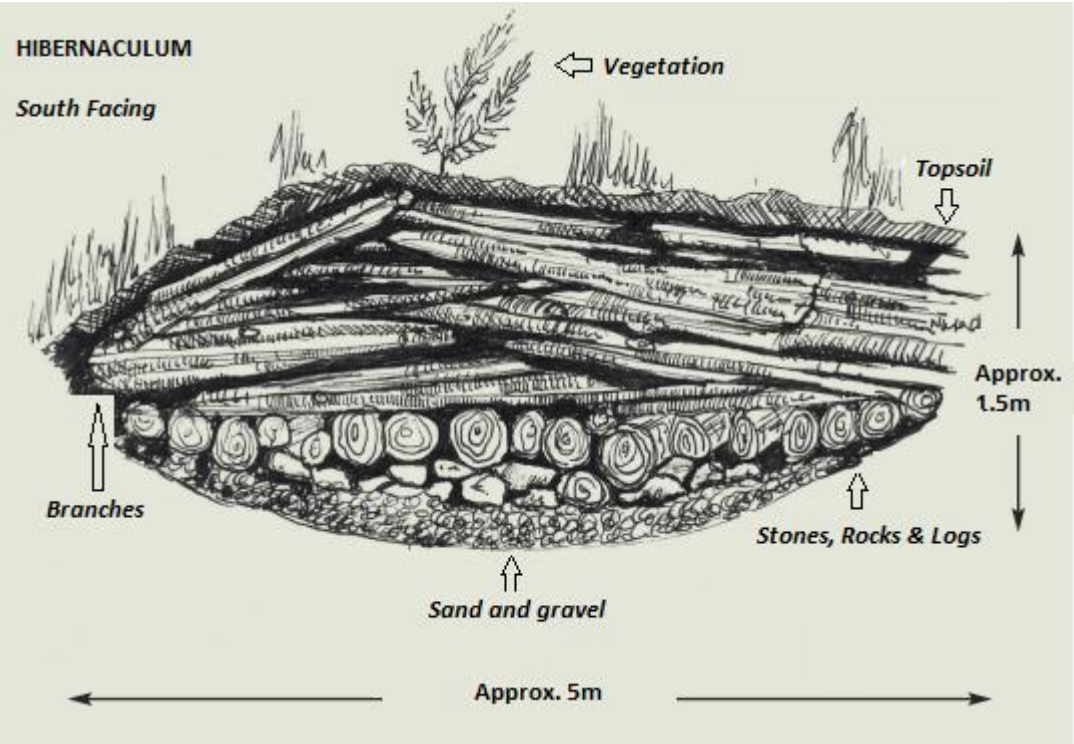
7 DECOMMISSIONING

7.1 At the end of the operational period, decommissioning will take place which will entail, dismantling and removing all of the materials and equipment in order to reinstate the land back to its original condition. Where possible, retaining sections of grassland and maintaining the hedgerow boundary after the 30-35 year lifespan of the development would be of benefit to local wildlife.

8 APPENDIX

APPENDIX A - HIBERNACULUM CONSTRUCTION

8.1 The hibernaculum will follow the basic construction set out below, with the log pile situated to the north of the hibernaculum.



- A 5m long east-west running ditch 1m deep and 1m wide will be dug.
- The base will be lined with sand and gravel.
- This will be followed with layers of stones, rocks and logs.
- Smaller branches will then be placed on top, and covered soil from the excavation will be placed over the pile, leaving gaps for access.
- The soil will be shaped into a mound.
- North facing side of the mound will be seeded / planted with species that will attract insects and will also provide extra shelter.
- South facing side will be maintained with a sparse vegetation cover to provide an area to bask.
- A log pile of approximately 2m by 1m will be placed to the north of the hibernaculum.