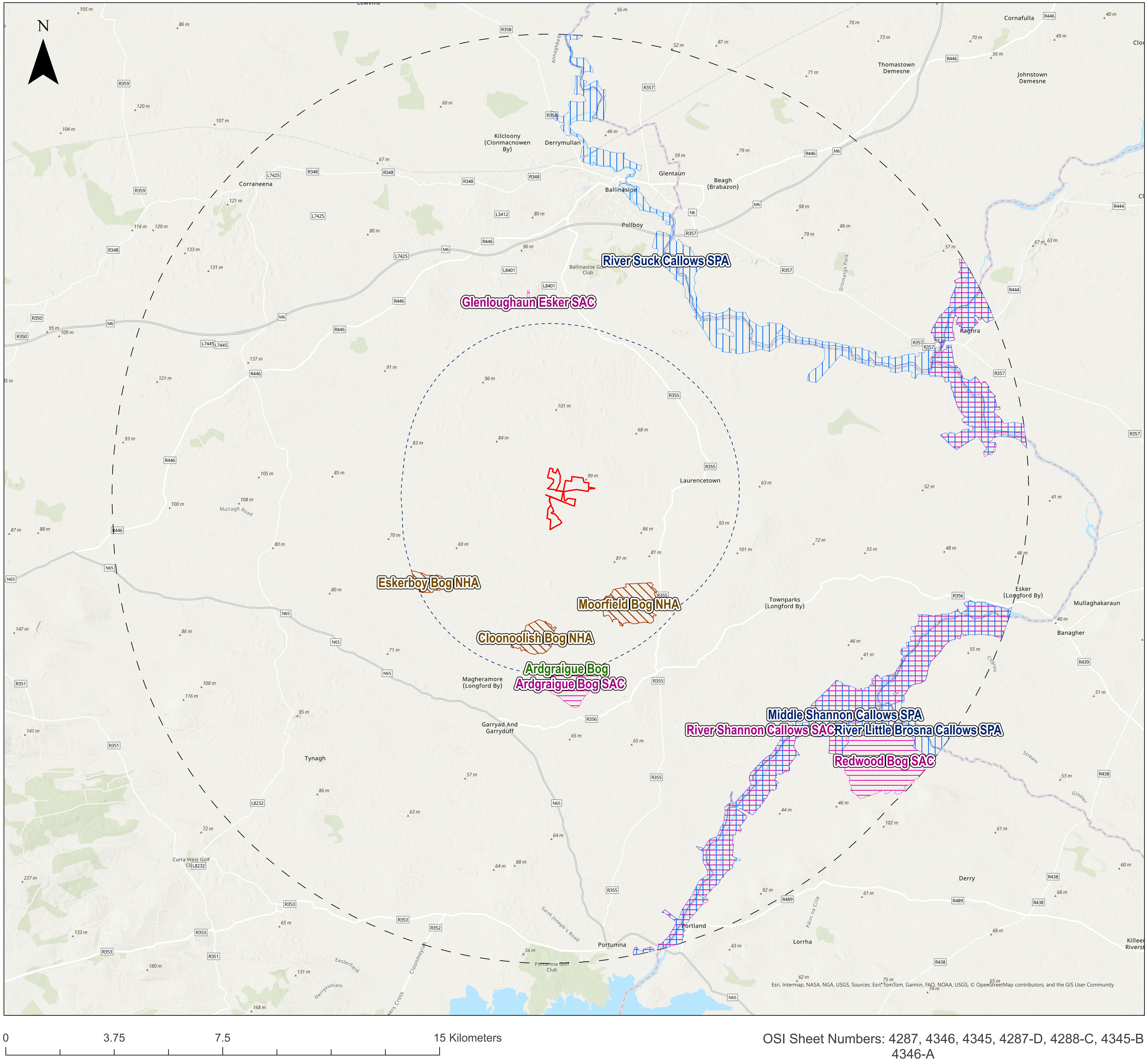

Ballydonagh Amendment Environmental Designations Map Appendix 2A Figure 2.1

Legend

- Development Boundary
- 15km Buffer
- 5km Buffer
- Special Areas of Conservation (SAC)
- Special Protection Area (SPA)
- Natural Heritage Area (NHA)
- proposed Natural Heritage Area (pNHA)

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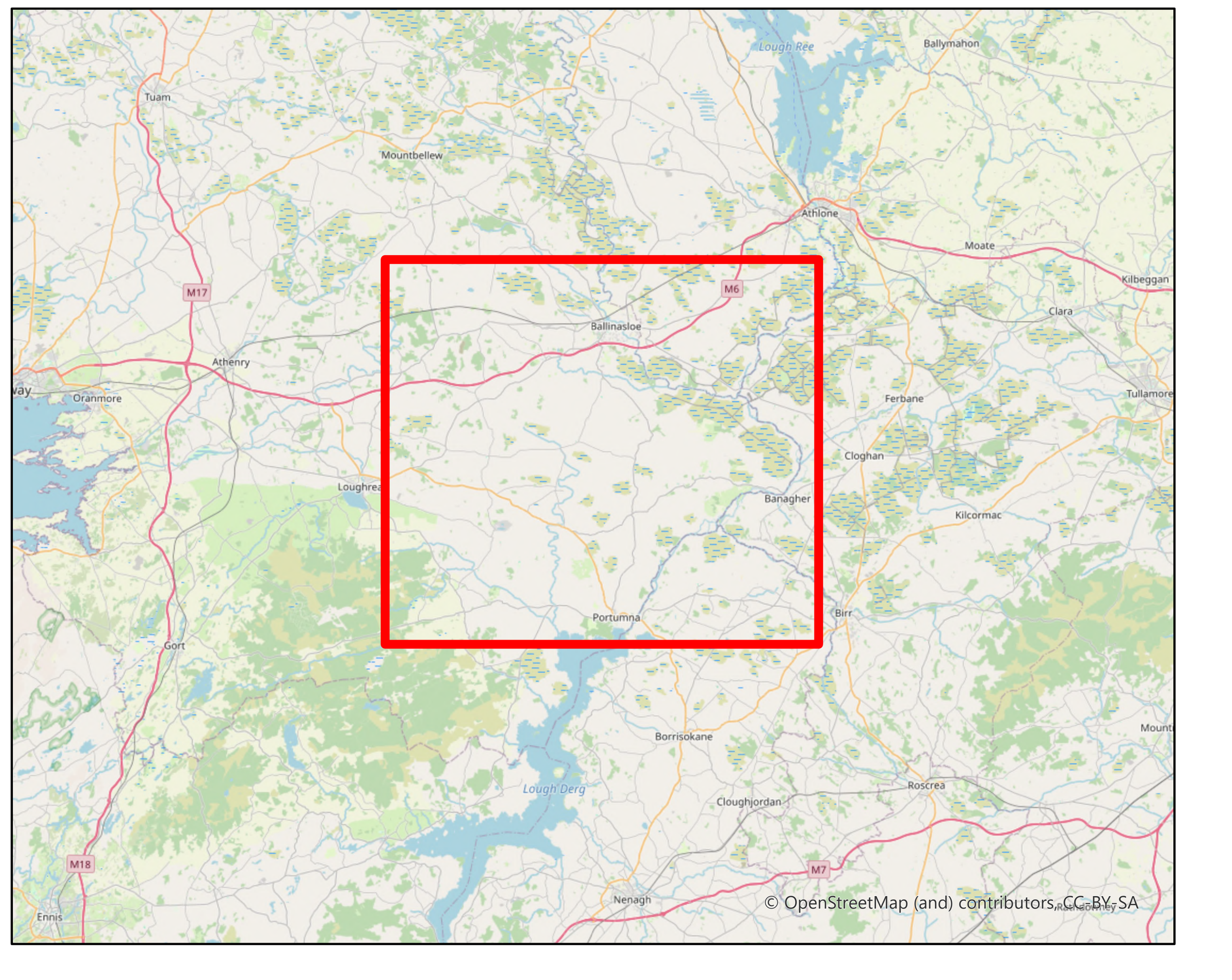

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Drawn By: Rhona Coghlan
Scale (A1): 1:65,000
Drawing No.: NEO00874/043I/A

NEO ENVIRONMENTAL

OSI Sheet Numbers: 4287, 4346, 4345, 4287-D, 4288-C, 4345-B 4346-A
Ordnance Survey Ireland Licence No. EN 0085321

Ballydonagh Solar Farm
2025 Fossitt Habitat Map
Appendix 2A - Figure 2.2

N

82 m
89 m
90 m
88 m
97 m
80 m
80 m
82 m
99 m
82 m
86 m
76 m
90 m
77 m
86 m
81 m
91 m
89 m
82 m
76 m

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

Sources: Esri, Vantor, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community, Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

0 0.25 0.5 1 Kilometers

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Key

- Development Boundary
- 50m ESA
- Tilled Land (BC3)
- Earth Banks (BL2)
- Buildings and Artificial Surfaces (BL3)
- Spoil and Bare Ground (ED2)
- Improved Agricultural Grassland (GA1)
- Amenity Grassland (GA2)
- (Mixed) Broadleaved Woodland (WD1)
- Mixed Broadleaved/Conifer Woodland (WD2)
- Conifer Plantation (WD4)
- Scrub (WS1)
- Lowland Depositing River (FW2)
- Drainage Ditch (FW4)
- Hedgerow (WL1)
- Treelines (WL2)
- Target Notes

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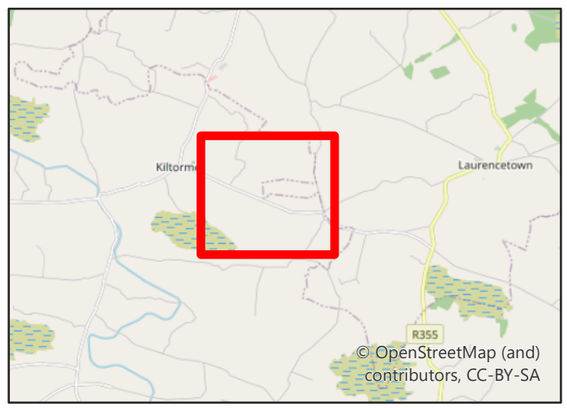

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Scale (A3): 1:8500
Drawing No: NEO00874/041IA

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Ballydonagh Solar Farm - Fossitt Habitat Map Figure 2.3

N

0 100 200 300 m

Key

- Application Site
- 50m Extended Survey Area
- Target Note
- WD1 - Broadleaved Woodland
- GA2 - Amenity Grassland
- GA1 - Improved Agricultural Grassland
- WD4 - Conifer Plantation
- GS4 - Wet Grassland
- BC3 - Tilled Land
- WN2 -Oak-Ash-Hazel Woodland
- WS1 - Scrub
- BL2 - Earth Banks
- BL3 - Buildings and Artificial Surfaces
- WL2 - Treeline
- WL1 - Hedgerow
- FW4 - Drainage Ditch
- FW2 - Depositing Lowland Rivers

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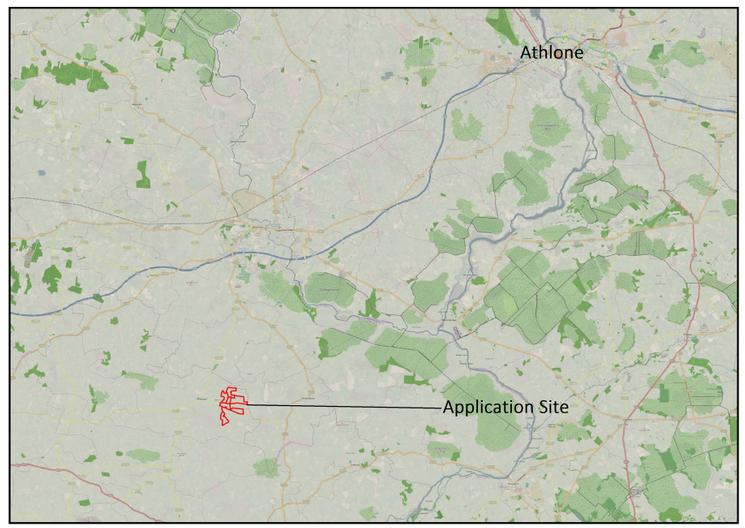

Date: 03/04/2023
Drawn By: Louis Maloney
Scale (A3): 1:8,500
Drawing No: NEO000874/001I/C

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Appendix B: Site Photographs

Photograph 1: Broadleaved Woodland (WD1) (21/10/2025)

Photograph 2: Amenity Grassland (GA2) (10/05/2022-13/05/2022)

Photograph 3: Improved Agricultural Grassland (GA1) (21/10/2025)

Photograph 4: Conifer Plantation (WD4) (10/05/2022-13/05/2022)

Photograph 5: Wet Grassland (GS4) (28/10/2025

Photograph 6: Tilled Land (BC3) (10/05/2022-13/05/2022)

Photograph 7: Oak-Ash-Hazel Woodland (WN2) (10/05/2022-13/05/2022)

Photograph 8: Scrub (WS1) (10/05/2022-13/05/2022)

Photograph 9: Earth Banks (BL2) (10/05/2022-13/05/2022)

Photograph 10: Buildings and Artificial Surfaces (BL3) (10/05/2022-13/05/2022)

Photograph 11: Treeline (WL2) (21/10/2025)

Photograph 12: Mixed Broadleaved/ Conifer Woodland (WD2) (21/10/2025)

Photograph 13: Hedgerow (WL1) (03/11/2025)

Photograph 14: Depositing Lowland Rivers (FW2) (10/05/2022-13/05/2022)

Photograph 16: Drainage Ditches (FW4) (03/11/2025)

Photograph 17: Potential Badger Sett (Target Note 12 – 03/11/2025)

Photograph 18: Tree with BRP (Target note 1 – 21/10/2025)

Photograph 19: Potential Badger Sett (Target Note 10 – 21/10/2025)

Photograph 20: Structure with bat roost potential (Target note 13 – 03/11/2025)

Appendix 2C

Appendix 2C– Habitat of Bat Species in Ireland

Table 2-9: General/Preferred Foraging and Commuting Habitats of Bat Species Returned by the Data Search

Species	Foraging and Commuting Habitat	Roosting Preferences
Common pipistrelle (*Pipistrellus pipistrellus*)	Shows a preference for deciduous woodland but a generalist using a wide range of habitats.	Maternity colonies are found mainly in buildings, usually roosting out of sight in crevices. Colonies may use a number of sites through the summer but are often loyal to the same sites for many years. Maternity colonies are extremely variable in terms of numbers, from 20 to over 1,000 bats. Males roost singly or in small groups in the summer, in buildings or trees. Bat boxes are used by both males and females but generally only males use them in the summer. These species do not use underground sites for hibernation but are sometimes found in the cracks and crevices of buildings in the winter.
Soprano pipistrelle (*Pipistrellus pygmaeus*)	Tends to select riparian habitats over other habitat types available.	
Nathusius' pipistrelle (*Pipistrelle nathusii*)	Riparian habitats, broadleaved and mixed woodland and parkland, occasionally found in farmland but always near water. Found over lakes and rivers.	The very few known Irish roosts are in buildings, with hibernation roosts in hollow trees and crevices in cliffs, walls and caves.
Leisler's bat (*Nyctalus leisleri*)	Recorded foraging in woodland edges, scrub or woodland-lined roads and over pasture. Also recorded over drainage canals, lakes and coniferous forests. Recorded as selecting parkland/amenity grasslands, deciduous woodland edge and river/canals but avoiding improved grassland.	Roosts in trees, bat boxes and buildings such as houses; for example around the gable end of lofts, under tiles, under soffit boards and in disused chimneys. Often uses a variety of sites in the summer. Hibernates in holes, buildings and sometimes in caves and tunnels.

Brown long-eared bat (*Plecotus auritus*)	Strongly associated with tree cover, prefers woodland with cluttered understory, including native species, particularly deciduous. Also forages in mixed woodland edge and among conifers. Use of hedgerows increase through the active season.	Maternity roosts found in the voids of large, old buildings and bat boxes in woodland. Usually roosts against wooden beams at the roof apex in attics or farm buildings. Bats often cluster at the highest part of the roof and require enough space for unobstructed, internal flight. Shows high roost fidelity. Common uses feeding perches and night roosts in porches or outbuildings separate from the main roost. Hibernate in underground sites, trees holes and buildings.
Whiskered bat (*Myotis mystacinus*)	Whiskered bats use mixed woodland, riparian vegetation, arable and rough grassland habitats although select the first two as core foraging habitats. One study found that whiskered bat selected pasture with hedgerows for foraging. A German study showed that whiskered bats favour areas near rivers and more open habitats with hedges and coppices.	Can roost in trees and a wide range of buildings in the summer. Hibernates in caves or other underground sites, where they can be found in the open or in cracks and crevices.
Natterer's bat (*Myotis nattereri*)	Preferred foraging habitat is semi-natural broad-leaved woodland, tree-lined river corridors and ponds, but also uses grassland. Avoids dense coniferous plantation. An autumn study revealed that the species use woodland and mixed agricultural areas.	Roost sites include tree holes and different types of buildings but has also been found in bridges. Usually roost in attics between late May and mid-July and often roosts have enough space for internal flights. This species also breeds in bat boxes. Timber-framed barns built between 12th and 19th centuries may be particularly important to this species, with roosts found in mortise joints in both summer and winter.

		Hibernates in cracks and crevices in caves and mines. Other hibernations sites recorded are canal and railway tunnels, ice houses and tree cavities.
Daubenton's bat (*Myotis daubentonii*)	Preferred foraging habitat is over water; this species favours riverine habitats but is also known to forage in woodland.	Roosts are found in hollow trees, bridges or sometimes buildings generally close to water. Nursery roosts are not exclusively female – males make up 25% or more of the colony and large male-only colonies have also been recorded. Hibernation sites are usually underground including caves, mines and suitable tunnels where bats are found both in crevices and on open walls. They may also hibernate in tree cavities.
Lesser horseshoe bat (*Rhinolophus hipposideros*)	Preferred foraging habitats include broad-leaved woodland well connected by commuting routes such as hedge, woodland edge and riparian trees. This species has also been recorded in coniferous woodland. Probably reluctant to cross open space as recorded very low (less than 1m) in open habitats. This species can remain active during the hibernation periods.	Roost sites include attics, chimneys and boiler rooms of buildings, rural houses and out buildings in the summer, and cellars, tunnels, disused mines and caves for hibernation. Also found in industrial buildings. This species prefers to fly directly into roost sites and into their roosting position.

Appendix 2D – Biodiversity Management Plan

Ballydonagh Solar Farm – Amendment Application

10/12/2025

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Prepared For:

Ballydonagh Solar Limited

Prepared By:

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Checked By:	Colleen Patterson	03/12/2025
	Name	**Signature**
Approved By	Paul Neary	

Contents

1. EXECUTIVE SUMMARY

1.2. Objectives have been established to enhance and maintain the biodiversity on lands within the townlands of Ballydonagh, Cloonineen, Skecoor, Kiltormer East and Graveshill, Co. Galway, as part of the proposed amendment to the consented Ballydonagh Solar Farm Development (Planning Reference: 2361049).

1.3. These include planting of species-rich hedgerows, species-rich treelines to provide a plentiful source of food and shelter for a range of fauna species. Other enhancement measures include the development of a species-rich grassland and wildflower areas across the site, as well as creating herptile hibernacula, log piles, bird and bat boxes.

1.4. Actions have been formulated within this document to enable the objectives to be met and to maximise the site's potential for supporting wildlife. Species which have been given priority within this management plan include birds, butterflies, bats and herptile species.

1.5. A Fossitt habitat survey was undertaken in May 2022 and an updated Fossitt habitat survey and species scoping survey was conducted from October and November 2025 in order to assess the current state of the Proposed Amendment Site.

1.6. An ecological Impact Assessment was then conducted to assess the local area and its ability to support a range of wildlife.

1.7. The enhancements and management measures set out in this document have been developed in accordance with the findings of the above habitat survey. This will enable the Proposed Amendment to deliver a net biodiversity gain.

2. INTRODUCTION

Background

Neo Environmental Ltd has been appointed by Renewable Energy Systems (RES) Ltd on behalf of Ballydonagh Solar Limited (the "Applicant") to undertake a Biodiversity Management Plan for a proposedamendment to a previously consented solar farm development (Planning Reference 2361049) (c. 81.9ha) (the "Proposed Amendment") in the townlands of Ballydonagh, Cloonineen, Skecoor, Kiltormer East and Graveshill, Co. Galway (the "Application Site"). Please see Figure 2 of Volume 203 for the overall layout of the Proposed Amendment.

Development Description

2.2. The Proposed Amendment will consist of several minor amendments to the previously consented development under Planning Reference 2361049. The amendments comprise the following; re alignment of the main entrance and access gate; re alignment and widening of internal access tracks; alteration of the boundary fence at the main entrance and at the northeast corner of the site; removal of the consented 38 kV substation in Field 22 to facilitate the Gortnalug Loop in and out 110 kV substation and associated grid connection (the 110kV substation and grid connection will form part of a Strategic Infrastructure development); combined central inverters and MV transformers are replaced by separate string inverters and central MV transformers; reduction in the size of related hardstanding areas; updated table layout to accommodate the 110 kV substation and grid cable including a reduction in PV table numbers from 3209 to 3120; new overhead line separation areas to reflect that a section of the existing 110 kV overhead line will be removed to facilitate the substation grid connection; inclusion of an additional badger sett buffer and extension the operational lifetime of the solar farm from 35 years to 40 years. These alterations are considered minor in nature and do not alter the overall design intent or scale of the consented solar development.

Site Description

2.3. The Application Site is located in a rural setting, approximately 9.5km south of Ballinasloe, 33km east of Athenry and 21km northeast of Loughrea. The area of the Proposed Amendment lies at an elevation of approximately 71 – 96m AOD and covers a total area of 81.9 hectares. It is centred at approximate Irish Grid Reference (ITM) X583549 Y 7200440 and is located c.7km northeast of the N65 and 8.4km south of the M6. Comprising of 26 agricultural fields (31 were surveyed in total, however fields 1, 5, 9, 10 and 11 have since been removed from the Proposed Amendment boundary), the site is currently being used for pastoral farming. The fields are bound by a mixture of trees, hedgerows and post-and-wire fencing. Access to both parcels of land is gained from existing access points off the L4301 which dissects the site.

3. GUIDANCE

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

3.3. Due to the nature of solar farm developments, a large proportion of the site is accessible for plant growth and potential wildlife enhancements. Currently no standard guidance is available in Ireland regarding the enhancement of solar farms for the benefit of local wildlife. In the UK each solar farm development requires a Biodiversity Management Plan (BMP), the purpose of which is to identify objectives for biodiversity and the means by which these objectives will be achieved. This can include the protection of existing species and habitats and the establishment of new habitats, as well as their maintenance and monitoring. Given the similarities between the species and habitats present in the UK and Ireland, it has been deemed that the adoption of the UK standard guidance is appropriate in the current absence of Irish guidance.

3.4. According to 'Biodiversity Guidance for Solar Developments'[1], 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 Natural Environmental and Rural Communities (NERC) Act 2006[2], and designated areas in close proximity to the amendmentd application 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;*

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

[2] Natural Environmental and Rural Communities Act (NERC) 2006, available at www.legislation.gov.uk; broadly equivalent legislation exists in Ireland

- *provide a plan for monitoring the site; and [sic] adapting management as appropriate to the findings of this monitoring; and,*
- *set out how the site will be decommissioned."*

3.5. The BMP has also been informed by the Fossitt habitat survey that was conducted in May 2022.

OBJECTIVE OF THE BIODIVERSITY MANAGEMENT PLAN

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

3.7. This will be achieved by:

- Creating and maintaining a species-rich diverse grassland with a varied sward structure;
- Creating and maintaining wildflower areas
- Creating and maintaining species-rich hedgerows;
- Creating and maintaining native tree planting (screening mix and feathered tree mix)
- Creating and maintaining wildlife shelters for priority and locally important species;
- Ensuring no net loss of biodiversity on the site as a result of the habitat creation scheme, and
- Maximising the floral and faunal biodiversity of the created and retained habitats.

4. CURRENT CONSERVATION & BIODIVERSITY

NATIONAL CONSERVATION

National Biodiversity Action Plan 2017-2021 [3]

4.2. Ireland's 4th National Biodiversity Action Plan for the period 2023-2027 has been in development since October 2021. Is it currently in the public consultation phase. For the purpose of this report, the objectives of the 2017-2021 plan has been considered.

4.3. The National Biodiversity Action Plan 2017-2021 sets out a vision and seven strategic objectives to halt the decline of biodiversity across Ireland, as follows:

- Objective 1 - Mainstream biodiversity into decision-making across all sectors.
- Objective 2 - Strengthen the knowledge base for conservation, management, and sustainable use of biodiversity.
- Objective 3 - Increase awareness and appreciation of biodiversity and ecosystem services.
- Objective 4 - Conserve and restore biodiversity and ecosystem services in the wider countryside.
- Objective 5 – Conserve and restore biodiversity and ecosystem services in the marine environment.
- Objective 6 - Expand and improve management of protected areas and species.
- Objective 7 - Strengthen international governance for biodiversity and ecosystem services.

4.4. This document outlines that special protection to sites of highest nature value and species most at risk, including designated sites, should be afforded. However, effective conservation and sustainable use of biodiversity should also occur within the wider countryside, as this is where much of the biodiversity lies.

4.5. The primary threat to biodiversity both within and outside protected areas is from habitat degradation, fragmentation and loss due to changes in agricultural practices (such as intensification), commercial forestry, fisheries over-exploitation, peat extraction, air and

[3] https://www.npws.ie/legislation/national-biodiversity-plan

water pollution, invasive alien species, land clearance and development, tourism and recreational activities, and climate change.

National Biodiversity Action Strategy 2022-2026[4]

4.6. The National Biodiversity Action Strategy was created by the Office of Public Works to identify strategic actions to help government delivery of the National Biodiversity Action Plan. The Plan outlines 48 strategic actions, each with an expected outcome and key performance indicators defined. These actions are divided into five strategic themes;

1. Strategic Theme 1 Planning for Nature
2. Strategic Theme 2 Natural Leaders
3. Strategic Theme 3 Working with Water and Wildlife
4. Strategic Theme 4 Diversity by Design
5. Strategic Theme 5 Natural Knowledge

Biodiversity Action Plan for County Galway 2008--2013[5] & the Galway Heritage and Biodiversity Plan 2017 - 2022[6]

4.7. Galway has a rich biodiversity with a great variety of habitats and species including some which are rare in Ireland and the rest of the world such as turloughs, eskers, limestone pavement, river callows and machair grasslands. Flower rich seminatural grassland and raised and blanket bogs and wetlands are common with the latter, attracting over-wintering water birds, and the cuckoo, swallow and corncrake in the summer. The rivers and lakes host a variety of fish species, birds and otters and rare invertebrates such as the white-clawed crayfish and the freshwater pearl mussel. Many of Galway's most important natural and semi-natural habitats are afforded protection under European and national legislation byway of designation as National Heritage Areas (NHAs), Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

4.8. The aims and objectives of the adopted Biodiversity Action Plan (2008—2013) is to:

[4] OPW (2022) Biodiversity Action Strategy 2022-2027

[5] Biodiversity Action Plan for County Galway 2008-2013. Available at: https://dpdgay9x1sxad.cloudfront.net/biodiversity/wp-content/uploads/sites/16/2017/02/bap-galway.pdf

[6] Galway County Heritage and Biodiversity Plan 2017-2022 (Draft 5 – 11 May 2017). Available at: https://www.galway.ie/en/media/Galway%20County%20Heritage%20and%20Biodiversity%20Plan%202017%20-2022.pdf

- *"promote, protect and enhance the biodiversity of the county for the benefit of both the people of Galway and our natural heritage.*
- *To foster a greater awareness and understanding of biodiversity among all sectors of the community, and encourage local people to become actively involved in the promotion, preservation and enhancement of local natural heritage*
- *To increase knowledge of biodiversity in County Galway through supporting and promoting research in the county and to facilitate the gathering and dissemination of biodiversity information and data.*
- *To help conserve the biodiversity of County Galway through direct action and through adopting an ecosystem approach to policy development."*

4.9. The Galway Heritage and Biodiversity Plan (2017—2022) is based on the National Heritage Plan whose main objective is to:

"ensure the protection of our heritage and to promote its enjoyment for all. The key to achieving this goal is the preparation and adoption of Local Heritage Plans involving local heritage fora, bringing together communities, local authorities and the Government. Local heritage plans will identify the steps necessary for the protection and enjoyment of heritage at the local level…. […] … provide the means for a significant broadening of community participation in the protection of heritage.".

4.10. The draft plan states that its key concept is to "place the protection and enjoyment of heritage at the heart of public life" and it aims to raise the profile of the countywide heritage and biodiversity as a priority.

4.11. Protected and notable species considered in Biodiversity Action Plan include: Red Grouse, Golden Plover, Curlew, Hen Harrier, Pyramidal Bugle, Pale Dog Violet, Green Winged Orchid, Spotted Rock-Rose, Marsh fritillary, Wood Bitter-Vetch, Lesser Horseshoe Bat, Fen Violet, Alder Buckthorn, Dropwort, Irish Lady's Tresses, Shrubby Cinquefoil, Arctic Char, Pollan, Fresh Water Pearl Mussel, White Clawed Crayfish, Whooper Swan, Wigeon, Lapwing, Greenland White-Fronted Geese, Foxtail Stonewort, Purple Sea Urchin, Bottlenose Dolphins, Underwater reefs, Chough, Little Tern, Narrow-leaved Helleborine, Bird Cherry, Yellow Birds Nest, brown Hairstreak, Red Squirrel, Pine Martin, Barn Owls, Swallow, Corn Flower, Darnel. Hairy Violet, Small Wood Reed.

All Ireland Pollinator Plan 2021-2025[7]

4.12. On the 17th of September 2015, Ireland joined a small number of countries in Europe who have developed a strategy to address pollinator decline and protect pollination services. In March 2021, a new Plan was released.

4.13. This new Plan has six objectives and has identified 186 actions in order to achieve its objectives. The six objectives are as follows:

- Making farmland pollinator friendly. Working together with the farming community, increase awareness of pollinators and the resources they need in order to survive on farmland.
- Making public land pollinator friendly. Working with Councils, Transport Authorities, Local Communities and others, to strengthen links between this plan and other initiatives and to increase shelter and food resources for pollinators.
- Making private plan pollinator friendly. Work together with the public and community groups to create networks of biodiversity-friendly habitat across the landscape.
- All-Ireland honeybee strategy. Working with beekeepers, achieve healthy, sustainable populations, and for honeybees to be part of a cohesive pollinator message that balances managed and wild pollinator populations.
- Conserving rare pollinators. Improving our knowledge on rare pollinators, and raising awareness through dedicated initiatives, achieve a Plan that protects as much wild pollinator diversity as possible.
- Strategic coordination of the Plan. Continually raising awareness; addressing gaps in knowledge through research, tracking where pollinators occur and how populations are changing, work from an evidence base that enables us to coordinate a dynamic plan that is targeted and effective.

4.14. The enhancements set out within this BMP will create areas of flower-rich habitat that will support Ireland's pollinator species, including bees and flies.

[7] National Biodiversity Data Centre (2015) All Ireland Pollinator Plan 2021-2025. Available at: https://pollinators.ie/wp-content/uploads/2021/03/All-Ireland-Pollinator-Plan-2021-2025-WEB.pdf

LOCAL CONSERVATION

4.15. The Proposed Amendment does not lie within or adjacent to any statutory on non-statutory designated environmental sites. Within 15km of the Application Site boundary there are four Special Areas of Conservation (SACs) and three Special Protection Areas (SPAs). Within 5km of the Application Site boundary there are three Natural Heritage Area (NHA) and one proposed Natural Heritage Area.

4.16. Please refer to the supporting Natura Impact Statement (NIS) for details of all European Designated sites.

4.17. From the findings of the Ecological Impact Assessment and NIS it is considered that, with the implementation of design, best practice and mitigation measures, the Amended Development will not significantly impact upon any of the designated and non-designated sites.

5. HABITATS & SPECIES PRESENT

5.2. A Fossitt habitat survey was completed in as part of the Ecological Impact Assessment in May of 2022 by Louis Maloney and updated in October and November 2025 by Rhona Coghlan. This highlighted the presence of the following 13 habitat types within the development boundary and 50m ESA:

- Improved Agricultural Grassland (GA1)
- Amenity Grassland (GA2)
- Scrub (WS1)
- Hedgerow (WL1)
- Treelines (WL2)
- Depositing Lowland Rivers (FW2)
- Drainage Ditches (FW4)
- Buildings and Artificial Surfaces (BL3)
- Wet Grassland (GS4)
- Mixed broadleaved woodland (WD1)
- Oak-Ash-Hazel Woodland (WN2)
- Tilled Land (BC3)
- Earth Banks (BL2)

RECORDED SPECIES

5.3. The Fossitt habitat survey covered all land within the Application Site and a 50m buffer around the entire site, where access allowed.

5.4. A list of flora species present onsite was compiled as part of the habitat survey, details of species observed can be found in Table 6-1.

Table 5-1 Flora identified within the Study area

Scientific Name	Common Name
Fraxinus excelsior	Ash
Quercus robur	Oak
Crataegus monogyna	Hawthorn
Ulex europaeus	Gorse
Corylus avellana	Hazel
Salix spp.	Willows
Picea sitchensis	Sitka Spruce
Prunus spinosa	Blackthorn
Acer pseudoplatanus	Sycamore
Fagus sylvatica	Beech
Alnus glutinosa	Alder
Lolium perenne	Perennial rye grass
Ranunculus repens	Creeping buttercup
Urtica dioica	Common nettle
Dactylis glomerata	Cock's-foot
Rumex obtusifolius	Broadleaved dock
Agrostis capillaris	Common bent
Trifolium pratense	Red clover
Hedera helix	European Ivy
Rubus fruticosus	Bramble
Urtica dioica	Nettle
Taraxacum officinale	Dandelion
Bellis perennis	Daisy
Cirsium vulgare	Spear thistle
Asplenium scolopendrium	Hart's-tongue fern
Sambucus nigra	Elder

FAUNA

5.5. The potential presence of protected species within the study area was assessed though an updated data search conducted through the NBDC. This identified records of invasive, rare, scarce and protected species within 2km of the Proposed Amendment location using the 'report by polygon' function.

5.6. Additional information on the suitability of habitat in the surrounding area for bats was also obtained from the NBDC in the form of a habitat suitability map. The map provided enhanced information on the recorded distribution of bats and broad-scale geographic patterns of occurrence and local roosting habitat requirements for Irish bat species.

5.7. In addition, the Fossitt habitat survey included a species scoping survey in order to assess the potential of the site to support protected species.

5.8. During the field survey evidence of fox and/or badger in the form of potential dens/setts were identified, for more detail see the accompanying Ecological Impact Assessment. Habitats present on site which are suitable for fox and badger include the agricultural grassland, treelines, woodland and hedgerows.

5.9. Many species of common farmland birds were identified on site, with treelines, woodland, hedgerow and scrub on site offering nesting and foraging opportunity.

5.10. Suitable habitat was also identified for bats, with treelines, mature trees and derelict buildings on site offering foraging, commuting and roosting opportunity.

5.11. Watercourses and field drains on site offer suitable habitat to common frogs with suitability for otter that may be used on occasion to commute or forage.

5.12. White-clawed crayfish were returned in the 2km desk study from a grid square that is located outside of the Application Site's boundary, the Kiltormer stream has been considered to have limited potential for this species. No white-clawed crayfish were discovered during the Fossitt habitat survey. For integral design measures and pollution control measures see – Ecological Impact Assessment.

Invasive Non-Native Species

5.13. No field signs or evidence of any notable invasive species was discovered during the Fossitt habitat survey. In addition, the data search did not return any invasive species of note.

6. POTENTIAL IMPACTS

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

- Potential habitat loss and fragmentation,
- Disturbance during construction and decommissioning, and
- Potential contamination of surface waters.

6.3. Each of these potential impacts have been considered below in relation to the Proposed Amendment.

POTENTIAL HABITAT LOSS AND FRAGMENTATION

6.4. The solar panels will be set on piles with minimal disturbance to the ground. The proposed panels also have no moving parts, and the overall ground-level development footprint will generally take up around 4.70% of the site, with piles taking up less than 1% (0.03%) of the overall developable area. As the panels will be raised off the ground, greater than 95% of the Application Site will be accessible for plant growth and potential wildlife enhancements.

6.5. The main habitat present under the Proposed Amendment footprint is improved agricultural grassland which currently offers limited potential to support local wildlife, and therefore the loss of these small areas is not considered significant. Also, as the surrounding landscape is of a similar nature, the alteration of this habitat will not result in fragmentation.

6.6. Existing habitats are to be enhanced and identified local species will be protected. It is therefore demonstrated that the proposal will have no significant adverse impact on local habitats and will indeed deliver biodiversity enhancements to the benefit of the site and wider area.

DISTURBANCE DURING CONSTRUCTION AND DECOMMISSIONING

6.7. The construction and decommissioning phases of a development have the potential to impact upon local wildlife.

6.8. Measures will be implemented prior to construction and decommission work taking place to minimise any potential disturbance to wildlife. Mitigation measures recommended within the supporting Ecological Impact Assessment include:

- Pre -commencement badger survey
- Pre-construction otter survey;
- Breeding bird check if works are to begin within the bird breeding season focusing along hedgerows and nest checks in grassland (considered to be March- August inclusive);
- Potential Roost Feature (PRF) survey of any mature trees to be removed;
- Securely covering all excavations at the end of each working day to prevent accidental trapping of badger, otter or other small mammals;
- Buffers around potential badger setts: 10m (no construction activities) / 20m (only light work, with no use of wheeled vehicles) / 30m (no use of heavy machinery)" and 50m (no works within breeding season) (see TA 2 – Ecological Impact Assessment for more detail); and
- Mammal fences to be installed within security fencing at locations determined during the pre-commencement check. Gates will be installed across current mammal pathways to allow the unrestricted movement of wildlife across the local area.

6.9. During the operational phase, the disturbance to local wildlife will not be significantly greater than the levels of disturbance that the land is currently subject to from current farming practice.

6.10. With the creation and maintenance of new species-rich grassland, a wildflower meadow, native trees and native hedgerow, the site's potential for supporting local wildlife can be greatly increased post-construction.

Potential Contamination of Surface Waters

6.11. The construction phase of the Proposed Amendment has the potential for contamination of surface waters, if appropriate measures are not implemented. As part of the integral design of the the Proposed Amendment ,swales have been implemented to control the movement of surface waters within the Application Site. During the construction phase all contractors working onsite will follow current best practice measures, which include the appropriate use and storage of fuels, oils and chemicals as required.

7. HABITAT CREATION & MANAGEMENT

7.2. Currently the improved grassland (agricultural land), which make up the majority of habitats on site offer limited benefit to wildlife. The existing agricultural habitats will be replaced by a mix of grasses and wildflower species. Native trees (screening mix combined with feathered trees) and native hedgerow species shall be planted.

7.3. The potential of the site to support wildlife will be significantly increased by the habitat creation measures set out in Tables 8-5 and 8-6. These habitats will remain in place and be managed for the duration of the development.

7.4. Various options exist to enhance the biodiversity value of a solar farm site. These include the creation of different habitats, such as: hedgerows, field margins, wildflower meadows and nectar rich areas.

7.5. Habitats that will be created as part of the Proposed Amendment will include:

- Sections of species-rich grassland;
- Wildflower meadow;
- Native species-rich hedgerow
- Native species-rich treeline (screening mix combined with selection of feathered trees)
- Hibernaculum;
- Bird boxes;
- Bat boxes and
- Invertebrate hotels.

7.6. 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 and treelines, 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.

7.7. The flower meadows, invertebrate hotels and nectar rich areas will not only support a wide variety of wildlife, but this will also contribute towards the All Ireland Pollinator Plan. This will be achieved by creating habitats that will support important pollinator species such as bees and flies.

GRASSLAND

7.8. Within the development site the planting of species rich diverse grassland will occur, with the management regime ensuring a varied sward structure.

Soil Stabilisation and Sward Establishment

7.9. Grass seed comprised of the mixture set out in **Table 8-1** below, or a mix further tailored to the soil conditions following soil testing, will be sown. The grass seed will be applied at a low-density rate of 20kg per ha, which will allow for natural vegetation regeneration.

7.10. Species such as common couch, broad-leaved dock, stinging nettle and creping thistle can be difficult to eradicate and may cause problems with sward establishment. These species should therefore be targeted when undertaking weed control measures on site. Spot treatments of herbicide shall be used.

7.11. Low intensity sheep grazing will ensure that areas of shorter swards will be managed and maintained. Due to selective grazing habits, sheep grazing can lead to a diverse sward structure, if stocked at correct numbers, leading to a post-development benefit local biodiversity.

Table 7-1 Grassland Mix Component

SCIENTIFIC NAME	COMMON NAME	PERCENTAGE MIX (%)
Agrostis capillaris	Common bent	4
Cynosurus cristatus	Crested dog's tail	4
Festuca ovina	Hard/sheep's fescue	27
Festuca rubra	Red fescue	35
Poa trivialis	Rough stalk meadow grass	15
Poa pratensis	Smooth stalked meadow grass	15

Management in Years 1-3

7.12. The grass seed will be sown in either early autumn (August – September), or spring (March – April). The seeds should be applied to the soil surface, which should be clear of weeds and gently firmed-in by rolling, to provide direct contact with the soil.

7.13. In the first year, the grass should be regularly cut and/or grazed to promote grass growth and control weeds. As a guide, once the sward reaches 10-15cm in height it should be cut to a height of 5-7cm. Once the grassland area has established, a grazing regime will allow for light grazing by sheep (10 or less per hectare) through the autumn and winter months, thus allowing vegetation to flower and seed throughout the summer. Another option is to use a lower stock density for grazing all year around.

7.14. The wildflower meadow, as shown within **Figure 1.14, Appendix 1A of Technical Appendix 1,** is a species-rich grassland composed of wildflowers and fine grasses. This will create an insect-rich habitat and support a range of birds, mammals and invertebrates.

7.15. A recommended wildflower mixture is set out in **Table 8-2** below. The seed will be applied at a rate of 40kg per ha, with a 20% wildflower and 80% grass mix.

Table 7-2 Wildflower Mix Component

SCIENTIFIC NAME	COMMON NAME	PERCENTAGE MIX (%)
Lotus corniculatus	Birds foot trefoil	8
Medicago lupulina	Black medick	3
Centaurea nigra	Black knapweed	5
Vicia sativa	Common vetch	4
Galium verum	Lady's bedstraw	2
Ranunculus acris	Meadow buttercup	3
Lathyrus pratensis	Meadow vetchling	3
Onobrychis viciifolia	Sainfoin	36
Leucanthemum vulgare	Ox-eye daisy	8
Trifolium repens	Red clover	10
Silene dioica/latifolia	Red/white campion	2
Prunella vulgaris	Selfheal	5
Achillea millefolium	Yarrow	6
Rhinanthus minor	Yellow rattle	3

Management in Years 1-3

7.16. The wildflower mix will be sown in September or March/April, after the completion of the construction phase.

7.17. Within the first year the main aim is to control weeds and to reduce competition from grasses. The sward will be kept short in the first year until the end of June to reduce competition, and then allowed to grow in July and August to permit any wildflowers to seed. All cuttings should be removed from site several days after cutting to avoid smothering the sward but allowing any seeds to disperse.

7.18. After the wildflower mix has established, this area should only require one cut in late summer (August – September), allowing flowering species to seed, with an additional cut in October. Cuttings should be left on site for several days to disperse any seeds, then removed from site.

HEDGEROW

7.19. Currently the hedgerows on site are a mixture of species-rich and species-poor features. This management plan will enhance the existing hedgerow boundary by infilling gaps and planting a new species-rich hedgerow.

7.20. Creating hedgerows will benefit a range of local species including such as terrestrial mammals, herptiles, invertebrates and birds. If the correct species are planted and maintained correctly, a hedgerow's potential can be maximised, providing food and shelter throughout the year as well as creating connecting corridors.

7.21. The hedgerows will be planted as double staggered rows at 6 per metre, with a spacing of 300-400mm between rows or as individual whip planting as required. Planting should contain the following species as proposed in Table 8-3.

Table 7-3 Hedgerow Species Mix

SCIENTIFIC NAME	COMMON NAME	PERCENTAGE OF TREES
Corylus avellana	Hazel	8
Prunus spinosa	Blackthorn	10
Rosa canina	Dog rose	2
Viburnum opulus	Guelder Rose	7
Crategus monogyna	Hawthorn	55
Ilex aquifolium	Holly	10
Euonymus europaeus	Spindle	8

TREES

7.22. A screening mix will also be planted throughout the site at 3/m^2 in groups of no more than seven of the same species. Species will consist of alder (*Alnus glutinosa*), hawthorn (*Crateugus monogyna*), spindle (*Euonymus Europaeus*), holly (*Ilex aquifolium*), blackthorn (*Prunus spinosa*), elderberry (*Sambucus nigra*), guelder rose (*Vibunum opulus*) and grey willow *(Salix cinerea*).

7.23. In addition, feathered trees will also be added as part of the screening mix including alder (*Alnus glutinosa*), bird cherry (*Prunus padus*), sessile oak (*Quercus petrea*), crab apple (Malus sylvestris) and whitebeam (*Sorbus aria*). Please see further details of proposed species planting in the Landscape and Ecological Management Plan of this PES.

Management in Years 1-3

7.24. New hedgerows will be planted within the first available planting season (November – March).

7.25. In year 2, newly planted hedgerow sections will be lightly pruned. Existing hedgerows will be cut on a 2- or 3-year cycle, with no more than 1/3 cut in any one year. Any pruning or cutting should be done outside of the breeding bird season (March to August inclusive) to minimise disturbance to nesting birds.

WILDLIFE SHELTERS

7.26. The creation of wildlife shelters, placed strategically throughout the Proposed Amendment Site, will provide shelter to a wide range of species.

Bat Boxes

7.27. Providing bat boxes will increase opportunities for roosting bats within the local area. Approximately four bat boxes should be erected in suitable locations throughout the site. It can, however, take bats a long time to make use of artificial roosts. Therefore, a number of factors must be considered when installing a new bat box.

7.28. Microclimate within a new roost is a very important factor in terms of increasing the chance of successful uptake by bats. In line with Bat Conservation Trust guidelines[8] bat boxes should be draught-proof and made from a thermally stable material. They should be located 2m above the ground in locations where they will receive full/partial sunlight (southeastern or southwestern orientation). Access points should also be clear of any obstructions. Bat boxes shall be positioned on a slant to prevent rain from entering

[8] Bat Conservation Trust – Bat Box Information Pack. Available at: http://www.bats.org.uk/data/files/publications/Bat_Box_Information_Pack_FINAL.pdf

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7.29. To allow a choice of roosting, bat boxes should be installed in more than one aspect. Bat boxes located on a shady side will be cooler and may be suitable as a hibernation roost or used by male bats throughout the entire year.

7.30. There is a wide range of bat boxes currently available, some which are more suitable for certain species. A variety of bat boxes are recommended in Table 8-4 below. It is recommended that 2 of each box detailed below (or similar design) be installed on site.

Table 7-4 Details of Bat Boxes

BAT BOX	DETAILS	IMAGE
Schwegler 2F[9]	Standard box and most popular. Simple entrance role. Used as summer roosting space.	
Schwegler 1FD[10]	Specific for smaller bats such as common pipistrelle, Nathusius' pipistrelle, Daubenton's bat and brown long-eared.	

Bird Boxes

7.31. In order to enhance the site for nesting birds, bird boxes shall be placed throughout the site. Several types of nest boxes will be installed at suitable locations to favour a variety of bird species.

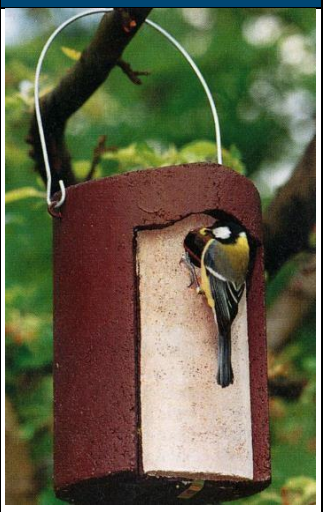
7.32. Open-fronted boxes will provide enhanced nesting opportunities for species such as robins, pied wagtails and spotted flycatchers. Boxes with entrance holes are suitable for tits, wren and tree sparrow.

7.33. Bird boxes should be mounted so that they face between the south-east and north to avoid direct sunlight. They should be tilted forwards so that rain is directed away from the entrance.

[9] Full specification available at: http://www.nhbs.com/title/158629

[10] Full specification available at: http://www.nhbs.com/title/177076/1fd-schwegler-bat-box

Table 7-5: Details of Bird Boxes

BIRD BOX	DETAILS	IMAGE
1B Schwegler Nest Box (32mm)[11]	This nest box will attract a wide range of species and is available with different entrance hole sizes to prevent birds from competing with each other for the boxes. The 32mm entrance hole will attract great, blue, marsh, coal tit, redstart, nuthatch, flycatcher, wryneck, tree and house sparrow and bats. The 26mm entrance hole suits blue, marsh, coal tit and possibly wren. All other species are prevented from using the nest box due to the smaller entrance hole.	
2H Schwegler Robin Box[12]	This traditional design has proved to be highly effective in attracting robins, as well as other small species such as black redstart, spotted flycatcher and wren.	

7.34. It is recommended that ten in total (5 of each type) of the above bird boxes (or similar) are installed on site.

Hibernaculum

7.35. Hibernacula comprise of log, rock and stone piles aimed at providing shelter for reptile and amphibians to hibernate. It may also be used by a variety of insects and small mammals. The hibernaculum will follow the instructions laid out within Appendix A below. The creation of three hibernacula are proposed on site.

[11] Full specification available at: http://www.nhbs.com/title/158587/1b-schwegler-nest-box
[12] Full specification available at: http://www.nhbs.com/title/161277/2h-schwegler-robin-box

Invertebrate Hotels

7.36. Four invertebrate hotels will be erected close to the Application Site margins to provide nesting and sheltering habitat for invertebrates including pollinator species. A number of non-swarming bees, which often adopt these habitats, are Priority species for England.

7.37. For optimal warmth, the hotels will be erected in south- or southeast-facing areas not shaded by solar panels (see Figure 14 of Volume 3, Technical Appendix 1: LVA).

Management in Years 1-3

7.38. The wildlife shelters can be installed at any stage within the first year. The final location and number of bird nest boxes and bat boxes will be determined on site by an ecologist.

7.39. Bird boxes should be cleaned annually to ensure that parasite build up doesn't occur. These boxes should be cleaned in October. This prevents the build-up of parasites and avoids the risk of disturbing birds using it as a roosting site during the cold winter months.

7.40. All bats and their roosts are protected by law and it is an offence to deliberately disturb, handle or kill bats. If a bat box need needs to be opened at any stage, a suitably licenced bat worker must be present. This includes during cleaning of the bat boxes.

7.41. The invertebrate hotels will be checked once each summer for a minimum of five years after installation. Any missing or damaged hotels will be replaced within seven weeks (to allow for sourcing and deployment).

RECOMMENDED MANAGEMENT

7.42. Management recommendations in this BMP have been made:

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

7.43. Recommendations of management actions required to achieve the desired condition of the site are summarised within Table 8-7 of this document. The table also provides a brief summary of the rationale and possible constraints to adopting the recommended management.

Table 8-7 Recommended Management

Objective	Action Plan Task	Timescale	Notes
To enhance the quality of habitats present	Create a diverse grassland with varied structure After the development of the solar farm, sections of wildflower, fine grasses and will be sown across the site.	Year 1	Most of the site will be sheep grazed with a stocking rate that will allow varied sward structure across the site. Areas of wetland meadow will be planted in order to support bird species such as
Creating a diversity of habitats within the site	Wildflower mix to contain: Bird's-foot-trefoil (*Lotus corniculatus*), black knapweed (*Centaurea nigra*), red clover (*Trifolium pratense*) and selfheal (*Prunella vulgaris*) amongst other species as listed in Table 8-2.	Year 1	Wildflower mix will provide an insect rich habitat. Sections of wildflower meadow to be fenced off to create un-grazed wildflower area.
Creating a diversity of habitats within the site	Grass mix to contain: Common bent (*Agrostis capillaris*), creeping red fescue (*Festuca rubra*), sheeps fescue (*Festuca ovina*), smooth stalked meadow grass (*Poa pratensis*), rough stalked meadow grass (*Poa trivialis*) and crested dogs tail (*Cynosurus cristatus*) as listed in Table 8-1.	Year 1	Fine grasses contain an ideal nesting habitat for ground-nesting birds such as skylarks and lapwing. This will also provide habitat for small mammals and larvae of pollinating insects, including butterflies and moths.
Creating a diversity of habitats within the site	Tree screening mix to contain: Alder (*Alnus glutinosa*), hawthorn (*Crateugus monogyna*), spindle (*Euonymus Europaeus*), holly (*Ilex*	Year 1	Planted trees provide an ideal nesting habitat for birds and in time once mature will have roosting potential for bats. Areas with planted

	aquifolium), blackthorn (*Prunus spinosa*), elderberry (*Sambucus nigra*), guelder rose (*Vibunum opulus*) and grey willow (*Salix cinerea*). Feathered tree mix to contain: alder (*Alnus glutinosa*), bird cherry (*Prunus padus*), sessile oak (*Quercus petrea*), crab apple (*Malus sylvestris*) and whitebeam (*Sorbus aria*)		trees will also provide habitat for small/medium mammals and invertebrates.
Creating a diversity of habitats within the site	Hedgerow mix to contain: hazel (*Corylus avellana*), blackthorn (*Prunus spinosa*), dog rose (*Rosa canina*), guelder rose (*Viburnum opulus*), hawthorn (*Crategus monogyna*), holly (Ilex aquifolium), spindle (*Euonymus europaeus*).		Planted trees provide an ideal nesting habitat for birds and foraging/commuting habitat for bats. Areas with planted hedgerow will also provide habitat for small/medium mammals and invertebrates butterflies and moths.
Ensure fencing does not inhibit the movement of wildlife	To allow movement of badgers, and other small mammals across the development area mammal gates will be installed within security fencing at locations determined during the pre-commencement check.	Year 1 (during construction phase)	Gates are to be located where mammal paths are present and where badger buffers are present, where necessary. A 10cm gap beneath security fencing in order to allow mammals to move freely throughout the site.
Creating a diversity of habitats within the site	Creation of hibernaculum (3 in total), stone piles and log piles	Year 1	See **Appendix A** The hibernaculum comprises of a log, rock and stone pile aimed at providing shelter for herptile species to hibernate. However, the hibernaculum / log pile may also be used by a

			variety of insects and small mammals.
Creating a diversity of habitats within the site	Creation of bat roosting habitat 4 bat boxes will be placed on 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.
Creating a diversity of habitats within the site	Creation of bird nesting habitat 10 bird boxes will be placed on mature trees within the site	Year 1	The creation of nesting habitat, along with the creation of species rich habitat that will encourage an abundance of invertebrate life (a potential food source). Boxes installed should include a mixture of single-hole and open-fronted bird boxes.
Creating a diversity of habitats within the site	Creation of invertebrate friendly habitat Four invertebrate hotels to be placed within the site	checked once each summer for a minimum of five years after installation	Create an environment to encourage invertebrates which are both pollinators and potential food source for other species within the site
Maintaining the species rich ground flora around solar PV installation	Low intensity sheep grazing	Each year	Low intensity sheep grazing will ensure that the areas of shorter swards and scrub will be managed and 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[13], 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, providing suitable habitat for a range of wildlife.

[13] Hedgelink UK, The Complete Hedge Good Management Guide, Available at www.hedgelink.org.uk

8. GENERAL CONSIDERATIONS

Obligations

8.2. During each of the development phases there are a number of legal obligations that should be considered by all those involved in site work:

- 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 on the same basis.
- Ensure all relevant Health & Safety at Work Act obligations are met on the same basis.

Good Ecological Practice

8.3. 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.

9. INDICATIVE MANAGEMENT SCHEDULE

9.2. Appendix B shows possible months in which activities will commence within the initial planting period after the construction phase.

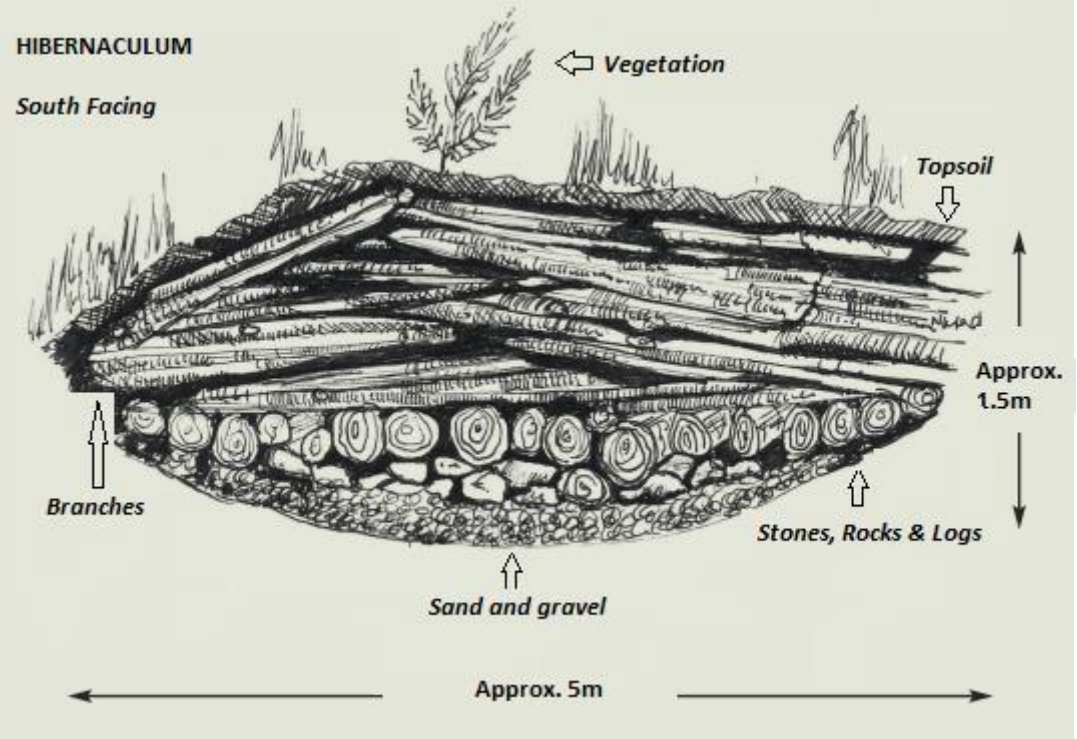
10. DECOMMISSIONING

10.2. At the end of the operational period, decommissioning will take place. This 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 40-year lifespan of the Proposed Amendment would be of benefit to wildlife.

11. APPENDICIES

APPENDIX A - HIBERNACULUM CONSTRUCTION

11.2. The hibernaculum will follow the basic construction set out below, with the log and stone piles 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.

APPENDIX B-INDICATIVE MANAGEMENT SCHEDULE

Timeframes for Management Activities

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1 – Initial Habitat Enhancement												
Hedgerow and tree planting	✓	✓								✓	✓	✓
Removal of existing vegetation and seeds beneath solar panels	✓	✓	✓	✓					✓	✓	✓	✓
Cultivate and allow soil to settle						✓	✓					
Grassland sowing beneath solar panels and wildflower meadow								✓	✓			
Field margin grazing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Installation of bat and bird boxes, invertebrate hotels and herptile hibernacula	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year 2 - Annual Habitat Management												
Grazing of grassland beneath solar panels (if sward is established)	✓	✓							✓	✓	✓	✓
Field margin grazing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Light pruning of newly planted hedgerow sections	✓	✓							✓			
Checks by contractor through the initial maintenance period to comprise weed clearance, watering and pruning			✓	✓	✓	✓	✓	✓				

Replacement of any dead, dying or diseased newly planted trees or hedgerow										✓	✓	✓
Existing hedgerows cut on a 2- or 3-year cycle, with no more than 1/3 cut in any one year	✓	✓										
Ongoing Annual Management – Year 3 onwards												
Grazing of grassland beneath solar panels	✓	✓							✓	✓	✓	✓
Ongoing Annual Management – Year 3-4												
Field margin cutting									✓	✓		
Ongoing Annual Management – Year 4 onwards												
Grassland margin cutting (after year three)									✓	✓		
Light pruning of newly planted hedgerow sections	✓	✓							✓			
Existing hedgerows cut on a 2- or 3-year cycle. All hedgerows from year 5, with no more than 1/3 cut in any one year	✓	✓										

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