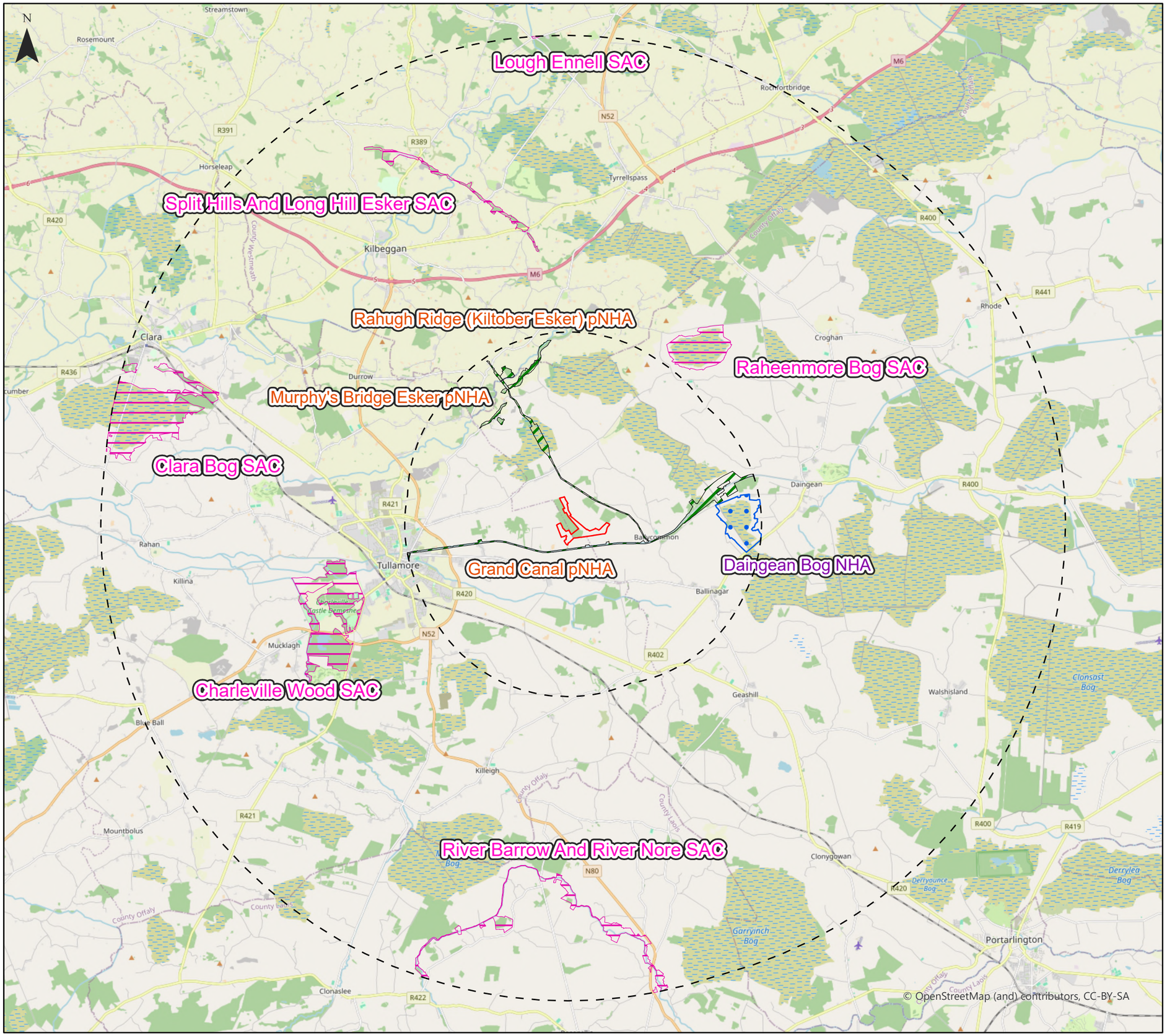
Ballyteige Solar Farm Amendment
Environmental Designations Map
Figure 2.1



0 3.75 7.5 15 Kilometres

Key

- Development boundary
- 15km Study Area
- 5km Study Area
- Special Areas of Conservation (SACs)
- Natural Hertiage Areas (NHAs)
- proposed Natural Hertiage Areas (pNHAs)

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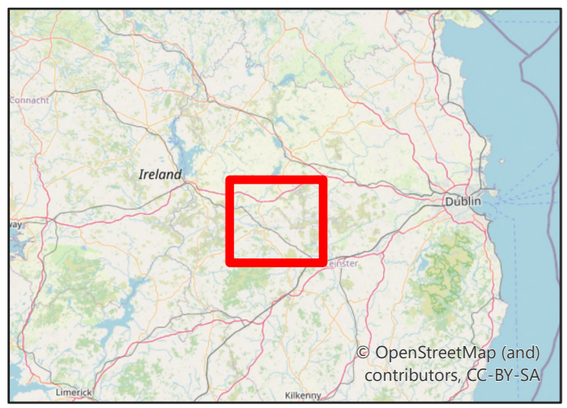

Date: 21/11/2025
Drawn By: Kellie Kerr
Scale (A3): 1:125,000
Drawing No: NEO00687/023I/B

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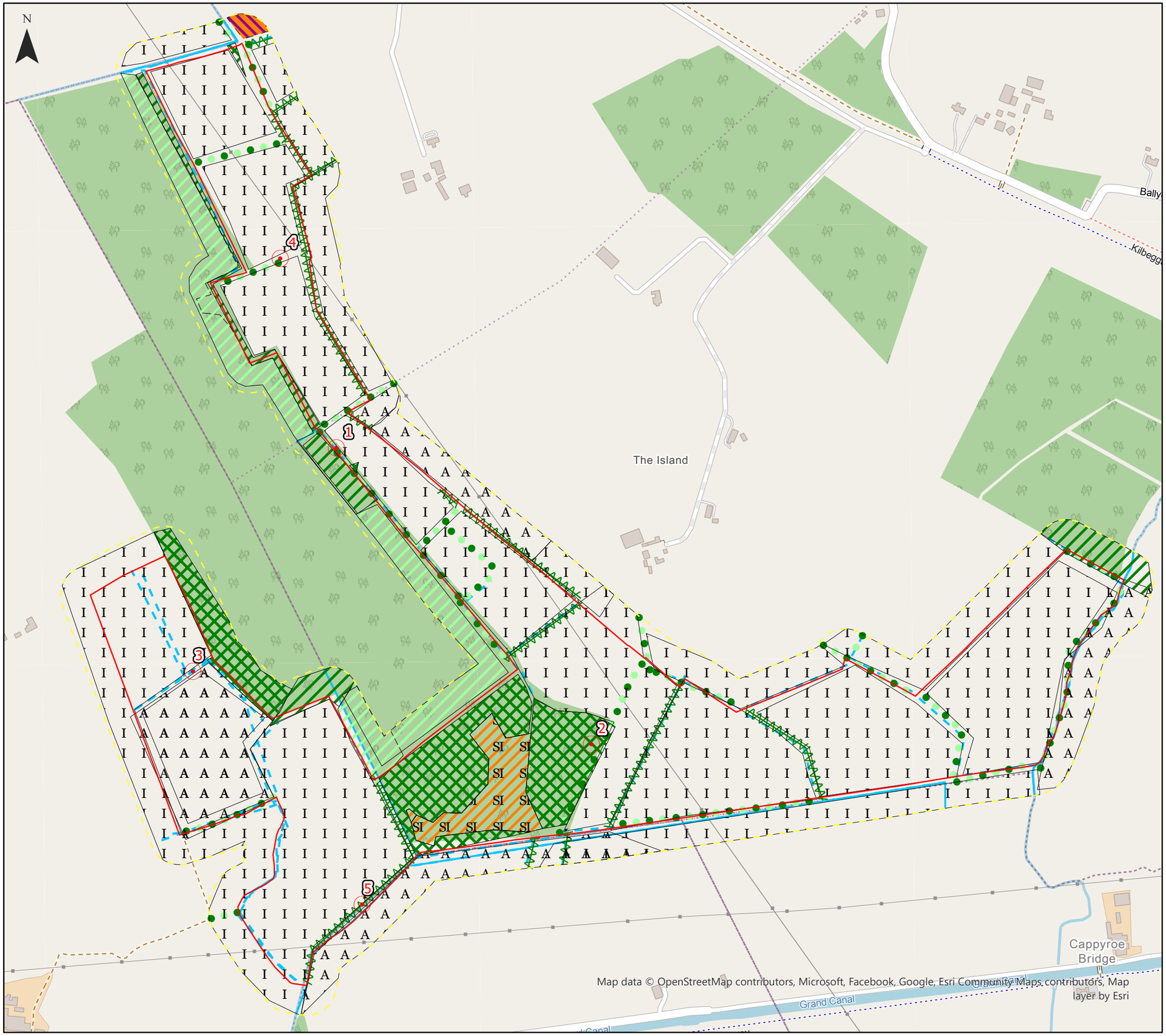
Ballyteige Solar Farm Amendment
Fossitt Habitat Map
Figure 2.2



Key

- Development Boundary
- 50m ESA
- Target Notes
- BC1 Arable Crops
- GA1 Improved Agricultural Grassland
- GS3 Dry-Humid Acid Grassland
- GS4 Wet Grassland
- WD1 (Mixed) Broadleaved Woodland
- WD4 Conifer Plantation
- WS1 Scrub
- FW2 Depositing/Lowland Watercourses
- FW4 Drainage Ditches
- WL1 Hedgerows
- WL2 Treelines

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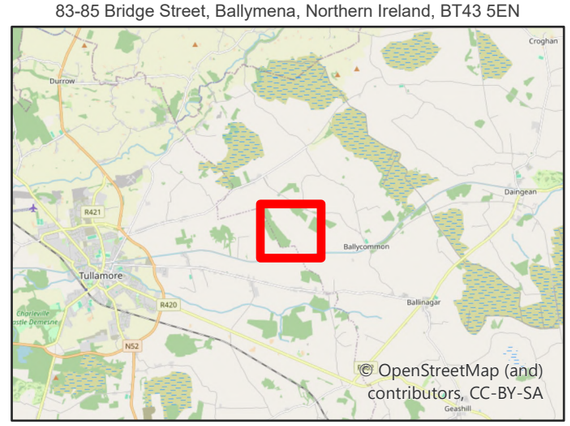

Date: 21/11/2025
Drawn By: Mark McBride
Scale (A3): 1:6,400
Drawing No: NEO00687/0037I/A

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Appendix 2B: Photographs

Photo: 1: Badger sett entrance (TN 1)

Photo 2: Burrow (rabbit) (TN 2)

Photo 3: Badger Sett Entrance (2024 survey) TN3

Photo 4: Field with scrub

Photo 5: Drainage (OWP ditch)

Photo 6: Mixed Broadleaved woodland

Photo 7: Coniferous woodland

Photo 8: Scrub

Photo 9: Improved Agricultural Grassland

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Appendix 2C – Habitats of Bats in Ireland

Appendix 2C– Habitat of Bat Species in Ireland

Table 1: General/Preferred Foraging and Commuting Habitats of Bat Species

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.

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Appendix 2D: Biodiversity Management Plan

Ballyteige Solar Farm Amendment (Planning ref. 2198)

Original report: 08/10/2020

Amendment: 20/11/2025

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Prepared For:

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	Name	Date
Edited By:	Kellie Kerr	20/11/2025
Checked By:	Colleen Patterson	20/11/2025
	Name	**Signature**
Approved By	Paul Neary	

Contents

EXECUTIVE SUMMARY

1.1. Objectives have been established to enhance and maintain the biodiversity of the land at the proposed solar farm development in the townlands of Ballyteige Little, Ballyteige Big and Colehill, Tullamore Co. Offaly. These include planting of species-rich hedgerows to provide a plentiful source of food and shelter for a range of fauna species. Other enhancement measures include creating a herptile hibernaculum and adding bird and bat boxes to the site.

1.2. Action tasks have been formulated within this document to enable the objectives to be met and to maximise the sites potential for supporting wildlife. Species which have been given priority within this management plan include farmland birds, bees, bats and herptile species.

1.3. While the previous recommendations have been included within this report remain consistent with the previously consented Biodiversity Management Plan which was completed in October 2020. As part of the amendment application, updated guidance suggests that natural meadow regeneration is more beneficial for habitats and should be considered as an alternative.

1.4. Fossitt habitat surveys of the site were conducted in June 2020 and October 2024 to assess the current baseline of the Application Site. An Ecological Impact Assessment (EcIA)[1] was then conducted to assess the local area and its ability to support a range of wildlife, as part of the full planning application.

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

[1] Technical Appendix 2: Ecological Impact Assessment (2025) Ballyteige Solar Farm. Neo Environmental.

INTRODUCTION

BACKGROUND

1.6. Neo Environmental Ltd has been appointed by RES on behalf of Ballyteige Solar Limited (the "Applicant") to produce a Biodiversity Management Plan for a Proposed Amendment to the consented Ballytiege Solar Farm (the "Proposed Amendment") in the townlands of Ballyteige Little, Ballyteige Big and Colehill Co. Offaly (the "Application Site").

1.7. Please see **Figure 203 of Volume 2** for the layout of the development.

DEVELOPMENT DESCRIPTION

Site Description

1.8. The Application Site is located in a rural setting, approximately 4.8km east of Tullamore and 3.9km northwest of Ballinagar. The main Grand Canal runs in a general east to west direction, circa 150m to the south of the Proposed Development (at its closest point). A narrower section of the canal runs northwest to southeast to the west of, and paralleled to, the Wood of O road circa 350m to the east of the main application site. Centred at approximate Irish Grid Reference (IGR) N 39618 26489, the Application Site is relatively flat and lies at an elevation of approximately 68 – 74m above ordnance datum (AOD), covering a total area of circa 60.53ha.

1.9. Comprising 16 fields, the Application Site primarily consists of pastureland, with one field to the southwest corner under arable crop. Fields are bound by a mixture of trees, hedgerows and post-and-wire fencing. Access to the Application Site is gained from the Wood of O road to the east of the Application Site.

Adopted Design Principles

1.10. Measures incorporated into the Proposed Development design include the following:

- A 5m buffer from hedgerows.
- 2m Buffer from Field Drains
- Tree Buffers dependant on height
- 10m OPW Drain Buffers
- 10m Buffer for overhead lines

- 30m Badger Sett Buffer (50m during the breeding season, if active)

PROPOSED AMENDMENT

1.11. Overall, the proposed footprint constitutes a relatively small percentage of the total area of the Application Site (60.53ha):

- 22,191.3m2 for infrastructure (c. 3.67% of the Application Site area); and
- 167.5m2 for piling (c. 0.03% of the Application Site area).

1.12. The total ground disturbance area resulting from the Proposed Development is therefore 22,358.8m2 or c. 3.69% of the Application Site area.

1.13. The Proposed Development will consist of an amendment to a previously consented development (planning reference: 2198). The proposed amendment seeks minor modifications to the Consented Development including the following:

- Removal of the 38kV substation and infrastructure within the most northern field (Field 1),
- Internal access track reduced from c.3.4km to c. 3.2km, relocated and tweaked to include turning areas,
- String inverters are used instead of combined central inverters and MV transformers. The central MV transformers remain, and increase from 11No. to 12 No., however there will be a reduction in their associated hardstanding areas,
- The number of string inverters is 128,
- Table layout updated (reduced),
- PV angle tilt reduced from 10º and 30º to 10º and 20º,
- Separation area between infrastructure and OHL towers increased,
- An additional badger sett buffer added (due to new sett found during updated Fossitt Habitat Survey),
- Temporary Construction Compound has been relocated from Field 1 to Field 4,
- Alter Condition No. 10 to increase the boundary fencing from 1.8m-2m high to 2.4m high and reduce in the perimeter fence length,

- CCTV number increase from 81 to 118 and their locations have been amended,
- Adjustment of the development period from 5 years to 10 years, and
- Alter Condition No. 11 to change the operational lifetime from 35 years to 40 years.

1.14. The Application Site was initially deemed an acceptable location for solar development in 2022 when Offaly County Council ('OCC') provided a grant of permission for a solar PV development proposed by the Applicant on 60.53 hectares of land in the townlands of Ballyteige Little, Ballyteige Big and Colehill, Tullamore, Co. Offaly.

1.15. The original development proposal (planning reference: 2198) was granted permission following a comprehensive planning and environmental assessment process. The consented scheme comprised the construction of a solar PV energy development with a total site area of 60.53 hectares, to include a single storey electrical substation building, inverter substations, modules, solar PV ground mounted on support structures, a temporary construction compound, internal access tracks, security fencing, electrical cabling and ducting, CCTV and other ancillary infrastructure, drainage, additional landscaping and habitat enhancement as required and associated site development works relating to the access of the site. The operational lifespan was 35 years.

GUIDANCE

1.16. 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.

1.17. 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 in 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 absence of current Irish guidance.

1.18. According to 'Biodiversity Guidance for Solar Developments'[2] the BMP should:

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

- *"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[3], 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."*

1.19. The BMP has also been informed by the extended Fossitt habitat surveys conducted in September 2016, April 2020 and October 2024

OBJECTIVE OF THE BIODIVERSITY MANAGEMENT PLAN

1.20. 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 Application Site boundary will increase the sites capability of supporting wildlife, through generation of renewable energy.

1.21. This will be achieved by:

- Creating and maintaining a species-rich diverse grassland with a varied sward structure;
- Creating and maintaining a wildflower meadow;
- Creating and maintaining wild bird seed mix strips;

[3] Natural Environmental and Rural Communities Act (NERC) 2006, available at www.legislation.gov.uk

- Creating and maintaining species-rich hedgerows;
- Creating and maintaining wildlife shelters for priority and locally important species;
- Ensure no net loss of biodiversity within the Application Site as a result of the habitat creation scheme; and
- Maximise the floral and faunal biodiversity of the created and retained habitats.

CURRENT CONSERVATION & BIODIVERSITY

National Biodiversity Action Plan ("NBAP") 2023-2030 [4]

1.22. Ireland's 4th National Biodiversity Action Plan 2023-2030 sets out a vision and five strategic objectives to halt the decline of biodiversity across Ireland, as follows:

- Objective 1 - Adopt a Whole of Government, Whole of Society Approach to Biodiversity
- Objective 2 - Meet Urgent Conservation and Restoration Needs
- Objective 3 - Secure Nature's Contribution to People
- Objective 4 - Enhance the Evidence Base for Action on Biodiversity
- Objective 5 - Strengthen Ireland's Contribution to International Biodiversity Initiatives

1.23. 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.

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

National Biodiversity Action Strategy 2022-2026[5]

1.25. 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

[4] 4th_National_Biodiversity_Action_Plan.pdf (npws.ie)
[5] OPW (2022) Biodiversity Action Strategy 2022-2026 - gov - OPW Biodiversity Action Strategy 2022 - 2026 (www.gov.ie)

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

All Ireland Pollinator Plan 2021-2025[6]

1.26. 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.

1.27. 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.

[6] 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

– **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.

1.28. 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.

County Offaly Biodiversity Action Plan 2025-2030[7]

1.29. The aim of the County Offaly Biodiversity Action Plan 2025-2030 is to build on previous works within the county to protect and enhance natural areas to benefit biodiversity and people. The strategic objectives of the plan are concerned with:

- Surveys and monitoring
- Actions for biodiversity
- Alien invasive species
- Building resilience
- Awareness and engagement

Local Conservation

1.30. The Proposed Amendment does not lie within or directly adjacent to any statutory or non-statutory designated environmental sites. Within 15km of the Application Site boundary there are six Natura 2000 designated sites, six Special Areas of Conservation (SACs); namely, Raheenmore Bog Sac, Charleville Wood SAC, Spilt Hills and Long Esker SAC, River Barrow and River Nore SAC, Clara Bog SAC, Lough Ennel SAC.

1.31. There are no Special Protection Areas (SPAs) identified within the 15km study zone, and the Application Site is not considered likely to support commuting species outside of this Zone of Influence (ZoI).

1.32. Please refer to the supporting Natura Impact Statement report for details of all European sites within the ZoI of the Proposed Amendment Site.

1.33. From the findings of the EcIA and NIS it is considered that with the implementation of design, best practice and mitigation measures the Proposed Amendment will not significantly impact

[7] Offaly County Council (2025) *Offaly Biodiversity Action Plan 2025-2030*. Available at: https://www.offaly.ie/app/uploads/Offaly-Biodiversity-action-Plan-2025-2030.pdf

upon any of the designated and non-designated sites located within the ZoI of the Proposed Amendment site.

HABITATS & SPECIES PRESENT

1.34. An extended Fossitt habitat and species scoping survey of the Proposed Development was undertaken on the 3rd June 2020 and updated on 10th October 2024. The following habitat types were identified:

- Arable Crops (BC1)
- Improved Agricultural Grassland (GA1)
- Scrub (WS1)
- Dry-Humid Acid Grassland (BC1)
- Wet Grassland (GS4)
- Conifer Plantation (WD4)
- (Mixed) Broadleaved Woodland (WD1)
- Drainage Ditches (FW4)
- Hedgerows (WL1)
- Treelines (WL2)
- Depositing/Lowland Watercourses (FW2)

(Note: Fossitt classification within brackets).

Fauna

1.35. The potential presence of protected species within the study area was assessed during the original application in 2020 using a data search conducted through the NBDC. An updated search was carried out in 2024 and most recently in November 2025. This identified records of invasive, rare, scarce and protected species within 2km of the Proposed Amendment location.

1.36. The Application Site is located within the 1km grid squares N3926, N4026, N4025 and N3925. A database search was also carried out for adjacent grid squares to ensure a full assessment of the 2km radius.

1.37. 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.

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

1.39. The Application Site and adjacent areas offer suitable habitat for otter, badger, bat, bird and herptile species which are known to be present in the local area.

Badger

1.40. Records of badger were identified within the 2km desk-study data search. Definitive signs of badger activity were noted. During the 2020 survey one inactive outlier sett was noted and during the updated species scoping survey in October 2025 there was an additional badger sett found within the Proposed Amendment Site.

1.41. Appropriate buffers of 10m (in which no construction activities will take place), 20m (only light work will occur, with no use of wheeled vehicles) and 30m (no use of heavy machinery) will be implemented around all badger setts present to reduce any chance of disturbance to the species[8]. During the breeding season (December to June inclusive), none of the above works should be undertaken within 50m of any sett deemed active prior to commencement. There should be no piling activity within 150m of active setts.

1.42. Suitable habitats for badgers were observed, including woodland and scrub for sett-building and arable habitat, amenity grassland and improved agricultural grassland for foraging badgers.

Bats

1.43. There were no records of bats in the 2km data search of the site. Improved grassland and arable habitats form the majority of this site, offering sub-optimal foraging habitat for bat species due to their limited prey abundance. The woodlands, treelines and hedgerows provide more suitable foraging and roosting habitat, while the watercourse, drainage ditches, scrub and wet grassland will also provide some foraging opportunities.

1.44. No sightings or field signs of bats were observed within the survey area. However, there were bat boxes identified within the Application Site during the Fossitt habitat survey, the location of this target note has been mapped and will be maintained.

Otter

1.45. Records of otter were identified by the 2km desk-study data search.

1.46. No sightings or field signs of otter were noted during the site walkover. However, suitable habitat for foraging/commuting otter was noted in the survey area. The watercourse and drainage ditches within the Development Area may provide suitable habitat for foraging and

[8] Available at: https://cieem.net/resource/guidelines-for-the-treatment-of-badgers-prior-to-the-construction-of-national-road-schemes/

commuting otters. However, most habitats within the Application Site are considered to be sub-optimal for otter, as these are predominantly arable grassland, bound by hedgerows and treelines. Therefore, the use of the Application Site by otter is likely to be restricted to foraging/commuting otter.

Pygmy Shrew

1.47. Records of pygmy shrew were identified within the 2km desk-study data search. This species is adapted to a wide range of habitats including improved grassland and hedgerows.

1.48. No evidence of this species was identified during the walkover surveys.

Red Squirrel

1.49. Records of red squirrel were identified within the 2km desk-study data search.

1.50. Conifer and mixed broadleaf forest in the ESA may provide suitable habitat for red squirrel. However, most habitats within the Application Site are considered to be sub-optimal, as these are predominantly arable grassland, bound by hedgerows and treelines. Therefore, the use of the Application Site by red squirrel is likely to be restricted to commuting along tree lines due to the abundance of optimal habitat outside of the Development Area.

Pine Marten

1.51. Records of pine marten were identified within the 2km desk-study data search.

1.52. Conifer and mixed broadleaf forest on the edge of the Development Area may provide suitable habitat for pine marten. However, most habitats within the Application Site are considered to be sub-optimal, as these are predominantly arable grassland, bound by hedgerows and treelines.

Other Mammals

1.53. Records of Irish hare were identified within the 2km desk-study data search. This species is adapted to a wide range of habitats including improved grassland and arable crops. No evidence of this species was identified during the walkover surveys.

1.54. There were no direct observations of terrestrial mammals during either site walkover survey.

1.55. During the phase one survey an unidentified mammal hole/burrow was also noted. Rabbits and fox were identified in the 2km data survey; therefore, this is more than likely a rabbit burrow or fox earth.

Birds

1.56. A desk study was completed to identify any possible protected species on or within 2km of the site, and the potential of the Application Site to support protected species.

1.57. Hedgerows, treelines and mature trees within the ESA provide suitable habitat for breeding birds. Improved grassland and arable land may offer potential nesting and feeding habitat for farmland breeding birds as areas of the Application Site sward are between five and fifteen centimetres high due to grazing.

Herptiles

1.58. The 2km desk-study data search found records of common frog. This species lives in a wide range of habitats and is strongly associated with water bodies such as ponds and drainage ditches. Suitable habitat for this species observed within the ESA includes wet drainage ditches, watercourse and wet grassland.

1.59. Hedgerows, woodland and scrub provide refuge, foraging and commuting habitats for herptile species.

1.60. No sightings or evidence of herptile activity was noted within the survey area.

Invertebrates

1.61. Speckled wood, green-veined white, red-tailed bumblebee and peacock butterfly were identified in the 2km desk study. These species are not of conservation concern in Ireland. There is available habitat on site for all three species, which are present in a wide range of habitats including woodland and drainage ditches.

1.62. Common garden snail (*Cornu aspersum*) and vulgar slug (*Arion (Arion) vulgaris*) were identified in the 2km data search. These invasive species are widespread and well-established in Ireland. The development does not include pathways that would facilitate their population expansion and are not considered to be impacted by the Proposed Amendment.

1.63. No notable invertebrate species were recorded during the Fossitt habitat surveys.

Flora

1.64. Japanese Rose (*Rosa rugosa*) was noted in the 2km data search. This invasive species is widespread and well-established in Ireland. This species was not identified within the Application Site and the development does not include pathways that would facilitate their population expansion and are not considered to be impacted by the Proposed Amendment.

1.65. Corn Marigold (*Glebionis segetum*) is classed as near threatened, this species was not identified within the Application Site and is not considered to be impacted by the Proposed Amendment.

POTENTIAL IMPACTS

1.66. Potential impacts which could arise from a Development include:

- Potential habitat loss and fragmentation;
- Loss of commuting/foraging habitat;
- Disturbance during construction and decommissioning; and
- Potential contamination of surface waters.

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

Potential Habitat Loss and Fragmentation

1.68. The solar panels will be set on piles with minimal disturbance to the ground. The total ground disturbance area resulting from the Proposed Development is therefore 22,358.8m2 or c. 3.69% of the Application Site area. As the panels will be raised off the ground, greater than 96% of the Application Site will be accessible for plant growth and potential wildlife enhancements.

1.69. Currently the habitat present under the Proposed Amendment footprint is primarily arable crops. As the surrounding landscape is of a similar nature, the loss of these small areas will not be significant, and the alteration of this habitat will not result in fragmentation.

1.70. Post-construction, with the implementation of this BMP, existing habitats are to be enhanced, with new habitats created. This document sets out how the habitats including hedgerows, trees and grasslands within the Application Site will be sensitively managed to ensure the maximum potential of these habitats are maintained throughout the lifetime of the solar farm.

1.71. It is therefore demonstrated that the Proposed Amendment will have a positive impact on local habitats and will indeed deliver biodiversity enhancements to the benefit of the site and wider area.

Disturbance During Construction and Decommissioning

1.72. The construction and decommissioning phases of the Proposed Amendment have the greatest potential to impact upon local wildlife.

1.73. Measures will be implemented prior to construction and decommission work taking place to minimise any potential disturbance to wildlife. Mitigation measures recommended within the Ecological Impact Assessment (please refer to Table 2-13 of the EcIA) include:

- Pre-construction bird surveys, if works commence between March and August inclusive;
- Pre-construction badger survey;
- Pre-construction otter survey;
- Securely covering all excavations at the end of each working day to prevent accidental trapping of badger, otter or other small mammals.

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

1.75. With the creation of new species-rich grassland, wildflower meadow, along with the introduction of hibernacula, bat and bird boxes and the enhancement of existing hedgerows and sensitive management, the sites potential for supporting local wildlife could be greatly increased post-construction.

Potential Contamination of Surface Waters

1.76. The construction phase of a development has the potential for contamination of surface waters, if appropriate measures are not implemented. As part of the integral design of 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.

1.77. See the **Technical Appendix 8: Outline Construction Environmental Management Plan (OCEMP)** which was submitted as part of the consented solar farm, for an outline of best practice construction methods to mitigate impacts of surface waters.

HABITAT CREATION AND MANAGEMENT

1.78. Recommendations within this section remain consistent with the previously consented Biodiversity Management Plan which was completed on 8th October 2020. In the interim it is noted that some of these recommendations are no longer upkeeping with best practice for supporting pollinators and native species.[9]

1.79. While the previous recommendations have been included within this report, as part of the amendment application it is now widely considered that natural meadow regeneration is more beneficial for habitats and should be considered as an alternative. An on-site ecologist should be responsible for determining specific enhancements at the relevant stage of development.

1.80. 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 Proposed Amendment of the site.

1.81. Recommendations of management actions required to achieve the desired condition of the site are summarised within **Table 1-1** of this document. The table also provides a brief summary of the rationale and possible constraints to adopt the recommended management.

Recommended Management

1.82. Currently the arable land of which the majority of the Application Site comprises 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 1-1** below.

Habitat Enhancement

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

1.84. Habitats that will be created at the proposed solar farm development will include:

[9] Available at: https://pollinators.ie/wp-content/uploads/2023/07/AIPP-Solar-Farms-2023-WEB.pdf

- Sections of species-rich grass;
- Wild bird seed mixture;
- Wildflower meadow;
- Hibernaculum;
- Bird and bat boxes;
- Bee and beetle banks.

1.85. 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.

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

1.87. Features have been incorporated into the new Landscape and Ecology Management Plan which was submitted as part of the consented solar farm (see Figures 1.11a to 11f.11d,) and consist of the following measures.

MANAGEMENT OBJECTIVES AND ACTION PLAN

Table 1-1: 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, the appropriate mix 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. Any newly planted species will be fenced off from the rest of the field to prevent grazing by sheep.
Creating a diversity of habitats within the site	Wildflower mix to contain: Birds foot trefoil (*Lotus corniculatus*), black knapweed (*Centaurea nigra*), red clover (*Trifolium pratense*), red/white champion (*Silene diocia/latifolia*), selfheal (*Prunella vulgaris*), sainfoin (*Onobrychis viciifolia*), ox-eye daisy (*Leucanthemum vulgare*), black medic (*Medicago lupulina*), common vetch (*Vicia sativa*), lady's bedstraw (*Galium verum*), meadow vetchling (*Lathyrus pratensis*), meadow buttercup (*Ranunculus acris*), musk mallow (*Malva moschata*), yellow rattle (*Rhinanthus minor*) and yarrow (*achillea milliefolium*).	Year 1	Wildflower mix will provide an insect-rich habitat. Sections of wildflower meadow to be fenced off to create an un-grazed wildflower area.
Creating a diversity of habitats within the site	Fine grass mix to contain: Common bent (Agrostis capillaris), creeping red fescue (Festuca rubra), hard fescue (festuca longifolia) and smooth	Year 1	Fine grasses contain an ideal nesting habitat for ground nesting birds such as skylarks. This will also provide habitat for small mammals and larvae of

	stalked meadow grass (Poa pratensis).		pollinating insects, including butterflies and moths.
Creating a diversity of habitats within the site	Wild bird seed mix to contain: Mustard, spring wheat (*Triticum spp),* white/red millet (*Panicum miliaceum*), triticale *(× Triticosecale*) and barley (*Hordeum vulgare L*).	Year 1	Wild bird seed mix provides a seed rich habitat, providing a further food source for farmland birds and small mammals. The area of wild bird seed mix will be fenced off from the rest of the field to prevent grazing by sheep.
To enhance the quality of habitats present	Enhance existing hedgerow boundary Gap existing hedgerows with blackthorn (*Prunus spinosa)*, hawthorn (*Crataegus monogyna)*, ash (*Fraxinus excelsior)*, alder (*Alnus glutinosa)*, hazel (*Corylus avellana)* and holly (*Ilex aquifolium)*. These corridors will allow the movement of small mammals and herptile species. To ensure a diverse hedgerow with a good structure it is important to plant and maintain ground flora along the hedgerow.	Year 1	A hedgerow provides shelter and a source of food for a variety of species including birds, small mammals, amphibians, reptiles and butterflies. If the correct species are planted and maintained correctly, a hedgerow's potential can be maximised, providing food and shelter throughout the year.
Ensure fencing does not inhibit the movement of wildlife	To allow movement of badgers, small mammals and herptiles across the Proposed Development area the fence will be above ground level, with at least a 10cm gap at the base, allowing access for these species where required.	Year 1 (during construction phase)	Although badgers will not pass through a 10cm gap, they will dig a depression into the ground at the required areas.
Creating a diversity of	Creation of hibernaculum, stone piles and log piles	Year 1	See appendix A

habitats within the site			The hibernaculum comprise log, rock and stone piles, which are aimed at providing shelter for herptile species to hibernate. However, the hibernaculum and 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 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.
Creating a diversity of habitats within the site	Creation of bird nesting habitat Bird boxes will be placed on a few of the 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) and the wild bird seed mix areas will be beneficial to local birds. 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 banks and insect hotels Several earth banks shall be created across the site to support invertebrates.	Year 1	See Appendix B Some banks should be left bare, and south facing for insects such as solitary bees, while others should be sown with grass for beetles etc.
Maintaining the species rich	Low intensity sheep grazing	Each year	Low intensity sheep grazing will ensure that the areas of

ground flora around solar PV installation			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[10], 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.

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

HABITAT CREATION

1.88. The existing farmland groundcover (currently arable, improved agricultural grassland and a small amount of amenity grassland) should be enhanced where appropriate to maximise the sites potential to support species. Existing hedgerows will be enhanced, with a new hedgerow created within the Proposed Amendment boundary. These habitats will be in place and managed for the duration of the Proposed Amendment.

1.89. It is noted that these are recommended in line with the previously consented solar farm. As an alternative for pollinator friendly management, these sections can be left to naturally restore with species from the soil seed bank.

GRASSLAND

1.90. Within the Application Site the planting of species-rich diverse grassland will occur, with the management regime ensuring a varied sward structure.

Soil Stabilisation and Sward Establishment

1.91. A grass seed comprised of the mixture set out in Table 1-2 below, or a mix further tailored to the soil conditions following soil testing, will be sowed. The grass seed will be applied at a low-density rate of 20kg per ha, which will allow for natural regeneration.

1.92. 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.

1.93. 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. Sheep grazing the grassland areas post-development benefits local biodiversity by eliminating the requirement of pesticides used as part of the current management regime for crops in the arable field.

Table 1-2: Grassland Mix Component

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

Management

1.94. 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.

1.95. 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.

1.96. Once the grassland area is 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 round.

Wildflower Meadow

1.97. The wildflower meadow, as shown within **Figures –1.11a to 1.11f**, is a species-rich grassland composed of wildflowers and fine grasses, and this will create an insect-rich habitat and support a range of birds, mammals and invertebrates.

1.98. A wildflower mixture comprised of the mixture set out in **Table 1-3** below. If deemed appropriate, the seed will be applied at 40kg per ha, with a 20% wildflower and 80% grass mix.

Table 1-3: Wildflower Mix Component

SCIENTIFIC NAME	ENGLISH NAME	PERCENTAGE MIX (%)
Lotus corniculatus	Birds Foot Trefoil	8
Centaurea nigra	Black Knapweed	5
Medicago lupulina	Black Medick	3
Vicia sativa	Common Vetch	4
Galium verum	Lady's Bedstraw	2
Lathyrus pratensis	Meadow Vetchling	3
Ranunculus acris	Meadow Buttercup	3
Malva moschata	Musk Mallow	2
Leucanthemum vulgare	Ox-eye Daisy	8
Silene dioicia/latifolia	Red/White Campion	2
Trifolium repens	Red Clover	10
Prunella vulgaris	Selfheal	5
Onobrychis viciifolia	Sainfoin	36
Achillea milliefolium	Yarrow	6
Rhinanthus minor	Yellow Rattle	3

Management

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

1.100. 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.

1.101. After the wildflower mix has established, this area should only require one cutting 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.

Wild Bird Seed Mix

1.102. Wild bird seed mix provides a rich habitat, providing a further food source for farmland birds and small mammals. Locations of the wild bird seed mix can be found within **Figure 2.5, Appendix 2A.**

1.103. If deemed appropriate, the composition of the wild bird seed mixture is detailed in **Table 1-4** below and will be applied a rate of 250kg per ha.

Table 1-4: Wild Bird Seed Mix Component

SCIENTIFIC NAME	ENGLISH NAME	PERCENTAGE MIX (%)
Sinapis arvensis	Mustard	10
Triticum spp	Spring wheat	25
Panicum miliaceum	White millet	20
Panicum miliaceum	Red millet	10
xTriticosecale	Tritiicale	10
Hordeum vulgare	Barley	25

Management

1.104. Wild bird seed crops are normally sown in the spring, grow through the summer and are left un-harvested through the winter. It is anticipated that this approach will be undertaken at Paddock solar farm. The crop is sown annually following ploughing and harrowing to a fine tilth.

1.105. The wild seed mix will be fenced off to prevent any grazing by livestock.

Tree mix

1.106. Planting of species listed in **Table 1-5** have been proposed to screen the Proposed Development from the surrounding area.

1.107. Planting trees will provide potential new habitat for roosting bats and birds, providing food and shelter for other BAP Priority Species.

Table 1-5-: Tree mix

SCIENTIFIC NAME	ENGLISH NAME	PERCENTAGE OF TREES
Alnus glutinosa	Alder	20
Quercus petrea	Sessile Oak	20
Prunus padus	Bird Cherry	15
Malus syvestris	Crab Apple	20
Sorbus aria	Whitebeam	25

Hedgerow

1.108. This management plan will enhance the existing hedgerow boundaries by infilling gaps and planting new species-rich hedgerows (see –Figure 1.11a to 11.11f) which was submitted as part of the consented solar farm.

1.109. Infilling hedgerows will benefit a range of local species including BAP Priority Species such as badgers, otters, 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 connecting corridors.

1.110. The hedgerows will be planted as double staggered rows at 6 per metre, with a spacing of 300 - 400mm between rows and should contain the following species as proposed in Table 1-6.

Table 1-6: Hedgerow Species Mix

SCIENTIFIC NAME	ENGLISH NAME	PERCENTAGE OF TREES
Corylus avellana	Hazel	8
Crategus monogyna	Hawthorn	55
Euonymus Europaeus	Spindle	5
Ilex aquifolium	Holly	5
Lonicera periclymenum	Honeysuckle	2
Prunus spinosa	Blackthorn	15
Rosa canina	Dog Rose	3
Viburnum opulus	Guelder Rose	7

1.111. It is also important to plant and maintain ground flora along the hedgerow to provide suitable commuting corridors for small mammals and herptiles.

Management

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

1.113. 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

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

Bat boxes

1.115. Providing bat boxes will increase opportunities for roosting bats within the local area. 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.

1.116. 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[11] bat boxes should be draught-proof and made from a thermally stable material. They should be located where they will receive full/partial sunlight (southerly orientation). The boxes should also be positioned a minimum of 2m above the ground. Access points should also be clear of any obstructions.

1.117. 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.

1.118. 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 1-7** below. It is recommended that three of each box detailed below be installed on site.

Table 1-7: Details of Bat Boxes

BAT BOX	DETAILS	IMAGE
Schwegler 1FF[12]	Can be used as a summer roost or nursery site. Is open at the bottom and does not require cleaning.	

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

[12] Full specification available at: http://www.nhbs.com/title/158636/1ff-schwegler-bat-box-with-built-in-wooden-rear-panel

Schwegler 2F[13]	Standard box and most popular. Simple entrance role. Used as summer roosting space.	
Schwegler 1FD[14]	Specific for smaller bats such as common pipistrelle, nathusius pipistrlle, daubenton's bat and brown long-eared.	

Bird boxes

1.119. In order to enhance the site for nesting birds, a number of 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.

1.120. 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 sparrows.

1.121. 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.

1.122. A variety of bird boxes are recommended in the table 1-8 below.

Table 1-8: Details of Bird Boxes

BIRD BOX	DETAILS	IMAGE

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

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

1B Schwegler Nest Box[15]	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 and Crested Tit, Redstart, Nuthatch, Collared and Pied Flycatcher, Wryneck, Tree and House Sparrow and bats. The 26mm entrance hole suits Blue, Marsh, Coal and Crested Tit and possibly Wren. All other species are prevented from using the nest box due to the smaller entrance hole.	
2H Schwegler Robin Box[16]	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.	

1.123. It is recommended that 1B Schwegler nest boxes (three 32mm and three 26mm holes) and 2H Schwegler robin boxes are installed.

Hibernacula

1.124. The hibernacula comprise of log, rock and stone piles and is aimed at providing shelter for reptile and amphibians to hibernate. It may also be used by a variety of insects and small mammals. The hibernacula will follow the instructions laid out within Appendix B below.

Management

1.125. Final location and number of bird nest boxes and bat boxes to be determined on site by an ecologist.

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

1.126. The wildlife shelters can be installed at any stage within the first year.

1.127. Bird and bat boxes should be cleaned annually to ensure that parasite build up doesn't occur.

1.128. Bird 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.

1.129. 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 cleaning of the bat boxes.

INDICATIVE MANAGEMENT SCHEDULE

1.130. Table 1-9 below shows possible months in which activities will commence within the initial planting period after the construction phase.

Table 1-9: 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								✓	✓			
Field margin cutting									✓	✓		
Installation of bat and bird boxes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Year 2 - Annual Habitat Management												
Grazing of grassland beneath solar panels (if sward is established)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Field margin cutting									✓	✓		
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	✓	✓										

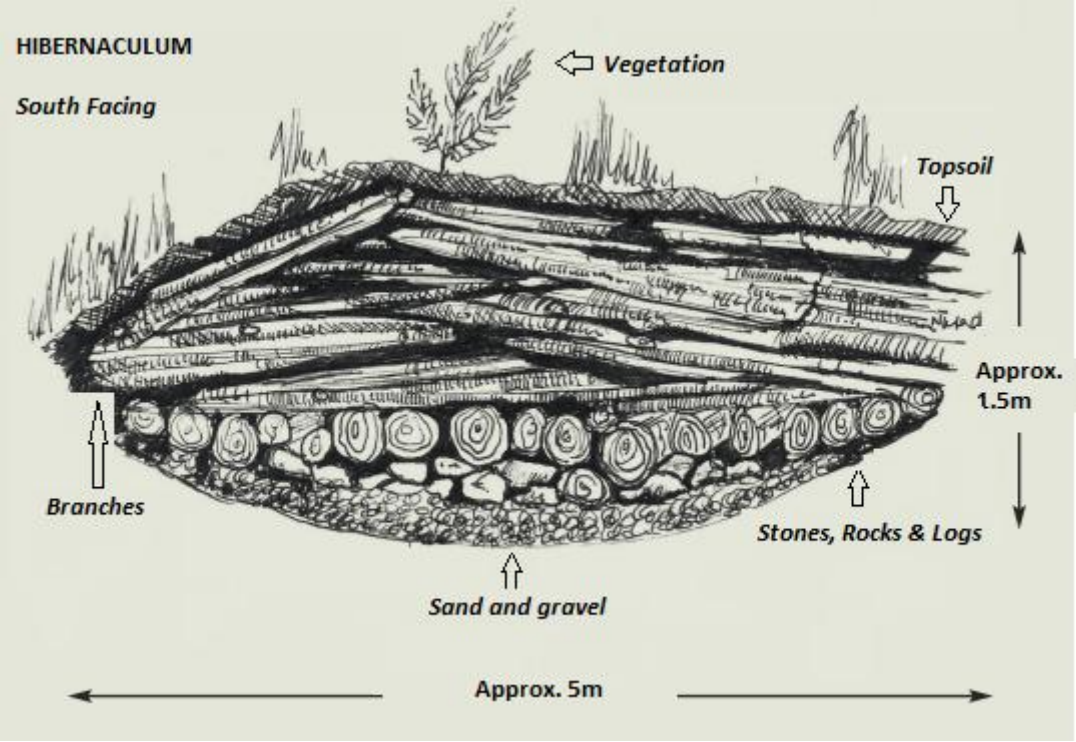
DECOMMISSIONING

1.131. 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 lifespan of the Proposed Amendment will be of benefit to wildlife.

APPENDICES

Appendix A - Hibernaculum Construction

1.132. 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 – Invertebrate Bank Creation

Beetle Bank

- September is the best month to establish the grass sward that forms a beetle bank.
- Create a raised bank of about 0.4 metres.
- The grass mix should include up to 60% of tussock-forming species such as cocksfoot or Scots timothy grass. For the rest of the mix choose native species and include fescues.
- Up to three cuts may be needed in the first summer (when the sward reaches 10 cm in height) to encourage the grasses to tiller and to help control invasive annual weeds.
- Once established, the grass strips should be cut typically no more than once every three years.

Bee Bank

- Material (such as aggregate and sand) will be shaped into a mound with various slopes, hollows and angles that may be utilised and favoured by different species.
- Vertical banks created on bee banks take much longer to vegetate and this makes them attractive to many species. Over time a bee bank will be vegetated over through succession.
- Planting vegetation in an open structure in front of a bee bank will provide extra habitat 0for invertebrates that are attracted to the bee bank.
- These banks should be created close to flower-rich areas which will provide important foraging areas for pollinators.

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