

Pollinator-friendly management of **SOLAR FARMS**

**National
Biodiversity
Data Centre**

Documenting Ireland's Wildlife



ISEA

Irish Solar Energy Association

**All-Ireland
Pollinator Plan**

www.pollinators.ie



Implementation coordinated by the

National Biodiversity Data Centre

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Guidelines 13

All-Ireland Pollinator Plan

Across the island of Ireland, pollinators are in decline. Experts agree that they are in trouble primarily due to a lack of food and shelter. A vast majority of our plants are pollinated by insects, (mostly wild bees), but our landscape doesn't provide the abundance and diversity of flowers they need to survive, or enough suitable nesting habitats. If we want to ensure the survival of our fruits, vegetables, and wild plants, we need to have healthy populations of wild bees and other pollinators.

There are over one hundred different types of wild bee on the island of Ireland. 20% are bumblebees and 80% are solitary bees. One third of these wild bees are threatened with extinction from the island. We also have one 'managed' pollinator; the honey bee, which is managed by beekeepers and is not in decline.

The All-Ireland Pollinator Plan was established in 2015 to help tackle pollinator declines. It is a framework bringing together sectors across the island of Ireland to create a landscape where pollinators can survive and thrive. The Pollinator Plan identifies and shares evidence-based recommendations to help pollinators so that we can collectively take steps to reverse declines and restore populations to healthy levels.

The All-Ireland Pollinator Plan is supported by over 100 governmental and non-governmental organisations who have pledged to take action to help pollinators. It is a shared plan of action. Everyone, from local communities to businesses, farmers, transport authorities, councils, schools and gardeners, has a role to play to help save these important insects.

About this guide:

This guide is about how to help pollinators on solar farms. It is part of a series of resources offering specific recommendations for helping pollinators in different sectors. All of the recommendations in this guideline are evidence-based, backed up by science.



Solar Energy on the island of Ireland

Across the island, both governments have committed to reduce overall greenhouse gas emissions and achieve net-zero emissions by 2050. It is expected that these targets will be achieved mainly through renewable energy expansion. Consequently, renewable energy developments in Ireland are predicted to increase rapidly over the coming years, solar energy in particular. This will have significant environmental impacts, particularly regarding the amount of land, and land-use change, that will be required to achieve these goals.

Environmental impacts of solar farms

Solar energy expansion is important for climate mitigation, but it can have consequences for biodiversity. Solar farms require huge areas of land which, during development, can undergo significant habitat destruction, degradation, fragmentation, and biodiversity loss. In recent years, the UK and Irish governments have become the first in the world to declare a climate and biodiversity crisis. It is important that we remember that this is a dual crisis and ensure there is a balance between climate and biodiversity mitigation measures.

Our natural habitats are declining at an alarming rate. When choosing locations for solar farms, we must avoid areas of high biodiversity value, and assess the ecology and potential management of the land to protect what is already there. In doing so, we can avoid further losses and optimise the land for energy production and biodiversity conservation.

How Solar Farms can help pollinators and biodiversity

Studies suggest that if solar farms are managed strategically, particularly on land that was previously managed intensively for agriculture, they can have positive impacts on local biodiversity. Furthermore, research has shown that managing vegetation on solar farms less intensively does not hinder the efficiency of energy production and can even increase local biodiversity.

Managing solar farms for pollinators can:

- ✓ Provide food and habitat for bees, hoverflies, moths, and other insects that provide important ecological and agricultural services such as crop pollination and natural pest control.
- ✓ Provide food, cover, and nesting habitat for some species of mammals, birds, reptiles, and amphibians.
- ✓ Significantly reduce wind and surface water erosion.
- ✓ Improve water quality by significantly reducing the use of fertilisers, herbicides, and pesticides.
- ✓ Reduce flooding by increasing organic matter and the water-holding capacity of soils.
- ✓ Improve the aesthetics of the solar farm.



Ten Actions to Help Pollinators on Solar Farms

The following recommendations are evidence-based actions for helping pollinating insects. They will also help biodiversity generally.

Every site is different and will have specific characteristics that dictate which measures can be used. Not every recommendation will work in every location. In all cases, make sure you seek site-specific ecological advice, and carry out careful planning and monitoring.

POLLINATOR ACTION | 1

Carefully consider site selection to minimise biodiversity loss

Studies have shown that solar farms can provide biodiversity benefits where appropriately located, designed and managed. However, poorly located, designed and managed solar farms could negatively impact biodiversity. It is important to limit any negative impacts of solar farms on local environments and ecosystems and promote and enhance biodiversity where possible.

Special areas of conservation, protected areas, biodiversity-rich habitats, and important locations such as bogs, peatlands, and native woodlands should not be used for solar farm developments. Sites that provide essential ecosystem services, such as natural flood zones, should also be avoided. Ideally, prioritise land that has previously been managed for intensive agriculture, as converting these areas to solar farms has been proven to positively impact local biodiversity.

Before sites are selected, a qualified ecologist should undertake an assessment of proposed locations to identify where biodiversity loss can be avoided, and where biodiversity can be enhanced. Sites proposed for development should also undergo a detailed carbon benefit analysis, particularly in areas of peatland soils where there are opportunities for peatland restoration and carbon sequestration.



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POLLINATOR ACTION | 2

Carry out a biodiversity assessment

Once sites are selected, a thorough biodiversity assessment by a qualified ecologist at the early design stage is vital. This will identify habitats and species to be protected during the construction and operation of the solar farm. The assessment should include a biodiversity metric (e.g., Natural England, 2023). If your site has sensitive habitats or species, on site or within the vicinity, site-specific plans should be drawn up to protect these in line with expert advice.

POLLINATOR ACTION | 3

Remove invasive species

Invasive non-native plant and animal species are extremely detrimental to biodiversity. They are the second greatest threat to biodiversity worldwide after habitat destruction. They can negatively impact native species, can transform habitats and threaten whole ecosystems causing serious problems to the environment and the economy. If the biodiversity assessment identifies invasive species on the site, an Invasive Species Management Plan by a specialist must be developed to assist in complying with relevant legislation.

Care should be taken not to introduce invasive species during the building phase.

For more information, see www.invasives.ie

Maintain and create native flowering hedgerows

Native hedgerows are extremely important for biodiversity. They support a diverse range of species, provide food and shelter for pollinators, and act as corridors for insects and other creatures, allowing them to move safely through the landscape.

Identifying and protecting existing native hedgerows with species such as Hawthorn and Blackthorn, is a crucial step in the development, construction, and operation of the solar farm.

Regular hedgerow cutting impedes the growth of blossom, which provides a vital source of food for pollinators when they emerge from hibernation. If you need to cut back your hedgerows, try to only do so between November and February and on a 3-year cycle. If you have to cut your hedgerow more regularly, try to stagger the maintenance on different areas (e.g., cut one third of the hedgerow every year instead of everything all at once) so that there is a constant food source for pollinators.

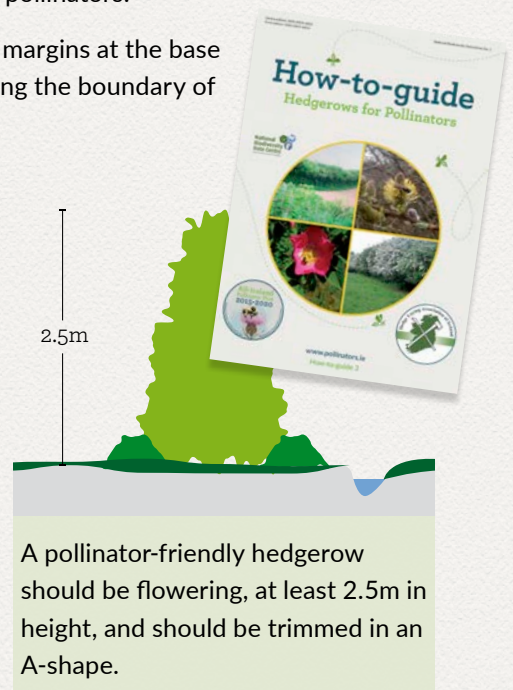
Hedgerows also provide places for pollinators to nest. Allow grassy margins at the base of all hedgerows. Where possible, try to plant native hedgerows along the boundary of the solar farm.



Intensively managed hedgerows don't offer flowers for bees or shelter for livestock



The ideal native hedge is made up of 75% Whitethorn and 25% of at least 4 other species.



Native hedgerow trees & shrubs

Willow



Blackthorn



Whitethorn/Hawthorn



Wild Cherry



Rowan



Spindle



Bramble



Wild Roses



Crab Apple



Ivy



Allow meadow regeneration in field margins and around solar panels

Solar farms are often required to keep a certain distance (usually 5m) between the panels and the site boundary. These peripheral areas provide the perfect opportunity to create new habitats, enhance biodiversity and support wildlife.

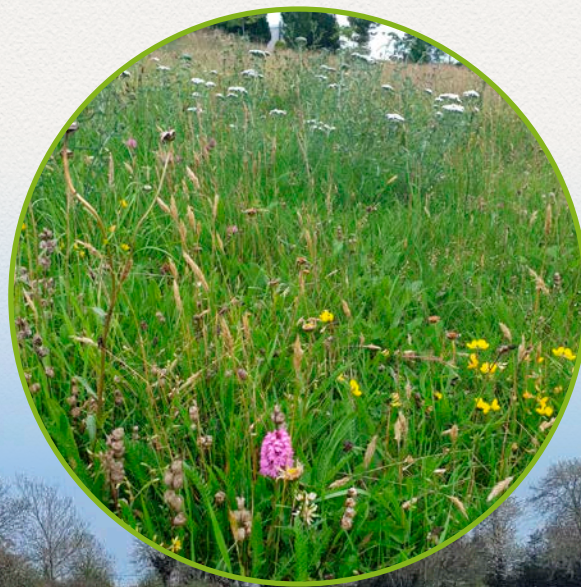
Field margins and areas around solar panels offer prime locations for the regeneration of natural meadows. Native meadows (or 'species-rich grassland') are hugely valuable habitats that have suffered serious declines in recent decades. They support a vast variety of life above and below ground, including native wildflowers which provide pollinators with a vital source of food.

To create this habitat, simply let wildflowers grow naturally. Over time, this will allow natural meadow regeneration, providing food and shelter for pollinators, invertebrates, ground nesting birds and small mammals, as well as maintaining healthy soils.

Carefully managed grazing can help maintain meadow areas and prevent scrub encroachment. Ensure grazing is limited to a small number of animals which are moved around throughout the year.

See [Farming for Nature](#) for a guide on how best to manage field margins for biodiversity.

It is recommended that Actions 4 and 5 are developed into a site-specific management plan for the landowner/ farmer to clearly outline how to manage hedgerows and meadows on their site for biodiversity.



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Idea box: Restoring meadows with green hay or brush harvested seed

Recreate a native meadow on site prior to the construction of the solar farm. This should be done under expert advice using either a green hay or brush harvesting approach. Both involve purchasing hay or seed from a local farmer who has a species-rich meadow. It is transferred from the donor site to the recipient solar farm site, recreating the local meadow in the new nearby location. It is only possible where a potential donor site occurs in the vicinity of the solar farm.

Establishing the native meadow on the site prior to construction is important as it may be harder once the panels are installed. This is also beneficial as bare soil may be prone to colonisation by more robust meadow plants. Once in place, it can be maintained through an annual hay cut, or by appropriate grazing.

Species-rich farmland hay meadow

Create nesting sites for wild bees

Wild pollinators need safe, undisturbed nesting sites to breed and hibernate over winter. Suitable areas include the base of hedgerows, bare earth banks, stone crevices, and holes drilled in unvarnished wood. Make sure you identify and protect existing nesting sites and consider establishing new ones.

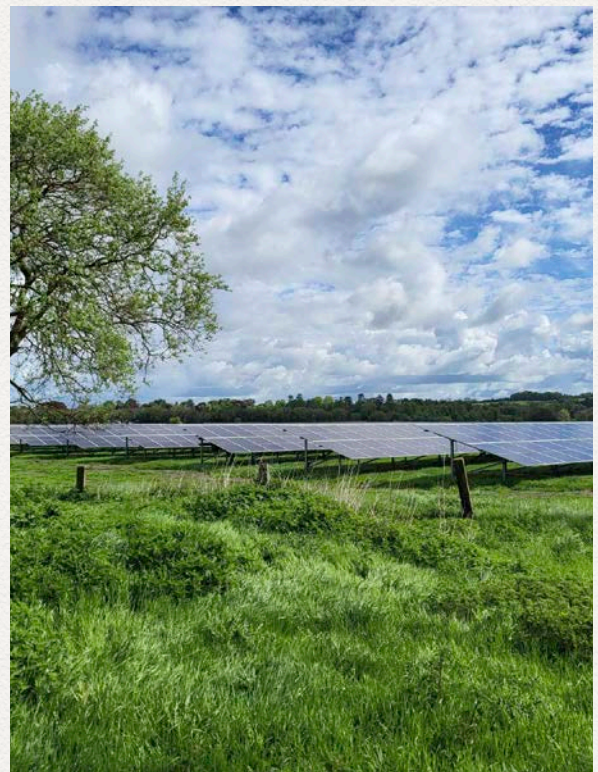


Mining bees at SSE's Knockastanna wind farm, Co. Limerick

Eliminate or reduce the use of pesticides

Pesticides, (including herbicides, fungicides, and insecticides) have negative effects on insect populations. Eliminating the use of herbicides will mean more wildflowers for pollinators to feed on. Consider whether vegetation removal is necessary or if plants can be left to grow undisturbed. Herbicides should not be used to 'tidy' vegetation; they should only be used sparingly to keep areas clear for necessary safety work and maintenance. In these cases, consider alternatives to chemical products.

Note: herbicides should still be used in the control of invasive species.



Hortland Solar Farm, Co. Kildare - owned by Neoen

POLLINATOR ACTION | 8

Avoid actions that may be detrimental to biodiversity

Plan carefully and ensure that all actions you take for biodiversity are evidence-based. Allowing species and habitats to regenerate naturally will often provide the best results. Less interference can be more beneficial than intensive management, as this allows the flora and fauna to establish in a natural way.

Avoid sowing wildflower seed mixes as these are not regulated and can be detrimental to biodiversity - simple changes to grass management practices can be more effective and less costly. Introducing honey bee hives will not help biodiversity. Honey bees are a domesticated pollinator, they are not in decline, and can compete for food with wild bees (bumblebees and solitary bees) who are already struggling.

POLLINATOR ACTION | 9

Raise awareness of pollinators and biodiversity

Communicate with your colleagues, employees, planners, and investors about the importance of mitigating biodiversity loss, the decline of pollinators, and what your company is doing to combat the climate and biodiversity crises. Share information and erect signage highlighting the areas of your solar farm(s) being managed for pollinators. Support and sponsor local biodiversity initiatives.



Ponds and ditches

Wet areas, like ponds and ditches, are very beneficial to wider biodiversity. They will be home to invertebrates, amphibians, birds and reptiles. If wet areas exist on the solar farm, they should be maintained. If creating new ponds, seek expert ecological advice on their siting, design and management.

Track progress and log your actions

To measure the impact of your actions, it is important to have a structured, regular monitoring system in place. Your initial biodiversity assessment should include a biodiversity metric, which can be tracked as the site is developed. Once the solar farm is operational, biodiversity assessments should be repeated by a qualified ecologist every five years. Monitoring assessments will identify if any changes or adaptations to management practices are needed, or if certain measures are not working. Monitoring biodiversity over a long period of time will allow you to see the impact of your work on the local and landscape level biodiversity.

Your site and actions should be added to the [Actions for Pollinators](#) map. This is a free-to-use online mapping system, managed by the National Biodiversity Data Centre, that allows you to register the actions you have taken for pollinators on your site. It is an important database that helps us build a picture of pollinator-friendly sites across the island of Ireland and keep track of how our landscape is supporting pollinators.

Summary

Solar farms have huge potential to hit energy targets and climate goals whilst mitigating biodiversity loss. With the correct management they can simultaneously harvest solar energy and conserve biodiversity. This win-win solution moves away from a trade-off approach to the climate and biodiversity crises, and instead promotes a method that does not tackle one at the expense of the other.

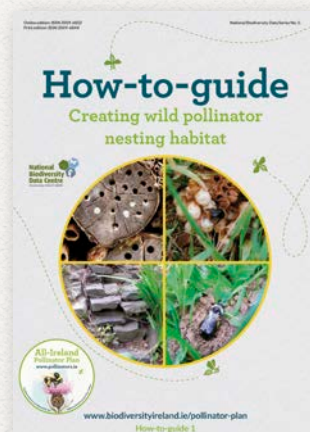
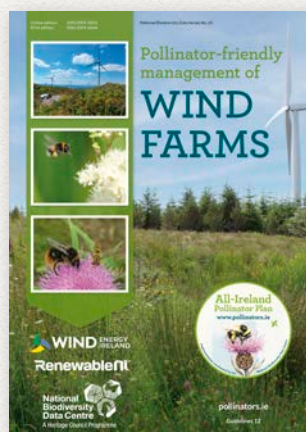
Biodiversity conservation and enhancement has a multitude of social, economic, and environmental benefits, and needs to be at the forefront of all development and management plans.

For more detailed information on how to help pollinators and biodiversity, and for free resources including how-to guides, flyers, posters and signage templates, visit pollinators.ie

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This booklet is one of a series of Guidelines produced to help different sectors take actions under the All-Ireland Pollinator Plan. For more information and other useful resources, please see www.pollinators.ie



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About the National Biodiversity Data Centre

The National Biodiversity Data Centre is a national organisation that collects and manages data to document Ireland's wildlife resource, and to track how it is changing. See maps.biodiversityireland.ie

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