

Protecting rare pollinators:

Shrill Carder Bee



**National
Biodiversity
Data Centre**
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**All-Ireland
Pollinator Plan**
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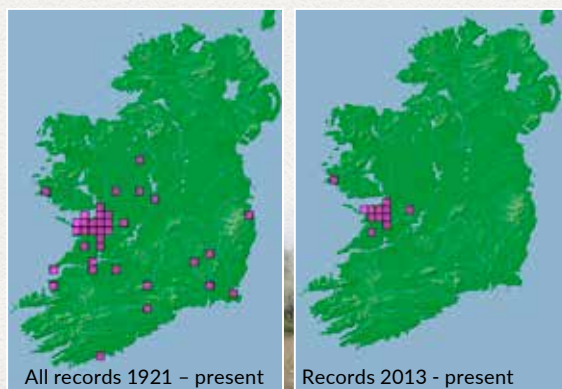
About the Shrill Carder Bee

The Shrill Carder Bee (*Bombus sylvarum*) is a rare bumblebee that is in decline across Europe. It is associated with open flower-rich grassland habitats and emerges from hibernation slightly later than other species to coincide with this food source becoming available.

Distribution

The Shrill Carder Bee is found across Europe but is rare at very northern latitudes¹. Historic records show that prior to 1980, it had a widespread but localised distribution in the southern half of Ireland. It has never been recorded further north than County Roscommon. Currently, populations are known only from the Burren Region, with occasional sightings in nearby areas such as south Galway.

In Britain, the Shrill Carder Bee was once widespread but has experienced a major decline in range and is now known from a small number of isolated populations in Wales and England².



Source: <https://maps.biodiversityireland.ie/Map/Terrestrial/Species/56033>

Conservation status

The Shrill Carder Bee is listed as Endangered in the Irish Regional Red List of Bees³. Although listed as Least Concern in the European Red List of Bees⁴, populations are experiencing declines throughout its range. It is listed as a priority species of conservation concern in England and Wales² and is Endangered in Belgium⁵ and Denmark⁶.



How to recognise the Shrill Carder Bee

Shrill Carder Bee queens can be up to 1.8cm in length, while males and workers are smaller. It has a reddish-orange tail and greenish-grey/yellowish-grey hairs. The thorax has a distinctive band of black hairs between the wings. Queens, workers and males all have this banding pattern. The common name comes from its distinctive high-pitched buzz when flying. The carder part of its common name refers to combing moss and dry grass to cover the nest which is similar to carding in the textile industry.

Confusion species: Older workers of the Common Carder Bee (*Bombus pascuorum*) are prone to fading and hair loss on the thorax which could be confused with a black band between the wings. You need to check if the black band on the thorax is a 'bald spot' (Common Carder Bee) or if it is a band of hairs (Shrill Carder Bee).



Shrill Carder Bee



Faded Common Carder Bee



Shrill Carder Bee

How does its lifecycle differ from other more common bumblebees in Ireland?

Small nest size: Shrill Carder Bee nests are small with less than 100 workers⁷.

Later emergence: Like other rare bumblebees such as the Great Yellow Bumblebee (*Bombus distinguendus*), the Shrill Carder Bee is strongly associated with open flower-rich grassland habitats in Ireland⁸. It typically emerges from

hibernation in May, which is later than other common bumblebee species, to coincide with when this food source will be available. Late emergence means the bees have a shorter timeframe in which to complete its lifecycle and are exposed to a greater risk of failing to produce sufficient offspring if floral resources are not available.



What it needs

A Suitable nest sites

The Shrill Carder Bee generally nests on the ground or underground using sheltered areas with slight hollows or disused small mammal burrows. Nests are typically in areas of rough vegetation with a litter layer, such as tussocky grasslands⁷. In the Burren, queens have been observed looking for nest sites in semi-natural grasslands, along stone walls, and scrub boundaries^{8,9}. Low levels of winter grazing or unmanaged grassland that has a tussocky or and rocky structure is ideal as the sides of the tussocks or rocks exposed to the sun are the most attractive for nesting.



B Supply of pollen and nectar throughout the season

Its foraging habitat is extensive flower-rich grassland, limestone pavement and flower-rich dunes characterised by an abundance of Vetches, Clover, Bird's-foot Trefoil and other legumes in May and June, followed by Common Knapweed, Devils-Bit Scabious and Red Bartsia in later summer and autumn. Little is known about foraging distances of the Shrill Carder Bee, with more research needed to determine the full forage range for this species in Ireland. Regardless, it is clear that flower-rich habitats need to be close to nesting sites so that the bees are supported throughout its lifecycle.

C Suitable hibernation sites

Overall, very little is known about hibernation sites for the Shrill Carder Bee, but it is thought to include loose soils under grass tussocks or under moss². As with many other bumblebee species, undisturbed north-facing banks of loose soil may also be used.



Native plants that provide food for the Shrill Carder Bee

Emerging queens												
Workers												
Males												
New queens												
	Apr	May	Jun	Jul	Aug	Sep						
Bush Vetch												
Dandelion												
Bitter Vetch												
Common Vetch												
Bramble												
Red Clover												
Common Vetch												
Yellow-rattle												
Kidney Vetch												
Sheep's-bit												
Meadow Vetchling												
Bird's-foot-trefoil ★												
White Clover												
Common Knapweed ★												
Red Bartsia ★												
Tufted Vetch												
Self-heal												
Spear Thistle												
Devil's-Bit Scabious ★												



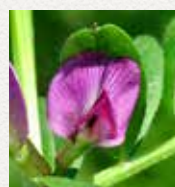
Bush Vetch



Dandelion



Bitter Vetch



Common Vetch



Bramble



Red Clover



Yellow-rattle



Kidney Vetch



Sheep's-bit



Meadow
Vetchling



Bird's-foot-
trefoil ★



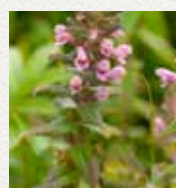
White Clover



Common
Knapweed ★



Devil's-Bit
Scabious ★



Red Bartsia ★



Tufted Vetch



Self-heal



Spear Thistle

★ Most important forage plants
based on experiences in Ireland

Thanks to Zoë Devlin for the use of plant images <https://www.wildflowersofireland.net>

Threats

Loss of habitat

The Shrill Carder Bee has been declining across much of its European range, primarily due to agricultural intensification of grassland sites. A major factor in the decline of rare bumblebees is the widespread replacement of hay meadows with silage and flower-poor fields dominated by grasses. This has led to a reduction of summer wildflowers throughout the agricultural landscape¹⁰. Land abandonment or under-management, leading to encroachment by scrub and trees, also plays a role. The Shrill Carder Bee needs a landscape interspersed with flower-rich grasslands and other semi-natural habitats. Appropriate management of species-rich meadows is crucial to halt the decline of the species.

Climate change

The Shrill Carder Bee has a narrower climatic niche than the Common Carder Bee (*Bombus pascuorum*) and has been found to be associated with warmer and drier areas of Western Europe¹¹. It is part of a southern grouping of bumblebee species in Britain¹². If climate change results in warmer summer temperatures in Ireland, this is unlikely to be a problem for the Shrill Carder Bee. However, increased frequency of extreme weather conditions such as prolonged rainfall and drought periods may have a negative impact, especially on more isolated populations outside the Burren. Sea level rise and flooding events may negatively impact coastal populations. If spring temperatures are unseasonably warm, queens may emerge from hibernation before sufficient suitable forage is available.

In Britain, the Shrill Carder Bee populations were found to be most likely to decline in areas nearer to the edges of its climatic niches, although this can be reduced locally by high food-resource levels¹¹. In Ireland, it has never been recorded further north of County Roscommon, and currently has become more restricted to the west in the Burren Region. This suggests there could be a suitable microhabitat in the Burren, in addition to good foraging habitat.

However, the Shrill Carder Bee may expand northwards as a result of climate change, provided suitable habitat (with food and nesting resources) is available. Very little is known on its dispersal distances, but it is suspected that it has a low dispersal distance in comparison to common species of bumblebee¹³. It is therefore important that interconnected networks of suitable habitat are available to allow it to respond to changes in climate.



Management recommendations

The Shrill Carder Bee does not have complex requirements. At the site level, it requires stable flower-rich grassland sites that provide food (pollen and nectar), safety (from pests, diseases and pesticides) and shelter (suitable nesting and hibernation spots).

This has been written based on studies and observations of Shrill Carder populations from PhD work conducted in the Burren Region^{8,9}. The Burren region in North County Clare and East County Galway is the only location on the island of Ireland where healthy populations are known to remain. Information from ongoing management practices and research in England and Wales has also been considered.

Retain the Shrill Carder where it occurs

This recommendation is key. While the Burren appears to retain interconnected populations, outside this, populations are very fragmented. In these instances, it is likely that once lost from a site it will be difficult for the species to naturally recolonise. It is essential that currently known sites continue to be managed to protect the bee. Site management needs to ensure the maintenance of the flower-rich grassland habitat.

Within this, priority should be given to:

- ✓ More isolated populations, away from the main centre within the Burren
- ✓ Sites with large healthy populations
- ✓ Sites where the land managers are sympathetic and prepared to undertake appropriate land management practices

Retain existing flower-rich grasslands

- ✓ Manage existing flower-rich areas with **appropriate mowing or grazing**. Ideally allow the flower-rich grassland to develop over the summer months, with delayed mowing or grazing until late September. This will maximise both the number of flowers available for foraging during the summer and for queens prior to hibernation. It will also allow for the plants to seed to ensure flowers for following years. If grazing during the summer, ideally use cattle at low grazing levels as this will provide the greatest diversity of sward structure and heights, in contrast to other grazing animals such as sheep. It is important that some mowing or grazing does take place to prevent scrub from replacing the flower-rich grassland.
- ✓ **Avoid scrub encroachment.** A cessation of grazing risks an invasion of coarse grasses and scrub which outcompete the flower-rich grassland communities.
- ✓ If required, **use organic or inorganic fertilisers at very low levels** although do not use fertilisers on previously unimproved grasslands. **Do not use insecticides, fungicides or herbicides.**

Maximise the amount of nesting and winter hibernation habitat within 1km of flower-rich areas

During mowing, leave field margins or areas uncut to provide grassy tussocks throughout the winter and the following summer. Or, if grazing, preferably use cattle at low levels to maximise the amount of tussocky grassland available.

Retain any field boundaries that are constructed of earthen walls (stone walls covered in soil and vegetated), hedgerow edges, rough vegetation growing alongside stonewalls, and scrub. Avoid compaction of sandy soils and dunes.



Minimise the exposure of wild bees to pests and diseases that could be transferred from Honey Bees in apiaries

It is recommended that Honey Bee hives are not installed in areas that have threatened wild bee populations to reduce potential disease transfer and competition for floral resources. The abundance of floral resources in the surrounding landscape should always be taken into consideration when deciding the density of managed Honey Bee colonies to ensure there is enough pollen and nectar resources available to support both healthy Honey Bees and the wider wild bee community (including any unknown threatened bee populations that could be in the area). Local beekeepers play an important role in protecting all pollinators by implementing best practice disease management within their apiaries.

Connectivity

Where possible, areas of suitable habitat should be increased and improved to create nature recovery networks. Buffering existing sites by increasing the areas of suitable habitat around the site, or through the restoration or creation of species-rich grassland and other semi-natural habitats will also help build the resilience of existing populations. This would allow species to move across the landscape more easily, making them more resilient to threats and particularly in the face of climate change.

In areas where field-scale restoration of flower-rich habitat is not currently possible, create small patches of flower-rich habitat along areas such as field margins by either using the green hay technique (spreading freshly cut hay from a nearby flower-rich site) or by directly collecting native wildflower seed from the local area such

as Bird's-foot-trefoil, Yellow-rattle (helps control grass cover), Knapweeds, Devil's-Bit Scabious and Red Bartsia to ensure forage is always available throughout the main flight period (May to September). These establish better when the identified areas are a mix of short vegetation height and bare soil. Flower-rich habitats can also be created by low level winter cattle grazing. During establishment exclude grazing animals from March to mid-September. Eliminate the use of organic or inorganic fertilisers and herbicides on these patches. Ideally aim for these patches to cover at least 2% or more of the field (2ha created per 1 km²) and prioritise areas within 1 km of nesting and existing flower-rich habitats.



Other threatened species that will benefit from this management

Management of sites for the Shrill Carder Bee could potentially benefit many threatened plant species and various other threatened animal species. Some of these are listed below:

Group	Common name	Species name	Conservation status
Birds	Corncrake	<i>Crex crex</i>	Red* 
	Meadow Pipit	<i>Anthus pratensis</i>	Red* 
	Skylark	<i>Alauda arvensis</i>	Amber* 
Bees	Small Scabious Mining Bee	<i>Andrena marginata</i>	Critically Endangered 
	Silver-sided Nomad Bee	<i>Nomada argentata</i>	Critically Endangered 
	Great Yellow Bumblebee	<i>Bombus distinguendus</i>	Endangered 
	Red-tailed Cuckoo Bee	<i>Bombus rupestris</i>	Endangered 
	Red-shanked Carder Bee	<i>Bombus rudarius</i>	Vulnerable 
	Field Cuckoo Bee	<i>Bombus campestris</i>	Vulnerable 
	Northern Colletes	<i>Colletes floralis</i>	Vulnerable 
	Grey-banded Mining Bee	<i>Andrena denticulata</i>	Vulnerable 
	Dull-headed Blood Bee	<i>Sphecodes ferruginatus</i>	Vulnerable 
	Furry-bellied Blood Bee	<i>Sphecodes hyalinatus</i>	Vulnerable 
	Large Carder Bee	<i>Bombus muscorum</i>	Near Threatened 
Butterflies	Small Blue	<i>Cupido minimus</i>	Endangered 
	Pearl-bordered Fritillary	<i>Boloria euphrosyne</i>	Endangered 
	Wall	<i>Lasiomata megera</i>	Endangered 
	Dark Green Fritillary	<i>Argynnis aglaja</i>	Vulnerable 
	Marsh Fritillary	<i>Euphydryas aurinia</i>	Vulnerable 
	Wood White	<i>Leptidea sinapis</i>	Near Threatened 
	Dingy Skipper	<i>Erynnis tages</i>	Near Threatened 
	Grayling	<i>Hipparchia semele</i>	Near Threatened 
	Small Heath	<i>Coenonympha pamphilus</i>	Near Threatened 
Moths	Forester	<i>Adscita statice</i>	Endangered 
	Chimney Sweeper	<i>Odezia atrata</i>	Vulnerable 
	Royal Mantle	<i>Catarhoe cuculata</i>	Vulnerable 
	Small Argent & Sable	<i>Epirrhoe tristata</i>	Vulnerable 
	Heath Rivulet	<i>Perizoma minorata</i>	Vulnerable 
	Yellow Shell	<i>Camptogramma bilineata</i>	Near Threatened 
	Wood Tiger	<i>Parasemia plantaginis</i>	Near Threatened 
	Reddish Light Arches	<i>Apamea sublustris</i>	Near Threatened 
	Small Purple-barred	<i>Phytometra viridaria</i>	Near Threatened 
	Burren Green	<i>Calamia tridens</i>	Near Threatened 
Snails	Moss Chrysalis Snail	<i>Pupilla muscorum</i>	Endangered 
	Point Snail	<i>Acicula fusca</i>	Vulnerable 
	Heath Snail	<i>Helicella itala</i>	Vulnerable

* Birds of Conservation Concern Ireland; other conservation status from Nelson, B., et. al. (2019) Checklists of protected and threatened species in Ireland. Irish Wildlife Manuals, No. 116. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.



Actions

Overarching objectives:

1 Maintain populations on current sites

2 Make the landscape friendlier for the Shrill Carder Bee

3 Raise awareness of the Shrill Carder Bee

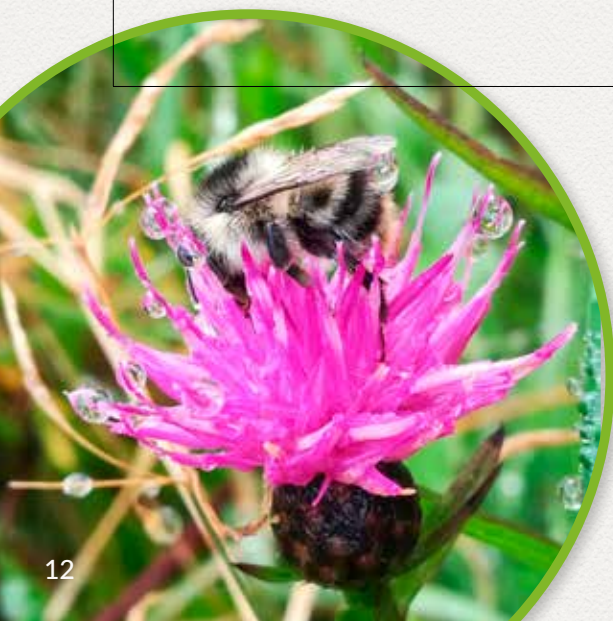
4 Increase our knowledge of the Shrill Carder Bee

POLLINATOR
ACTION

1

Maintain populations on current sites

ACTION	What is required
A Maintain as many existing populations as possible	- Where known populations occur, this guideline document should be provided to site managers - Establishment of regular recording of the species on known sites, with data submitted to the National Biodiversity Data Centre
B Establish a monitoring programme on known sites	- Expand upon current sites being monitored to establish as many existing Shrill Carder Bee sites as possible within either the National Pollinator Monitoring Scheme or the All-Ireland Bumblebee Monitoring Scheme. - Funded surveys may be required to complement this



Source: <https://maps.biodiversityireland.ie/Map/Terrestrial/Species/56033>

Making our landscape friendlier for the Shrill Carder Bee

ACTION	What is required
A Encourage farmers to adopt positive land management	• Awareness raising campaign through local farming organisations in areas where the species remains
B Adoption of positive land management for the Shrill Carder Bee across Natura 2000 designated land in priority areas	• Integration of appropriate measures within Conservation Objectives for Natura sites managed by the NPWS
C Creation of new native meadows for the Shrill Carder Bee on public land	• Potential sites identified by Local Authorities & local communities (e.g. Tidy Towns). Establishment prioritised by proximity to existing habitat • Integration within development or biodiversity plans • Suitable locations promoted as reference sites illustrating best practice
D Adoption of pollinator highways along quiet roads and walking trails in priority areas	• Appropriate areas along quiet roadsides identified for wildflower habitat creation through a reduced mowing approach
E Pollinator-friendly management of educational properties in priority areas	• Schools and other educational bodies in priority areas to take pollinator-friendly actions, in particular 'Pitches for Pollinators'. This campaign encourages school pitches to be unmown over the summer holidays, allowing wildflowers to emerge
F Encourage the public in priority areas to take voluntary actions to make their gardens and rural lanes more pollinator-friendly	• Local promotion of existing All-Ireland Pollinator Plan guidelines, in particular the guide for creating and restoring meadows in local communities and gardens, and the pollinator friendly planting code. Note that horticultural species should never be planted outside garden settings.
G Encourage business properties in priority areas to make their outdoor spaces more pollinator-friendly	• Local promotion of existing All-Ireland Pollinator Plan business guidelines • Targeted engagement with businesses who have premises adjacent to existing flower-rich grassland habitats
H Encourage all those who create Shrill Carder habitat to log their activities on the mapping system 'Actions for Pollinators'	• All actions logged on 'Actions for Pollinators' to facilitate coordination at local levels
I Support the collection and use of local wildflower seed in small-scale habitat restorations	• Promote the AIPP How-to-guide: Collecting and using pollinator friendly wildflower seed • Seed collecting workshops in priority areas

Raise awareness of the Shrill Carder Bee

ACTION	What is required
A Develop and promote an area as a Shrill Carder Bee reference site to illustrate best practice and as an educational resource	• Identify a suitable existing site that could be promoted in this context
B Disseminate this How-to-guide	• Appropriate dissemination in areas where the species still occurs
C Deliver a series of talks targeting stakeholders: local government, farmers, hospitality sector, beekeepers, general public	• Creation of a freely available talk that can be downloaded and delivered by local experts
D Shrill Carder Bee signage templates and information board templates developed for use in priority areas	• Development of these resources

Where possible, areas of suitable habitat should be increased and improved to create nature recovery networks.



A close-up photograph of a bumblebee with black and yellow stripes, fuzzy body, and long antennae, perched on a vibrant purple flower with many small, spiky petals. The background is a soft-focus green field with other plants, including a cluster of small white flowers in the upper right. The image is framed by a dark green circular overlay at the bottom containing white text.

Increase our knowledge of the Shrill Carder Bee

ACTION	What is required
A Commission a survey of the current distribution of the Shrill Carder Bee	• Funding to survey suitable habitat nationally at the broad-scale 10km level • Funding for surveys at the 1km scale within 10km of known sites
B Encourage the submission of casual Shrill Carder records and identify new areas for targeted surveying by volunteers ('Shrill Carder Bee hunt')	• Establish a mechanism for submission of positive (presence) and negative (absence) records to the National Biodiversity Data Centre
C Develop a spatial strategy for conservation of the species	• Using information on current distributions as well as existing land cover and land-use maps, identify areas for habitat creation as corridors for dispersal or stepping stone habitats. Make this publicly accessible to facilitate local efforts.
D Undertake detailed studies on the ecology and genetics of species in an Irish context	• Detailed study of forage preferences for pollen and nectar across castes and colony cycle • Identification of hibernation and nesting microhabitats • Detailed studies on the likely impact of climate change • Studies focusing on the genetic health of known populations to identify any potential barriers to gene flow



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“In Ireland the Shrill Carder Bee visits a variety of grassland plants with Common Knapweed being one of its favourites”.

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. Find out what biodiversity has already been recorded in your local area: maps.biodiversityireland.ie

Help us to build up the knowledge of biodiversity in your local area by submitting sightings to records.biodiversityireland.ie

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