



Cumbria's Plan Bee

A pollinator action plan for Cumbria

Cumbria Local Nature Partnership





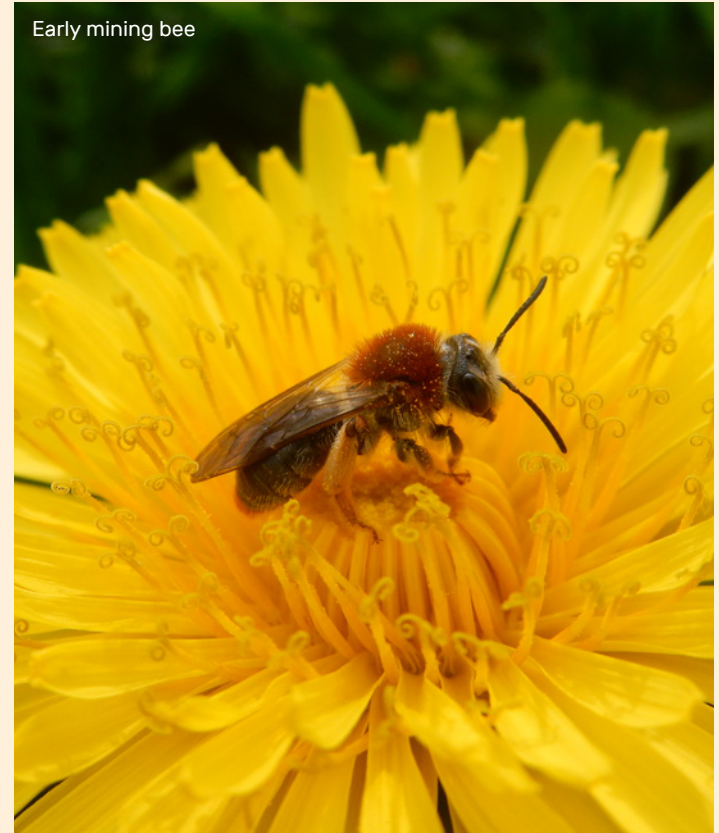
Cumbria's Plan Bee: A pollinator action plan for Cumbria

Cumbria's Plan Bee has been developed by the Cumbria Local Nature Partnership. It identifies a number of priority actions for councils, communities, farmers, landowners and businesses – in fact, everyone in Cumbria – to take forward to help our native insect pollinators.

Our vision for insect pollinators in Cumbria

Together we will build a network of flower-rich areas throughout Cumbria to provide abundant food and habitat for all our insect pollinators, enabling them to live, recover and flourish into the future. In order to achieve this, we must work together to deliver Cumbria's Plan Bee to:

- Restore and create more wildflower-rich meadows and pastures across our farmland.
- Ensure all our gardens and urban green spaces include pollinator-friendly flowers and trees, as well as shelter and nesting areas.
- Manage existing and new woodlands and hedgerows to provide abundant wildflowers and shrubs.



Early mining bee

Green hairstreak



Why a Plan Bee?

We all depend on pollinators. They play a vital role in our food production and are a key component of our natural world; however, many species are in trouble. We need a Plan Bee to get **everyone thinking about pollinators, everyone taking some action** (however small) and to get **every available piece of land working for pollinators**. Plus, we need commitments from key organisations, groups, businesses, farmers, gardeners and landowners to deliver the priority actions identified.



What difference can our Plan Bee make?

Within Cumbria we have:

- Nearly 450 miles (700 km) of roadside verges – if managed well, these can provide an incredible resource for our native pollinators.
- Some of the best wildflower-rich meadows and limestone habitats in the country.
- A track record of successful pollinator projects, and more in the pipeline.
- A large number of farmers, landowners, businesses and communities wanting to help.

By getting everyone working together we can piece together a new flower-rich landscape and sustain our pollinators into the future.



Green-veined white

© Amelia Bennett Margrave

Cumbria's Plan Bee:

Can help:

- Ensure local authorities take pollinators into account across their work and estate, including through development control and in the design of green infrastructure, and through the management of highways and green spaces.

It can support:

- Farmers and landowners to make space for pollinators through the creation of wildflower-rich habitats and areas for nesting or overwintering insects.

It can assist:

- Businesses and utilities to identify opportunities to make their estates/buildings more pollinator friendly, while also encouraging staff and customers to take action themselves.

And it can work with:

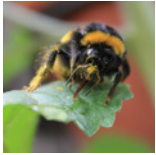
- Local communities, schools and individuals to all do something, however small, to create both a pollinator- and people-friendly environment.



What are pollinators?

The UK has over 5,500 native pollinator species.

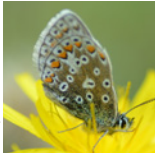
© Michelle Waller



Bumblebee

Bees include bumblebees, domesticated honeybees that live in large nests, and solitary bees that live alone. There are over 270 different bee species in Britain, 100 of which have been recorded in Cumbria¹ (including 21 of Britain's 24 bumblebees).

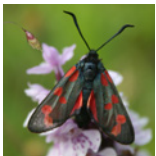
© Ryan Clark



Common blue

Butterflies depend on wildflowers as a source of nectar for the adults and as food plants for their caterpillars. Female butterflies 'taste' plants with their feet, allowing them to detect the right plant on which to lay their eggs. Cumbria is home to 42 butterfly species, including the UK's smallest resident butterfly, the small blue.

© Cumbria Wildlife Trust



Six-spot burnet moth

Moths can be just as colourful as their butterfly relatives and some flowers, such as greater and lesser butterfly-orchids, depend almost entirely on moth pollination. More than 2,500 species are found in Britain, with over 580 larger moth species recorded in Cumbria².

© Tanya St Pierre



Wasp

Wasps range from the familiar yellow-and-black wasps to those no more than a few millimetres in size. Many adult wasps feed on nectar and visit plants to collect insect prey for their young. By feeding on insects that are considered crop pests, wasps take on the role of natural pest control. Britain is home to 9,000 wasp species.

© Tanya St Pierre



Hoverfly

Flies visit over 70% of global crop plants³. They are abundant and able to fly in less favourable conditions, making them very important pollinators. There are around 7,000 fly species in Britain, including around 270 hoverflies.

© Charlotte Rankin



Common red soldier beetle

Beetles are found in a diverse range of habitats and many species feed exclusively on flowers, or need nectar and pollen as part of their diet. This includes species such as soldier beetles, longhorn beetles and tumbling flower beetles.

Pollination is the process by which flowering plants (including wildflowers, trees, fruit and vegetable crops) reproduce, set seed and produce fruit. A large proportion of plants rely on insects to pollinate their flowers. When these insects visit flowers for pollen and sugar-rich nectar, pollen grains stick to their bodies and are transferred from the reproductive parts of one flower to another.



Providing food

Pollinators need flowers to feed, suitable habitat to breed, and undisturbed habitat to safely spend the winter. Diverse and connected habitat is needed to support pollinators' four-stage life cycle (egg, larva, pupa and adult).

Floral resources

Some plants are visited for nectar (an ideal source of fuel for adults) and others are visited for pollen (vital for developing bees). As some pollinators emerge in early spring and others fly later in summer, flowers are needed throughout the year.

Year-round larder

In late winter this includes trees and shrubs such as goat willow, blackthorn and hawthorn, as well as dandelion and woodland flowers. Summer wildflowers include clovers, trefoils and vetches, oxeye daisy, hogweed and foxglove. Thistles and knapweed can flower late into the season, and ivy bursts into bloom in autumn.

Wildflower meadow at Eycott Hill Nature Reserve, Berrier



© Tanya St Pierre

Volucella at Eycott Hill Nature Reserve



© Amelia Bennett Margrave



Nesting and shelter

Nesting and egg-laying habitat

Pollinators need a suitable place to lay their eggs or build a nest. Butterflies and moths lay eggs on (or near) wildflowers and grasses that are the food plants for their caterpillars. Bumblebees nest in wilder areas, such as tussocky grass or at the base of hedgerows. Some solitary bees, such as leafcutter and mason bees, nest in dead wood, while mining bees nest in bare ground.

Some pollinators have quite different needs during their development stage. Hoverfly larvae, for example, require water, dead wood or aphids.

Bumblebees utilise material left over by previous occupants of their nest site, such as small mammals. Solitary bees collect a range of natural materials including cut leaves, damp mud and leaf mastic (resin).

A place to spend the winter

Different species overwinter in different life stages. Many pollinators overwinter in the soil, amongst leaf litter, or attached to plant material. Queen bumblebees dig into soil of north-facing banks, while solitary bees remain within the burrows where they were born. Leaving areas of undisturbed habitat, such as long grass, leaf litter and dead wood, is therefore critical for the survival of next year's pollinators.



Peacock caterpillar

© Amelia Bennett Margrave



Leafcutter bee nesting in dead wood

© Charlotte Rankin

Connected habitat

Habitat connectivity is vital to enable pollinators to find food and breed within their flight range. On a wider scale, a connected landscape will increase the ability of pollinators to respond and adapt to a changing climate.



Pressures on pollinators

Pollinators and other insects are under threat, and many are experiencing declines due to habitat loss, pesticide exposure, disease and climate change⁴.

- Between 1980 and 2013, a third of hoverflies and native bees in Britain experienced declines⁵.
- A third of UK bumblebees are listed as priority species of conservation concern⁶.
- 41% of British butterflies are listed as threatened⁷.
- Between 1970 and 2016, 41% of moth species have decreased in abundance and 32% in distribution⁸.

The statistics show a frightening picture, but Cumbria's Plan Bee sets out how we can start to reverse this trend together.

Habitat loss and fragmentation

Since 1950, it is estimated that the UK has lost 150,000 miles of hedgerow, 98% of flower-rich grassland and 50% of ancient woodland⁹.

Changes in agricultural practices, the growth of urban and industrial areas, and larger road networks have reduced the amount of pollinator habitat. Although some habitats are being restored and created, we currently have too little habitat and pollinators are unable to find food or nest sites.



© Cumbria Wildlife Trust

Pesticide use

Research is showing that chemicals commonly used in agriculture, gardens and urban areas can harm pollinators.

While pollinators are not the target species, they can be exposed through chemicals in the nectar and pollen of treated crops, and even in adjacent wildflowers (chemicals can travel through the soil to adjacent wildflowers¹⁰). Neonicotinoid pesticides can impair bumblebee foraging¹¹ and colony success¹², while glyphosate, found in 'weed killers' readily available for home use, can affect bee health¹³ and harm brood growth¹⁴.

Climate change

Climate change is already impacting on some pollinator species.

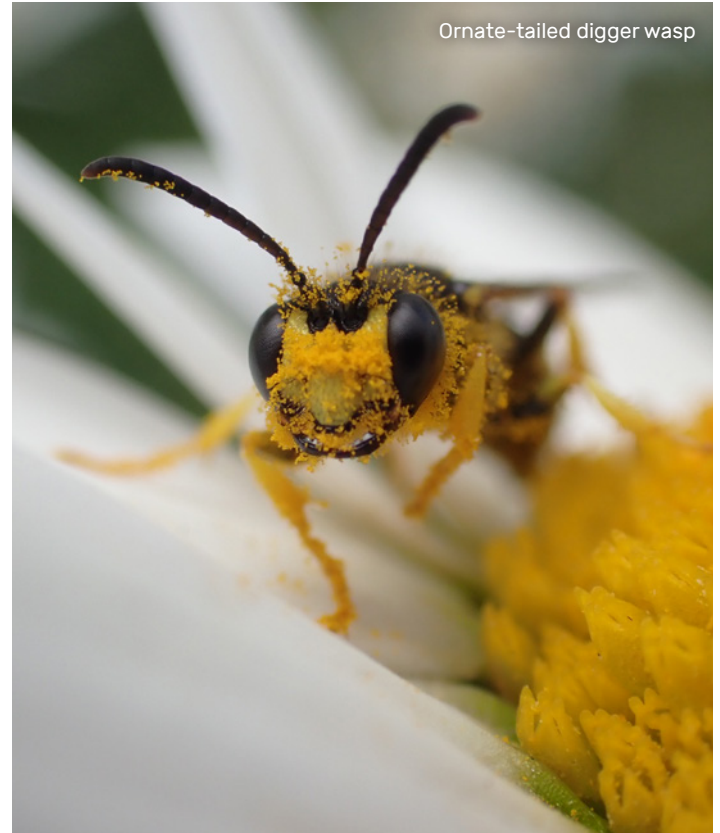
Extreme weather events may impact pollinators, whilst longer-term climate change may lead to plant and pollinator lifecycles being out of sync. Some insects are managing to move as the climate changes, but not all will be able to.

Further pressures

Research has shown that light pollution can be disruptive to nocturnal moths.

Artificial street lighting can reduce moth caterpillar numbers by up to a half compared with unlit sites¹⁵.

*The pressures on pollinators are complex, and many of these pressures can act together. **But together we can all play our part to help them.***



Ornate-tailed digger wasp



What's happening in Cumbria now?

Individuals and organisations are already working together to help Cumbria's pollinators.

Buglife's B-Lines

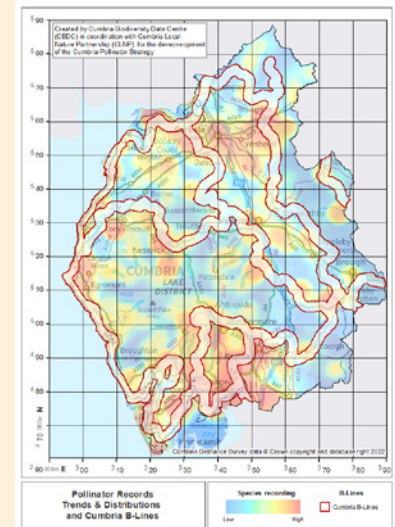
B-Lines is a Buglife-led national initiative aiming to create and restore 150,000 hectares of flower-rich habitat in a UK-wide network of 'pollinator pathways'.

Get Cumbria Buzzing! and Planting for Pollinators

Working with communities, National Highways and partners, Get Cumbria Buzzing! has already created 115 hectares of wildflower-rich habitat in Cumbria. Planting for Pollinators is creating pollinator habitat in 57 new areas across north-west Cumbria, and is also training communities in wildlife gardening and recording.

Back On Our Map (BOOM)

The University of Cumbria is working with local communities and partners, including the Morecambe Bay Partnership, Cumbria Wildlife Trust, Natural England and Forestry England, to reintroduce locally threatened or extinct species to south Cumbria. This includes helping the Duke of Burgundy butterfly to expand its range along Morecambe Bay and in the Rusland Valley.



Cumbria B-Lines network

Mapping Cumbria's pollinators

Much of what we know about pollinators in Cumbria is down to dedicated volunteers carrying out butterfly transects or recording insects. Cumbria Biodiversity Data Centre and national species recording schemes collate and use these records to inform conservation efforts; for example, over 7,600 records were used in the *Cumbrian Bumblebee Atlas (2022)*.

Butterfly Conservation

Working with farmers and landowners, Butterfly Conservation is leading the conservation of several of Cumbria's rare butterflies, most recently leading a species recovery project in South Cumbria, funded by Natural England, to help target action by landowners for 11 declining and threatened species of butterfly and moth.

University of Cumbria Brampton Road Campus

Students and staff have worked together to improve the campus grounds for pollinators. The grassland is now managed to allow more wildflowers to bloom. Wildflowers have been planted and interpretation boards have been placed across campus.



Common carder bee

© Amelia Bennett-Margrave



An introduction to some of Cumbria's rarer pollinators

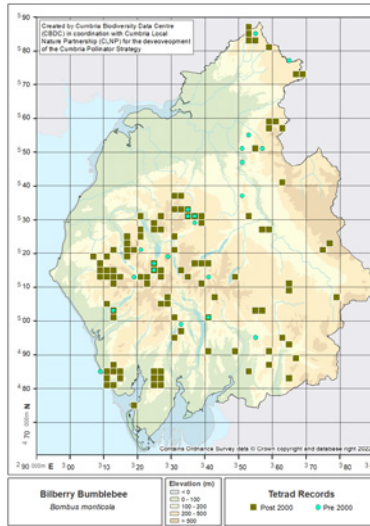
Cumbria's coastal habitats, grasslands, uplands and bogs support some of our most specialist pollinators, many of which are particularly vulnerable to pressures such as habitat loss and climate change.

Bilberry bumblebee, *Bombus monticola*



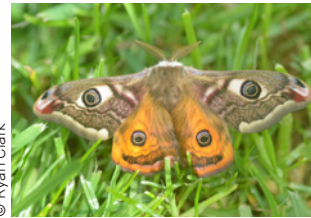
© Charlotte Rankin

Also known as the mountain bumblebee, this red-tailed bumblebee is found in higher altitude areas such as the Lake District fells and upland hay meadows. Bilberry is an important part of this bumblebee's diet, but it relies on a mosaic of moorland, meadow and scrub for food. Cumbria is a stronghold for this species.



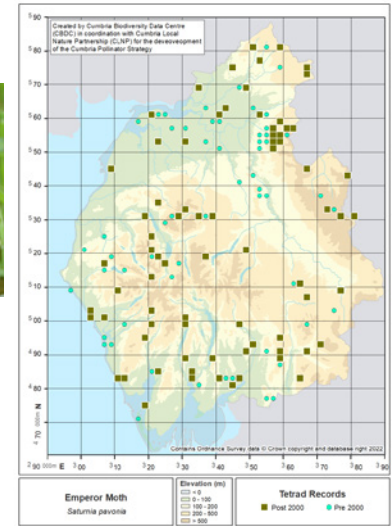
Distribution map for the bilberry bumblebee

Emperor moth, *Saturnia pavonia*



© Ryan Clark

The large and spectacular emperor moth is found widely across Cumbria between March and May. The colourful males can be seen flying in the daytime, searching for the pheromones which will lead them to the grey, resting females. In autumn or winter you may find one of their silk cocoons in bramble, heather or scrub as they turn from silky white to ginger brown.

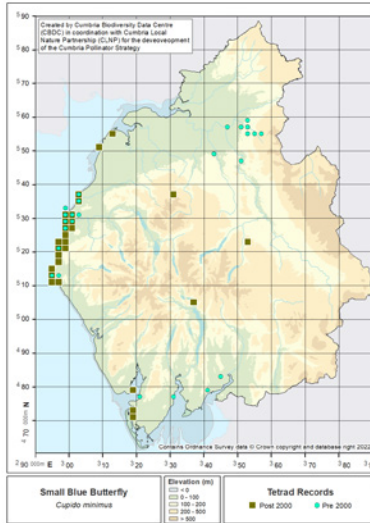


Distribution map for the emperor moth



Small blue butterfly, *Cupido minimus*

The small blue is the smallest butterfly in the British Isles. Females lay their eggs only on kidney vetch (one egg per plant, tucked amongst the developing flower heads), where the larvae will eat a hole into the growing flower. Habitat restoration on the west coast of Cumbria by Butterfly Conservation, Workington Nature Partnership and Get Cumbria Buzzing! has created new corridors between the small blue colonies.

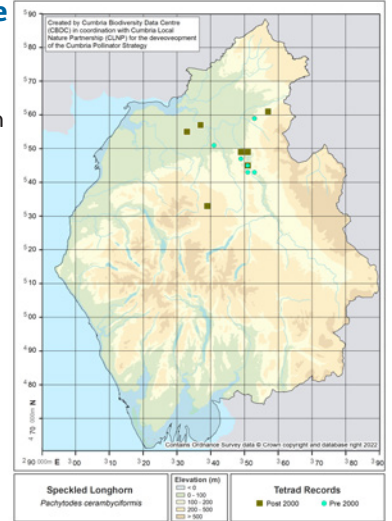


Distribution map for the small blue butterfly



Speckled longhorn beetle *Pachytodes cerambyciformis*

The speckled longhorn lives in deciduous woodland, where the larvae develop and feed in rotting trunks or fallen branches. The adults emerge in summer and can travel far to reach flower-rich habitat, often using large white umbellifers and hawthorn flowers in hedgerows and woodland edges. In Cumbria, they have been recorded mainly in the north of the county.



Distribution map for the speckled longhorn beetle



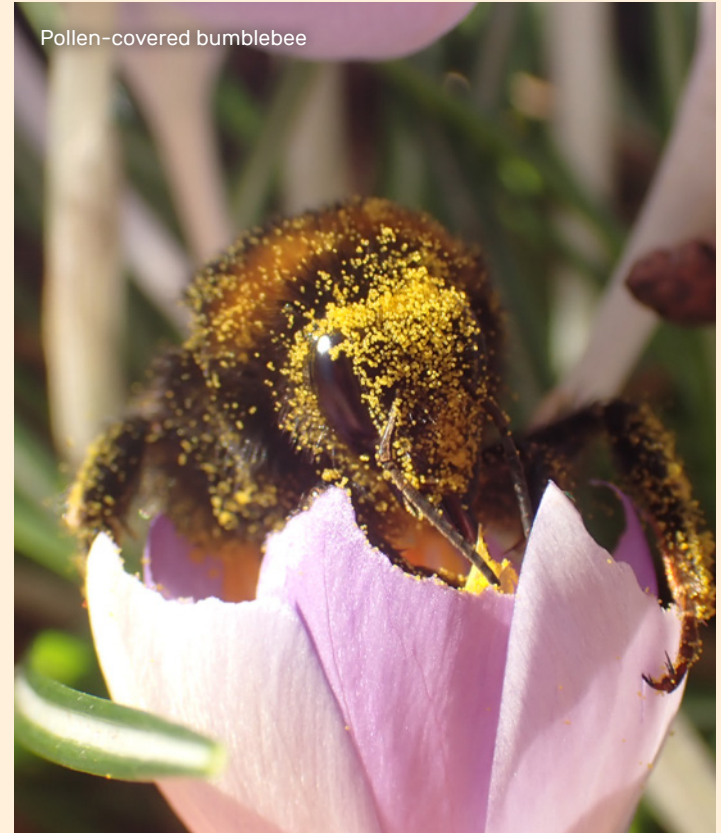
Growing and joining up work for pollinators

We are not alone – we are part of UK-wide action for pollinators

Cumbria's Plan Bee will ensure we all do our part in helping to deliver the National Pollinator Strategy (NPS) and specific actions within the NPS Action Plan 2021–24. We will join many other areas of the country which are delivering their own Pollinator Action Plans, and we will continue to create a network pollinator habitats as part of Buglife's UK-wide B-Lines.

By supporting the work of the national Pollinator Monitoring and Research Partnership, we will increase our knowledge of pollinators – ensuring that we all continue to take the right action in the right places. Cumbria's Plan Bee will also support the developing Cumbria Local Nature Recovery Strategy and help deliver its key outcomes for pollinators and flower-rich habitats.

Take part and commit to Cumbria's Plan Bee
Please help deliver Cumbria's Plan Bee by joining the increasing number of people and organisations taking action for pollinators. Keep reading to see how you can help, and join others by committing to do your bit to secure the future of our native pollinators across Cumbria.



Pollen-covered bumblebee



Cumbria's Plan Bee: Action for people and communities

The priorities for us all are:

1. To make our gardens pollinator-friendly by:

- Planting more pollinator-friendly flowers, trees and shrubs to provide pollen and nectar from March to November.
- Using the lawnmower less, implementing a 'No Mow May' regime, and then leaving some areas to grow taller for the rest of the year.
- Reducing, and ideally avoiding, the use of harmful pesticides.
- Leaving some 'untidy' corners of your garden or allotment for pollinators to nest and overwinter in.
- Erecting bee/insect 'hotels', or creating other nesting sites for pollinators.

2. To get involved and make the whole of Cumbria more pollinator-friendly by:

- Volunteering with local pollinator projects or community groups which manage pollinator habitats.
- Encouraging your local community groups, parish/town councils and schools to take action for pollinators.
- Supporting your local council in making changes to parks, open spaces and verge management.

3. To help us find out more about our pollinators by:

- Taking part in pollinator species recording schemes, for example Bee Walks, Butterfly Recording, or the UK Pollinator Monitoring Scheme.
- Sending your pollinator records to the Cumbria Biodiversity Data Centre.



Swollen-thighed beetle



Cumbria's Plan Bee: Action for farmers, foresters, landowners and managers

The priorities for our farmers, foresters and landowners are:

1. To reduce the impact of land management on pollinators by:

- Reducing the use of pesticides and, where possible, implementing integrated pest management systems on your land.
- Use pollinator-friendly tree and shrub species within new plantings and avoid tree planting on existing valuable habitats.
- Ensuring you do not inadvertently damage important pollinator habitats such as bramble, nettles and scrub.

2. To increase the amount and condition of pollinator-friendly habitats by:

- Managing your existing grasslands (meadows, pastures and upland habitats) to allow plants to flower, and to provide rough areas for nesting and overwintering.
- Restoring and creating new wildflower-rich meadows and pastures.
- Allowing scrub or taller vegetation to develop on hill/fell sides, woodland edges, along water courses or in field corners.
- Managing your woodlands (including conifer and plantation woodlands) and hedgerows to increase the range of native tree/shrub species, to develop wildflower-rich ground vegetation and to create softer woodland/scrub edges.
- Considering options for agroforestry with small scale tree/scrub planting supplementary to conventionally managed land.
- Planting or restoring orchards.
- Maintaining and creating wetland features, which provide habitat for pollinator larvae, as well as flowering plants as pollen and nectar sources.



3. To provide additional food, shelter and nesting for pollinators by:

- Planting pollen and nectar mixes, or adding herbal leys into your grassland management.
- Establishing flower-rich margins or plots to buffer hedgerows, ditches and woodland.
- Managing hedgerows on a two-or-three-year rotation, providing somewhere for hedgerow flowers every year.
- Creating pockets of permanent tall, tussocky or scrubby vegetation, and cutting these in rotation to maintain plentiful nesting sites.
- Maintaining standing and fallen dead and decaying wood to provide nesting sites for species such as solitary wasps and hoverflies.



Bowber Head Farm meadows

© Cumbria Wildlife Trust



Green fritillary

© Andrew Walter



Cumbria's Plan Bee: Action for our local authorities and councils

The priorities for our new local authorities and other councils are:

1. To ensure the needs of pollinators are delivered through local plans and planning policy by:

- (At the earliest opportunity) including policies to implement priorities of the Local Nature Recovery Strategy and Cumbria's Plan Bee within current or emerging local plans (including minerals and waste local plans), and associated guidance.
- Raising awareness of, and promoting the creation of, pollinator-friendly features with developers and minerals/waste operators.
- Recognising and capitalising on opportunities in new/existing development (including through landscaping schemes, green infrastructure design, minerals/waste restoration schemes etc.) to make them pollinator-friendly and using Biodiversity Net Gain and Section 106 agreements to secure habitats for the long term.
- Identifying opportunities to develop more, and joined up, wildlife-rich open spaces and green corridors in our urban areas; linking these to wider habitat networks.

2. To increase the contribution of roadside verges to pollinator conservation by:

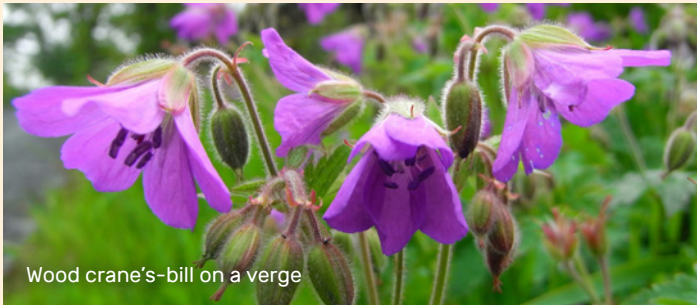
- Managing 'special verges' proactively for pollinators and other wildlife, and protecting them from damage.
- Ensuring council guidelines are implemented by all contractors, staff and others who manage Cumbria's roadside verges.
- (At the earliest opportunity) reviewing verge management contracts and implementing new best practice.
- Researching and implementing cut-and-collect grassland management, looking for opportunities to utilise biomass for energy generation, composting etc.



© Tanya St. Pierre

3. To increase awareness of pollinators and their habitat needs by:

- Providing long-term support to local communities and residents, helping them to take action.
- Providing or signposting pollinator guidance and advice.
- Increasing the number of young people who understand the value of their local pollinators.
- Supporting local schools to develop wildflower areas or, where space is limited, planting pollinator-friendly plants in containers and baskets.



Wood crane's-bill on a verge

4. To increase the contribution to pollinator conservation of all land under the ownership of, or managed by, the local authority or council by:

- Working with communities to review management and maintenance of parks and other public land:
 - Ensuring amenity planting (e.g. plants in flowerbeds, containers/pots) and tree/shrub species are both attractive and pollinator-friendly.
 - Avoiding the use of plants treated with pesticides or grown in peat.
 - Establishing and maintaining networks of pollinator habitats across public spaces.
 - Putting in place pollinator-friendly grass-cutting regimes, including 'No Mow May'.
- Reviewing the use of pesticides and committing to the Pesticide Action Network UK's 'Three Year Phase Out Plan' for pesticides.
- Arranging appropriate training for staff and contractors involved in land management to increase understanding of the needs of pollinators and how they can be helped.



Cumbria's Plan Bee: Action for businesses

The priorities for for businesses are:

1. To increase the value to pollinators of all building and land assets by:

- Adding pollinator-friendly features to buildings and land, e.g. bee hotels or green roofs.
- Reviewing management of your land including:
 - Making amenity planting (e.g. plants in flowerbeds, containers or pots around offices, etc.) pollinator-friendly.
 - Avoiding the use of plants treated with pesticides or grown in peat.
 - Making grass-cutting regimes pollinator-friendly.
 - Planting pollinator-friendly trees and shrubs (e.g. 'blossoming' species).
- Stopping the use of neonicotinoid pesticides (linked to the decline of pollinators) and developing plans to reduce, or cease use of, glyphosate herbicides.
- Surveying land to assess its importance for pollinators, especially industrial or brownfield sites.

2. To support customers and local communities to help pollinators by:

- Committing your business to helping pollinators and promoting this to your customer base (e.g. through social media, websites etc.).
- Providing funding to or sponsoring local community pollinator initiatives.
- Providing support to local schools to develop and maintain pollinator habitats.

3. To help staff engage in pollinator work by:

- Encouraging and helping staff to volunteer in local pollinator projects, through provision of time, training or resources.



Coastal grassland with Kidney Vetch

© Charlotte Rankin



Cumbria's Plan Bee: Action for nature and environmental organisations

The priorities for our nature and environmental organisations are:

1. To increase the delivery of pollinator action by:

- Ensuring pollinators' needs are included in projects and programme delivery.
- Increasing the focus on wildflower-rich habitat restoration and creation, particularly permanent habitats and open mosaic habitats (brownfield).
- Increasing provision of, and access to, advice regarding Countryside Stewardship (and future ELM) options.
- Supporting the development of urban pollinator projects linked to initiatives to connect people with nature for improved health and wellbeing.

2. To focus pollinator action within priority areas by:

- Helping to develop the B-Lines network and wider habitat networks identified in the Local Nature Recovery Strategy.
- Developing species recovery programmes for rare and threatened pollinators.
- Identifying and mapping priority pollinator species that require targeted action, and working with landowners and managers to improve habitat for these species.

3. To increase awareness and provision of advice by:

- Providing more joined-up advice for land managers/owners and the general public.
- Working with farmers and other land managers to find solutions to reduce impacts of land management on pollinators.
- Working with local communities to increase the level of involvement in taking action for pollinators, including habitat creation and management, and participating in pollinator events and species-recording schemes.



Marsh fritillary

© Amelia Bennett-Margrave



Further reading

➤ **Working to protect pollinators (Cumbria Wildlife Trust)**

Information on activities and how to help pollinators:
<https://www.cumbriawildlifetrust.org.uk/pollinators>

➤ **Land management for pollinators – farming, community focused, greenspace/parks management & highways/verges**

Bumblebee Conservation:
<https://www.bumblebeeconservation.org/land-management-advice/>

Buglife:
<https://www.buglife.org.uk/resources/farming-hub/>

Butterfly Conservation:
<https://butterfly-conservation.org/>

➤ **Community Group Guidance (Buglife)**

www.buglife.org.uk/our-work/b-lines/b-lines-guidance/

➤ **Schools advice/guides**

Get Cumbria Buzzing Teacher Resources:
<https://www.primarybusinesspartnership.org.uk/resources/>

Activities for schools (Buglife):
<https://www.buglife.org.uk/get-involved/>

➤ **'How to guides' for habitat creation, bee hotels, garden planting etc.**

Buglife:
<https://www.buglife.org.uk/get-involved/>

RSPB:
<https://www.rspb.org.uk/get-involved/activities/>

Cumbria Wildlife Trust:
<https://www.cumbriawildlifetrust.org.uk/pollinators>

Royal Horticultural Society (RHS):
<https://www.rhs.org.uk/>

> Pollinator ID

Bumblebees:

<https://www.bumblebeeconservation.org/>

Butterflies and moths:

<https://butterfly-conservation.org/>

Hoverflies (NatureSpot):

<https://www.naturespot.org.uk/gallery/hoverflies>

Beetles:

<https://www.coleoptera.org.uk/beetle-families>

> Pollinator recording

Cumbria Biodiversity Data Centre:

<https://www.cbdc.org.uk/>

UK Pollinator Monitoring Scheme:

<https://ukpoms.org.uk/>

iNaturalist:

<https://www.inaturalist.org/>

iRecord:

<https://www.coleoptera.org.uk/beetle-families>

Butterfly and moth recording (Butterfly Conservation):
<https://butterfly-conservation.org/>

¹ Cumbria Bumblebee Atlas – Cumbria Wildlife Trust
https://www.cbdc.org.uk/about-us/projects/bumblebee_atlas/

² CBDC Moth Atlas 2017. A Provisional Atlas of Cumbria's Larger Moths Cumbria Biodiversity Data Centre (CBDC) and Cumbria Moth Group June, 2017
www.cbdc.org.uk/uploads/Moth_Atlas/Download/Larger_Moth_Atlas.pdf

³ Rader et al. 2020. Non-Bee Insects as Visitors and Pollinators of Crops: Biology, Ecology, and Management. Annual Review of Entomology Vol. 65:391-407
<https://www.annualreviews.org/doi/10.1146/annurev-ento-011019-025055>

⁴ Goulson et al. 2015. Bee declines driven by combined stress from parasites, pesticides, and lack of flowers. Science Vol. 347(6229)
<https://www.science.org/doi/10.1126/science.1255957>

⁵ Ollerton et al. 2014. Extinctions of aculeate pollinators in Britain and the role of large-scale agricultural changes. Science Vol 346 (6215):1360-1362
<https://www.science.org/doi/10.1126/science.1257259>

⁶ Powney et al. 2019. Widespread losses of pollinating insects in Britain. Nature Communications Vol. 10, Article number: 1018
<https://doi.org/10.1038/s41467-019-08974-9>

⁷ Fox et al. 2022. A revised Red List of British butterflies. Insect Conservation and Diversity Vol. 15 (5): 485-495
<https://doi.org/10.1111/icad.12582>

⁸ Fox et al. 2021. The state of Britain's larger moths. Butterfly Conservation.
<https://butterfly-conservation.org/sites/default/files/2021-03/StateofMothsReport2021.pdf>

⁹ Professor Dave Goulson. Insect declines and why they matter – Wilder Future – South West Wildlife Trusts. FULLAFI REPORT WEB1_1.pdf (somersetwildlife.org)
https://www.somersetwildlife.org/sites/default/files/2019-11/FULL%20AFI%20REPORT%20WEB1_1.pdf

¹⁰ Botías et al. 2015. Neonicotinoid Residues in Wildflowers, a Potential Route of Chronic Exposure for Bees. Environmental Science and Technology Vol. 49 (21): 12731-12740
<https://pubs.acs.org/doi/10.1021/acs.est.5b03459>

¹¹ Feltham, Park and Goulson 2014. Field realistic doses of pesticide imidacloprid reduce bumblebee pollen foraging efficiency. Ecotoxicology Vol. 23: 317-323
<http://dx.doi.org/10.1007/s10646-014-1189-7>

¹² Whitehorn et al. 2012. Neonicotinoid Pesticide Reduces Bumble Bee Colony Growth and Queen Production. Science Vol. 336 (6079):351-352
<https://pubmed.ncbi.nlm.nih.gov/22461500/>

¹³ Motta, Raymann and Moran 2018. Glyphosate perturbs the gut microbiota of honey bees. Applied Biological Sciences Vol. 115 (41): 10305-10310
<https://www.pnas.org/doi/full/10.1073/pnas.1803880115>

¹⁴ Weidenmüller et al. 2022. Glyphosate impairs collective thermoregulation in bumblebees. Science Vol. 376(6597):1122-1126
<https://www.science.org/doi/10.1126/science.abf7482>

¹⁵ Boyes et al. 2021. Is light pollution driving moth population declines? A review of causal mechanisms across the life cycle. Insect Conservation and Diversity Vol. 14 (2): 167-187
<https://resjournals.onlinelibrary.wiley.com/doi/10.1111/icad.12582>

Cumbria's Plan Bee has been produced by the Cumbria Local Nature Partnership and overseen by the Planting for Pollinators Steering Group. Our Plan Bee must be long term, and we hope over time that the priority actions outlined will become part of everyday life and require no second thought to deliver. However, to get to this stage we need determination and support from as many of our half a million residents as possible.

The *Planting for Pollinators* project is a Cumbria Local Nature Partnership initiative delivered by:

Green Recovery Challenge Fund



Department
for Environment
Food & Rural Affairs

The
National Lottery
Heritage Fund



Environment
Agency

NATURAL
ENGLAND

Thank you to our funders

The funding for this project comes from the Green Recovery Challenge Fund and the Environment Fund administered through Cumbria County Council. It will help us build on the work of the Get Cumbria Buzzing! project, increasing and connecting the range of habitat on the ground for pollinators along the B-Lines across north and west Cumbria.

