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Pollinators and Road Verges In Wales

© Plantlife

Shrill Carder Bee © Mike Clark

Dr. Mike Howe
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May 2014

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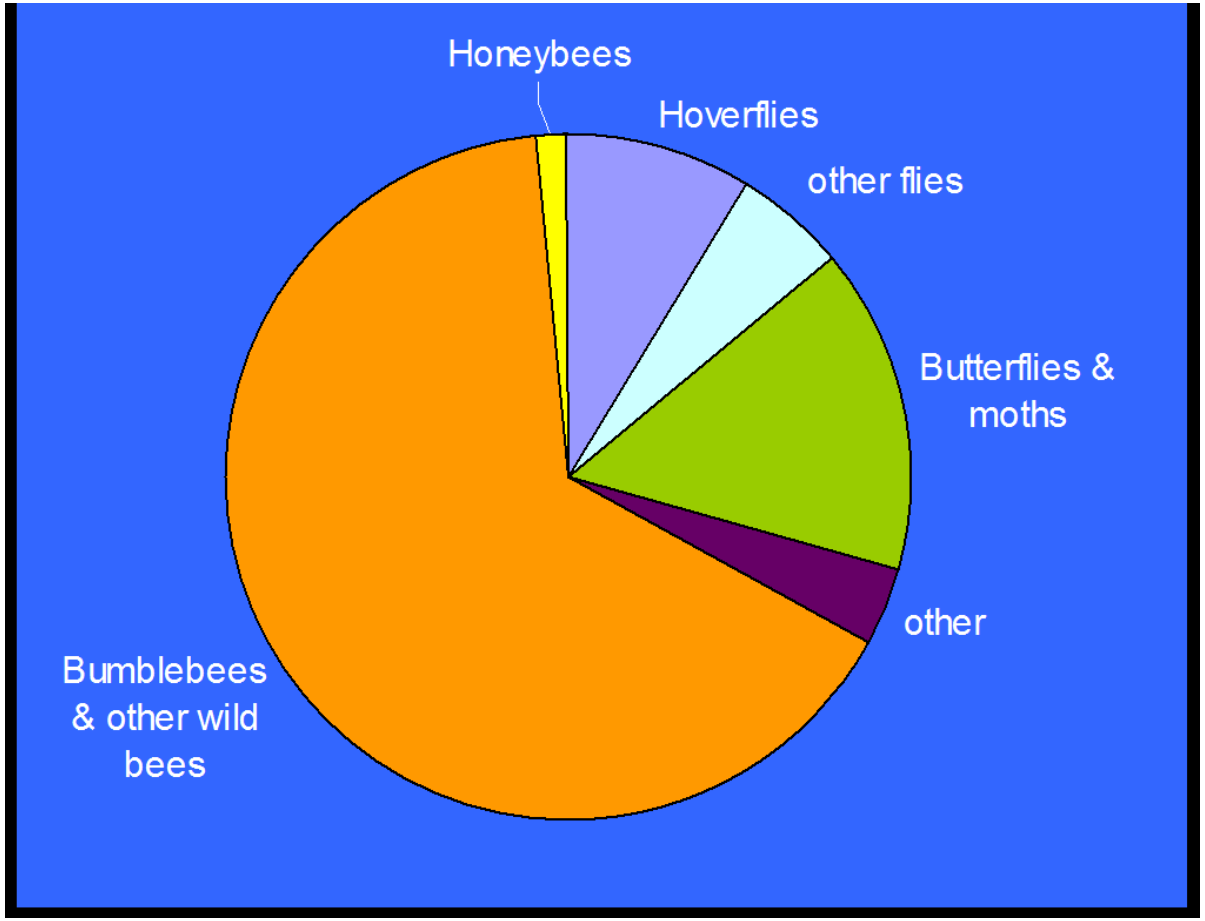
Key Pollinators



Pie chart constructed using data from transect recording of insect-plant visitation in an ancient hay meadow at Shelfanger, Norfolk, by Lynn Dicks in 1999.
From: Dicks, Corbet & Pywell (2002) Compartmentalization in plant–insect flower visitor webs. J Animal Ecology 71, 32-43.

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Pollinator Declines - 1

Butterflies © Butterfly Conservation

- 50% of 56 spp show a strong (25%) or slight decline
- 72% have declined in abundance
- 54% have declined in distribution

Moths © Butterfly Conservation

- 60% of 676 spp show a strong (50%) or slight decline
- 67% of 337 widespread spp show a significant decline, with 37% declining by >50%

Sources: State of Nature Report 2013

The State of the UK's Butterflies 2011

The State of Britain's Larger Moths 2013

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Pollinator Declines – 2

Hoverflies © Buglife

- 50% of 178 spp show a strong (25%) or slight decline
- 33% of 257 spp show a significant decline

Wasps
© Buglife

- 60% of 175 spp show a strong (25%) or slight decline

Sources: State of Nature Report 2013

Atlas of the Hoverflies of Great Britain 2011

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Pollinator Declines - 3

Solitary & Social Bees © Nigel Jones

- 50% of 178 spp show a strong (25%) or slight decline

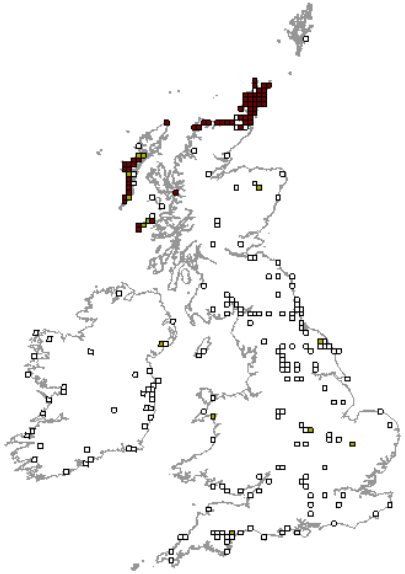
Bumblebees © Buglife

- 6 of 25 spp have declined by at least 80% in last 50 years

Sources: State of Nature Report 2013
Buglife pers. comm. 2014

Great Yellow Bumblebee © BBCT
Bombus distinguendus

Short-haired Bumblebee © Nikki Gammans
Bombus subterraneus



Bumblebees lost to Wales

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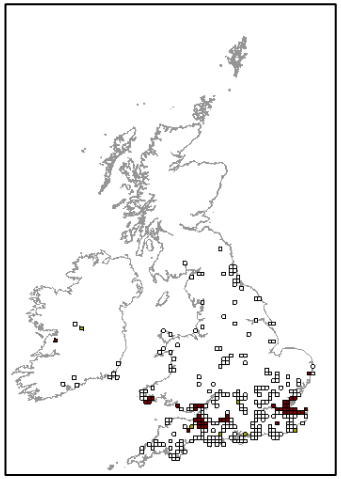
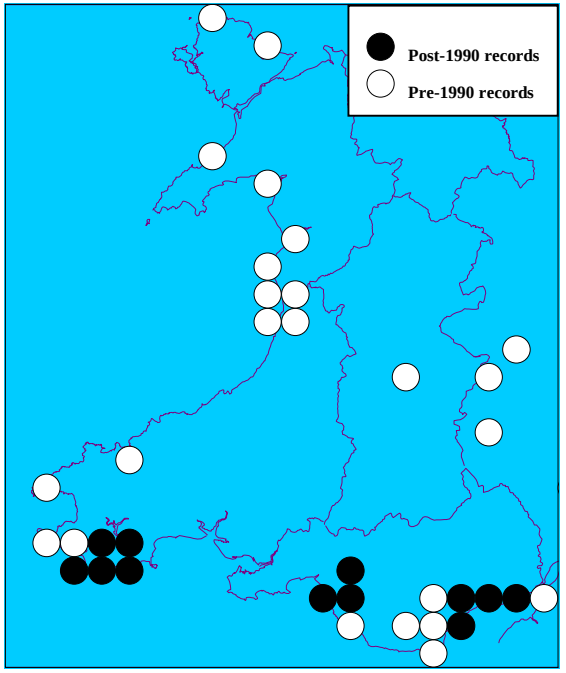
Declining Bumblebees -1

Shrill Carder Bee © Mike Clark
Bombus sylvarum





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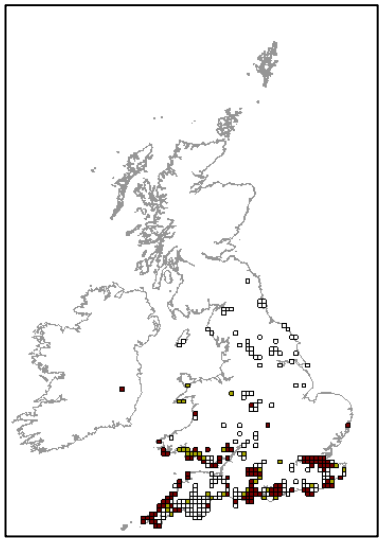
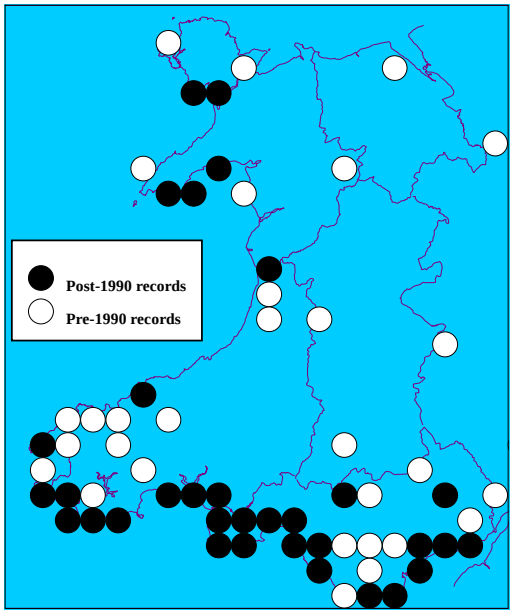
Declining Bumblebees - 2

Brown-banded Carder Bee © Steven Falk
Bombus humilis





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Loss of Flower-rich Grasslands

- **6.5 million ha of semi-natural lowland grassland in England and Wales lost between 1934 and 1984**
- **Only 3% remaining = 0.2 million ha**

© Monmouthshire Meadows Group

Source: JNCC 2008 UK HAP for Lowland Meadows

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Do Pollinator Declines Matter?

- **75% of wild flowering plant species in temperate regions require insect pollination to develop their fruits and seeds fully**

- **Pollinators improve or stabilize the yield of 75% of all crop types globally, representing around 33% of global crop production by volume**

- **Many fruit, vegetable, oil, seed and nut crops that provide vital nutrients for human diets worldwide, including more than 90% of our vitamin C, are pollinated by insects**

- **The cultivated area of pollinator-dependent crops has risen, raising worldwide demand for insect pollination services three-fold since the 1960s.** Globally the crop production attributable to insect pollination was valued at US $215 billion in 2005

Source: Vanbergen & Dicks, 2014

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Pastoral or Mixed Farming Approach

Pastoral systems don't need pollinators. 80% of land use is agricultural, 61% is permanent pasture.

Source: WG Pollinator Action Plan 2013

Any future shift to more mixed farming, with arable crops pollinated by insects, will require the safeguarding of pollinator populations.

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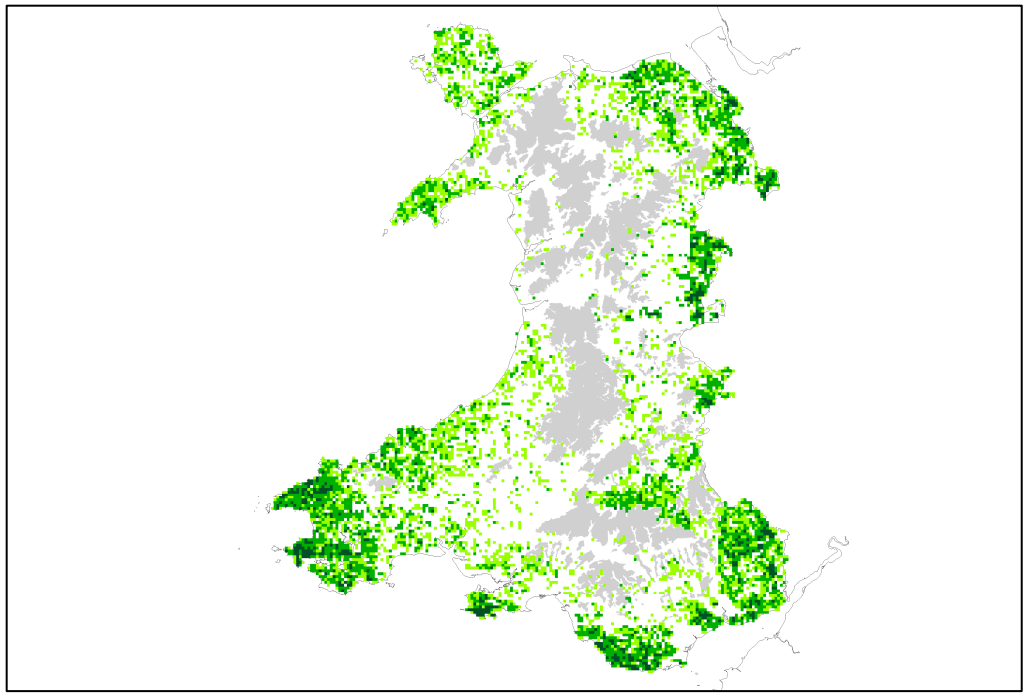
Arable Crops



12% of agricultural land is arable, including crops not requiring pollinators – potatoes, cereals.

Sources: CCW Habitats of Wales 2010

WG Pollinator Action Plan 2013

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Crops Requiring Pollinators

Table 14.12 Crop dependencies on pollinators and annual value of pollination in 2007.

Crop	Dependence on Pollinators (%)	Value per annum (£ millions)
Oilseed rape	25	106
Strawberries	45	72
Dessert apples	85	44
Culinary apples	85	43
Raspberries	45	39
Cucumbers	65	22
Tomatoes	25	21
Runner beans	85	16
Plums	65	6
Pears	65	5
Others	5–85	54
Total		**Approx. £430 million**

Source: UK NEA 2011. Chapter 14. Regulating Services

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Welsh Government Pollinator Action Plan

Outcome 1: Wales has joined up policy, governance and a **sound evidence base for action for pollinators**

Outcome 2: Wales provides diverse and connected flower rich habitats to support our pollinators

Outcome 3: Wales' pollinator populations are healthy

Outcome 4: Wales' citizens are better informed and aware of the importance and management of pollinators

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Outcome 2: Wales provides diverse and connected flower rich habitats to support our pollinators

• Beneficial flower rich habitats are promoted, created and enhanced wherever possible across Wales, at landscape scale, and also at smaller scales.

• Opportunities for habitat creation and enhancement for pollinators are promoted and supported on farmland, across protected areas and the wider countryside, and in urban and developed areas.

Area for Action 2.1: Promoting, creating and enhancing diverse and connected flowering habitats across farmland

Area for Action 2.2: Promoting, creating and enhancing diverse and connected flowering habitats across protected areas and the wider countryside

Area for Action 2.3: Promoting, creating and enhancing diverse and connected flowering habitats in our towns, cities and developed areas

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Actions 2.1 and 2.2

Area for Action 2.1: Promoting, creating and enhancing diverse and connected flowering habitats across farmland

- **Consider how Glastir can improve outcomes for biodiversity and pollinators.**
- Inclusion, where feasible, of biodiversity outcomes within the Common Agricultural Policy (CAP) reform process and the development of the next RDP.
- Linking outcomes for pollinators with WG work on Payments for Ecosystem Services (PES).
- Raising awareness of best practice with farmers and land managers through Farming Connect, and dissemination of best practice guidance.

Area for Action 2.2: Promoting, creating and enhancing diverse and connected flowering habitats across protected areas and the wider countryside

- **Work with NRW to ensure action for pollinators on designated sites, and within the woodland estate.**
- Ensure National Park and AONB outcomes and indicators include biodiversity and pollinators.
- Review key regulations and designations which impact on pollinators to ensure they are fit for purpose.

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What Key Pollinators want and how achieve this

The provision of extensive areas of flower-rich grasslands, heathlands and other habitats throughout the spring and summer by both safeguarding currently flower-rich areas and restoring (some) agriculturally-improved swards.

Recent research has highlighted the benefits to pollinators (bees) of providing a 10-20% flower-rich landscape with a Swiss agri-environment scheme.

Source: Buri, Humbert & Arlettaz 2014. Promoting pollinating insects in intensive agricultural matrices: field-scale experimental manipulation of hay-meadow mowing regimes and its effects on bees. Plos One, 9: 1-8.

- Adopt **targeted actions** for selected pollinator species.
- Adopt **geographically-targeted actions** where there are important pollinator populations or where there are crops requiring pollinators.
- Adopt a **more flexible approach to cutting and grazing regimes**. In flower-rich hay meadows and pastures, leaving areas (10-20%) uncut or ungrazed and managing these on rotation to prevent the development of rank swards.
- **Restrict the use of** organic and inorganic **fertilisers**.
- **Sympathetic management of hedgerows and road verges.**

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Species Reliant on Road Verges

On the Gwent Levels, the shrill carder bee forages extensively on ruderal road verges in late summer, with thistles being particularly important.

Andrena hattorfiana © Jeremy Early

In the Caerwent area of Gwent, road verges with field scabious *Knautia arvensis* are important for the mining bee *Andrena hattorfiana*.

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Sympathetic Verge Management

11,000ha of Road Verge must have the capacity to:

- **Make a valuable contribution towards the target of 10-20% flower-rich landscapes**
- **Provide the only forage for pollinators in some landscapes**
- **Provide early (dandelion, blackthorn, hawthorn, sallow) and late forage (knapweed, thistle) sources**
- **Provide connectivity and dispersal routes for pollinators between fragmented flower-rich habitats**

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