buglife

Pollination and the invertebrate fauna of roadside verges

Clare Dinham

www.buglife.org.uk
@buzz_dont_tweet

How important is insect pollination?

Insect pollination is essential to growing our food

“One out of every 3 mouthfuls”

90% of world’s crop species

In UK worth £500m p.a. or 13% of UK agricultural revenue .

£13 billion across EU

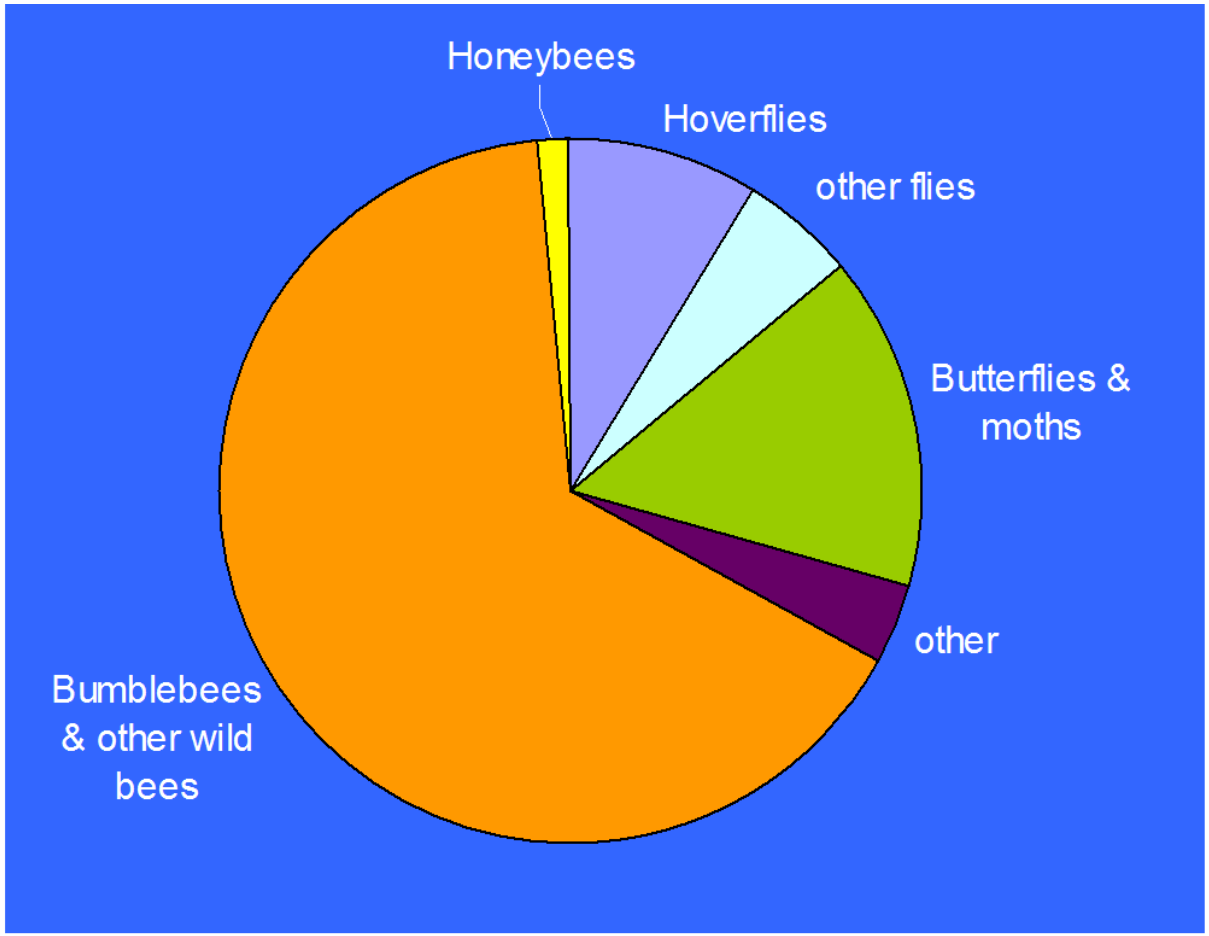
£132 billion around the world

Insect pollination is essential to maintaining a healthy and thriving environment

80% of British wild plants are pollinated by insects

Thick legged flower beetle (Oedomera nobilis)

Invertebrate Pollination



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

Dicks, Corbet & Pywell (2002) Compartmentalization in plant–insect flower visitor webs. J Animal Ecology 71, 32-43

Why do we need to take action for Pollinators?

Over half of our bee species have suffered declines over the past 50 years

Six of 25 bumblebee species have declined in UK by at least 80% in last 50 years

Short-haired bumblebee extinct in early 1990s

Brown-banded carder bee (*Bombus humilis*)

Shrill carder bee (*Bombus sylvarum*)

- **Suffered massive declines due to loss of wildflowers**
- **Both species present in south and west Wales**
- **Large areas of open flower rich grassland 10-15km^2**
- **Needs lots of wildflowers throughout April - September**
- **Forage on Bird's-foot trefoil, clovers, vetches, dead nettles…..**

Why do we need to take action for Pollinators?

38% of hoverfly species in decline

71% of butterfly species in decline

75 moth species declined by over 70% over 35 years

Over 250 UK pollinators are in danger of extinction

White-line dart (*Euxoa tritici*)

- 92% decline in 35 years

Loss of wildflower rich habitat

Why the decline?

- 3 million ha of flower rich grassland lost sinceWW2
- Pesticides
- Disease

Destruction of wildflower rich grassland

Fragmentation of remaining natural habitats

Road side verges

Verges can be the most flower-rich habitat available, especially within an agricultural setting

Considerations

- Forage resource
- Larval development
- Shelter and Over-wintering habitat
- Basking
- Nesting

New road cuttings – Weymouth relief road

- Not top-soiled and seeded with wild-flowers incl. Kidney vetch
- BC monitoring site - 20 species of butterfly recorded including Small blue

Nutrient poor soils – allow natural colonisation or seed with wildflowers

Small blue *(Cupido minimus)*

- Found in South and West Wales, stronghold in south England
- Mosaic of open short sward vegetation (rich in Kidney vetch), and tall vegetation for perching/roosting
- Nectar source: bird's-foot trefoil, vetches
- Natural colonisation more likely with large source population and good connectivity
- **Restore connections between colonies on: new road verges, brownfields, quarries, disused railway, field margins…..**

Calcareous roadside verge

Dingy skipper (Erynnis tages)

Grayling (Hipparchia semele)

Red-shanked carder bee (B. ruderarius)

- **Bird's-foot trefoil – nectar source for many butterflies and bumblebees including Dingy skipper, Grayling and Red-shanked carder bee**
- **Flowers May - September**

- **Habitat mosaic including short sward vegetation with bare ground, taller vegetation, (docks, nettles, thistles), hedgerow/scrub species**

- **Provide forage, nesting, shelter, basking, breeding habitat**

- Wide road side verge allowed to regenerate naturally
- Sandy/silt substrate, free draining, low nutrient
- Open, bare patches of bare ground – burrowing and basking invertebrates

Late flowering species rich verge

- Devil's-bit scabious, Meadow buttercup, Wild carrot, Autumn hawkbit, Common knapweed, Selfheal, Yarrow…

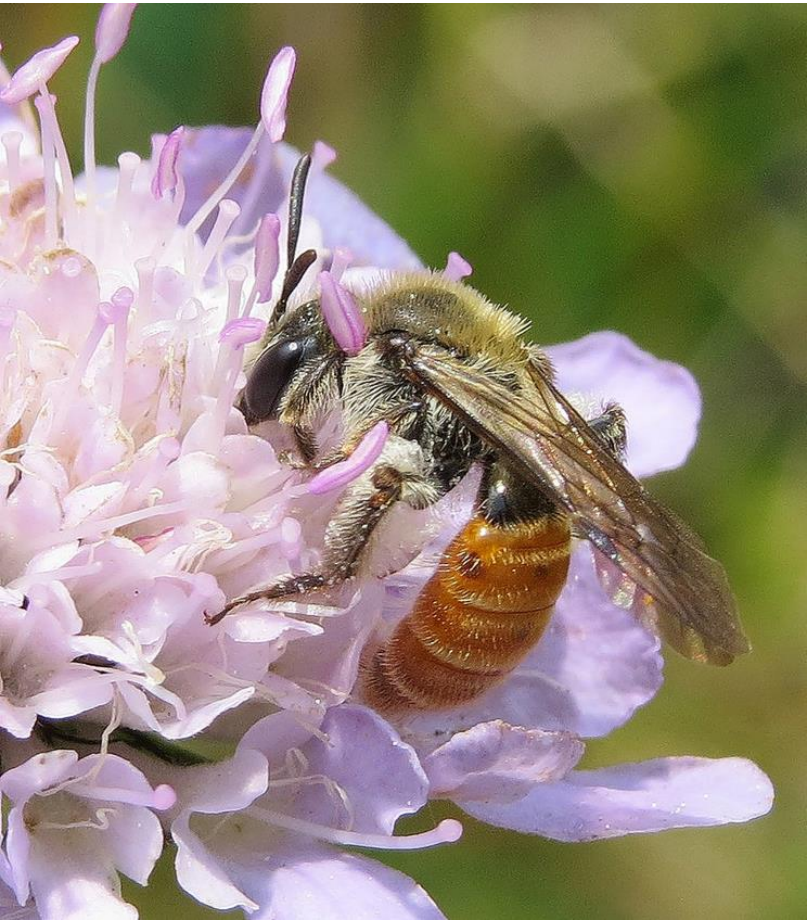
Devil's-bit scabious

- In flower July - October
- Used by a wide range of invertebrates including bees, moths and butterflies
- Important for rarer species such as Broken-belted bumblebee, Small scabious mining bee and Marsh fritillary
- **Consider delaying cutting to allow wild-flowers to set seed**

Broken-belted bumblebee *(Bombus soroeensis)*

- **Suffered substantial decline**
- **Residual populations in West Wales**
- **Queens emerge May/June feeding on dead nettles, clovers, brambles, Bird's-foot trefoil**
- **Prefers sites with large areas of late flowering grassland – Devil's-bit scabious a favourite for workers, males and new queens in late summer/early autumn**
- **Vulnerable to habitat fragmentation**

Small scabious mining bee *(Andrena marginata)*



- **Suffered large declines over most of its former range**
- **Most records in South Wales and southern England**
- **Calcareous sites - Field and Small scabious (late July/early August)**
- **Acidic sites - Devil's-bit scabious (late August/early September)**
- **Thought to nest in sparsely vegetated ground**

Marsh fritillary *(Euphydryas aurinia)*

- North-west and south-west Wales
- Colonies typically art of meta-population and slightest barrier can prevent dispersal
- Requires extensive habitat network and needs warm sunny areas
- Nectar – Betony, Bugle, Buttercups, Dandelions, Hawkweeds, Knapweeds
- Larval food plant – Devil's-bit scabious (will also use Field and Small scabious)

Roadside hedges

Tawny mining bee (Andrena fulva)

Ashy mining bee (A. cineraria)

- Willow, Blackthorn, Hawthorn, Wild cherry, Bramble, Rose
- Provide important early forage resource (emerging bumblebee queens and solitary bees), summer flowers and autumn berries
- Hedges and tussocky grassland understory rovide shelter, sunbathing foliage, over-wintering habitat

Sunken lanes

- Tend to be old and support ancient woodland flora
- South facing sunny banks
- Can be flower-rich whilst also containing bare earth for nesting
- Bee-flies if host mining bees present

Roadside ditches

Hoverfly (Helophilus pendulus)

Wainscots

Broad-bodied chaser (Libellula depressa)

- **Can provide valuable nesting and forage habitat**
- **Typical flora – Meadowsweet, Great willowherb, Yellow flag, Reeds**
- **Avoid dredging cutting between March – September**
- **Allow some uncut vegetation to remain at all times**

Wildflower lawns

- Alternative to amenity grassland where verge must be kept short
- Self-heal, Cowslip, Red clover, Bedstraws, Bird's-foot trefoil, Ox-eye daisy, Buttercups, dead nettles
- Can withstand a more frequent mowing regime

Species poor verges – valuable?



- **Species such as Hogweed, Cow parsley, Ragwort and Thistles provide an important forage resource for many invertebrates including some generalist pollinators such as flies and beetles**

- **Can tolerate cuttings where they are unable to be removed from site**



Flower power

Roesel's bush-cricket *(Metrioptera roeselii)*

- c. 100 years ago only found in S.E. England
- Rapid expansion of its range - west and north
- Favours damp meadows and grassland
- Dispersal largely aided by roadside verges (rough grassland and scrub)
- Feed mostly on buds, seeds and flowers

Management

- Cutting typically once or twice a year (April and September)
- Target management for certain species, i.e. later cuts where Marsh fritillary is present
- Differential cutting – structural diversity in vegetation
- 2 – 3 year cycles for winter shelter
- Removal of arisings where possible esp. on wildflower rich verges
- Natural regeneration can be a good option where suitable ground conditions allow

View road verges on bigger landscape context…

B-Lines

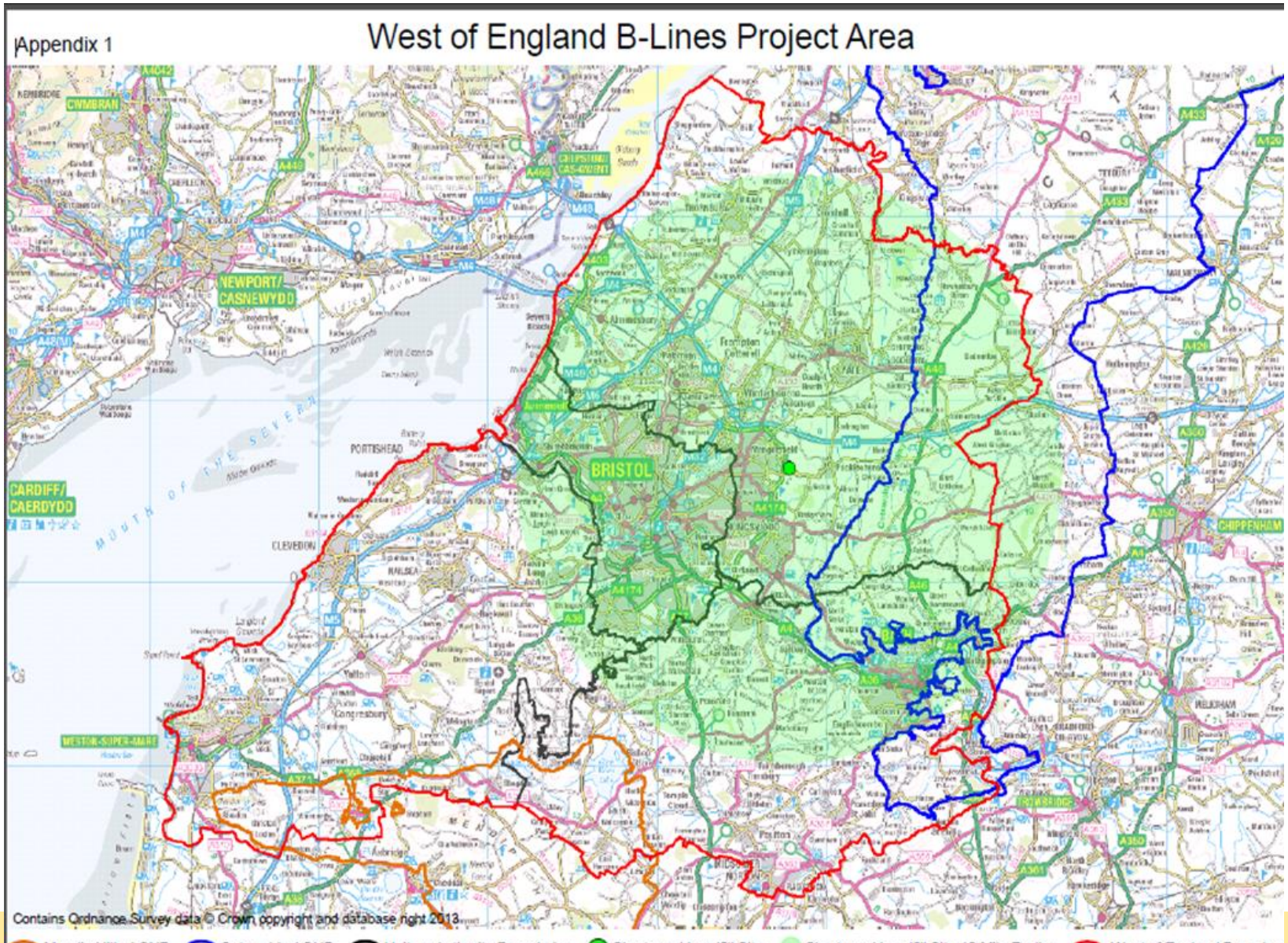
Wide **continuous** lines of permanent **wildflower-rich** habitat

Link together and expand best wildlife areas by **enhancing**, **restoring** and **creating** new habitat.

Linking with and **joining** other wildlife initiatives

Co-ordinated and **collaborative** work

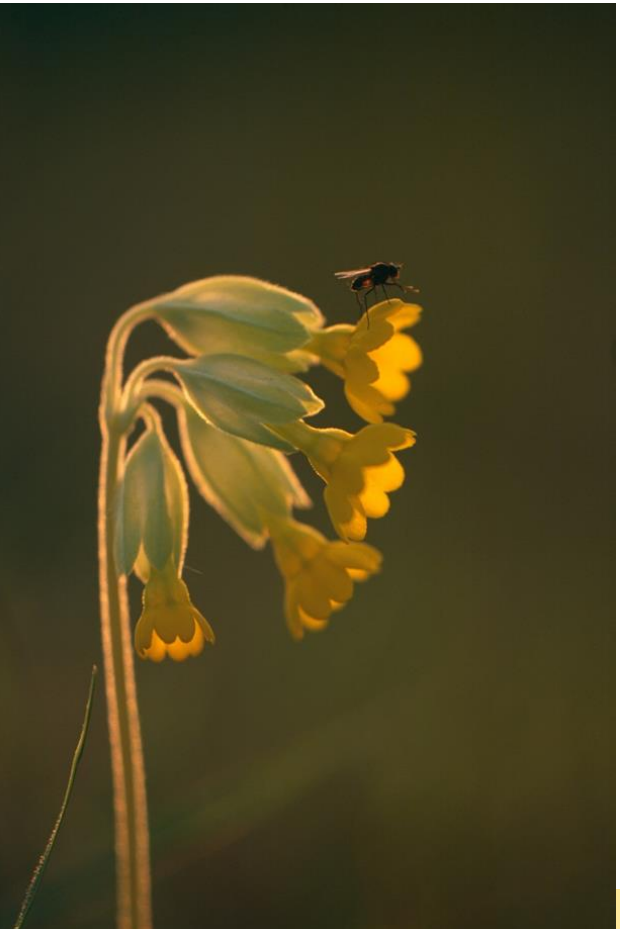
West of England B-Lines



B-Lines Wales?

Welsh Pollinator Strategy:

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



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clare.dinham@buglife.org.uk

www.buglife.org.uk Tel: 01733 201210 @buzz_dont_tweet

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