



Overview of Scottish solitary bees and hoverflies

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www.buglife.org.uk
[@buzz_dont_tweet](https://twitter.com/buzz_dont_tweet)

Who is Buglife?

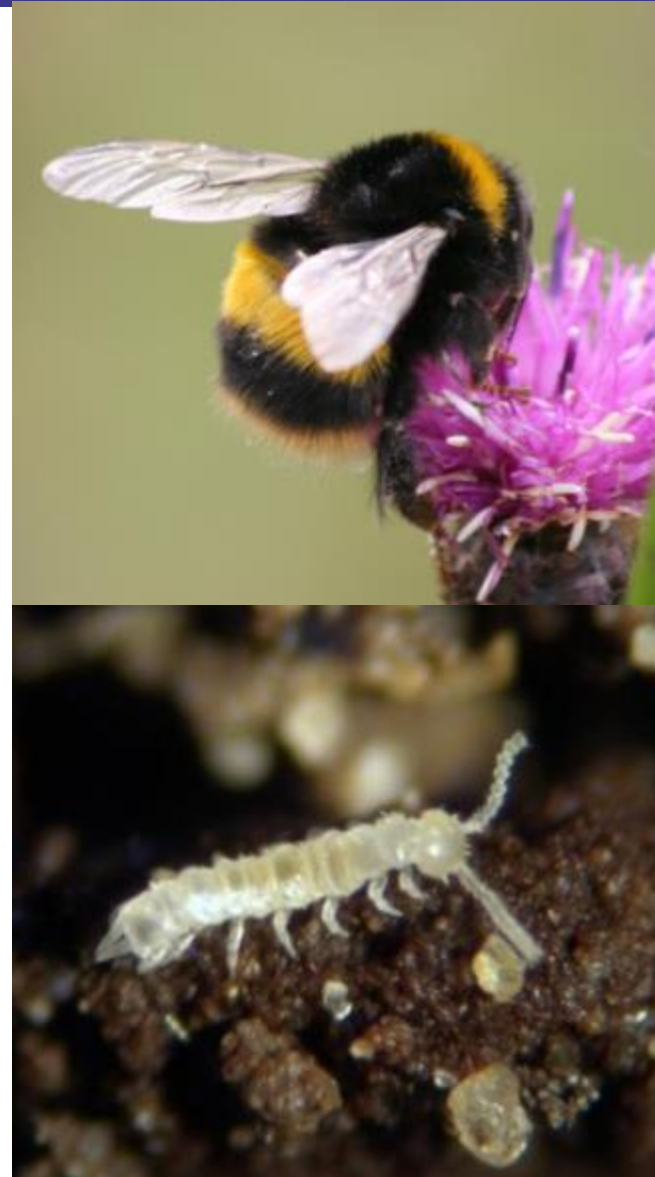
We are the only organisation in Europe concerned with the conservation of ALL invertebrates.



Our aim is to halt invertebrate extinctions and achieve sustainable populations of invertebrates in the UK.

Invertebrate Services

- Over 40,000 species in the UK!!
- Soil management & nutrient cycling
- Waste management
- Control of pest species
- Food for us and other animals
- Pollination



Pollinators provide us food

Pollination by insects is essential to growing our own food!

“It is thought that insects pollinate one out of every three mouthfuls of food we eat”

- Insects pollinate 90% of world's crop species.
- In UK pollination is worth ~£500m a year or 13% of UK agricultural revenue.
- Worth ~£132 billion around the world.



UK Pollinating Insects



At least 4,000 species in the UK and includes bees, butterflies, moths, beetles, wasps and flies!



Declines in our UK pollinators

- Over 97% of flower-rich grassland has been lost in the UK in last 100 years (over 3 million hectares) - remaining habitat has been left fragmented and isolated.
- Pesticides & herbicides –
Neonicotinoids (systemic pesticides).
- Diseases & Parasites- e.g. from commercially reared honeybees & bumblebees that are released into the wider countryside.



Declines in our UK pollinators

- Over 250 sp. threatened with extinction!
- Six of our 25 bumblebees have declined in the UK by at least 80% in the last 50 years.
- Higher proportion of bees fall into Nationally Scarce & Vulnerable categories than any other insect group!
- 38% of hoverfly sp. in decline.
- 71% of butterfly sp. in decline.





Meet the Pollinators: bees and wasps (Order Hymenoptera)

Social wasp- 9 species



Solitary bee- 250 species



Bumblebee- 24 species



Honey bee- 1 species



UK Bee Diversity

- Over 270 sp. of bees in Britain.
- Six Families:
 - Colletidae- 21 sp.
 - Andrenidae- 69 sp.
 - Halictidae- 62 sp.
 - Melittidae- 6 sp.
 - Megachilidae- 40 sp.
 - Apidae- 76 sp.- includes 1 sp. of honey bee and 24 sp. of bumblebee.
- About 112 sp. in Scotland (4 thought to be extinct, 2 have insufficient data):
www.buglife.org.uk/sites/default/files/Hymenoptera%20-%20Aculeata%20-%20Bees.pdf



Honey bee



Tree bumblebee

Family Apidae

- Apidae- 76 sp. in the UK, at least 32 in Scotland.
- A diverse group that includes numerous nest cleptoparasitic sp. that are specific to other bees. Group has a range of tongue lengths
- Contains many solitary sp. plus a range of social sp. (bumblebees), that vary in complexity.

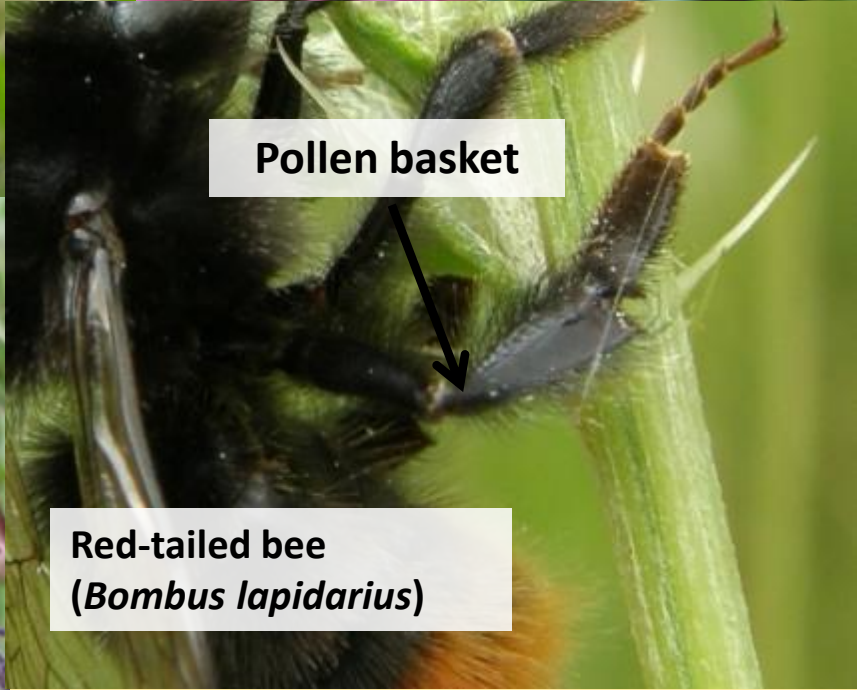


Panzer's nomad bee
(*Nomada panzeri*)



Fork-tailed flower bee
(*Anthophora furcata*)

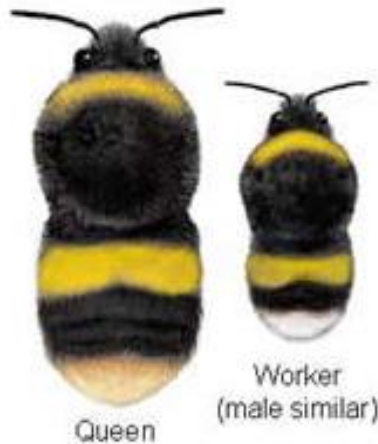
Bumblebees



Red-tailed bee
(*Bombus lapidarius*)

Bumblebees

Buff-tailed bumblebee
(*Bombus terrestris*)



Early bumblebee
(*Bombus pratorum*)



Common carder bee
(*Bombus pascuorum*)



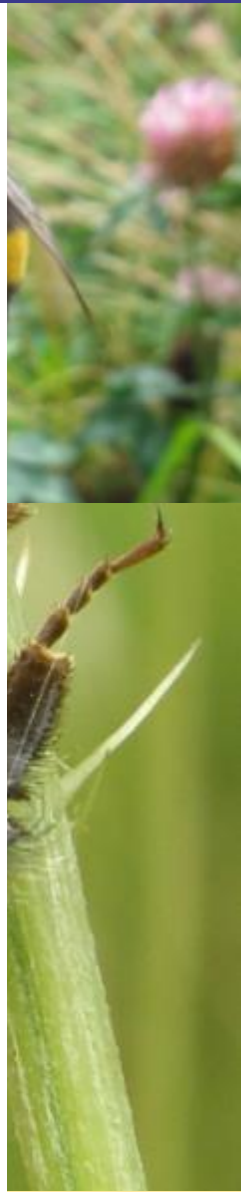
White-tailed bumblebee
(*Bombus lucorum*)



Red-tailed bumblebee
(*Bombus lapidarius*)



Garden bumblebee
(*Bombus hortorum*)



Cuckoo bees



Forest Cuckoo
(*Bombus sylvestris*)



Red-tailed Cuckoo
(*Bombus rupestris*)



- Not all species of bumblebee are social.
- There are six sp. of Cuckoo-bumblebee which act as 'cleptoparasites' of specific sp. of social bumblebees.
- Cuckoo bees lack workers and have simple hind legs.

Family Colletidae

- 21 sp. in UK- short bilobed tongued bees, regarded as a primitive family.
- Plasterer bees *Colletes* 4 of 9 sp. in Scotland: Have banded abdomens with flattened whitish/yellowish hairs and nest in the ground, often in steep sandy soils.
- Yellow-faced bees *Hylaeus* 4 of 12 sp. in Scotland: small bees, carry pollen back to the nest in their crop and regurgitate into the nest cell.



Davie's colletes
(*Colletes daviesanus*)



Hairy yellow face bee
(*Hylaeus hyalinatus*)

Family Andrenidae

- A large group of bees with 69 sp. in 2 genus- *Andrena*- 26 sp. And *Panurgus*- 0 sp. in Scotland.
- Vary from densely furry to inconspicuously hairy, wear with age. Have short tongues.
- *Andrena* can be distinguished from similar genera such as *Colletes* by broad strips of velvety pile (facial hairs) alongside inner eye margins (most obvious in females).
- Also have more extensive pollen-collecting apparatus than most other bees, involving most parts of the hind-legs and sides of the propodeum (first abdominal segment).



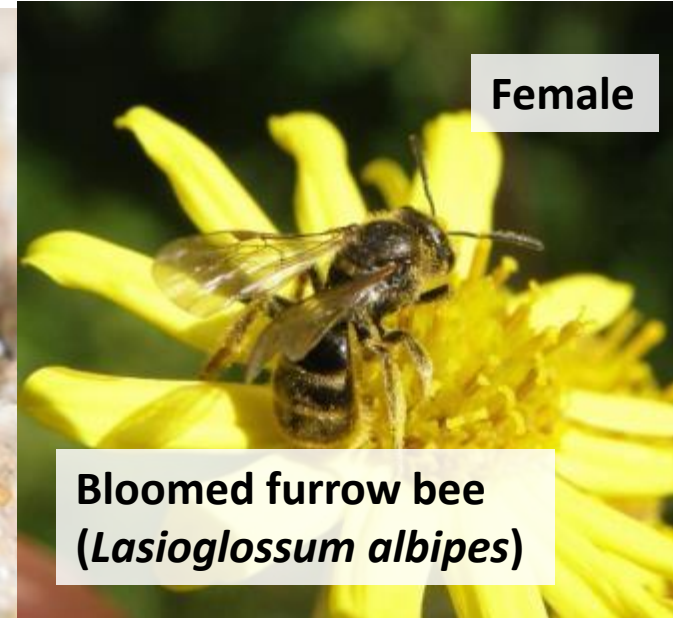
Groove-faced mining bee
(*Andrena angustior*)



Early mining bee
(*Andrena haemorrhoa*)

Family Halictidae

- Halictidae- 20 of 62 sp. in Scotland- Short pointed tongued bees.
- Includes several cleptoparasitic species and show a range of sociality with several eusocial sp. in *Lasioglossum*. Most sp. nest underground in light soils.
- Furrow bees *Halictus* 2 of 8 sp. in Scotland; Blood bees *Sphecodes* 5 of 17 sp. in Scotland; Base-banded furrow bee *Lasioglossum* 13 of 34 sp. in Scotland.



Family Megachilidae- *Megachile* and *Osmia*

- 14 of 40 sp. in Scotland- no social sp.
- Nest mostly in pre-existing cavities in wood, hollow stems, walls, some *Osmia* in empty snail shells!
- Leafcutter bees *Megachile* 4 of 10 sp. in Scotland- males of some sp. have expanded front tarsi.
- Term leafcutter: females make nests with cut out sections of leaf.
- Mason bees *Osmia* 6 of 12 sp. In Scotland- often with box-shaped heads and powerful jaws.



Red mason bee
(*Osmia bicornis*)



Gold-fringed mason bee
(*Osmia aurulenta*)

Bee mimics- hoverflies



Eristalis tenax



Honey bee
(*Apis mellifera*)

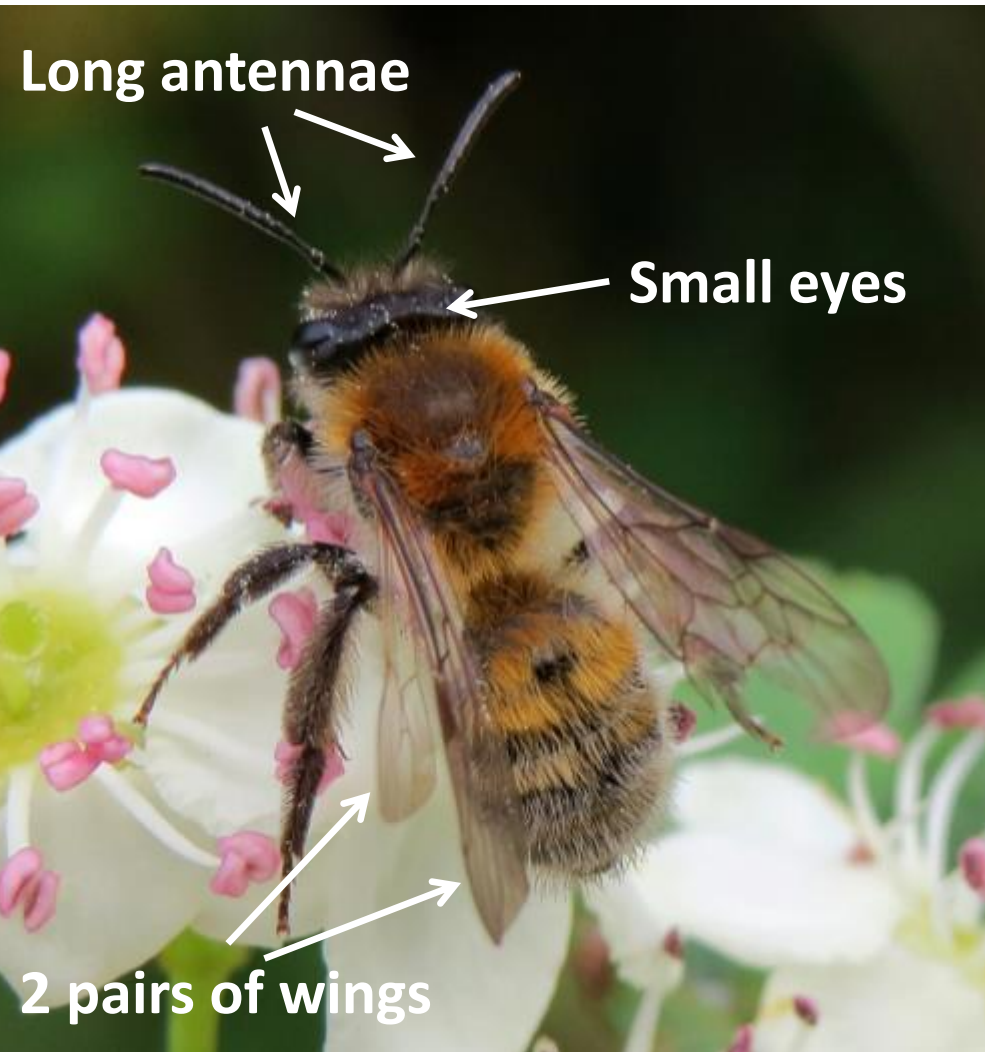


Buffish mining bee
(*Andrena nigroanea*)

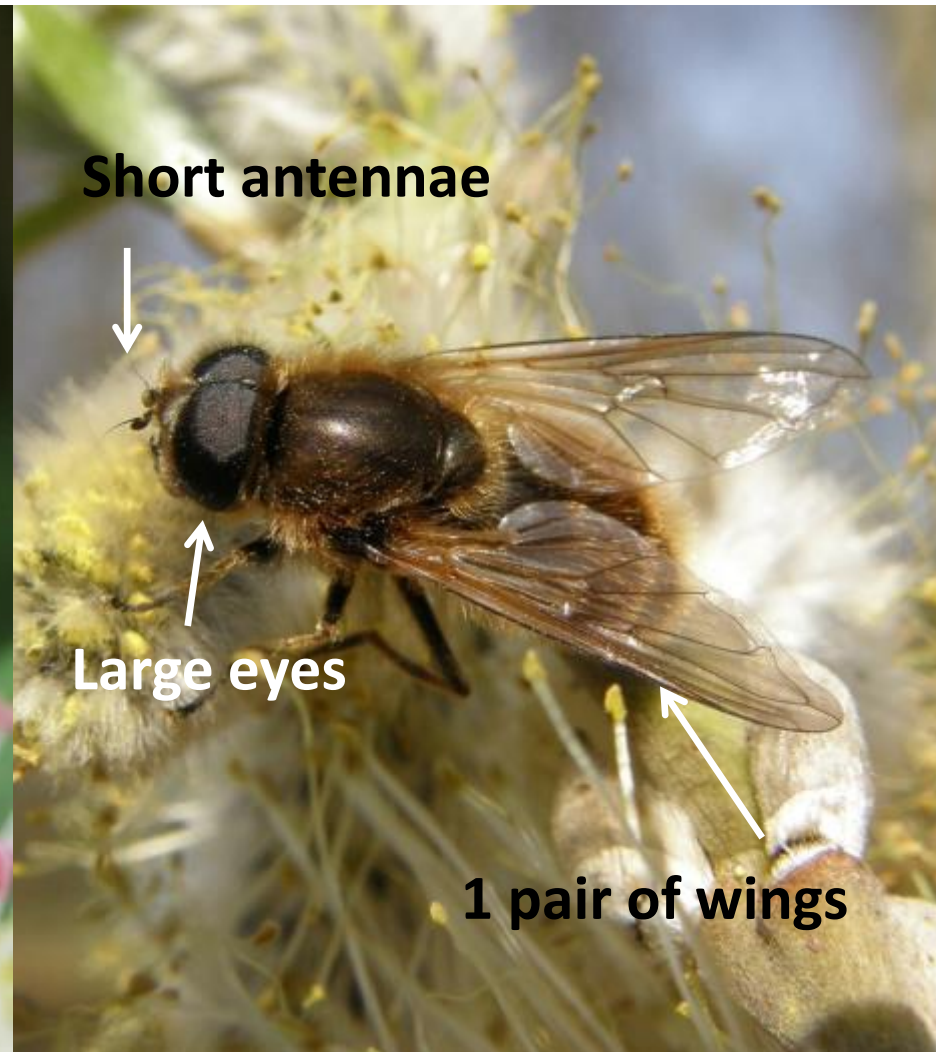


Bees vs. Flies

Solitary Bee



Hoverfly





Meet the Pollinators: hoverflies

Looks like a bee!



Looks like a wasp!



Looks like a wasp!



Looks like a hornet!

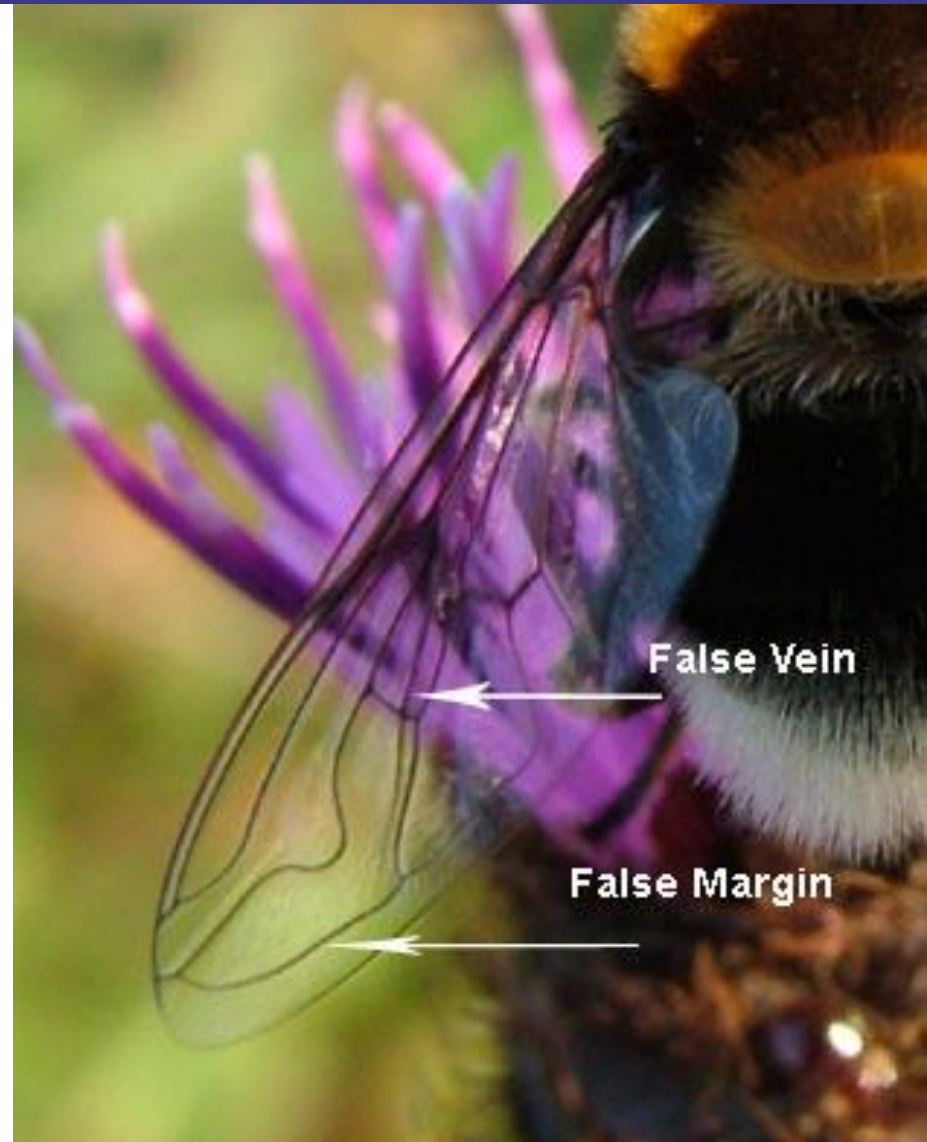
Hoverflies (Family Syrphidae)

- At least 282 species have been recorded in the UK.
- About 6,000 species globally and found on every continent except Antarctica.
- Adults feed on nectar and pollen and larvae (maggots) eat a wide variety of food, many are predatory feeding on pests such as aphids.



What makes a hoverfly a hoverfly?

- False vein (Vena spuria) that runs through wing.
- False margin formed by outer cross veins.
- Fairly compact build without very elongated bodies, or long legs, or long proboscis.
- They may be furry but are never bristly like houseflies!



Marmalade hoverfly (*Episyrphus balteatus*)

- Our most common hoverfly.
- Variable species as background colour influenced by temperature at which larvae develop.
- Larvae feed on aphids.
- Migratory species that can be found all year.
- Only hoverfly with double black marking- second bar looks like a moustache.



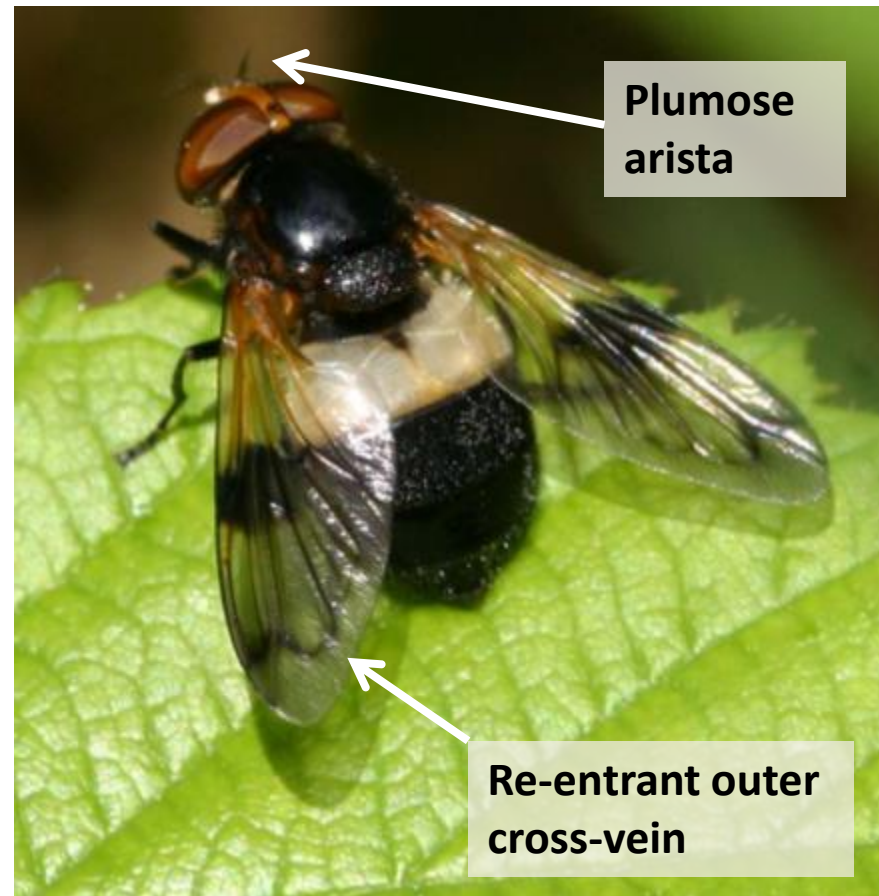
Yellow belted hoverfly (*Chrysotoxum bicinctum*)

- A large hoverfly with long antennae.
- Distinctive yellow bars on abdomen and chocolate- coloured wing markings.
- Found in open grassland and grassy woodland rides.
- Widespread across the UK although less common in Scotland.
- Very little is known about the biology of the larvae.



Large pied hoverfly (*Volucella pellucens*)

- A large hoverfly and one of the most obvious with large white markings on abdomen that contrast with black markings.
- Adults found in sheltered woodland rides and tree-lined paths.
- Larvae live in nests of social wasps.



Large pied hoverfly (*Volucella pellucens*)

Re-entrant outer
cross-vein

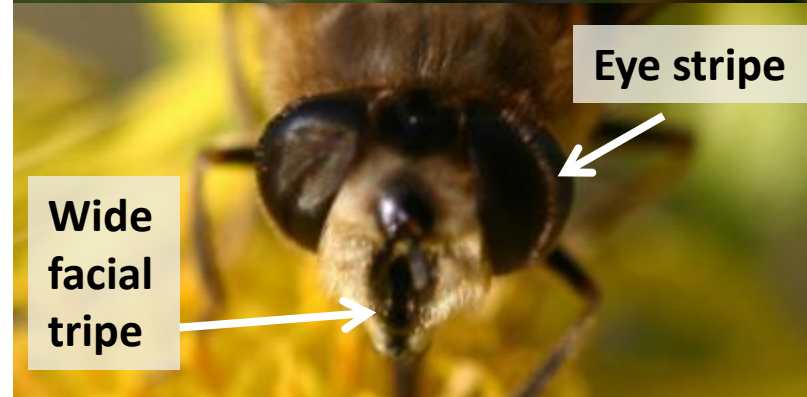


Plumose
arista

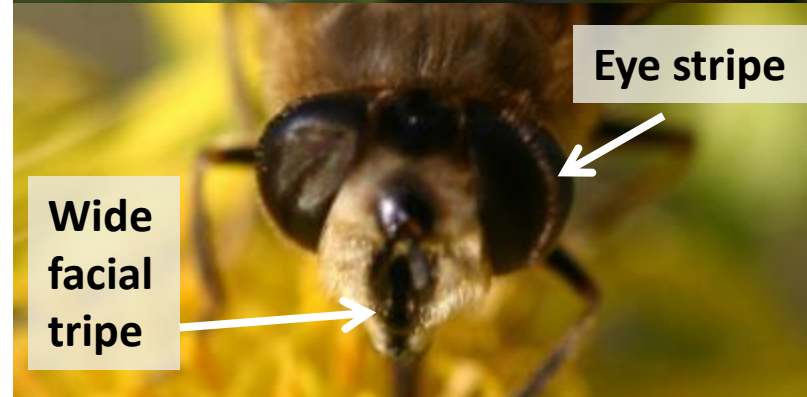


Dronefly (*Eristalis tenax*)

- Honey-bee mimic.
- Eyes have vertical stripe of longer dark hairs, black facial stripe is wide and hind tibia is enlarged and curved.
- Often numerous on Ivy.
- Females hibernate in sheltered cavities in caves and buildings.
- Larvae are aquatic 'rat-tailed maggots' that live in highly enriched aquatic environments such as slurry tanks.



Dronefly (*Eristalis tenax*)



Tiger hoverfly (*Helophilus pendulus*)

- Common and widespread species.
- Wing loop is present. Male and female eyes are separate so to sex them need to look at end of abdomen.
- Larvae are aquatic and have been found in farmyard drains, wet sawdust and cow manure.
- Stripes on thorax and black antennae- diagnostic for this group.
- Similar species: *H. hybridus*. Males- black marks on abdomen don't meet the edge. Females- apical half of hind tibia is black.



Tiger hoverfly (*Helophilus pendulus*)

Helophilus hybridus





Where to find bees and hoverflies

Wildflower meadows



Open Heathland



Woodland



Urban areas



Collecting bees and hoverflies

Don't need much to begin with.

Butterfly net, pots, pooter, hand lens....



Sampling habitats for pollinators

- Look on flowers.
- Sweep vegetation.
- Bee hotels.
- Look on bare ground.





Help with id...bees

- Steven Falk- Field guide to the bees of Britain and Ireland. Also check his Flickr page.
- Guide to solitary bees of Britain by Ryan Clark:
<http://www.wildlifetrusts.org/reserves-wildlife/guide-solitary-bees-britain>
- Facebook page: Bees, wasps and ants recording (BWARS) group- <https://www.facebook.com/groups/1590641777855221/>
- iRecord- for verification of all sp., remember to upload a photo!

See handout for more information!

Help with id...bees

Steven Falk > Collections > Insects > Hymenoptera (bees, wasps, ants and relatives)



Apoidea (bees)

Welcome to the BRITISH BEES ON FLICKR site. This collection covers nearly all 278 species of bee on the British and Irish list (including the Channel Islands) acting as a virtual field experience and virtual museum collection. Special thanks are due to the Natural History Museum, London and the Oxford University Museum for allowing me to photograph specimens that were lacking in my own collection and to other photographers for allowing me to host their images.

The collection is organised as alphabetically arranged genera containing alphabetically-arranged species 'albums'. Photos within individual species albums are arranged in a set sequence: males (living), males (pinned and microscopic views), females (living), females (pinned and microscopic views), habitat(s), key forage plants, any special parasites/hosts.

Once in a species album, hover your cursor over the top of page to view the species accounts that have been prepared for every species. These often contain live hyperlinks to other websites



Andrena (mining bees)

59 albums



Andrena s.g....

10 albums



Anthidium (wool-carder...)

2 albums



Anthophora (flower bees)

6 albums



Apis (honey bees)

1 album



Bombus (bumblebees)

32 albums



Ceratina (small...)

1 album



Chelostoma (scissor bees)

1 album

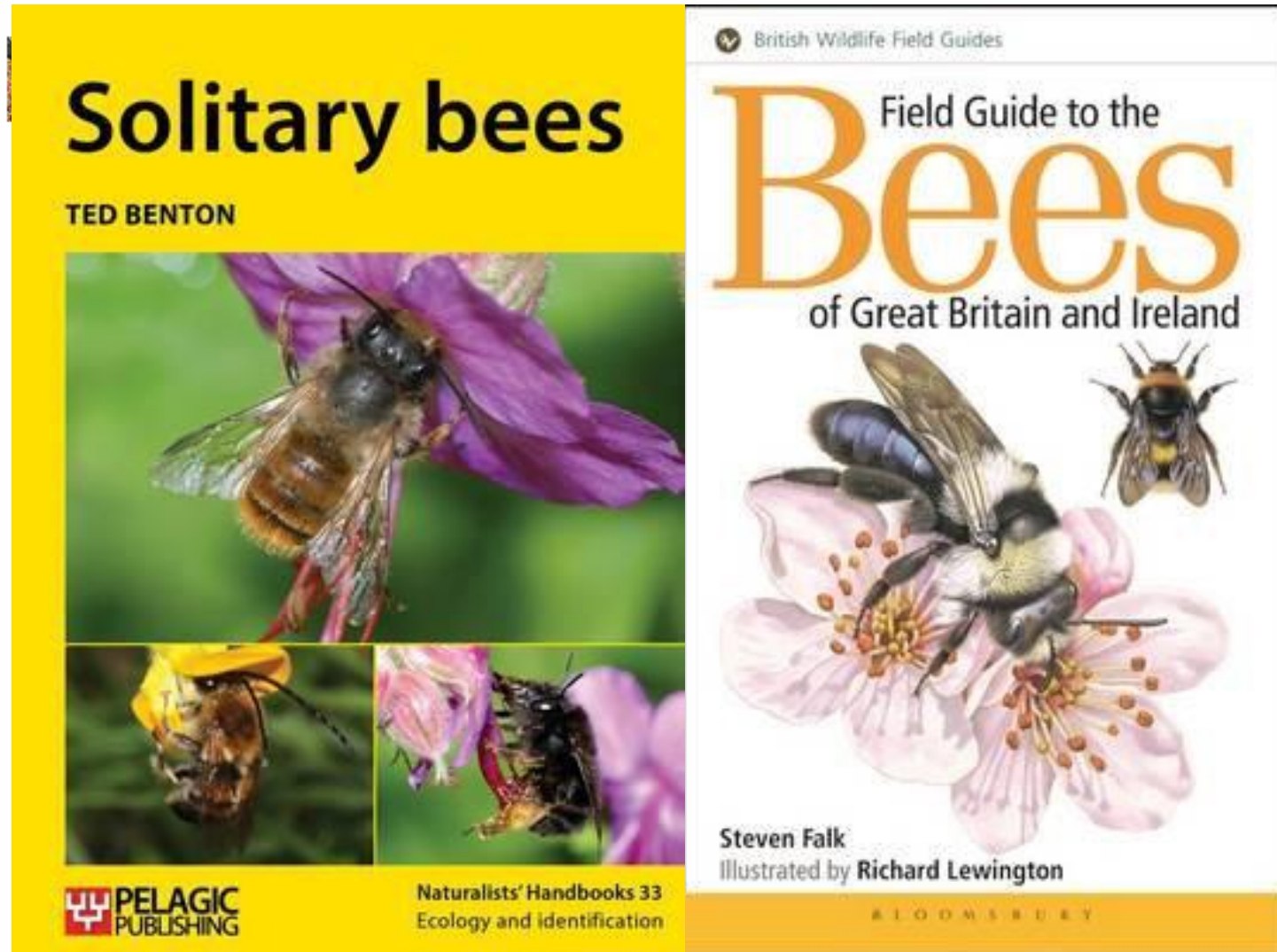


Coelioxys...

8 albums

Help with id...bees

Steven Falk > Collections > Insects > Hymenoptera (bees, wasps, ants and relatives)



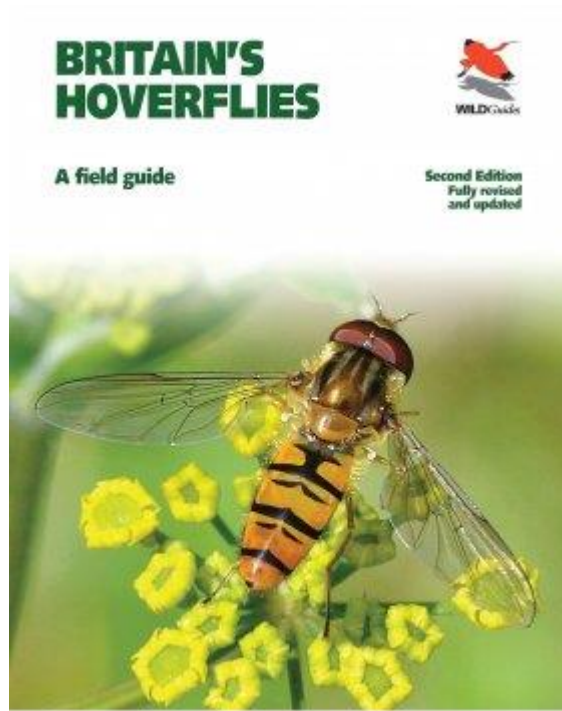
prepared for every species. These often contain live hyperlinks to other websites

(small...

(solitary bees)

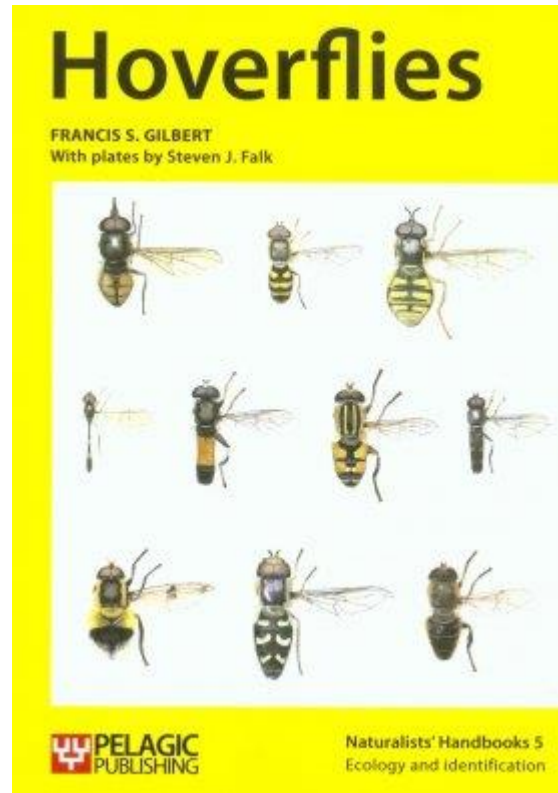
diagrams

Help with id...hoverflies

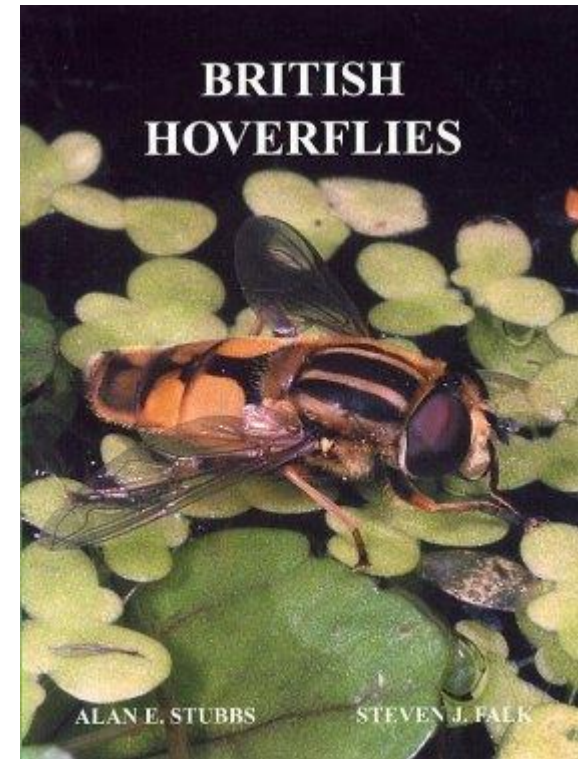


Stuart Ball and Roger Morris

**Wild Guides by
Stuart Ball and Roger
Morris £17-25**



**Naturalists
Handbook by Francis
Gilbert £20**



**British Entomological
and Natural History
Society by Alan
Stubbs and Steven
Falk £37.50**




Recording bees and hoverflies

- Important to record what you find!
- Can do this through **IFLI's Forth Nature Counts iRecord form!**
- Need to collect information on the location, habitat, date and surveyor.
- Remember to take lots of photos and upload them to help the experts verify them.



Thank you for listening
Are there any questions?

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

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