

BeeWalk

Monitoring the plight of the bumblebees

Sponsors and Supporters

Bees in the UK

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Around 270 bee species in Britain

- 1 honeybee
- 25 bumblebees (19 social)
- The rest are **solitary bees**

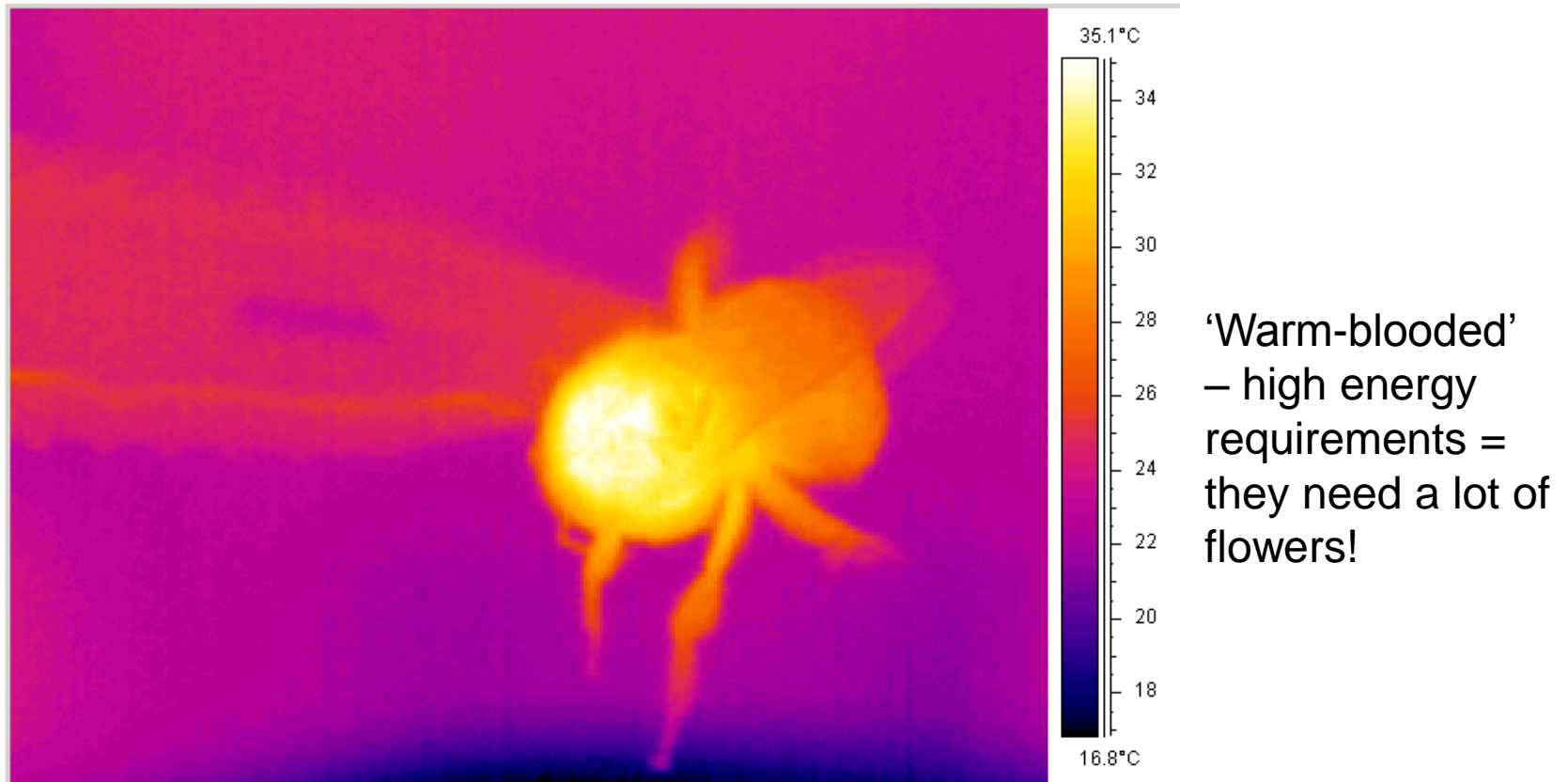


What are bumblebees?

- Order Hymenoptera; genus *Bombus*
- Around 250 species worldwide
 - Cryptic species
- Annual life cycle
- Feed exclusively on pollen and nectar
 - Adapted for efficient collection
- Cold-adapted
 - Predominantly northern hemisphere



Adaptations to cold



Picture from Volynchik et al. 2006. Microscopy Research and Technique 69: 903-912.



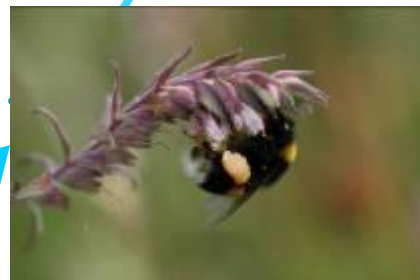
Bumblebee
Conservation
Trust

The bumblebee life cycle

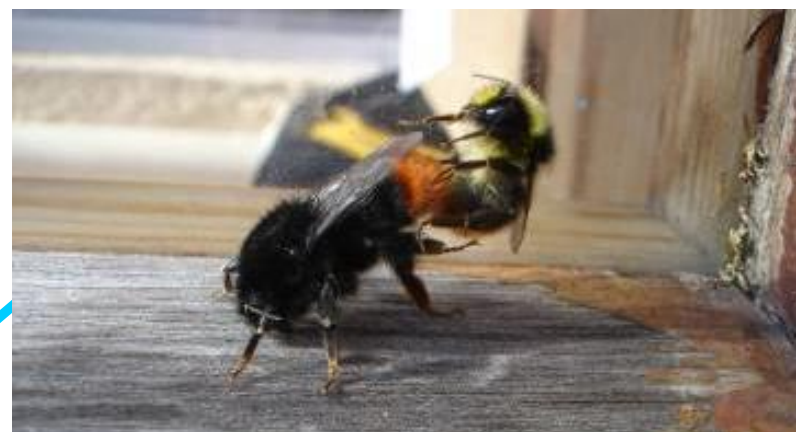
Spring



Summer



Winter



Late summer

bumblebeeconservation.org

Decline and fall

- 1980 *Atlas* of bumblebees found widespread declines from 1900
- Over a third of the social bumblebees (7 species) declined by more than **70%** 1900-1980
- **2 species extinct**
- **8 Conservation Priority**

Extinct:

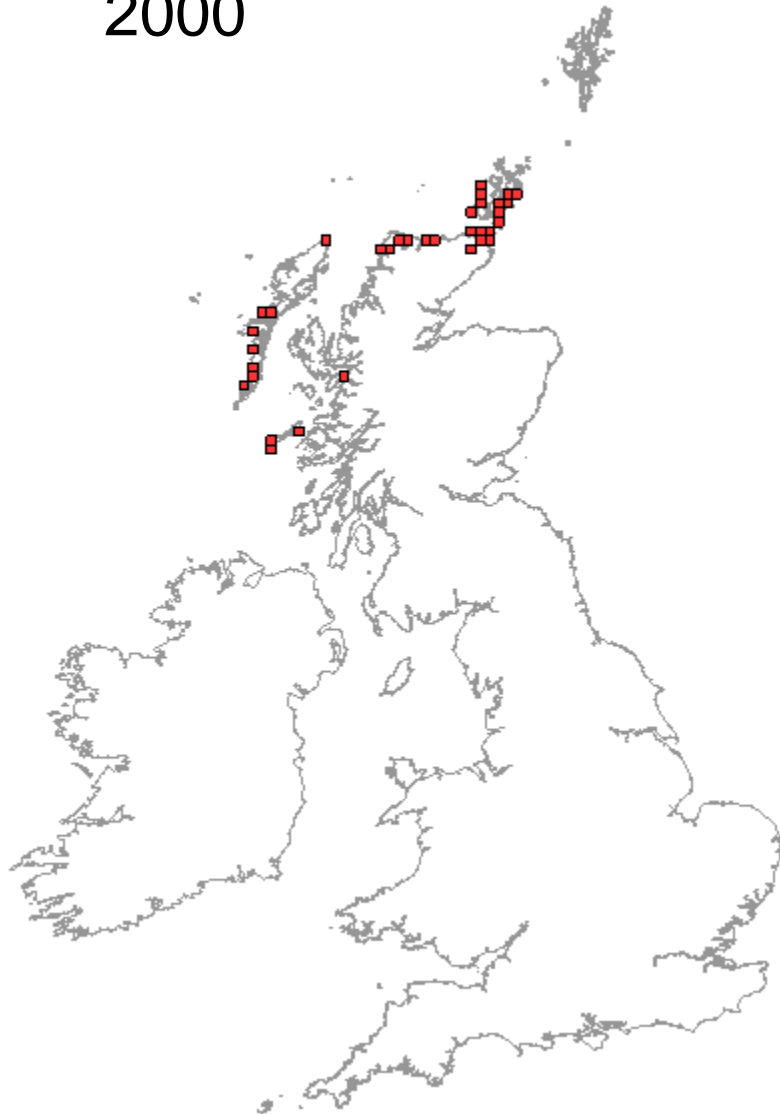
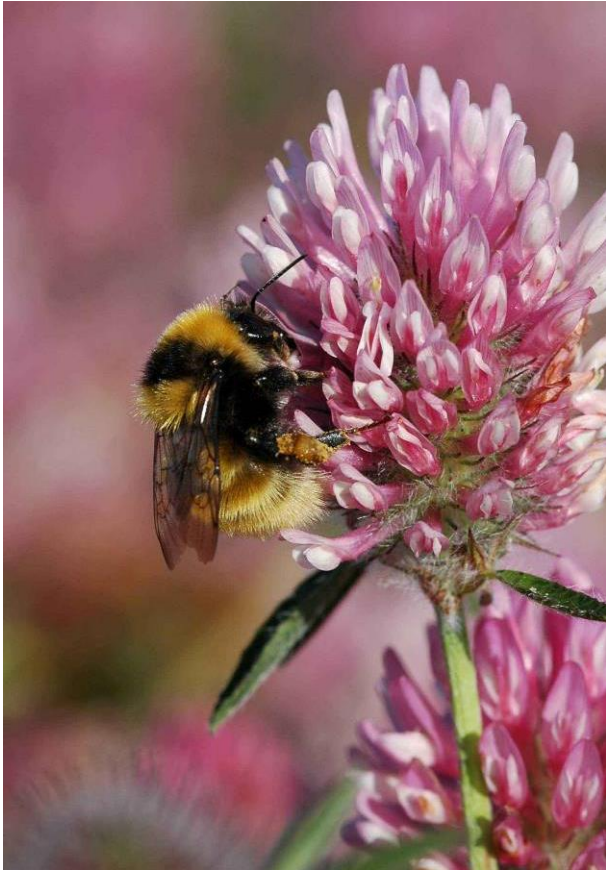
1. Culluman's Bumblebee, *B. cullumanus* (1941)
2. Short-haired Bumblebee, *B. subterraneus* (1988)

Declining/rare:

1. Moss carder, *B. muscorum*
2. Brown-banded carder, *B. humilis*
3. Great Yellow Bumblebee, *B. distinguendus*
4. Red-shanked carder, *B. ruderarius*
5. Large Garden Bumblebee, *B. ruderatus*
6. Shrill carder, *B. sylvarum*
7. Billberry Bumblebee, *B. monticola*
8. Short-haired bumblebee, *B. subterraneus* (reintroduced population)

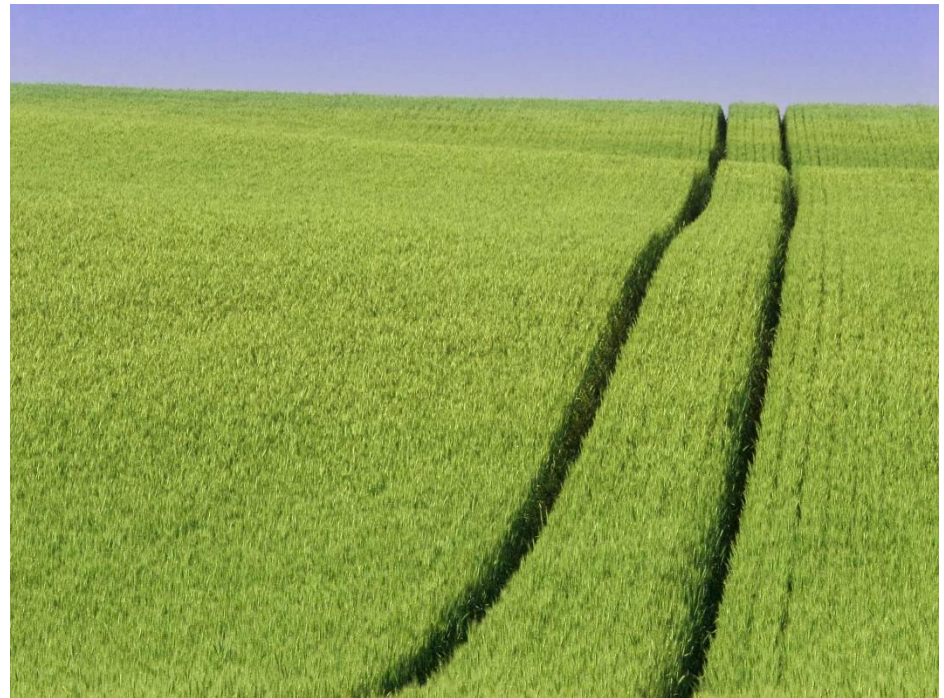
Great yellow bumblebee

2000



Why are bumblebees declining?

- Great loss of bumblebee habitat
 - 98% of flower-rich grassland has been lost in UK since 1940s
- Agricultural changes to more intensive methods
 - Cutting grass many times a year and heavy grazing
 - Removal of hedgerows and areas without crops

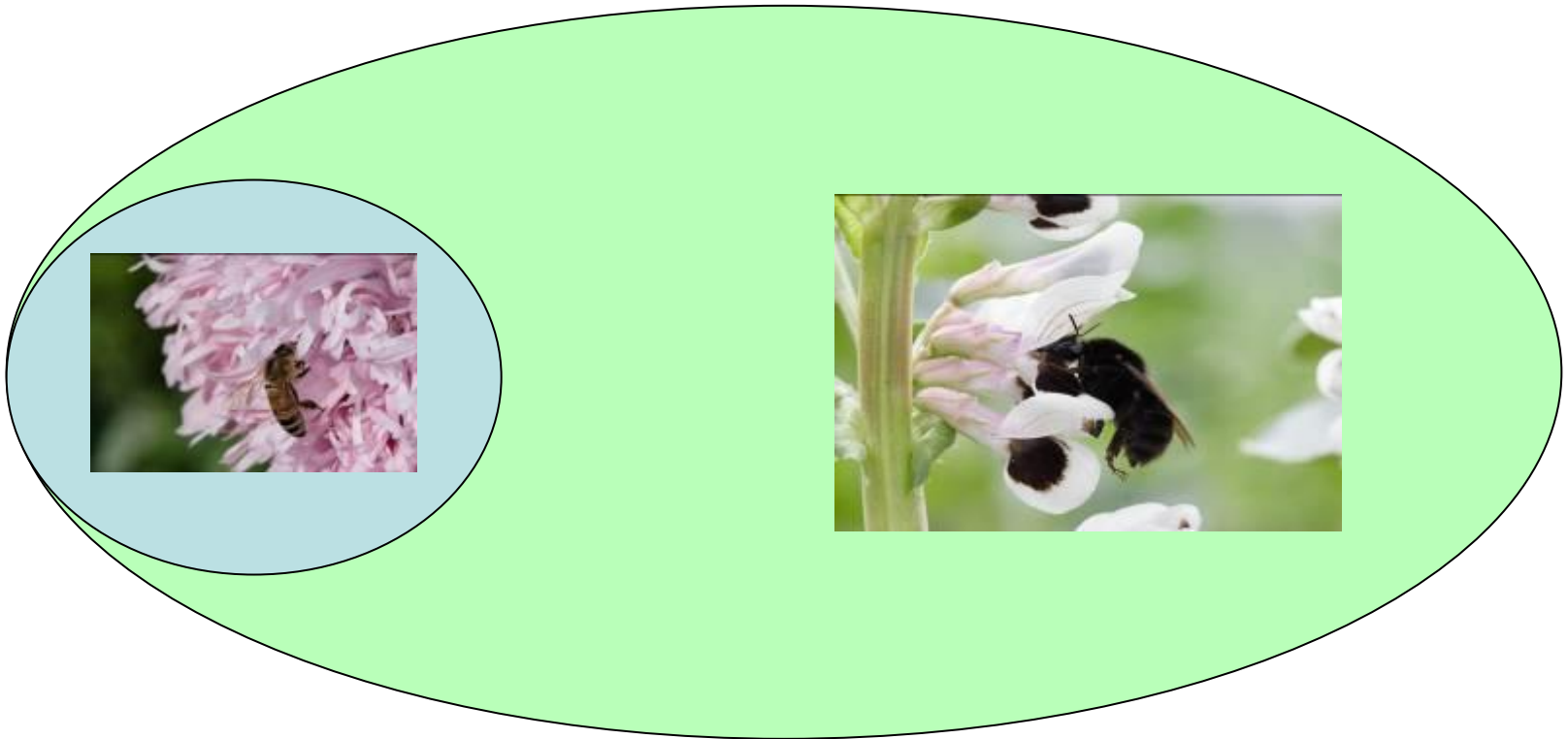
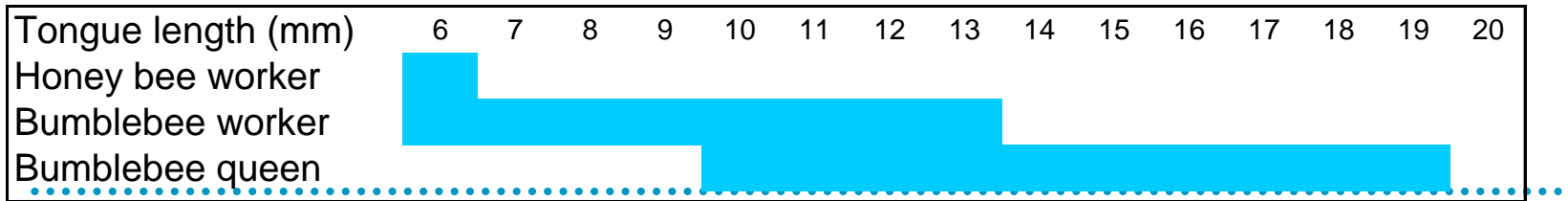


Should we be worried?

- Huge commercial importance as pollinators
 - Insect pollination in the UK worth £603 million (2014) – 75% crop species
 - Replacement cost £1.8 billion (2012)
 - €14.2 billion in EU
 - €265 billion worldwide
- 90% of 9000 wild/garden flowering plants depend on insects for pollination
 - Bumblebees help to support networks of semi-natural flower-rich grassland
 - No bumblebees = sweeping changes to the countryside



bumblebee at commercial raspberry flower



Schematic representation range of plants visited by honey bees and bumblebees
(showing area of overlap)

Common species?

- Many of the common species were found ‘everywhere’
- Reasonable distribution records – so we know where the bees **are**
- But we don’t know very much about **abundance**
- Early warning
- Enter BeeWalk!



Surveys

BeeWalk:

- Volunteers walk a monthly transect March-October
 - 1-2km
 - Count bees, ID species
- National scheme for abundance
 - Detect population declines over time
 - Early warning of losses



BeeWalk Aims

- To gather **ABUNDANCE** and **DISTRIBUTION** data for the UK's bumblebees
- To analyse the data and report **trends** in bumblebee populations over time
- To investigate the causes of changing trends in bumblebees i.e. climate change/ habitat change

Guidelines – transect establishment

1. Establish transect in preferred location - make extra site visit to map your route
 - Choose route carefully - **convenient, accessible**
 - **1-2km**, taking about **60** minutes to walk
 - Split into at least 3 sections based on **habitat**

Register your transect on the website!

Sites » Radley Lakes

Site details

View

Edit

Site Details

Your Route

Section Details

Transect Details

Transect Name:

Radley Lakes

This site has walks recorded on it. Please do not change the site details without considering the impact on the existing data.

Grid Ref.:

SU515973

Click on the map to set the central grid reference.

The Site Code will be allocated by the Administrator.

Site details

Details

County:

Oxfordshire

No. of sections:

7

Overall Length (m):

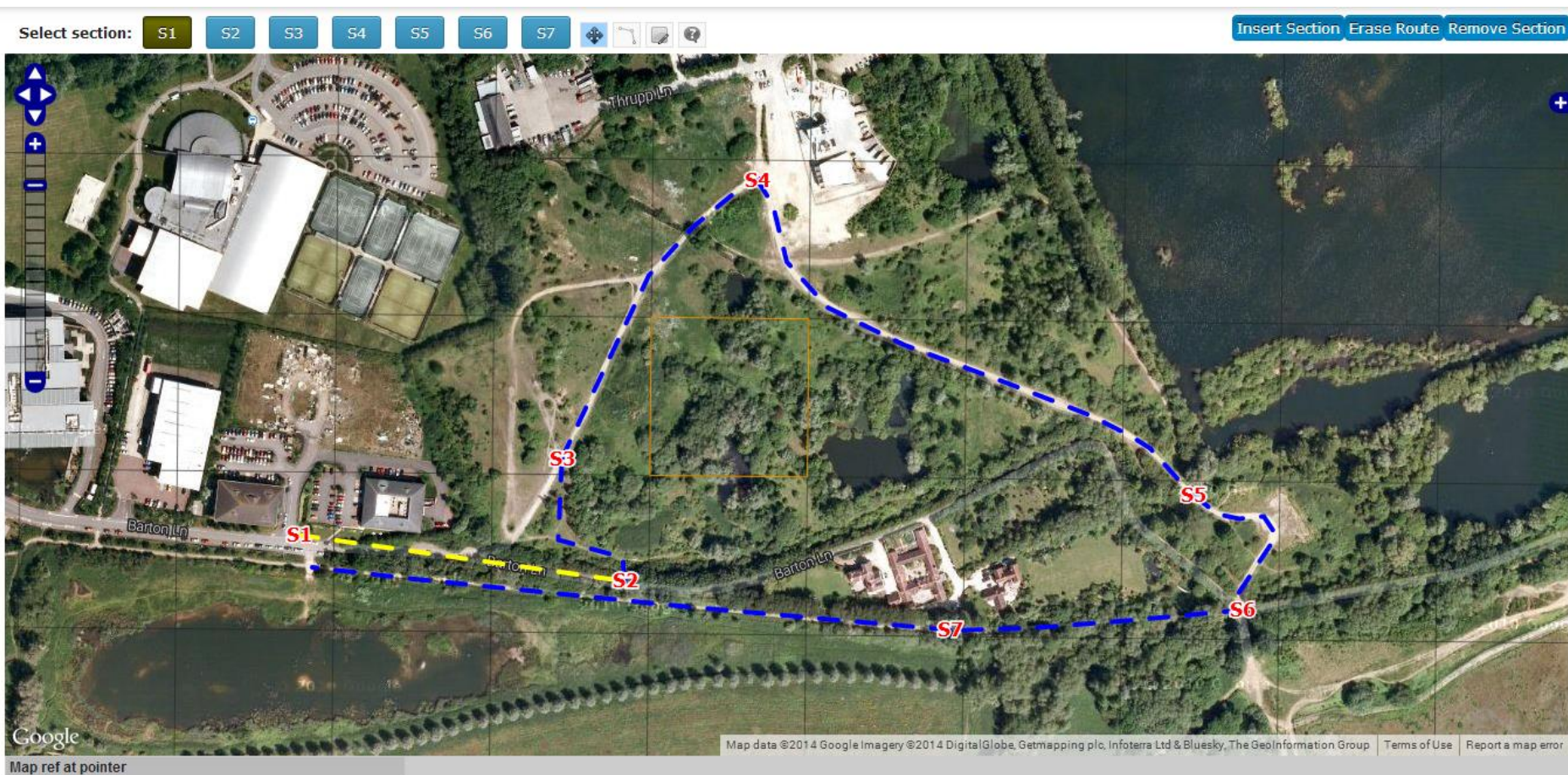
1604

Year Established:

2014



Register your transect online



Guidelines – monthly survey

1. Walk the same transect every time!
2. Walk transect **once per month** during main flight period
March to October inclusive.
3. Only survey when weather conditions are suitable for
bumblebee activity: **Warm, not too windy, no rain,**
between 11am-5pm
4. At the start of each survey, fill in the environmental details first
on the **Field Recording Form (F2)**

Survey Guidelines

5. Walk at a **slow and steady pace**. Do not linger in hotspots.
6. Record all bumblebees seen **within a 4x4x2m 'recording box'**.
7. Record **species, number, caste**
Record caste or species as unknown if not possible to determine.
Try to record specific **numbers** i.e. 21 instead of 20ish
Count Honeybees
Bumblebees can be captured for closer examination.

Survey Guidelines

8. Be Consistent!

9. Put data on the website

www.beewalk.org.uk

BeeWalk - what support is available?

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- **Website resources** <http://beewalk.org.uk/node/11>
 - Full guidance document
 - Guidance videos <http://bit.ly/2ryaADS>
 - Links to ID resources
- **Surveys & GIS Officer**
 - beewalk@bumblebeeconservation.org
 - 01786 594 129 (Stirling)
- **BeeWalk Mentors**
 - Local assistance in some areas of the UK (contact beewalk@bumblebeeconservation.org)

449

BeeWalk continues to grow, with a record 449 sites submitting data for 2017

91,117

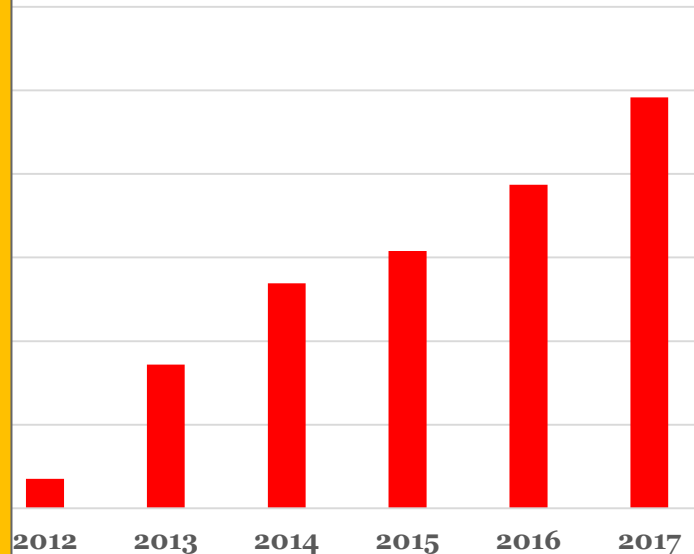
The number of records submitted to BeeWalk by the 31st January 2018 – 24,591 for 2017 alone

291,321

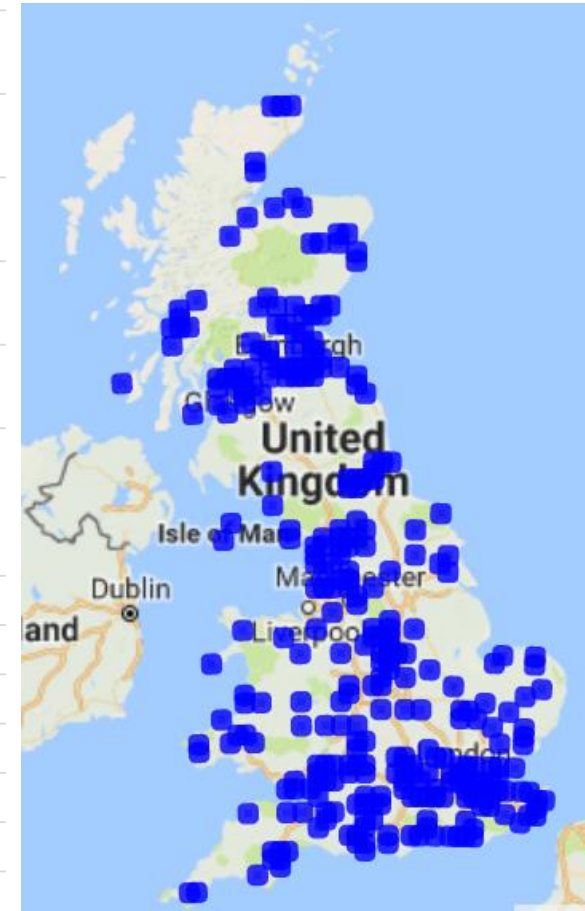
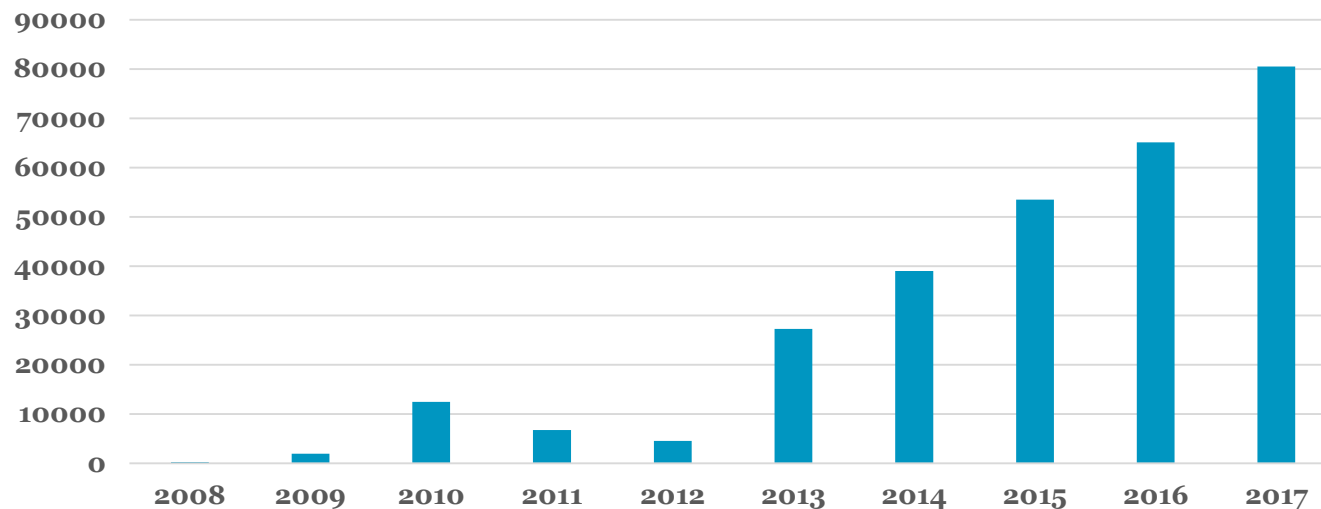
The number of individual bees recorded on BeeWalk so far

BeeWalk: The story so far

Records per year



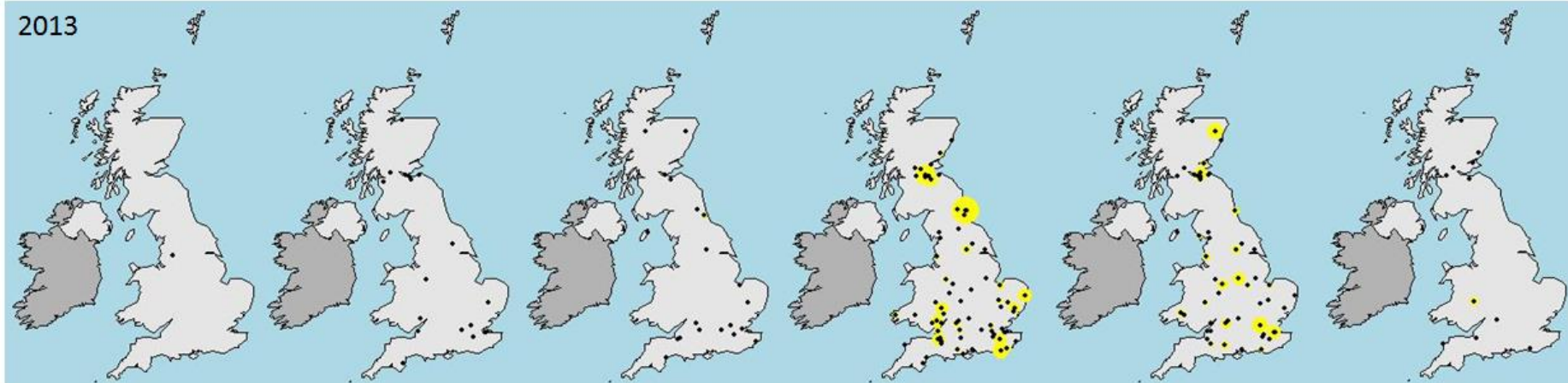
Bumblebees seen per year



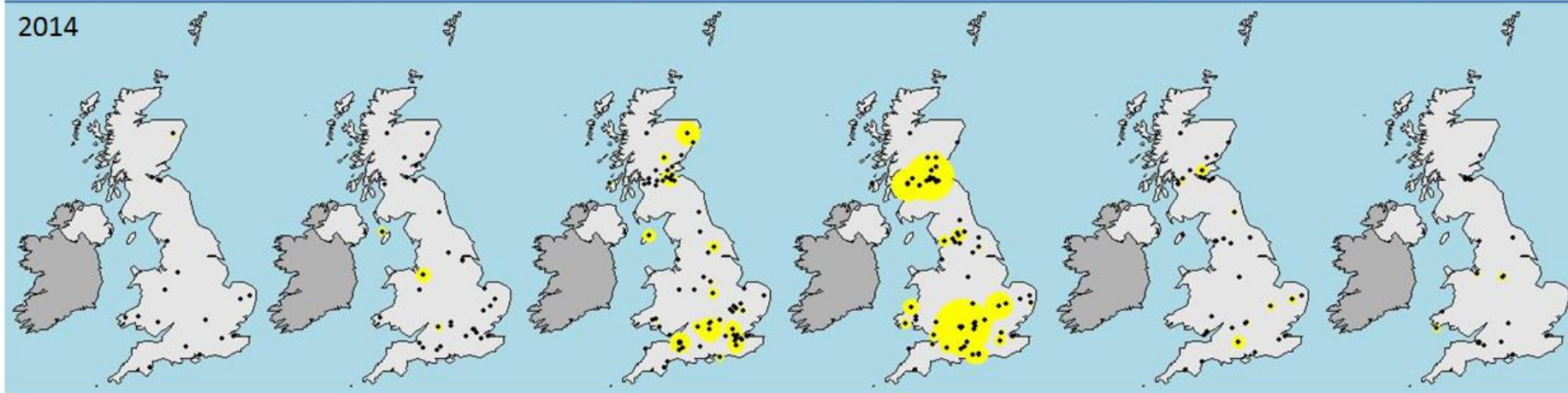
bumblebeeconservation.org

Early bumblebee, *Bombus pratorum* 2013 vs 2014

2013



2014



March

April

May

June

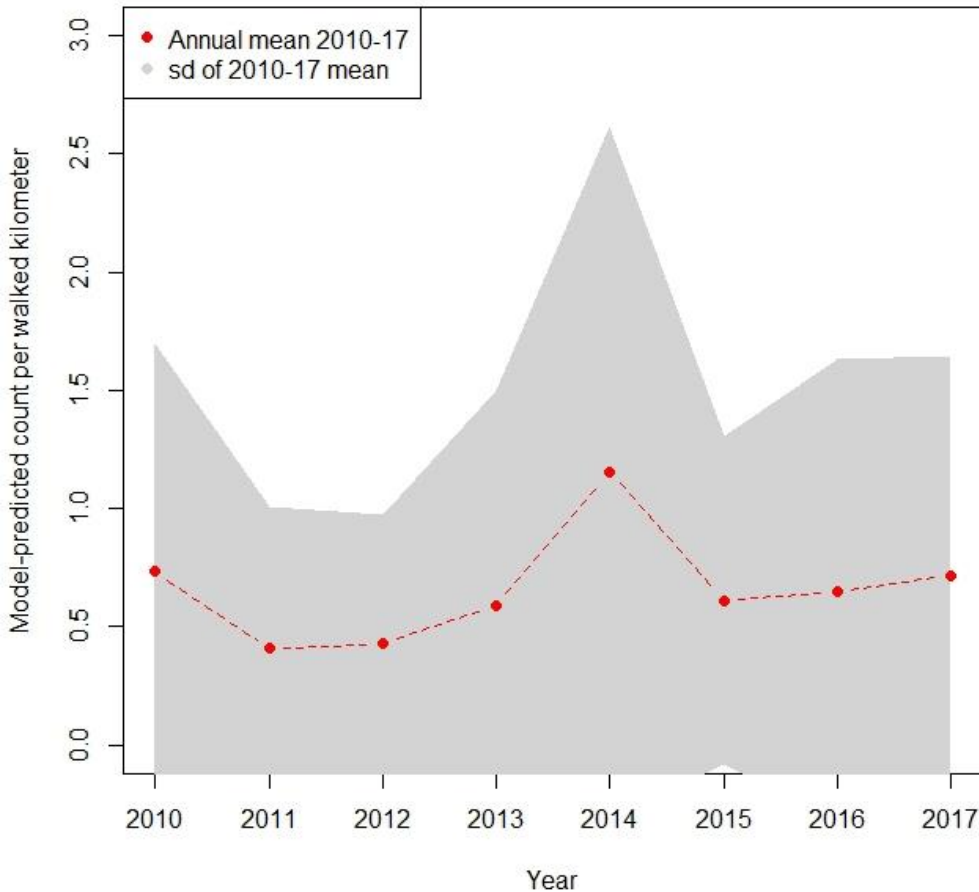
July

August

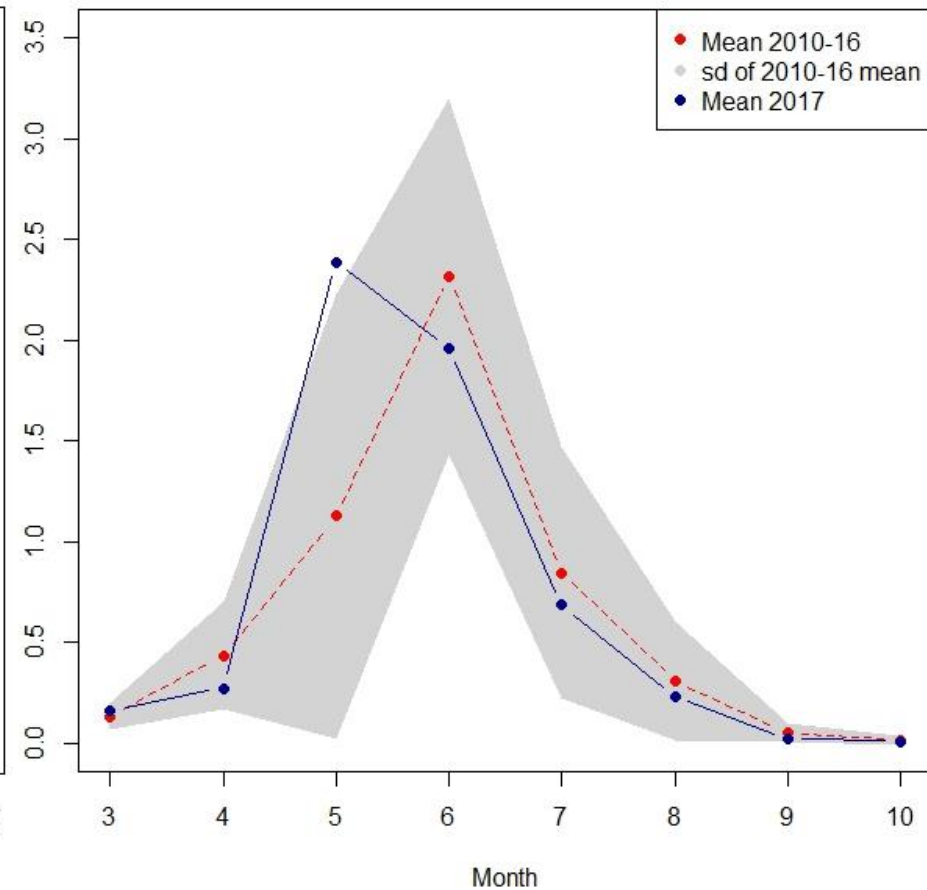
Early bumblebee, *Bombus pratorum*

Trend & phenology

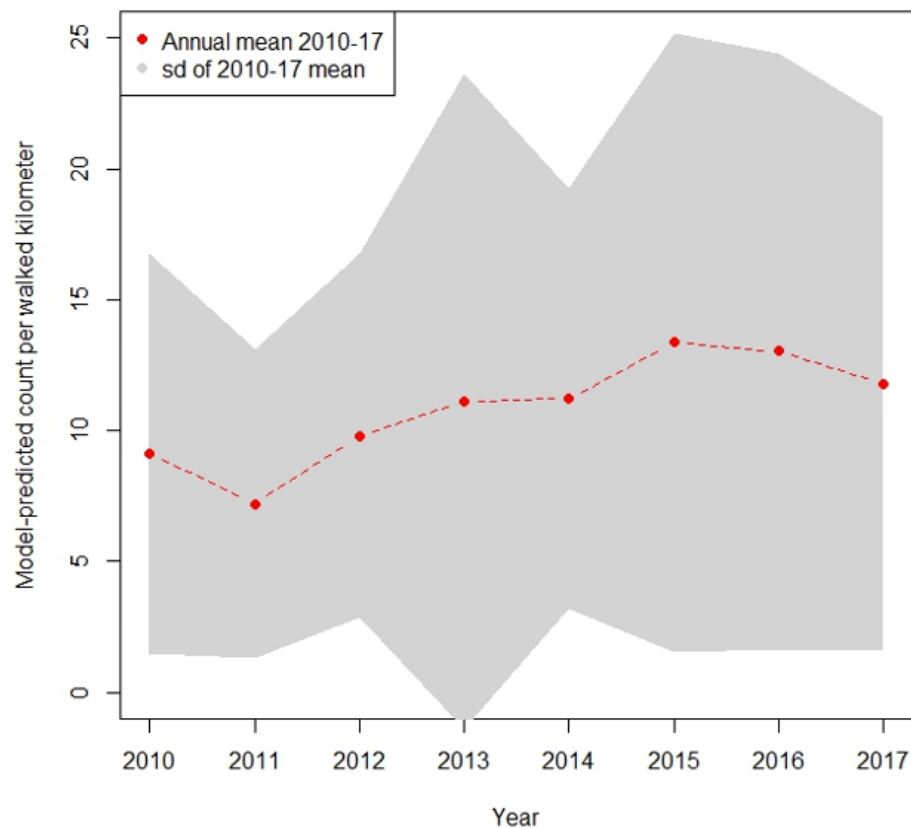
Mean number of *B. pratorum* counted on transects



Mean number of *B. pratorum* counted on transects

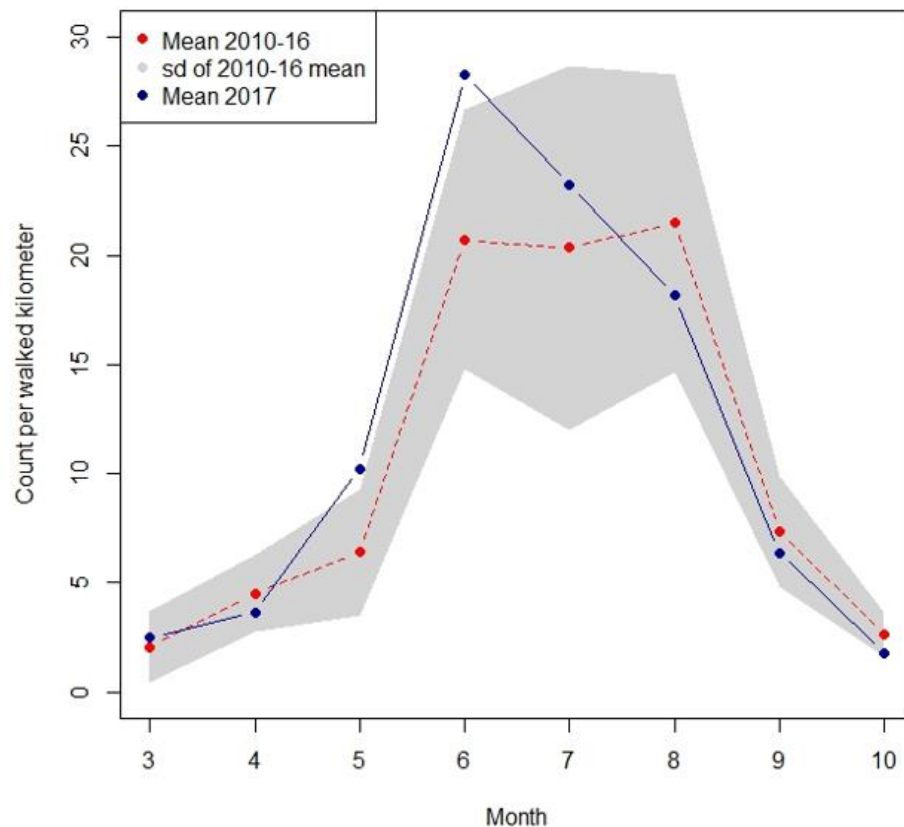


Overall results



The abundance trend of all bumblebees recorded on BeeWalk transects between 2010 and 2017, including individuals not identified to caste or to species. This is shown as the mean number of bumblebees counted per kilometre walked each year (red line). The grey cloud is a measure of the annual variation around this average (standard deviation)

Mean number of bumblebees counted on transects



The mean number of total bumblebees per kilometre per month between March and October 2017 (blue line), plotted against the average monthly abundance for the seven-year period 2010-16 (red line). The grey cloud indicates the variability of the 2010-16 average – where the blue (2017) line is outside this grey area the count is significantly different to what would be expected.

Results

2010-2017 population trends for the 20 bumblebee species and 3 species aggregates with sufficient records in the BeeWalk dataset. Species showing population increases are on the left of the table, those showing decreases are on the right. Both groups are ordered from the top down, most to least change. Conservation priority species have been highlighted in blue and cuckoo species in red.

Species	Records	Trend	Species	Records	Trend
<i>B. ruderarius</i>	105	0.42572	<i>B. muscorum</i>	156	-0.24757
<i>B. lucorum/terrestris</i> workers	27,998	0.217157	<i>B. campestris</i>	413	-0.17259
<i>B. humilis</i>	457	0.12863	<i>B. soroeensis</i>	31	-0.14758
<i>B. monticola</i>	168	0.105991	<i>B. barbutellus</i>	86	-0.13692
<i>B. hypnorum</i>	7,924	0.075109	<i>B. sylvestris</i>	766	-0.11037
<i>B. vestalis</i>	1,388	0.068388	<i>B. rupestris</i>	373	-0.08743
<i>B. sylvarum</i>	123	0.053367	<i>B. ruderatus</i>	47	-0.06689
<i>B. jonellus</i>	429	0.045686	<i>B. bohemicus</i>	710	-0.05281
TOTAL bumblebees	217,926	0.038208	<i>B. lucorum</i> agg	23,491	-0.03116
<i>B. lapidarius</i>	34,287	0.01415	<i>B. hortorum</i>	6,957	-0.01369
<i>B. pascuorum</i>	52,944	0.014071	<i>B. pratorum</i>	12,451	-0.01327
			<i>B. terrestris</i>	32,654	-0.00603

UK Pollinator Monitoring Scheme



- Combine improved analyses of existing long-term records with new systematic surveys to establish how pollinator populations are changing.
- Focus on bees (including honeybees) and hoverflies, in recognition of their functional importance as pollinators
- Methods used will sample or survey a wide range of other flower-visiting insects
- Data integration and modelling to create metrics or indicators of change at GB and country level.



www.defra.gov.uk

The National Pollinator Strategy: for bees and other pollinators in England
November 2014



Funders & partners



New systematic surveys (from 2017)



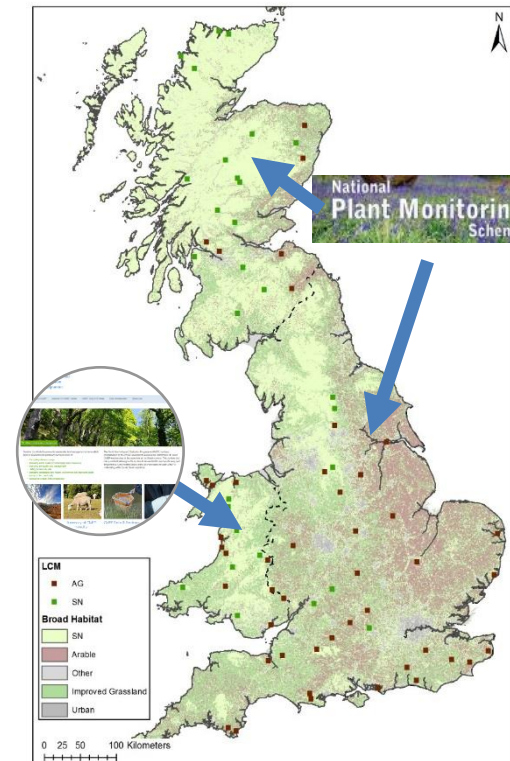
1) Flower-Insect Timed Count (FIT Count)

- Count ALL insects that land **on target flowers** within 50×50cm patch during 10-minute period
- Identify to group level using guides provided
- Anyone can do them anywhere!



2) Intensive survey of pollinators & floral resources

- Network of **75 1km random survey squares**
- Stratified by country area and relative cover of agric (AG) vs semi-natural (SN) land
- Designed to detect broad GB-level changes in abundance of pollinator groups and some species
- Pan trapping (+species ID) & FIT Counts
- 4 x 6 hr surveys per year



How to get involved?



www.ceh.ac.uk/pollinator-monitoring

- Visit the webpages for FIT Count guidelines and how-to videos
- Submit counts and records on iRecord
- Email us to join in with 1km square surveys



poms@ceh.ac.uk



BWARS

Bees, Wasps & Ants
Recording Society



Hymettus



UNIVERSITY OF LEEDS



www.beewalk.org.uk



bumblebeeconservation.org

www.ceh.ac.uk/pollinator-monitoring

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