BeeWalk
Annual Report 2019

Richard Comont and Stephanie Miles

Bumblebee Conservation Trust

BeeWalk Annual Report 2019

About BeeWalk

BeeWalk is a standardised bumblebee-monitoring scheme active across Great Britain since 2008, and this report covers the period 2008–18. The scheme protocol involves volunteer BeeWalkers walking the same fixed route (a transect) at least once a month between March and October (inclusive). This covers the full flight period of the bumblebees, including emergence from overwintering and workers tailing off. Volunteers record the abundance of each bumblebee species seen in a 4m x 4m x 2m 'recording box' in order to standardise between habitats and observers.

It is run by Dr Richard Comont, Stephanie Miles and Helen Dickinson of the Bumblebee Conservation Trust (BBCT). To contact the scheme organisers, please email **beewalk@bumblebeeconservation.org**.

Acknowledgements

We are indebted to the volunteers and organisations past and present who have contributed data to the scheme or have helped recruit or train others in connexion with it. Thanks must also go to all the individuals and organisations who allow or even actively promote access to their land for bumblebee recording.

We would like to thank the financial contribution by the Redwing Trust, Esmée Fairbairn Foundation, Garfield Weston Foundation and the many other organisations, charitable trusts and individuals who have supported the BeeWalk scheme in particular, and the Bumblebee Conservation Trust in general. In particular, the Biological Records Centre have provided website support, data storage and desk space free of charge.

Finally, we would like to thank the photographers who have allowed their excellent images to be used as part of this BeeWalk Annual Report.

Citation

Comont, R. F. & Miles, S. (2019). *BeeWalk Annual Report 2019*. Bumblebee Conservation Trust, Stirling, Scotland UK.

This report can be downloaded from **www.bumblebeeconservation.org**

Further information on the scheme can be found on the BeeWalk website, **www.beewalk.org.uk**.

Cover photo: A BeeWalk in progress at RSPB Dungeness

Contents

News and research

BeeWalk highlights in numbers

559 BeeWalk continues to grow, with a record 559 sites submitting data for 2018

55 extra transects were walked during 2018, an 11% increase on the 504 walked during 2017

1,900+ There are now over 1,900 registered users of the BeeWalk website

120,224 The number of records submitted to BeeWalk to the end of the 2018 season – 26,664 for 2018 alone

382,563 The number of individual bees recorded on BeeWalk so far

23 The number of bumblebee species recorded on BeeWalk transects so far

86,652 The most individual bees recorded in a single year on BeeWalk – in 2017, from 504 transects

BeeWalk mentoring

BeeWalk Mentors are experienced BeeWalkers who volunteer to be local points of contact for new volunteers – helping out with setting up transects, bumblebee ID, and more.

2018 saw the continuation of our BeeWalk Mentor scheme, originally set up as a small trial in 2017. We currently have mentors in Aberdeen, Northumberland, Cardiff, Edinburgh, Essex/Suffolk, London, and Maidstone.

The scheme will continue in 2019, and will hopefully expand in coming years: If you would like to be in touch with your local Mentor or would like to offer your assistance as a Mentor please email **beewalk@bumblebeeconservation.org**.

Adopt-a-transect

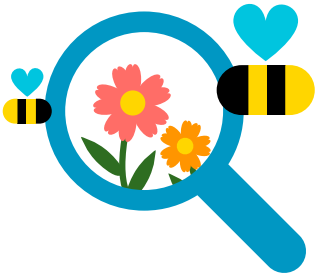
We have a number of established transects fully set up on the website which are not currently being walked, and are consequently looking for a new BeeWalker. If you could help increase our number of active transects, please see the un-walked transect map on page 10, or contact us on **beewalk@bumblebeeconservation.org**.

Pollinator Monitoring Scheme (PoMS)

BBCT have come together with a range of organisations including universities, research institutes, recording schemes and other charities in order to understand how all pollinating insects are doing nationwide.

Data from BeeWalk is feeding into the new scheme, but there's also scope for anyone to contribute directly to the scheme, either by carrying out short FIT counts (watch a patch of flowers for 10 minutes and see what turns up) or by taking on monitoring a 1km square – for details, see pages 7 and 22 of this report.

Rate your garden for bees using Bee kind



We have launched our redeveloped Bee kind tool! Bee kind is an online educational gardening resource designed to help you choose the best plants for bumblebees and other pollinators in your garden. It is free to access and you can use it to rate your garden and get suggestions of plants to help improve your garden for bumblebees and other pollinating insects – filling in any gaps in the flowering period and increasing the amount of food available.

Rate your garden at: **www.beekind.bumblebeeconservation.org**

Bee kind – What's new?

- The total number of plants has expanded from around 150 plants to a library of almost 700 pollinator-friendly plants, including over 200 bumblebee super-plants.
- Data on the volume of pollen and nectar that plants produce, to identify super-plants.
- Filter based on the growing conditions in your garden, as well as your personal preferences, so the more information you enter, the more appropriate your plant recommendations.

  For example, you may want to choose a shrub which produces purple flowers in September and will grow in acidic soil: Bee kind will list all of the flowers that match those specifications – in this case recommending plants like Heathers and Lavenders.
- New scoring system with feedback about how your garden scored points:
  - Get points for having pollinator-friendly plants throughout the key months of the bumblebee life-cycle (March to October).
  - Get bonus points for native species, floral diversity and flower coverage for plants which are known bumblebee favourites and for planting plants which are native to the UK.
  - The scoring system will be revised and updated as pollinator science, including your information from BeeWalk, tells us more about plants pollinators use.
- Once you sign up, you can now add multiple gardens so if you want to compare your front garden to your back or if you manage multiple gardens, you can now assess their individual bee-friendliness scores.
- Create a wishlist so you know which plants or seeds to get next to fill in the gaps in your bee-friendly garden.

Rate your garden at: **www.beekind.bumblebeeconservation.org**

Share your score with people on your social network and encourage others to #Beekind!

Dates for your diary

October 2019: 13th annual AGM and Members' Day

The Trust's 13th AGM and Members' Day will take place in Manchester and is open to all members of the Trust. Details will be announced via Buzzword and the website later in the year once the programme is confirmed.

Training days

With an increasing number of new projects, this summer is set to be one of our busiest yet in terms of bumblebee ID and surveying training. We already have many events and training workshops advertised on the Trust website Events Calendar **https://www.bumblebeeconservation.org/events-calendar/** and this will be updated throughout the season.

BeeWalk trivia

- 482 BeeWalkers submitted sightings in 2018!
- 275 new transects were set up in 2018, of which 193 submitted data
- Top five counties with new transects in 2018:
    - Kent 46 (40 submitted data)
    - Devon 26 (23 submitted data)
    - Hampshire 11 (7 submitted data)
    - Pembrokeshire 10 (9 submitted data)
    - Somerset 9 (6 submitted data)
- Most new transects set up by a single BeeWalker: Matt Holden, 11 new transects set up in South East Devon as part of his PhD to monitor the impacts of agricultural management on natural capital. Best of luck with the research Matt!
- Most remote transect set up in 2018 goes to Arnisdale on the west coast of Scotland
- Most southerly transect set up in 2018 goes to the Isles of Scilly

Photo credit: Nikki Gammans

BeeWalks in Kent.

Research and collaborations

BeeWalk was established with the twin aims of collecting abundance and distribution data on Britain's bumblebees, and using this data as widely as possible to analyse population trends and carry out other research as appropriate. BBCT carry out some of this research in-house, but we also collaborate widely with other researchers on shared projects such as the State of Nature reports and the national Pollinator Monitoring Scheme (PoMS – see more below).

Additionally, we make the BeeWalk data freely available on the National Biodiversity Network (NBN) website for others to use (as long as they acknowledge us as the source of the data), and share our data with the national Bees, Wasps and Ants Recording Society, BWARS.

We are keen to work with students at all levels, and can both help with project ideas and provide data. BBCT are currently collaborating with undergraduate, Masters and PhD students on a range of topics, with BeeWalk projects generally concerned either with elements of phenology (seasonal timings) and flower visitations.

Photo credit: Tim Rich

A BeeWalk in progress in Cardiff.

Major ongoing collaborations

UK Pollinator Monitoring Scheme (PoMS)

One of the main take-home messages of the all the National Pollinator Strategy (NPS) has been the lack of available data on wild pollinators. To help solve this, since 2015, BBCT have worked with a group of research institutes, universities, national recording schemes, and other charities to devise and carry out a new survey approach.

This new scheme – the National Pollinator Monitoring Scheme, PoMS – began gathering data in 2017 and will run to at least 2021, funded by the UK, Welsh and Scottish Governments, and JNCC. Part of the approach is pulling together all the data currently collected separately to analyse together, and we supply BeeWalk data for this.

Secondly, you can get involved directly. PoMS includes two new surveys, FIT Counts (for anyone, anywhere), and a more in-depth 1km grid square survey. For details of how to join in, check out the 'Our projects need your help' section on page 22 for further details. You can read more about PoMS in the newsletter at: **https://www.ceh.ac.uk/sites/default/files/PoMS_newsletter_jan2019.pdf**

Research and policy publications 2018

Gammans, N.G., Comont, R.F., Morgan, S.C., & Perkins, G.P (eds), (2018). *Bumblebees: an introduction*. Biddles, UK.

Featuring ecology, history and ID of the 25 British bumblebee species, this is the Bumblebee Conservation Trust's first book. Published in April 2018 and available from **www.ypdbooks.com**.

Matechou E., Freeman, S. N. & Comont, R. F. (2018) *Caste-Specific Demography and Phenology in Bumblebees: Modelling BeeWalk Data*. Journal of Agricultural, Biological and Environmental Statistics.

These models allow us for the first time to estimate bumblebee phenology and within-season productivity, defined as the number of individuals in each caste per colony in the population in that year, from citizen science data. All of these parameters are estimated separately for each caste, giving a means of considerable ecological detail in examining temporal changes in the complex life cycle of a social insect in the wild.

Due to the dynamic nature of the models, we were able to produce population trends for a number of UK bumblebee species using the available time-series. Via an additional simulation exercise, we show the extent to which useful information will increase if the survey continues, and expands in scale, as expected. Bumblebees are extraordinarily important components of the ecosystem, providing pollination services of vast economic impact and functioning as indicator species for changes in climate or land use.

Our results demonstrate the changes in both phenology and productivity between years and provide an invaluable tool for monitoring bumblebee populations, many of which are in decline, in the UK and around the world.

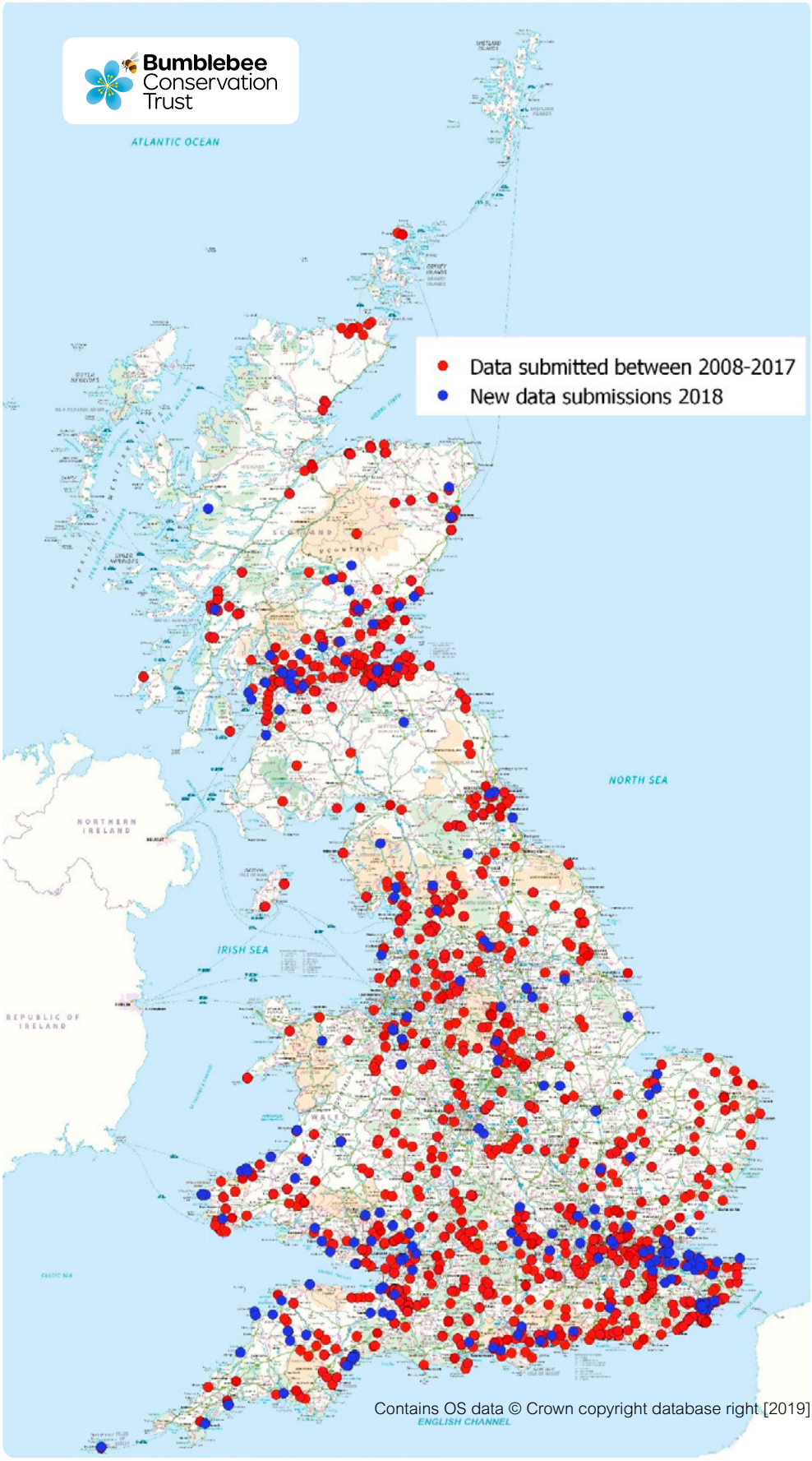
The paper and supplementary information are available online at **https://link.springer.com/article/10.1007/s13253-018-0332-y**

Photo credit: Kit Houghton

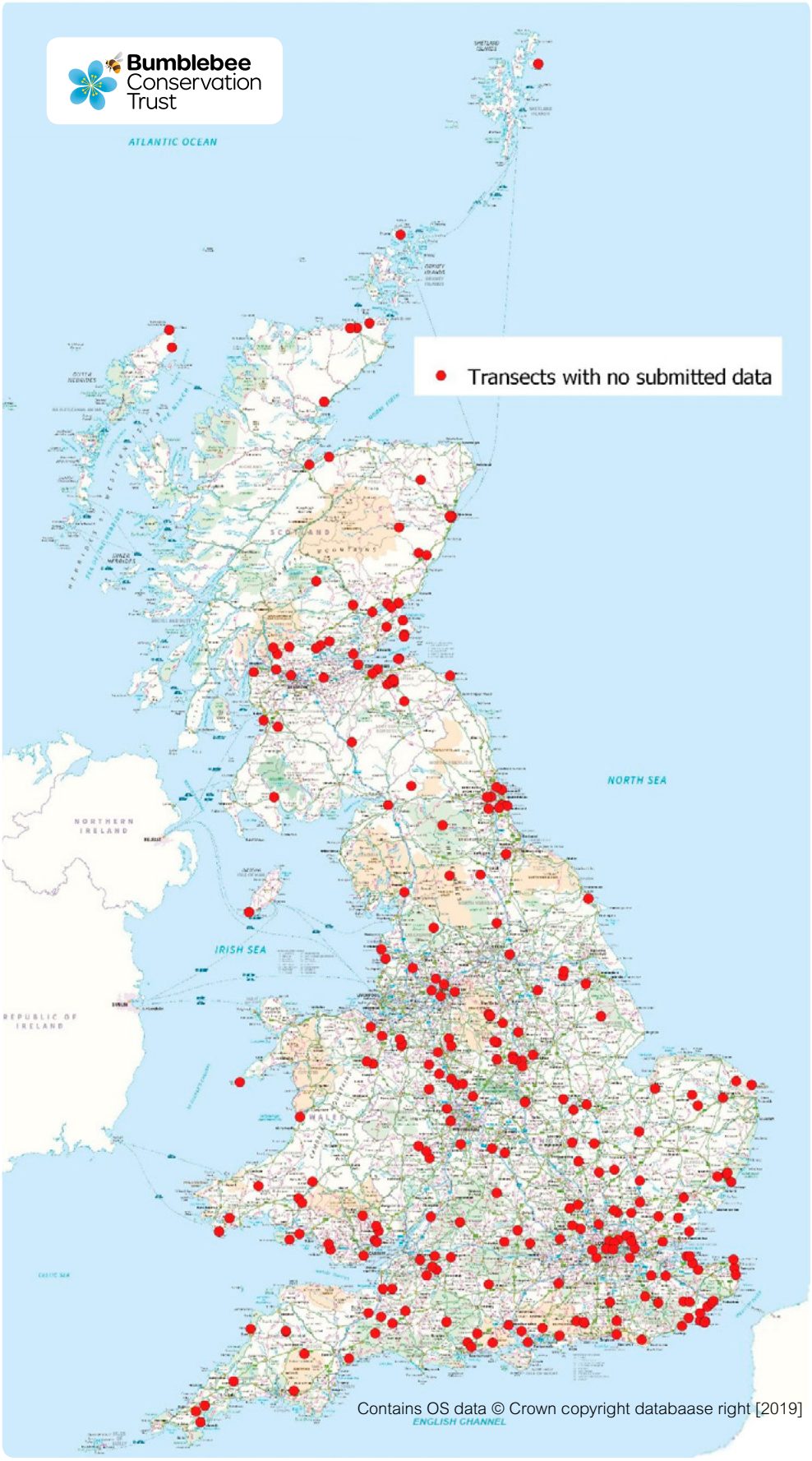
Moss carder bee (Bombus muscorum) nest.

This BeeWalk publication means we can now track changes in bumblebee populations.

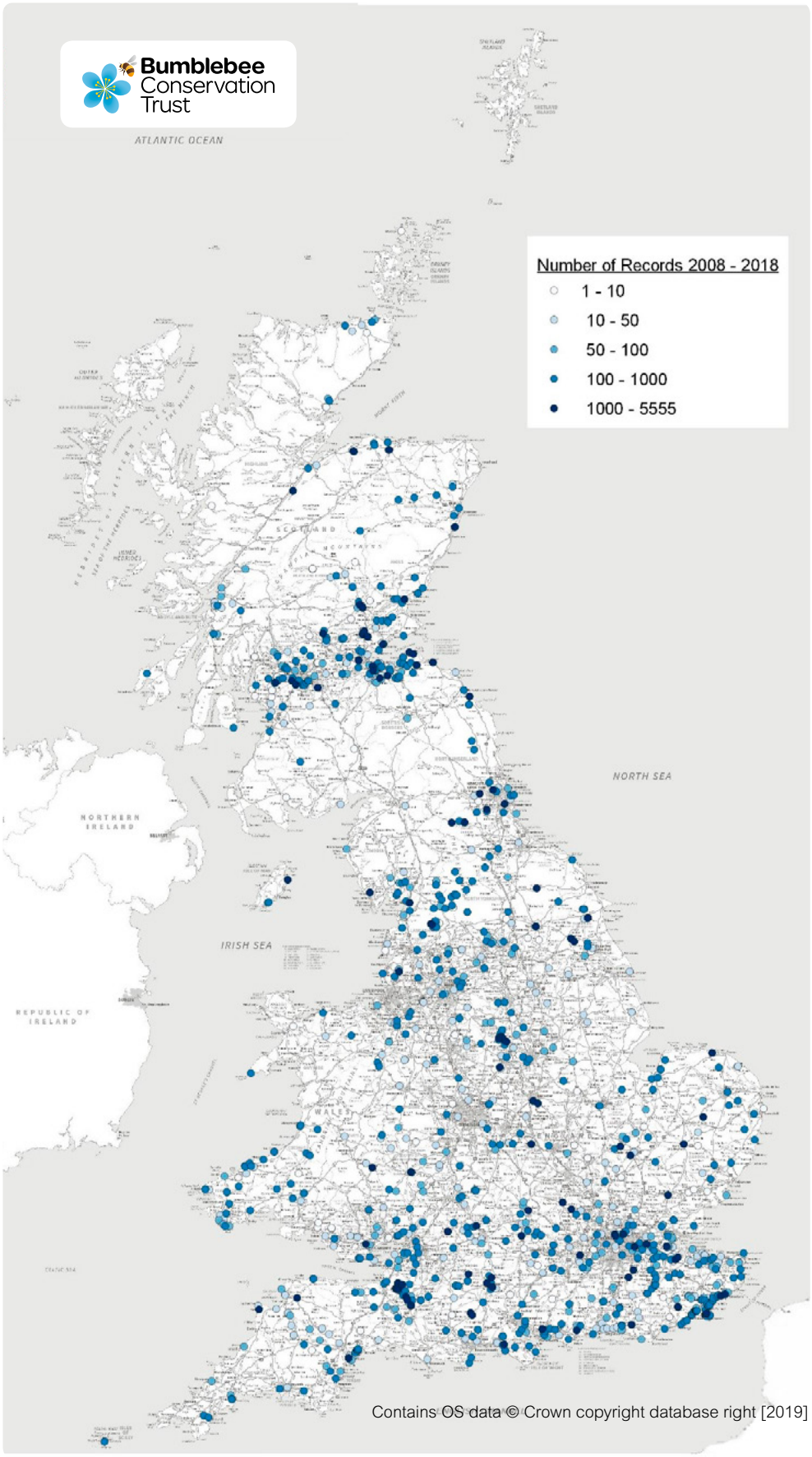
Mapping BeeWalk



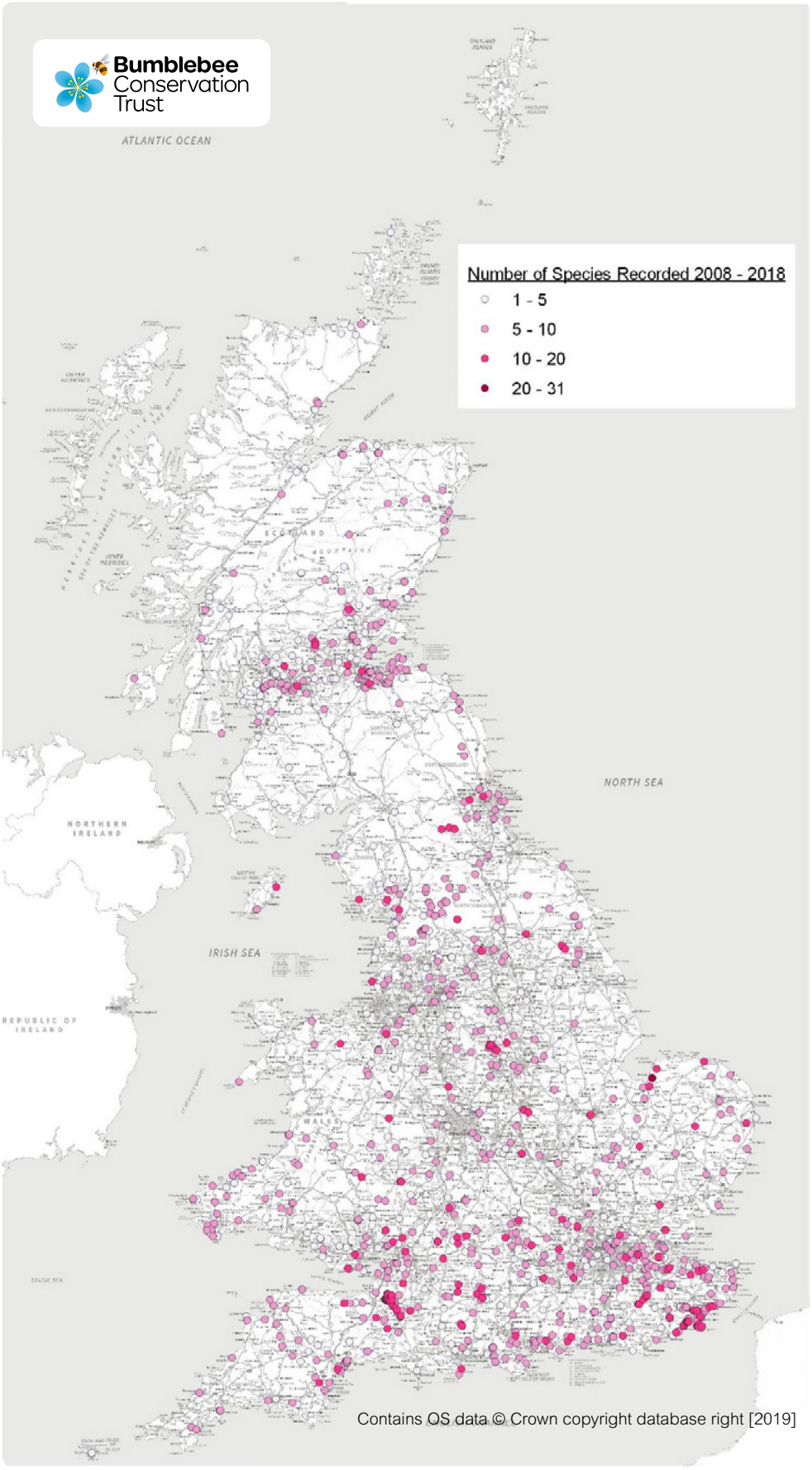
BeeWalk network growth during 2018. Red dots indicate transects where data was first submitted between 2008 and 2017, blue dots show transects which first submitted data in 2018.



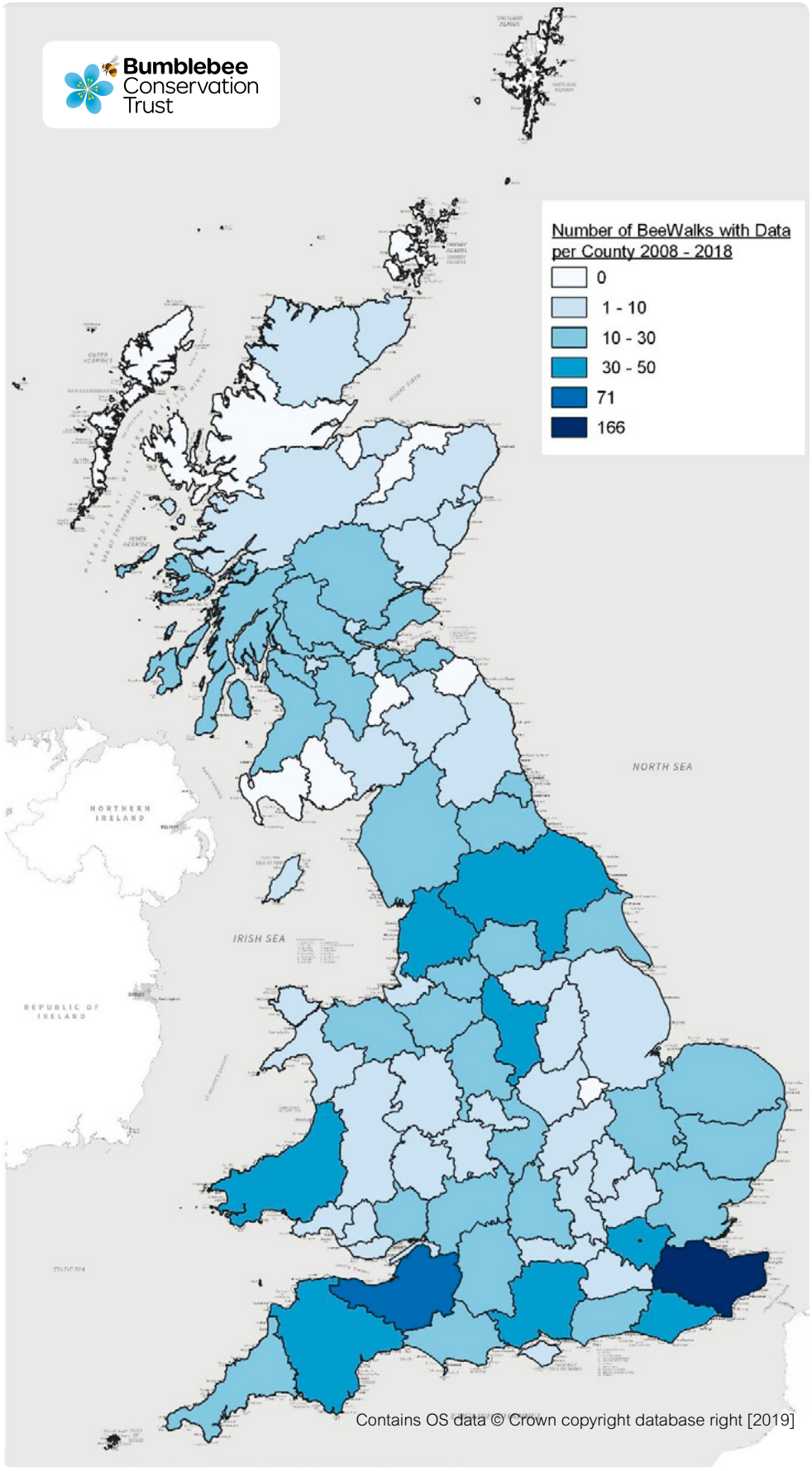
Transects available! Each dot indicates a transect which has been set up on the website but which is not currently being walked and so is available to be taken on by someone else. See page 4 for further details.



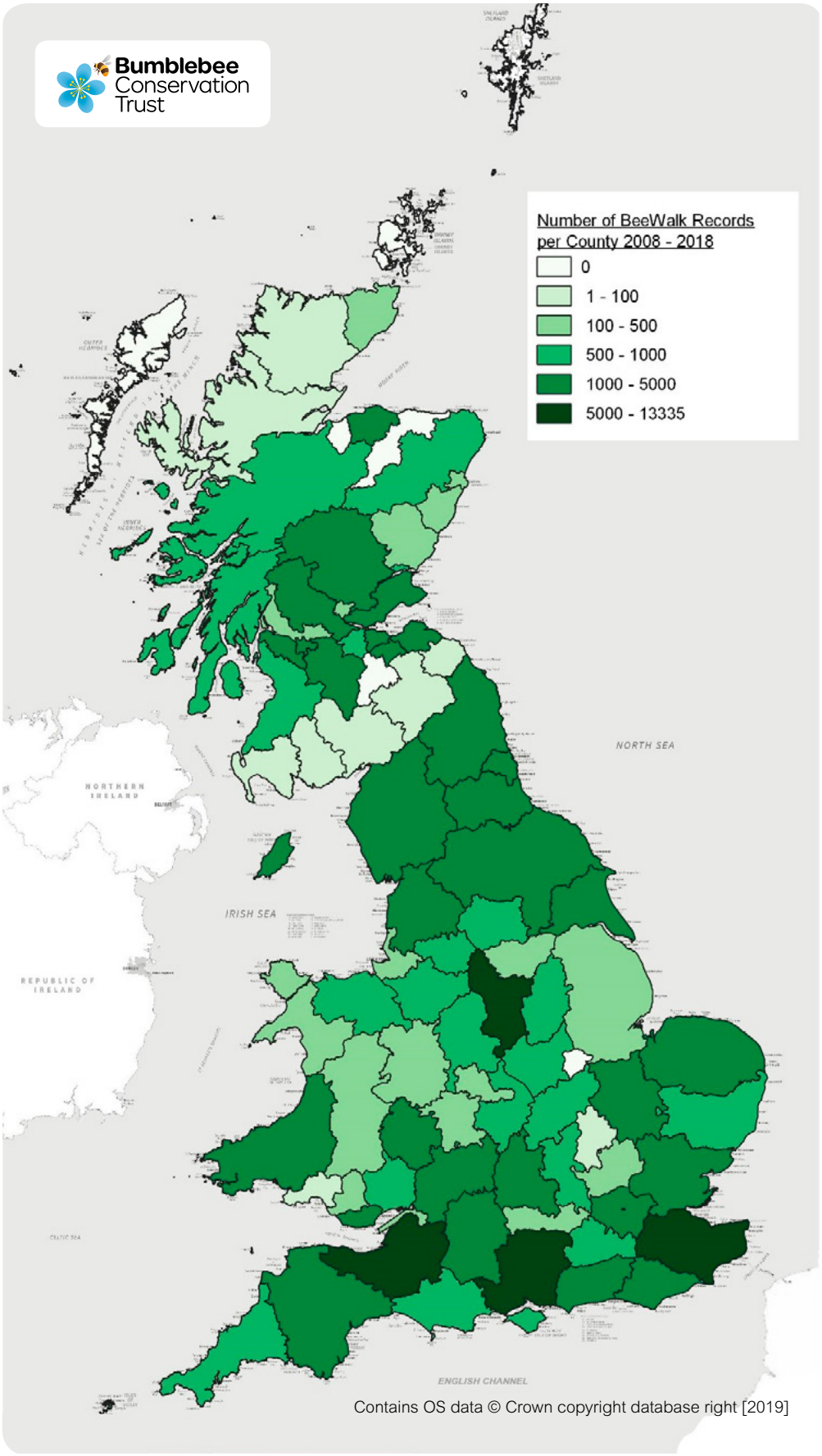
Number of records per BeeWalk transect, for the full 2008-2018 period



Number of species recorded per BeeWalk transect, 2008-2018 (including solitary bee species)



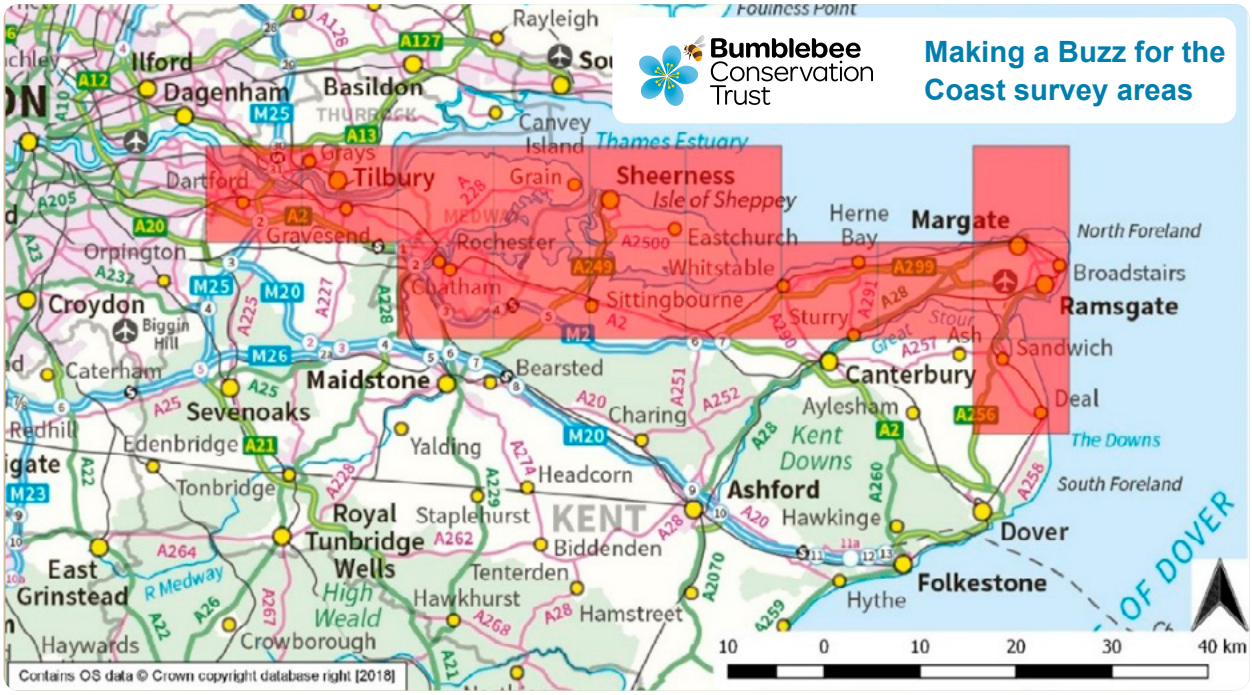
Number of active BeeWalks per county 2008-2018



Number of records submitted to BeeWalk for each county, 2008-18

Our projects need your help

Making a Buzz for the Coast spans 135 miles of Kent coastline from Dartford to Deal, an area recognised as nationally important for its diversity of bumblebee species. Starting in 2017, the project aims to protect and strengthen these wild bee populations, some of which are isolated and vulnerable to further decline or loss. Surveying key habitats and bumblebees is an ongoing and essential part of the project and will enable us to gather better data, evaluate our activities and monitor bumblebee populations along the coast.



BeeWalkers at Milton Creek.

Photo credit: Laren Kennedy

Of the five rare species present, the Shrill carder bumblebee (*Bombus sylvarum*) is particularly important to the project. Currently known from scattered sites along the Kent coast, BeeWalk data are already helping to build a greater understanding of the species' distribution and abundance, with data from the first year of the project in 2018 providing increased records for Shrill carder. By carrying out even more BeeWalks, we want to continue to improve our understanding of this and other rare species. This will help us better target our conservation work to link up fragmented populations. We can offer advice, site suggestions, and a field session with one of our team to prospective BeeWalkers – contact us on mab@bumblebeeconservation.org. For more information on the project as a whole, visit **https://www.bumblebeeconservation.org/making-a-buzz-for-the-coast/**, where a 2018 annual review of the project is available, showing more detailed MaB project BeeWalk results.

The Short-haired Bumblebee Reintroduction Project was formed in 2009 with the aims of reintroducing the nationally-extinct Short-haired bumblebee (*Bombus subterraneus*), and advising farmers and land owners on improving management of flower-rich areas for bumblebees more generally. The project focusses on Dungeness and the surrounding area.

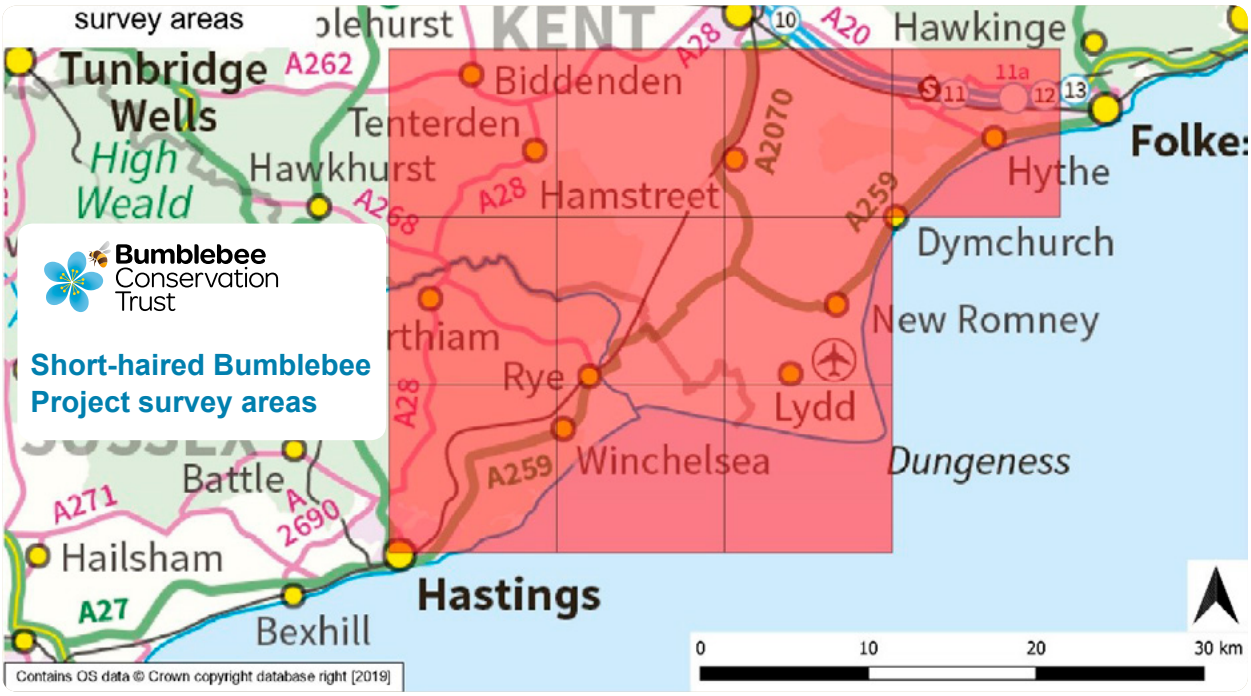


Photo credit: Nikki Gammans

A Short-haired bumblebee.

The project provides bespoke habitat-management advice to over 100 landowners, including farmers and conservation organisations. We also have 40 volunteers who carry out practical conservation work including wildflower and bumblebee surveys. We are looking to increase our BeeWalk transects in the project area. If you are interested in starting a BeeWalk in one of these areas please contact **nikki.gammans@bumblebeeconservation.org** who can give individual mentoring and discuss specific locations. For more information on the project as a whole, visit **https://www.bumblebeeconservation.org/short-haired-bumblebee-reintroduction-project/**

The Shrill Carder Recovery Project is looking for new BeeWalkers and transects in the areas surrounding Somerton and Langport in South Somerset to help in the search for the Shrill carder (*Bombus sylvarum*) bumblebee, one of the UK's rarest and smallest bumblebee species. Once widely distributed across southern Britain they are now found at only a handful of sites across the country, including Somerset, so it is really important to find out more about the distribution of this species, which is currently on the brink of extinction in the UK. If you could walk a transect in this area please contact **daisy.headley@bumblebeeconservation.org**. For more on the project, please visit **https://www.bumblebeeconservation.org/shrill-carder-recovery-project/**

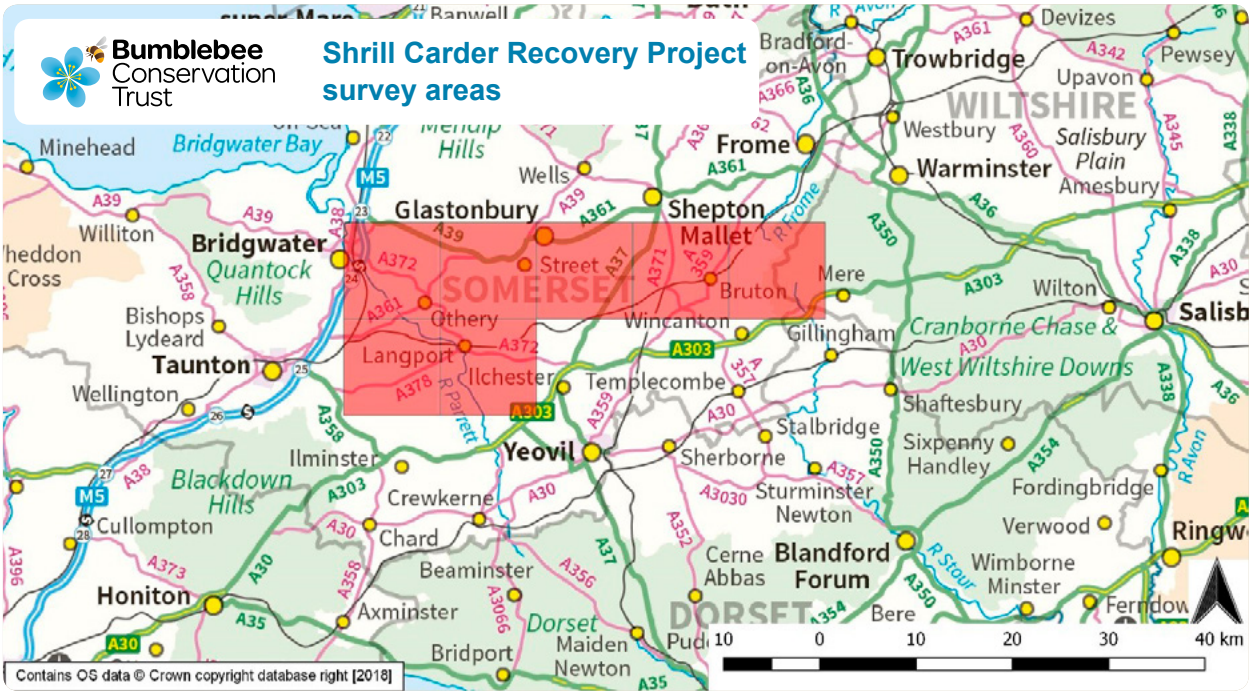
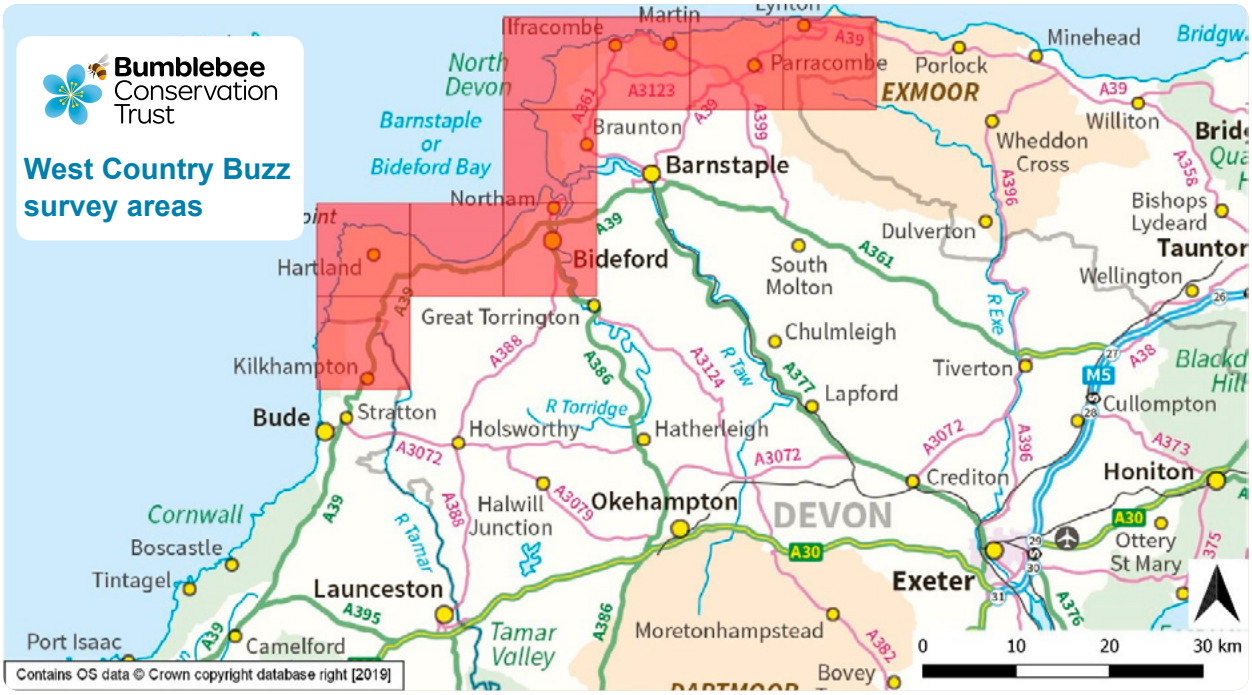


Photo credit: Holly & David Harries

A Shrill carder bumblebee, the focus of BBCT's Somerset work.

West Country Buzz is calling for BeeWalkers to help survey and monitor the nationally declining Brown-banded (*Bombus humilis*) and Moss carder (*Bombus muscorum*) bees on the north Devon coast. This is the last remaining area in the county for these two species. They were once found widely across Devon, but sadly they are now mostly confined to the coast. With generous support from the Dulverton Trust, we are surveying and monitoring these target species.

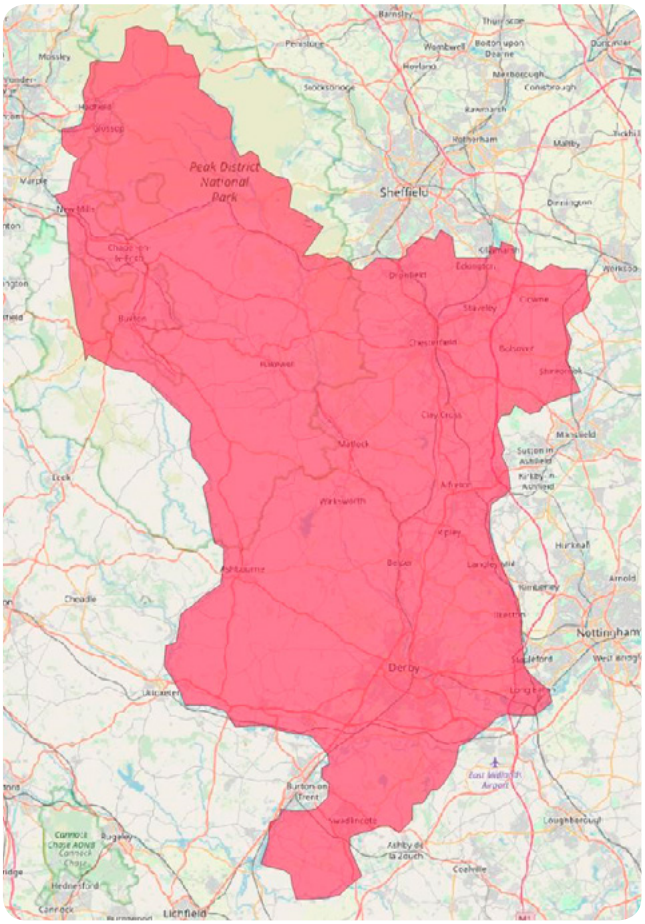
The area is big and under-recorded, and we need more BeeWalkers to get involved to help protect these remaining populations. Please contact **cathy.horsley@bumblebeeconservation.org** if you can help. For more on the project, see **https://www.bumblebeeconservation.org/west-country-buzz/**



The Brown-banded carder bumblebee is a West Country Buzz target species.

Photo credit: Ray Reeves

Pollinating the Peak is working with partners across the Peak District and Derbyshire to improve public understanding and identification of bumblebees, with a view to reversing the decline of iconic species such as the Bilberry bumblebee (*Bombus monticola*). Surveying habitat and bumblebees is an essential part of the project and enables us to gather better data, evaluate our activities and monitor bumblebee populations.



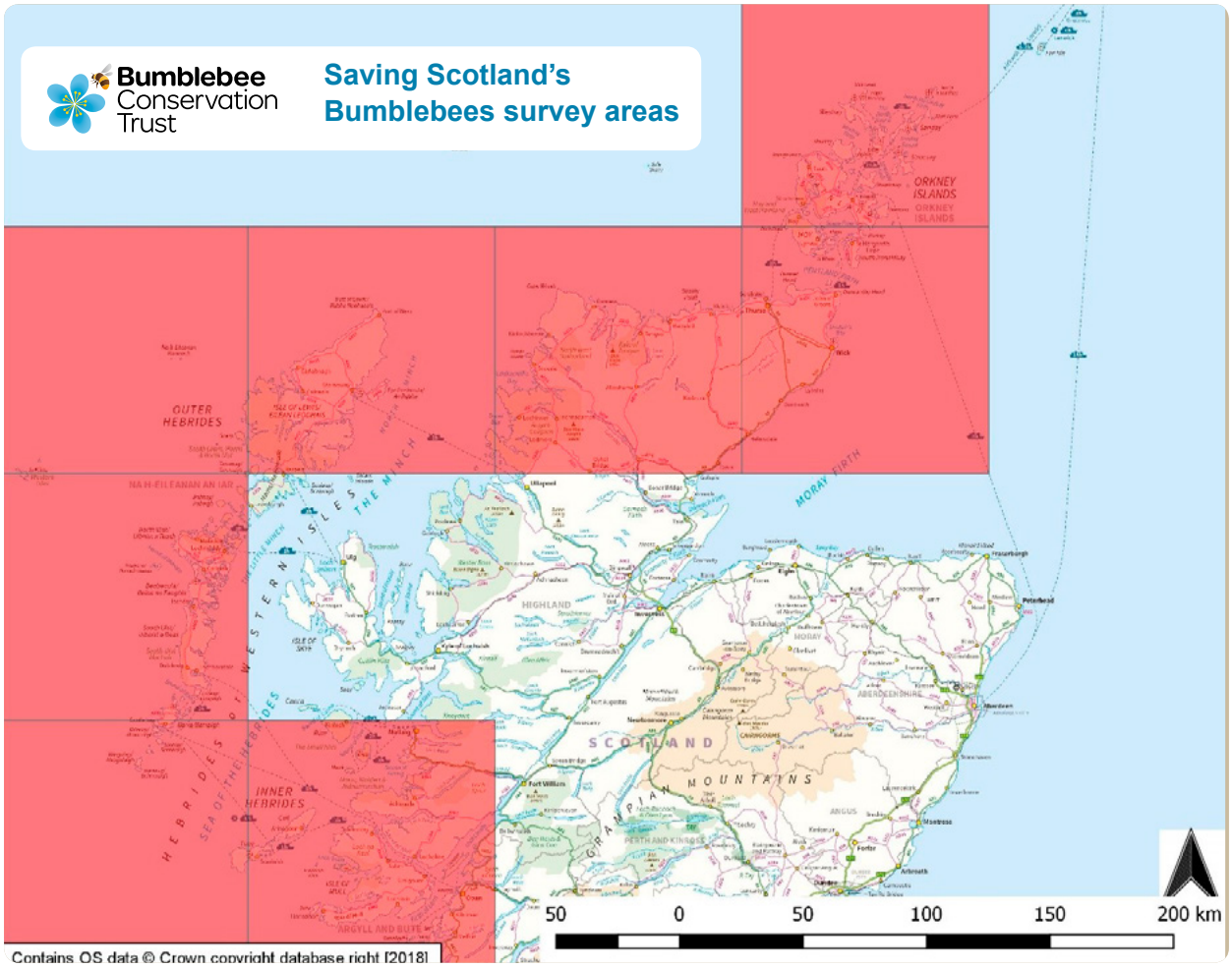
Surveying in the Peak District.

Photo credit: BBCT

The rare but iconic Bilberry bumblebee is particularly important to our project, and is found in and around the bilberry moorland. We are really keen to find and monitor local populations to gain a greater understanding of the species' local distribution and abundance.

We're looking for people who are interested in helping us find this precious 'Treasure of the Peak'. We can offer advice, site suggestions, and a field session with one of our team to prospective BeeWalkers – contact **rhodri.green@bumblebeeconservation.org**. For more information on the project as a whole, visit **https://www.bumblebeeconservation.org/pollinating-the-peak**

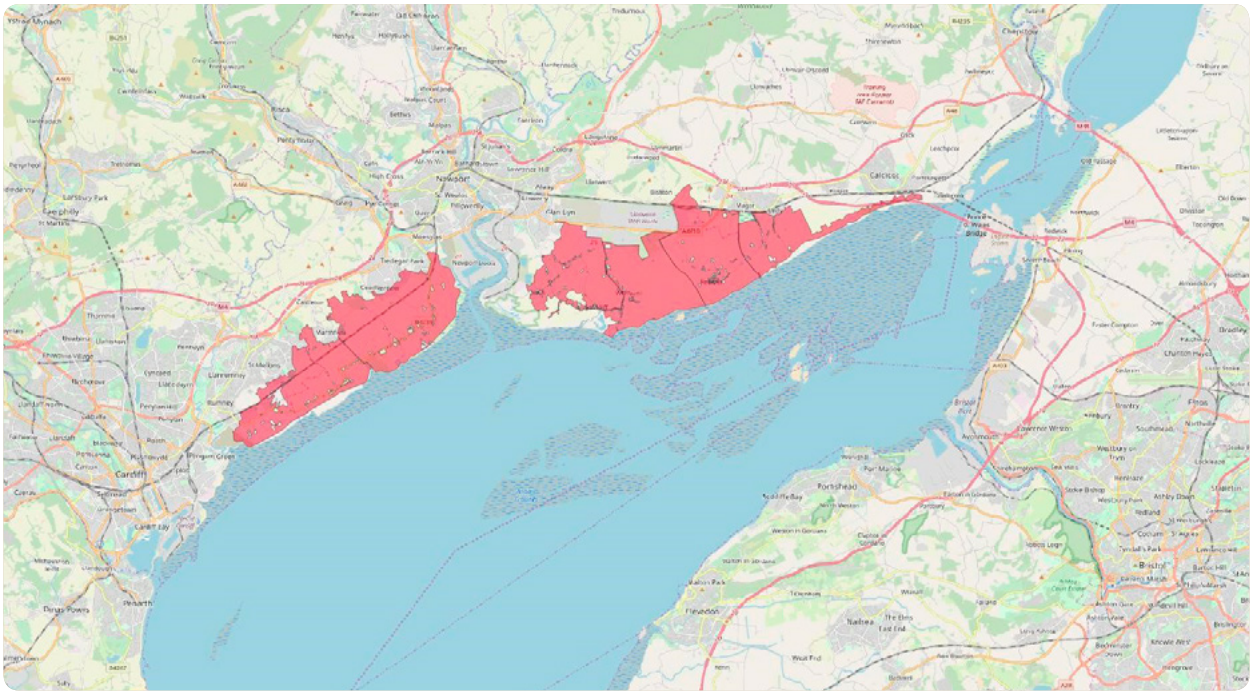
Saving Scotland's Bumblebees aims to increase awareness of bumblebees and recording across Scotland, particularly of our rarer species including the Great Yellow bumblebee (*Bombus distinguendus*). This species now only occurs in a handful of areas on the north and west coast and the Islands. The project would like to increase the number of BeeWalk transects in these vastly under-recorded areas. If you could help us increase recording in these areas please contact **katy.malone@bumblebeeconservation.org**. For more on the project, please see **https://www.bumblebeeconservation.org/saving-scotlands-bumblebees/**



The Great Yellow bumblebee, one of our most endangered bumblebee species.

Photo credit: Roxanne Curtis

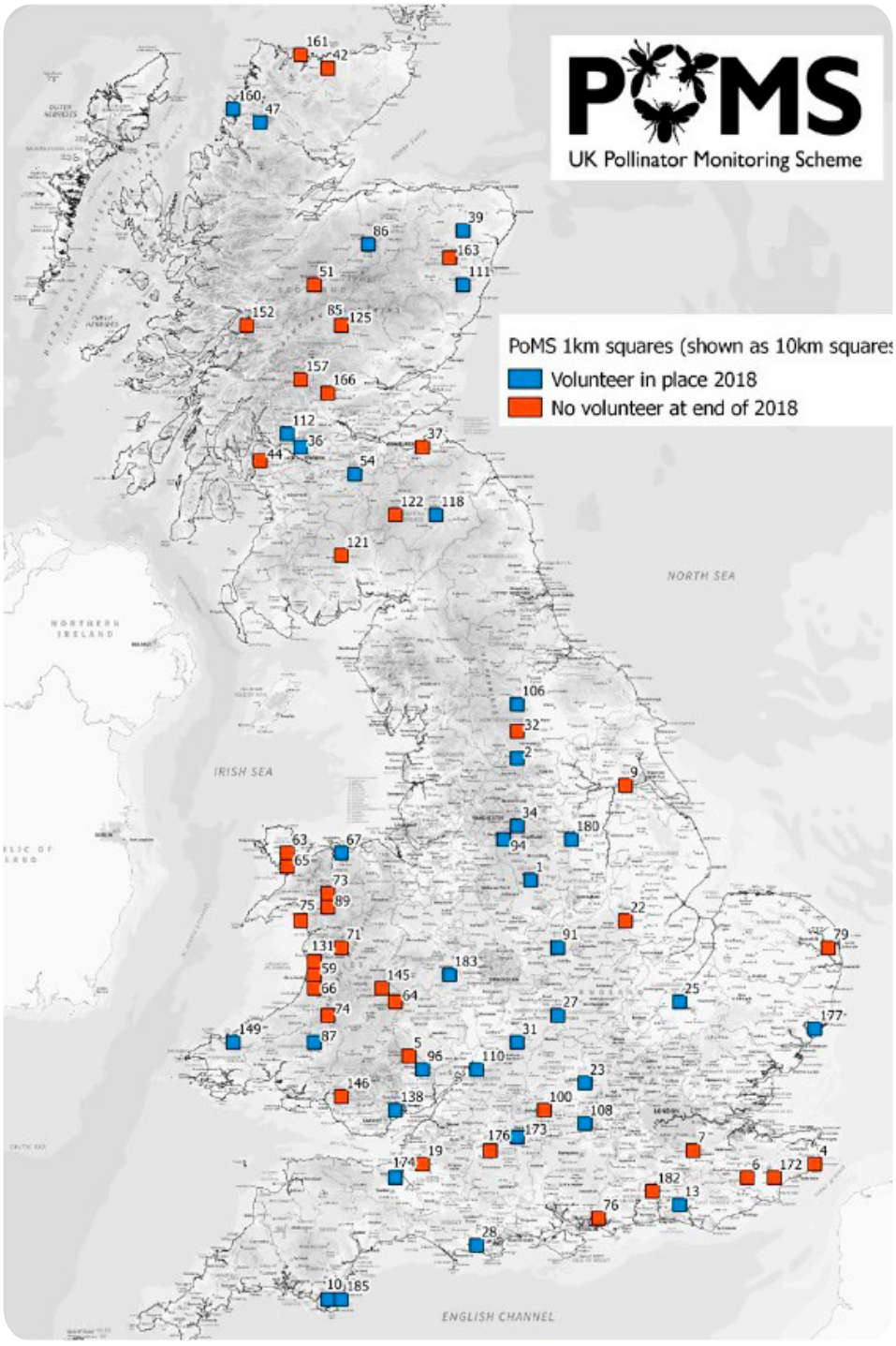
Pollinating the Levels is a project covering the Gwent Levels between Chepstow and Cardiff in south Wales. Collecting data about the rare and scarce bumblebees on the levels is an essential part of the project. The Shrill carder bumblebee (*Bombus sylvarum*) is particularly important to the project. Currently known from 5–6 areas in England and Wales, the Gwent Levels is a stronghold for this species. We aim to gain a greater understanding of the species' distribution and abundance in the Levels. This will let us better target our conservation work to link up fragmented populations.



The network of six SSSIs which make up the core of the Gwent Levels landscape

Pollinating the Levels is part of the Living Levels Landscape Partnership which is funded by the Heritage Fund and aims to deliver a programme of work which will promote and reconnect people to the heritage, wildlife and wild beauty of the historic landscape of the Gwent Levels (Find out more here **https://www.livinglevels.org.uk/**). Volunteers who are interested in helping to monitor bumblebees in the Gwent Levels, or help survey for rare bumblebee species, please get in touch with **sinead.lynch@bumblebeeconservation.org**.

The UK Pollinator Monitoring Scheme (PoMS) is looking for more recruits for 2019! The PoMS seeks the help of volunteers to collect data on pollinating insects, to help inform their conservation. There are two ways to get involved. One is to carry out a 10-minute Flower-Insect Timed Count. Anyone can take part, at any location where there are flowers and insects, and a full survey guide is provided.



A smaller group of volunteers is required to help with the systematic surveying of random sites across England, Scotland and Wales. This involves 'adopting' a 1km survey square, meeting on site with a PoMS team member and visiting the square on three further occasions during summer to collect insects with water-filled pan traps.

If you'd like to volunteer please email **poms@ceh.ac.uk** and visit the website for more details **www.ceh.ac.uk/pollinator-monitoring**

Background and methods

Background to BeeWalk

The Bees, Wasps and Ants Recording Society (BWARS) has been collecting data on the distribution of hymenoptera since 1978. This provides a good understanding of the distribution of bumblebee species across the UK, but there has been a significant lack of data on bumblebee abundance. Abundance data, knowing the size of populations and how these change over time, is key to monitoring population trends for bumblebee species, identifying which species are most at risk and acting as an early warning system for significant declines.

The lack of abundance data, alongside the need to better understand what's happening to all our species, not just the rarest, led to the development of the BeeWalk project. BeeWalk collects bumblebee data from across the UK to gain an accurate understanding of current bumblebee populations and distributions. In particular, the scheme aims to:

- Collect long-term data on bumblebee distribution and abundance.
- Analyse data to identify population trends and drivers thereof.
- Use these and other findings to inform policy and conservation interventions by BBCT and others, including improved understanding of forage plants & identification of management impacts.
- Encourage the public understanding of bumblebees.

BeeWalk transects (fixed monitoring routes) are monitored by volunteers using a standardised methodology to ensure accurate and comparable data is gathered. Most transects are roughly 1-2 km in length and take in some flower rich habitat. Transects are walked a minimum of once a month between March and October (the main bumblebee flight period), ideally between 11am and 5pm on days with minimal wind or rain.

Photo credit: BBCT

A bumblebee identification and survey training day with BBCT's Nikki Gammans.

Bumblebees are identified to species and caste where possible (and recorded as 'unknown bumblebee' or 'unknown caste' where not) and the number of each entering the 'recording box' on each section of the transect is recorded. The recording box covers an area up to four metres in front of the recorder, two metres either side of them (4m wide in total), and between ground level and two metres up. This is employed in order to standardise between habitats, which may have very different levels of visibility, as well as between recorders (different people will be

able to identify bees from different distances, depending on experience) and species (more distinctive species can be identified from further away).

A typical BeeWalk transect (Radley Lakes, Oxfordshire).

Recorders who are confident of their plant ID skills also have the option to record which flower species the bumblebees are visiting. This provides us with a better understanding of the forage preferences of bumblebee species nationwide and across a range of habitat types, which will allow us to better tailor our flower advice to gardeners and landowners. Holding up-to-date national population data allows us to better target our conservation activities and ensure that the advice we provide, including to governmental organisations, results in policies which reflect the current needs of our bumblebees.

BeeWalk from the beginning

The survey methodology for the BeeWalk scheme is based on existing transect-walking schemes such as the UK Butterfly Monitoring Scheme, with minor changes to reflect the facts that bumblebees are harder to identify than butterflies (so the recording box was made slightly smaller) and that bumblebees are less reliant on good weather to be flying (so the weather criteria were relaxed slightly). Transects are registered and records submitted directly on the BeeWalk website **www.beewalk.org.uk**, hosted by the Biological Records Centre.

The project was trialled during 2008 and 2009, opened to BBCT members in 2010, and launched as a scheme for the general public in 2011. In these early years the scheme was run as part of a University of Stirling PhD project, undertaken by Leanne Casey (supervised by Professor Dave Goulson). Following this research project, the scheme was run as an entirely BBCT-led project from 2013 onwards, and continued to grow through funding by the Esmée Fairburn and Garfield Weston foundations.

The scheme has a high degree of focus on accuracy, validation and verification in order to meet the high standards required for monitoring scheme data to be viewed as scientifically robust and reliable. After three scoping years and eight in operation as a public recording scheme, the BeeWalk dataset now stands at 120,221 validated records of 22 bumblebee species (records of the *Bombus lucorum* group are aggregated as *B. lucorum* aggregate for analysis: *B. subterraneus* has not yet been recorded on the transect network).

Bumblebee population trends

The central goal of the BeeWalk programme is to be able to reliably evaluate the trends in British bumblebee populations. Transect counts provide an annual estimation of the abundance of a species. They do not provide an absolute measure of the total abundance, but a relative measure which requires statistical interpretation to evaluate changes over time. This is complicated by the fact that transect locations change over time, allied to the effects of short-term weather conditions, etc.

Estimates of population trends across the 2010–18 period were calculated using a method similar to the analysis methodologies used by the UKBMS and the BTO's Breeding Bird Survey. First, a list is generated of the sites that each species has ever been recorded on within BeeWalk. This is used to establish the sites that each species could be expected to occur at, and thus the distance walked each month in those areas. This is in order to act as a measure of the area surveyed whilst improving analyses for more range-limited species.

Next the bumblebee counts submitted by BeeWalkers were added up to produce total counts of each caste of each species per month surveyed. The resulting monthly counts were then analysed using a log-linear model. This works out the monthly counts as a rate (count/distance), which allows for the fact that the distances walked per month varies between months, years, and species. The model estimated abundance trends across the 2010-2018 period.

These data were also used to demonstrate the abundance of each of the 23 species or species aggregates in 2018 against the 2010–17 mean monthly abundance per kilometre surveyed, in order to see whether 2018 was statistically a 'good', 'bad', or 'standard' year for each species.

Photo credit: BBCT

Early bumblebees, like this worker, will be affected enormously by changing spring conditions and so different years will have differing emergence times, amongst much else.

Bumblebee population and phenology trends

Population trends were positive for eight species and two species aggregates. This included total bumblebees, one cuckoo bumblebee (*B. vestalis*) and four conservation-priority species (*B. ruderarius*, *B. humilis*, *B. ruderatus* & *B. sylvarum*). This represents a decrease of one from the 2018 report which showed nine species and two aggregates increasing.

Two species (*B. monticola* and *B. jonellus*) have switched from an increase in the 2018 report to a decrease now, and one species, *B. ruderatus*, has moved from an overall decrease to an increase. All three species have a small number of records on the database, however, so small changes in the numbers of bees seen each year can have large effects on trends.

Unsurprisingly the range-expanding Tree bumblebee *B. hypnorum* continues to increase, but it is striking to see four rare, conservation-priority species as the most-increasing species 2010-18. The increasing abundance of *B. humilis* corresponds with the apparent increases in range shown by this species. More work is needed to understand the drivers of population change in these species, and the small number of records should also be noted. However, the majority of BeeWalk records of *B. sylvarum* and *B. ruderatus* come from areas specifically managed for these species, so their abundance increases bode well for ongoing management approaches.

Conversely, population trends are negative for 12 species and one aggregate species. This includes the remaining five cuckoo species and two conservation-priority species, *B. muscorum* and *B. monticola*. It is concerning to see *B. muscorum* combining an ongoing range contraction with a continued decrease in abundance within that range, although it should be noted that the large Scottish population of this species is not currently well-surveyed and the population trends presented here are largely for the English and Welsh populations.

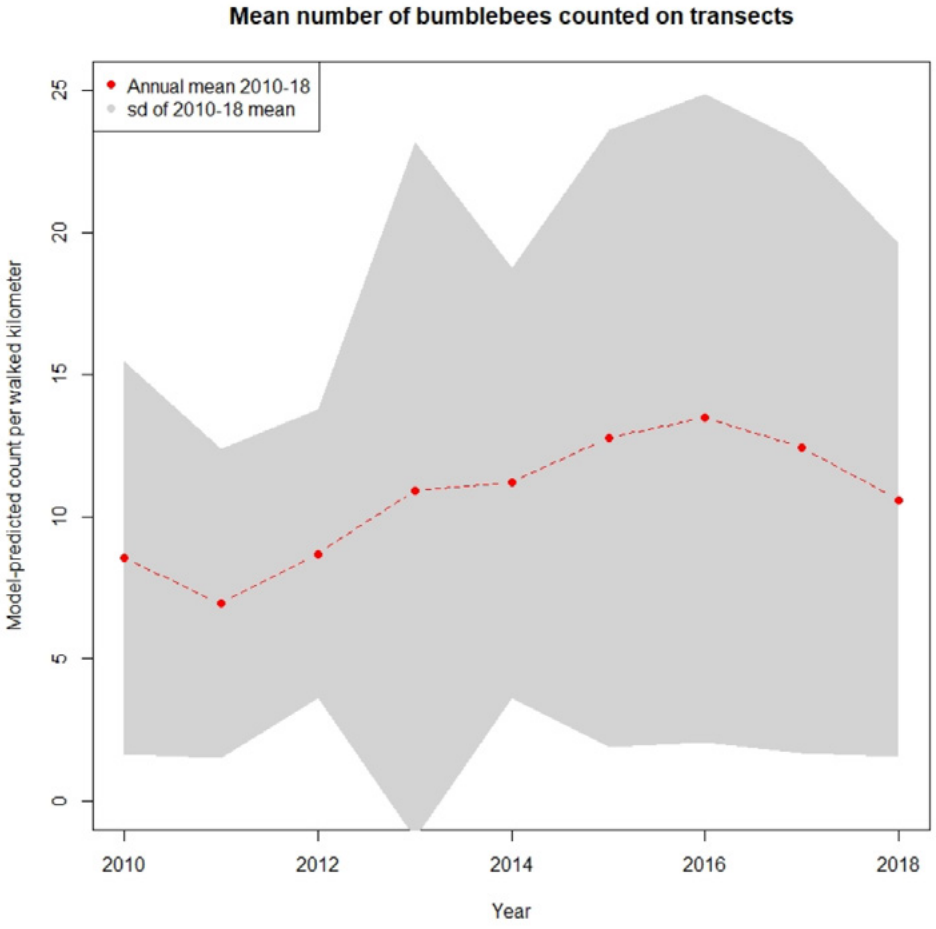
A major reason for the existence of BeeWalk is to monitor population trends of the common species, in order to receive early warning of species declines. To this end, it is concerning to see five of the 'Big Eight' widespread and abundant species declining: *B. terrestris*, *B. hortorum*, *B. jonellus*, *B. pratorum*, and the *B. lucorum* aggregate.

Rank		Species	Records	Trend
1	(1)	*B. ruderarius*	73	0.256
2	(7)	*B. sylvarum*	144	0.236
3	(17)	*B. ruderatus*	165	0.147
4	(3)	*B. humilis*	910	0.134
5	(2)	*B. lucorum/terrestris workers*	9,569	0.109
6	(5)	*B. hypnorum*	4,837	0.079
7	(6)	*B. vestalis*	1,219	0.071
8	(11)	*B. pascuorum*	26,870	0.026
9	(9)	*TOTAL bumblebees*	11,1445	0.025
10	(10)	*B. lapidarius*	15,428	0.018

Rank		Species	Records	Trend
11	(4)	*B. monticola*	113	-0.00111
12	(12)	*B. terrestris*	17,596	-0.00234
13	(14)	*B. hortorum*	5,077	-0.0171
14	(8)	*B. jonellus*	336	-0.0215
15	(23)	*B. muscorum*	395	-0.0315
16	(13)	*B. pratorum*	6853	-0.0315
17	(15)	*B. lucorum agg.*	11,183	-0.0510
18	(20)	*B. barbutellus*	85	-0.0694
19	(18)	*B. rupestris*	342	-0.0788
20	(19)	*B. sylvestris*	576	-0.101
21	(16)	*B. bohemicus*	517	-0.117
22	(22)	*B. campestris*	336	-0.162
23	(21)	*B. soroeensis*	25	-0.224

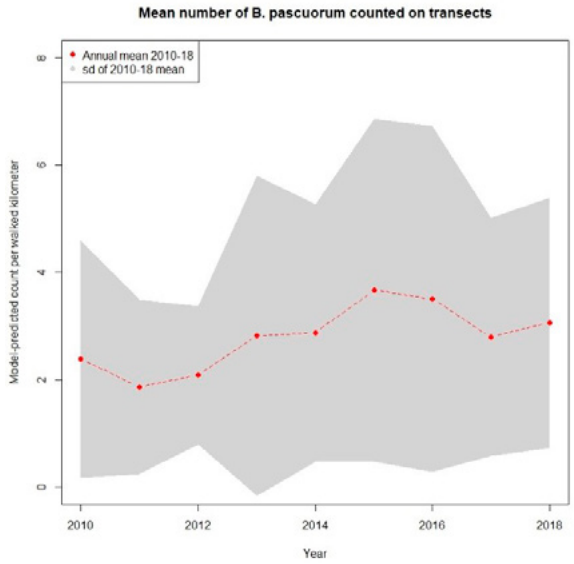
2010-2018 population trends for the 20 bumblebee species and 3 species aggregates with sufficient records in the BeeWalk dataset. Species showing population increases are on the left of the table, those showing decreases are on the right. Species are ordered from most positive change to most negative change and ranked accordingly, with last year's rank in brackets for each species. Conservation priority species have been highlighted in blue and cuckoo species in red.

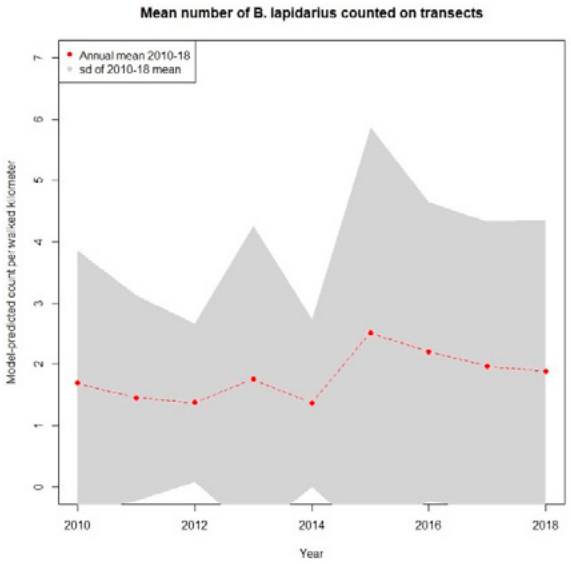
The inability to reliably discriminate between all castes of *B. lucorum sensu stricto*, *B. magnus*, and *B. cryptarum*, and between workers of *B. lucorum sensu lato* and of *B. terrestris* make interpretation of these taxa problematic. In general, there is an increase in the number of workers but a slight decrease in the number of reproductive individuals (queens and males) recorded, with a slight increase overall if both taxa are combined.

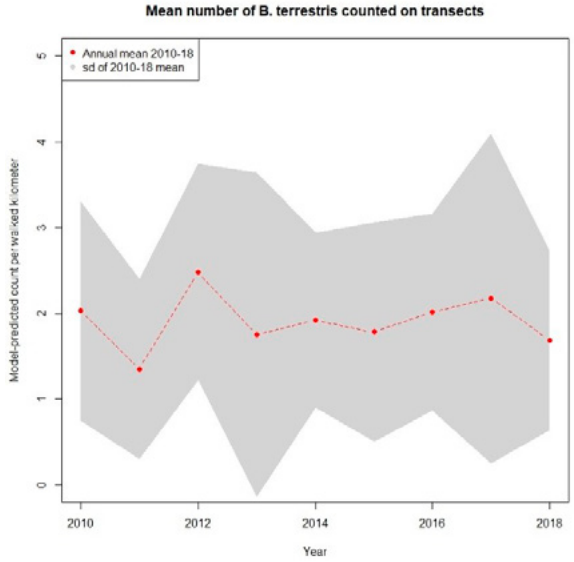


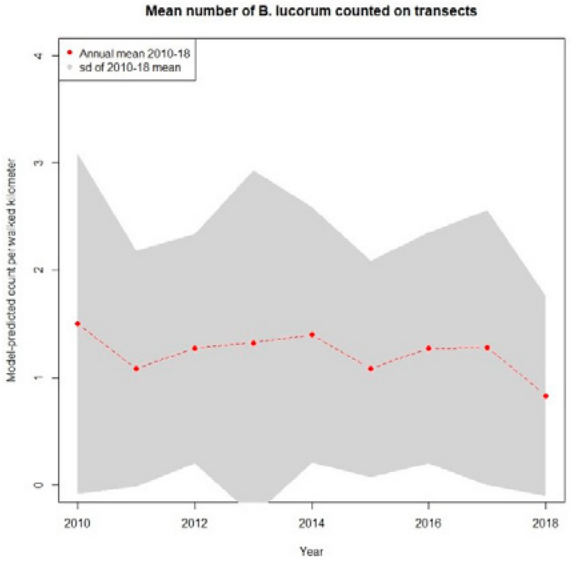
The abundance trend of all bumblebees recorded on BeeWalk transects between 2010 and 2018, including individuals not identified to caste or to species. This is shown as the mean number of bumblebees counted per kilometre walked each year (red line). The grey cloud is a measure of the annual variation around this average (standard deviation)

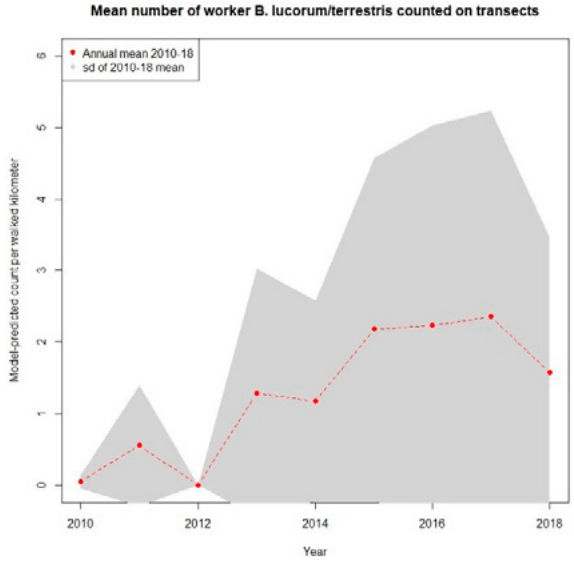
Widespread bumblebee species









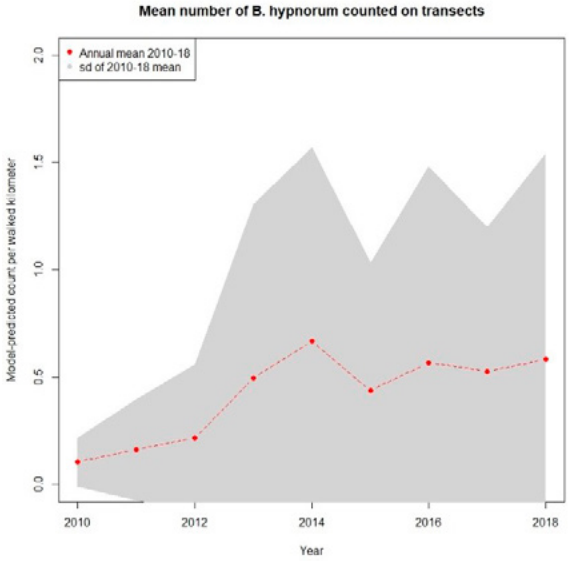


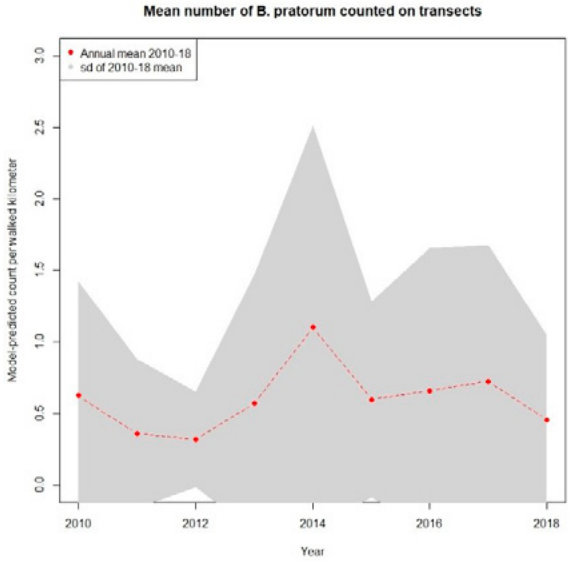
Abundance trends for widespread British bumblebee species 2010-18, shown as the mean number of bumblebees of that species counted per kilometre walked each year on transects where the species has ever been recorded (red line). The grey cloud is a measure of variability (standard deviation).

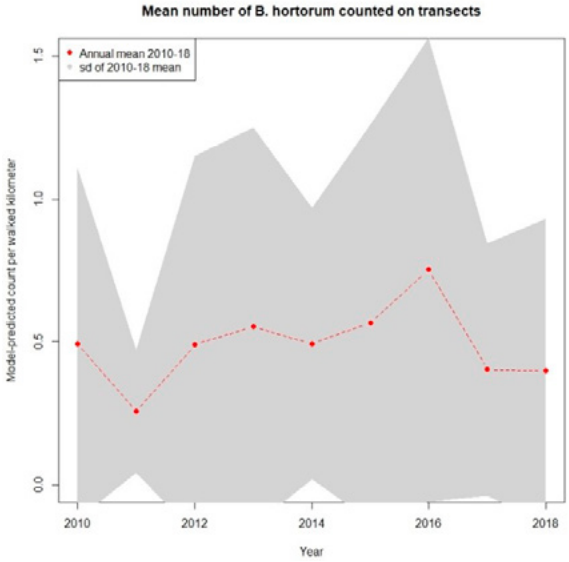
Note: the vertical axis varies with species' abundance and thus differs between plots

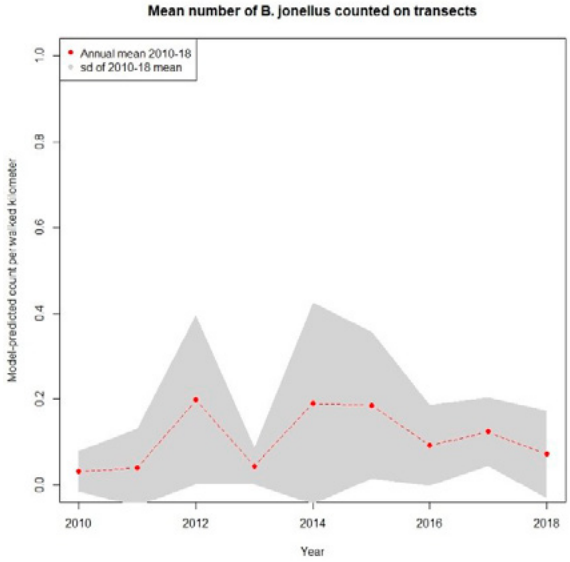
Bombus lucorum & B. terrestris often cannot be reliably split as workers, so records submitted as 'B. lucorum/ terrestris workers' are plotted in addition to both species.

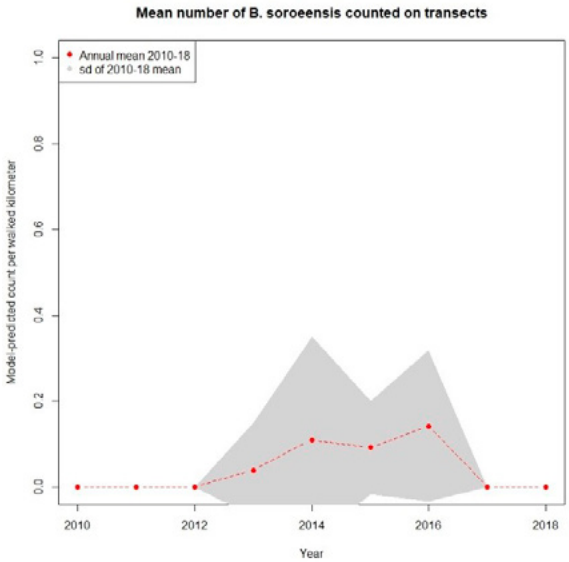
Widespread bumblebees species



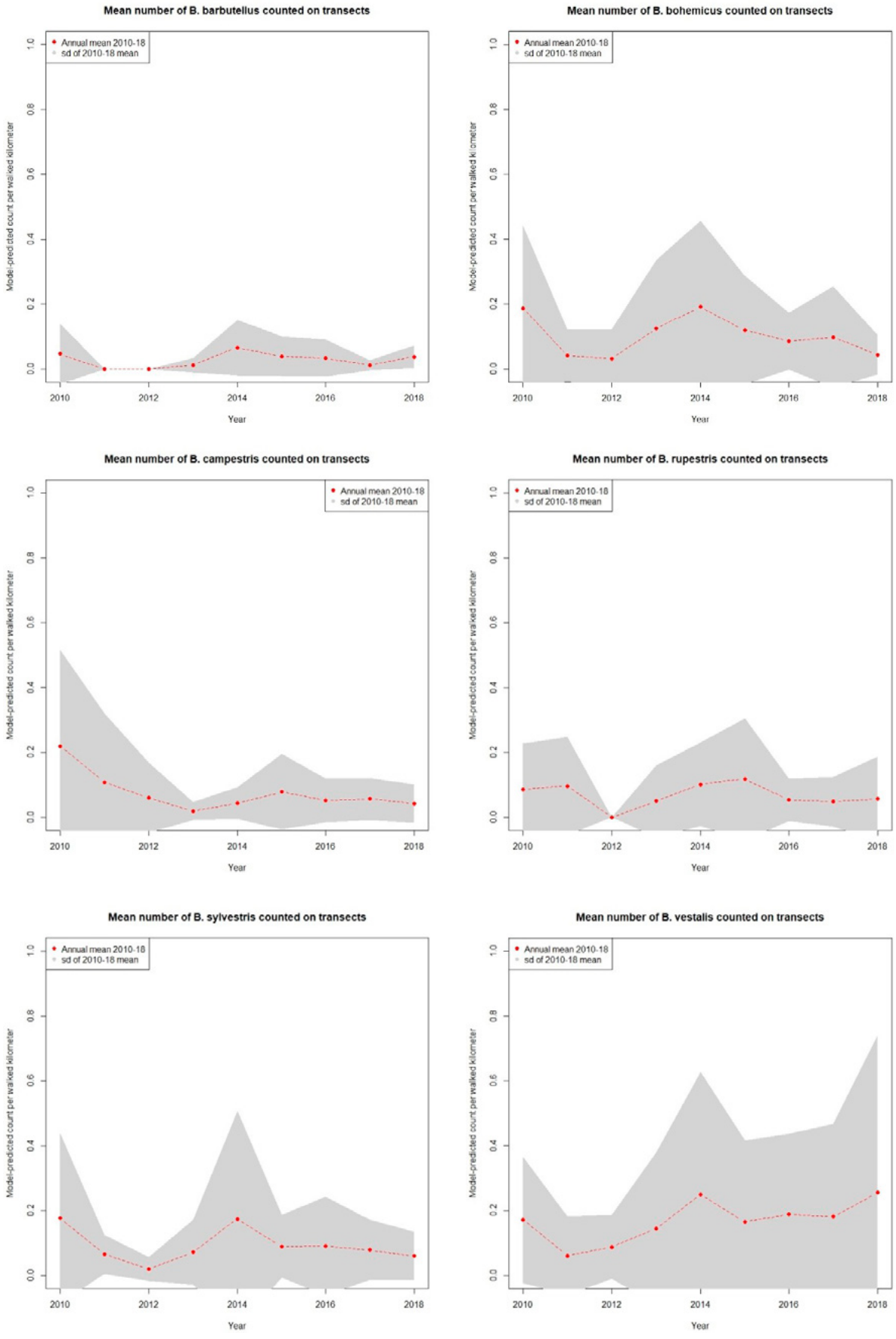




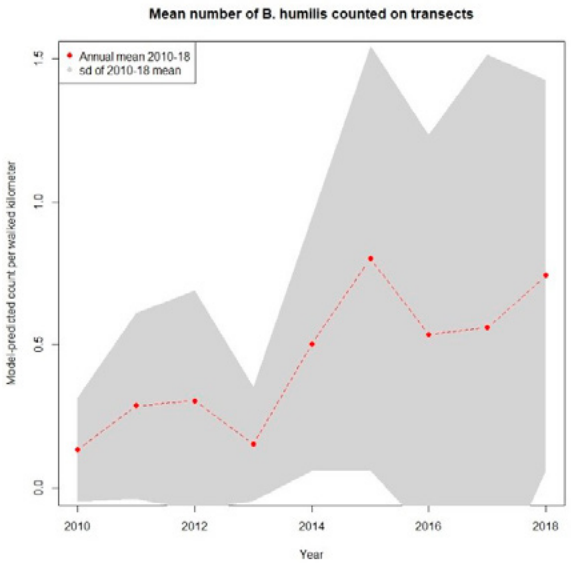


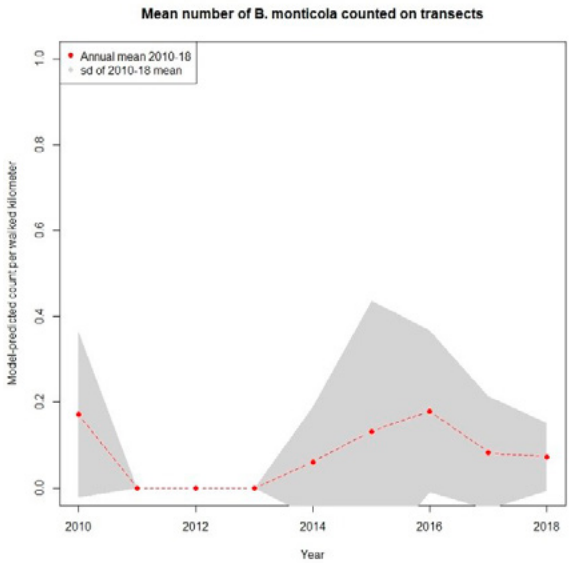


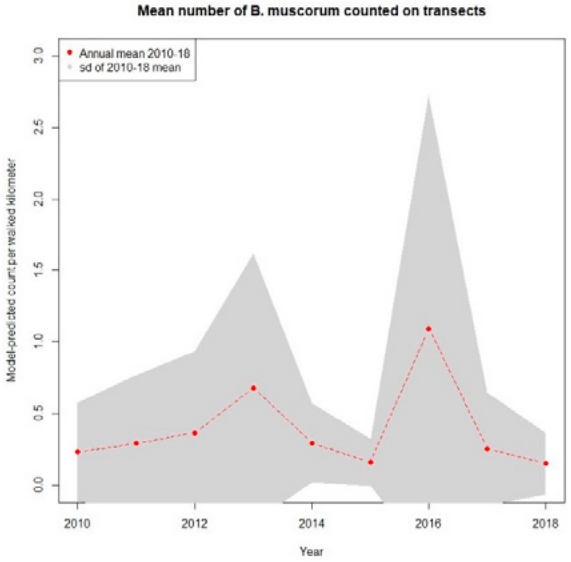
Cuckoo bumblebees

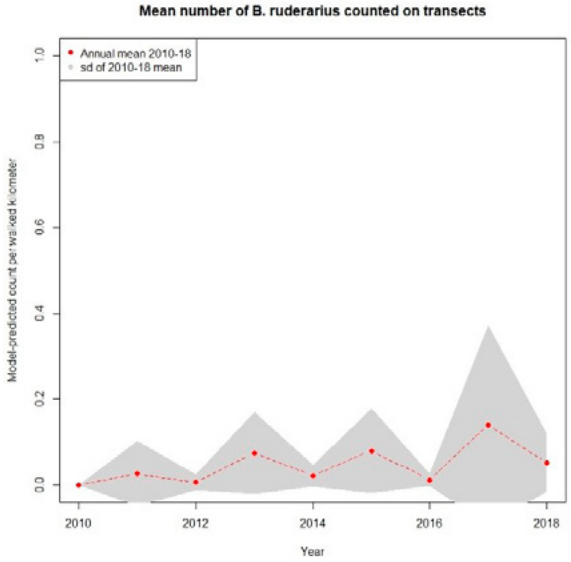


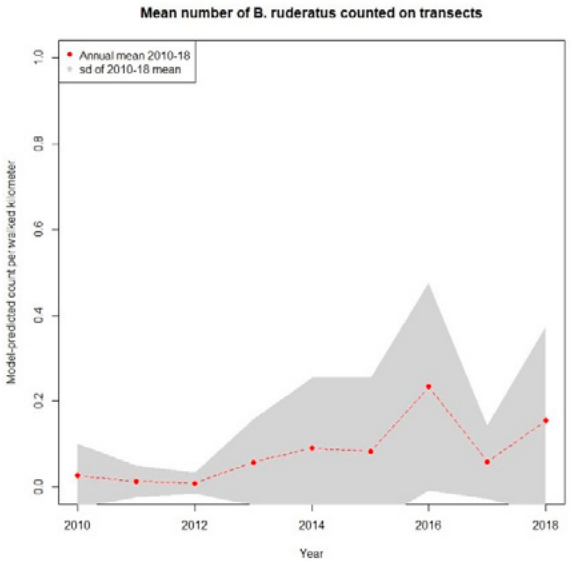
Conservation priority bumblebees species

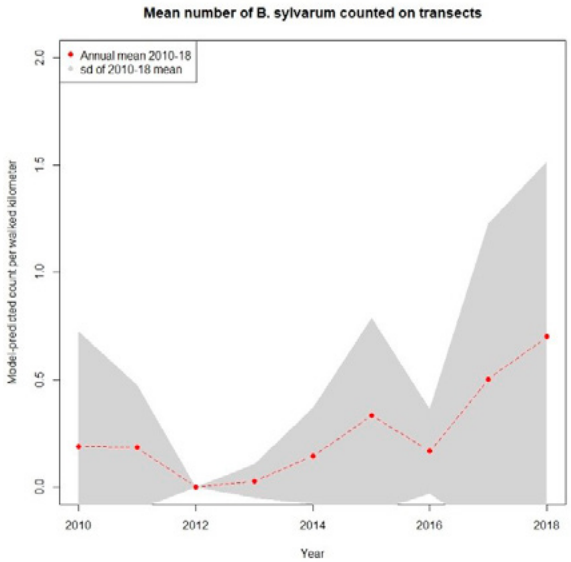












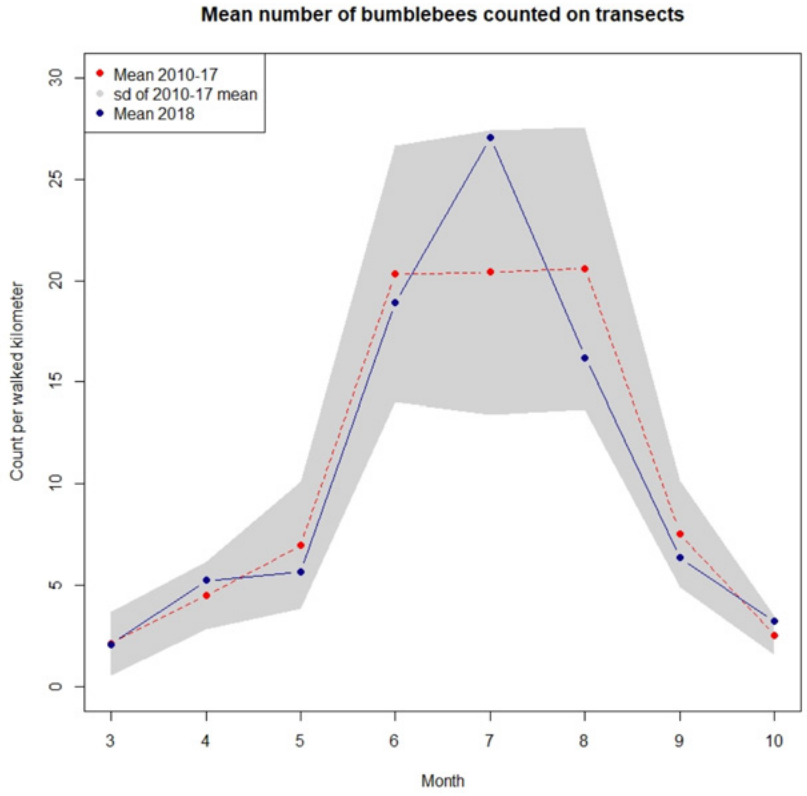
2018

On the whole, 2018 was not a great year for bumblebees. The cold weather of the 'Beast from the East' in late February and early March pushed the start of the season back, and most species only really got going with a spell of good weather in mid-April. The late start combined with the May-July heatwave to see most species reach or exceed their usual abundances by July, although the late-summer, early-autumn tail-off in abundance coincided with the usual emergence time of the new reproductive individuals and so is potentially concerning. Bumblebees are known not to do well in hot, drought conditions so it is perhaps unsurprising to see that the year was a poor one for the group as a whole.

The spring specialist *B. pratorum* had a particularly bad year, its worst since the near-constant rain of 2012. It is likely that the cold March caught out early-emerging queens and the remaining bees were unable to fully make up their numbers in the remaining spring.

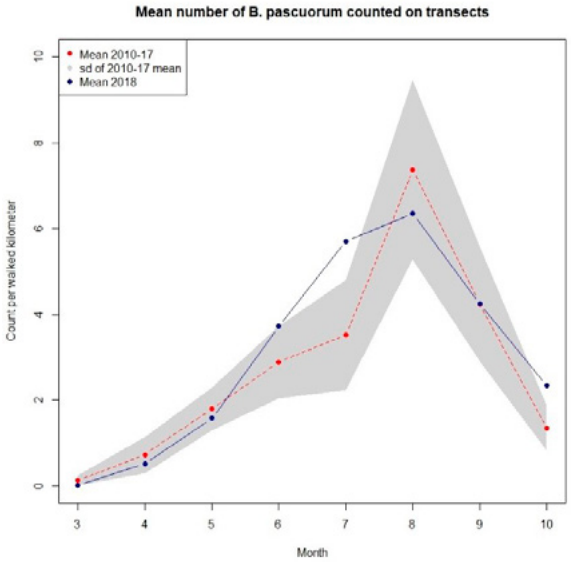
Many other species had a below-average start to the flight season. A proportion (species such as *B. hortorum*) caught up with their average abundance eventually, but declined more quickly thereafter and had a poor year overall. Others, such as *B. hypnorum*, were more abundant than normal later in the summer – possibly because the effect of the shortened flight season was for all nests to peak at approximately the same time rather than spread across several months, but potentially also reflecting the species' possible greater suitability for the conditions.

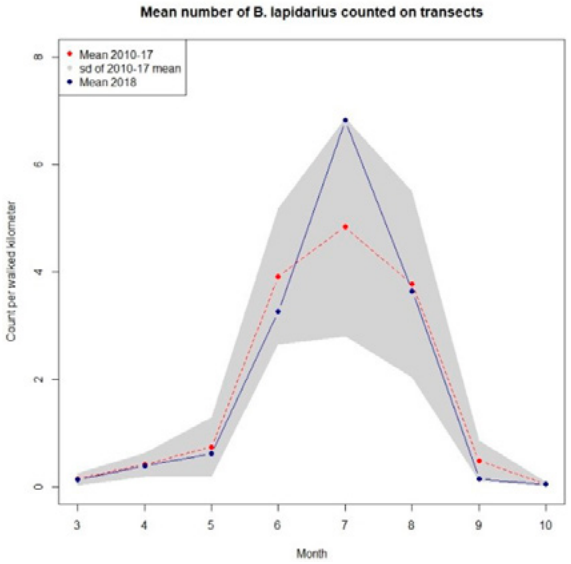
A few species had very good years in 2018. These were principally *B. humilis*, *B. sylvarum*, and *B. ruderatus*, all rare species which reach the northern edge of their ranges in England and Wales. All three are late-emerging species so the cold March is likely to have had a minimal effect on numbers (possibly even reducing competition for nest sites), and effect which can also be seen in the late-emerging common bumblebee *B. pascuorum*. As more southerly-distributed species than most of the other British bumblebees, it is likely that the hot conditions were more favourable to these species as well. Finally, it should be mentioned that all three rare species are primarily monitored on sites which are at least partially managed for the species, and this is also likely to play a role in the species' increased abundance.

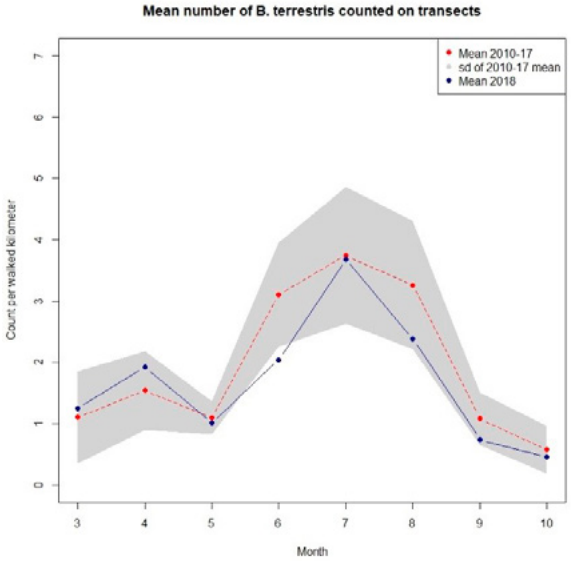


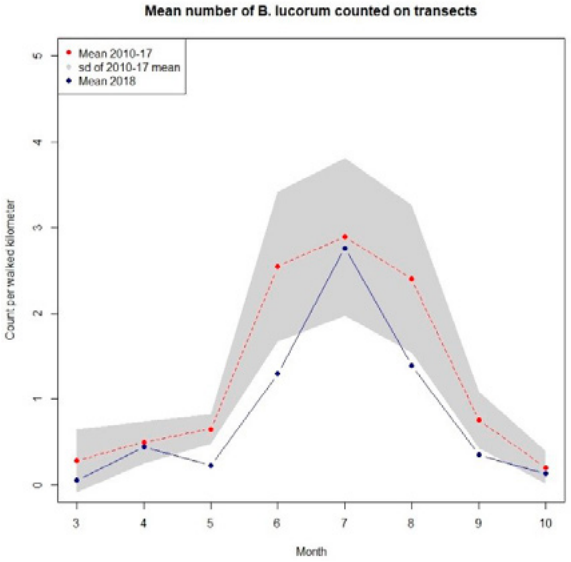
The mean number of total bumblebees per kilometre per month between March and October 2018 (blue line), plotted against the average monthly abundance for the seven-year period 2010-17 (red line). The grey cloud indicates the variability of the 2010-17 average – where the blue (2018) line is outside this grey area the count is significantly different to what would be expected.

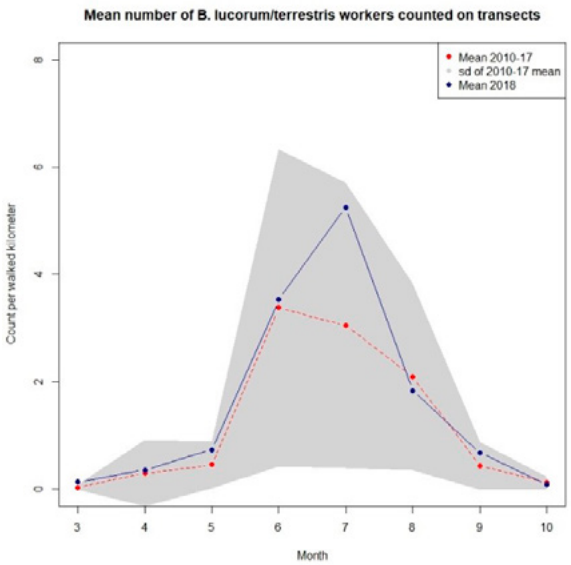
Widespread bumblebees species









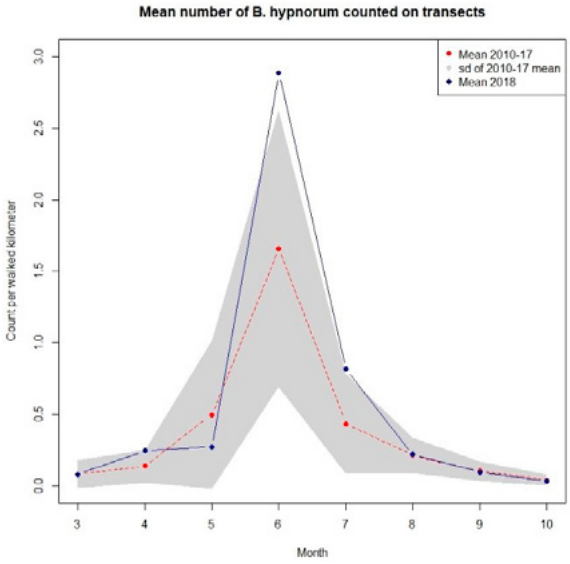


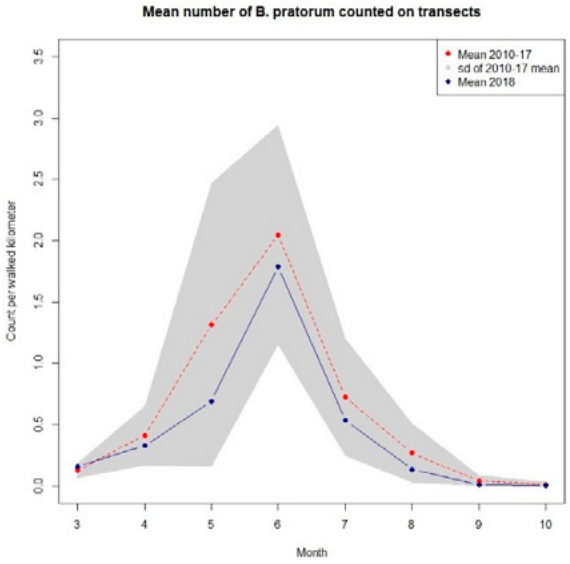
The mean number of bumblebees per kilometre per month between March and October 2018 (blue line), plotted against the average monthly abundance for the seven-year period 2010-17 (red line). The grey cloud indicates the variability of the 2010-17 average (standard deviation).

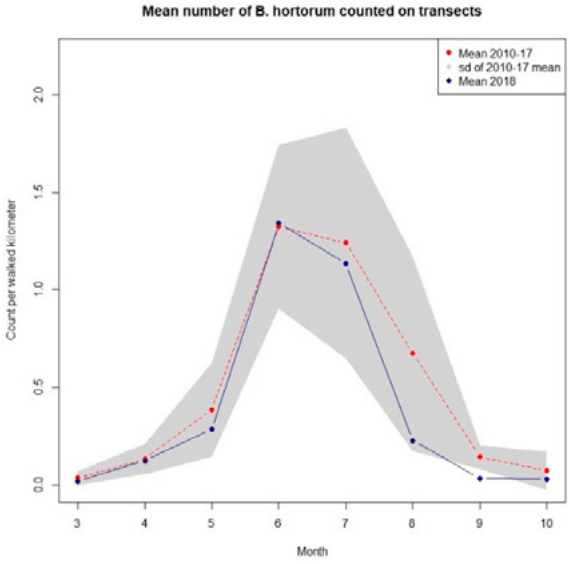
Note: the vertical axis varies with species' abundance and thus differs between plots.

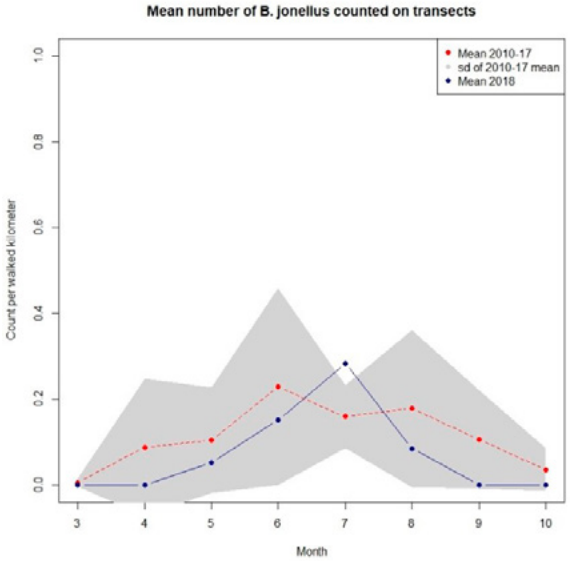
Bombus lucorum & *B. terrestris* often cannot be reliably split as workers, so records submitted as 'B. lucorum/ terrestris workers' are plotted in addition to both species.

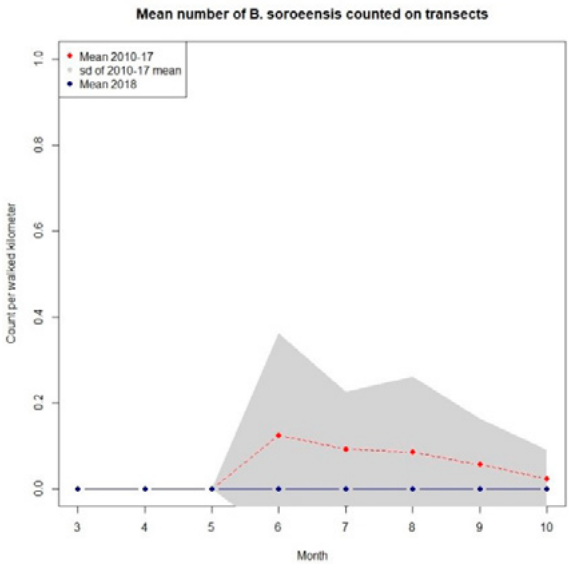
Widespread bumblebee species



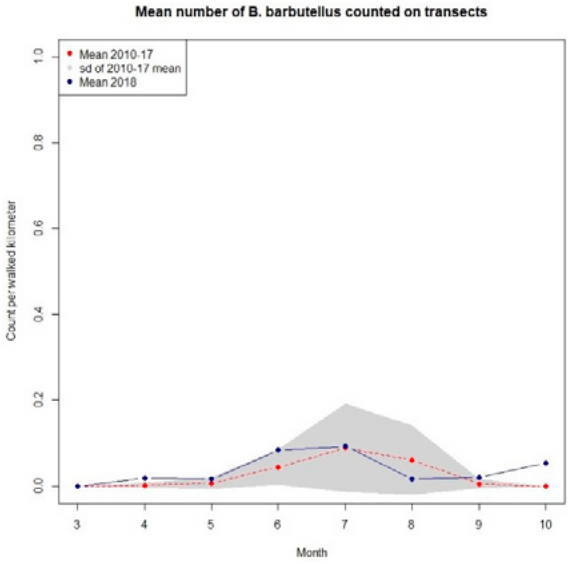


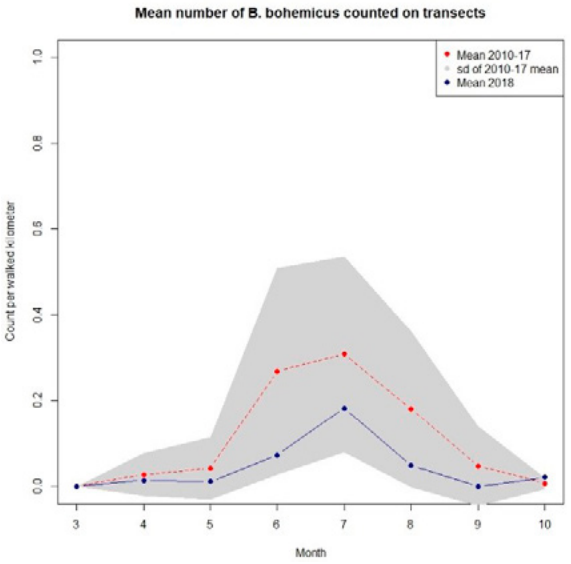


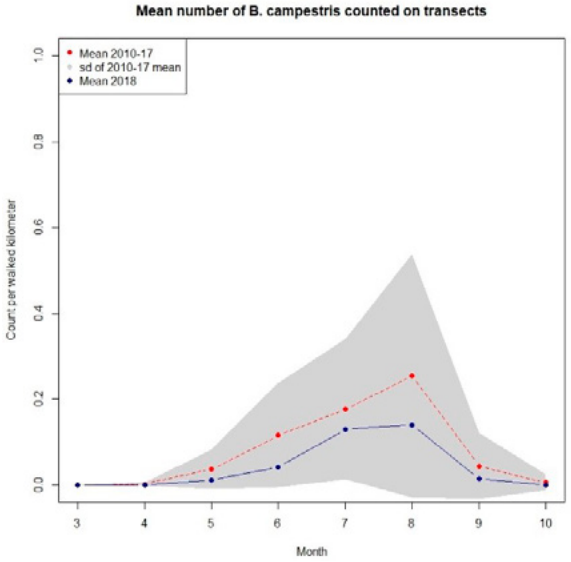


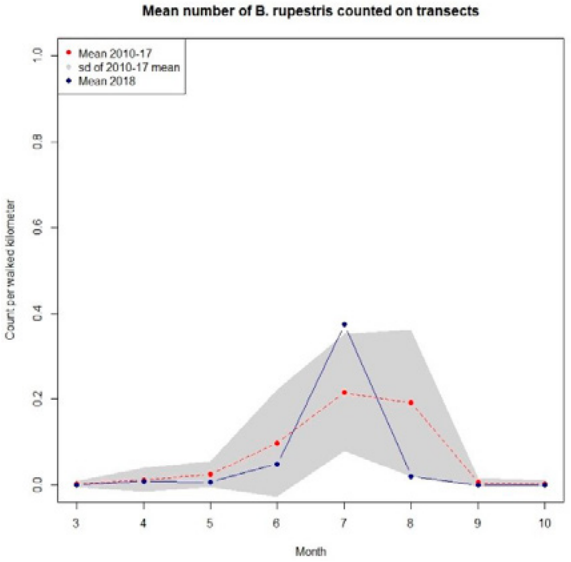


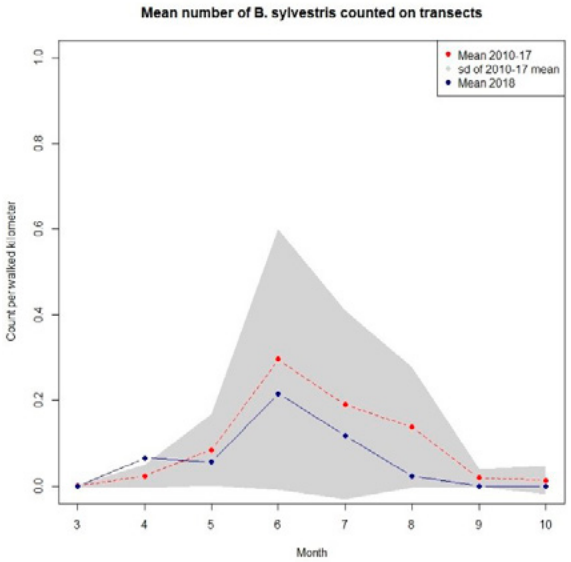
Cuckoo bumblebees

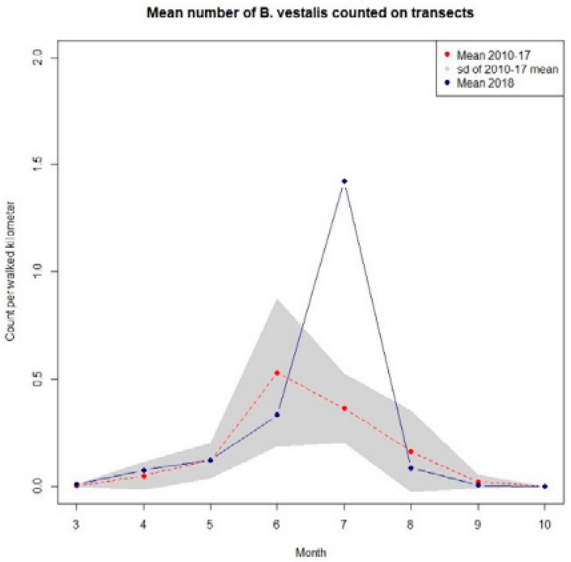




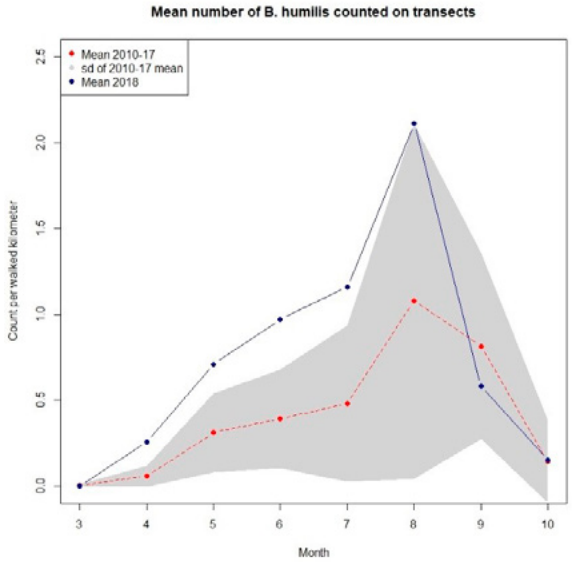


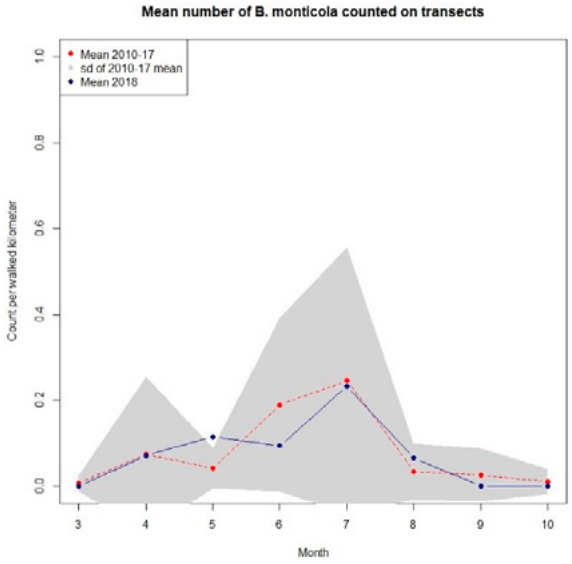


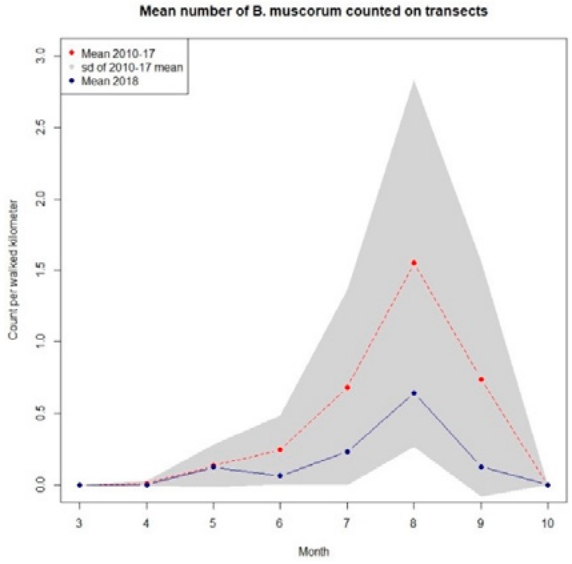


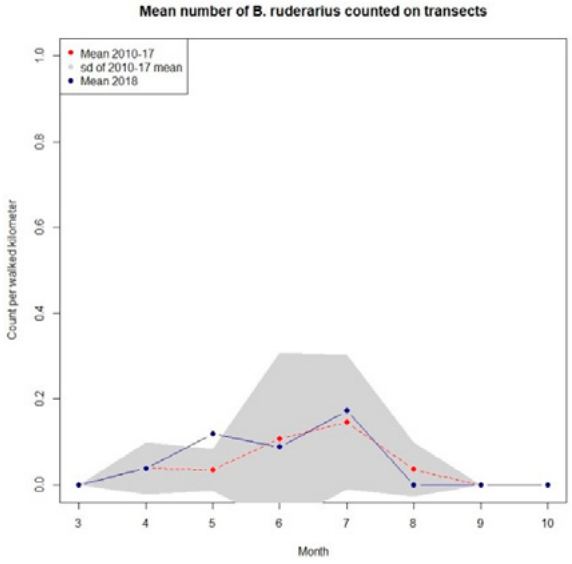


Conservation priority bumblebee species









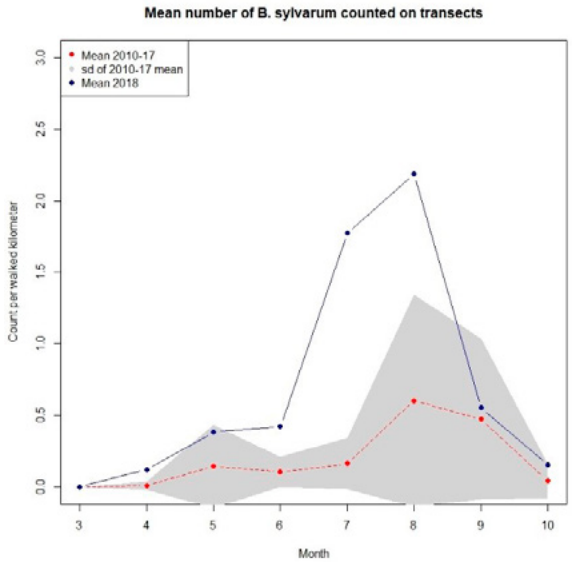


Photo credit: BBCT

This report should be cited as Comont, R. F. & Miles, S. (2019). *BeeWalk Annual Report 2019*. Bumblebee Conservation Trust, Stirling, Scotland UK.

It can be downloaded from **www.bumblebeeconservation.org** and further information can be found on the BeeWalk website, **www.beewalk.org.uk**.