UK Pollinator Monitoring Scheme

Annual Report 2025

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UK Pollinator Monitoring Scheme

Welcome

Welcome to the fourth Annual Report of the UK Pollinator Monitoring Scheme (PoMS)! The report provides an overview of survey coverage and progress from the 2025 season, includes news and updates from the PoMS partnership and showcases some of the contributions of PoMS volunteers. For the first time, the Annual Report also includes results on trends in the different insect groups from the Official Statistics in Development that have been produced from PoMS data collected between 2017 and 2024.

PoMS aims to understand how insect pollinator populations are changing across the UK through implementing two large-scale surveys: the Flower-Insect Timed Count (FIT Count) and the 1 km square survey (on which pan trap surveys and FIT Counts are carried out). These surveys use a combination of dedicated volunteers and professional surveyors, taxonomists and researchers to collect and process data on the abundance and species distribution of flower-visiting insects from a wide range of habitats across the UK. Through continued monitoring at this scale, PoMS will provide evidence for understanding how these insects, which play such a vital role in our countryside, gardens and culture, are responding to changes in our environment. The UK PoMS partnership is coordinated by UKCEH, further details are provided on page 54.

We welcome feedback on any elements of this report or on other types of article you would like to see in future.

Discover PoMS

- Website: ukpoms.org.uk
- Mailing list: ukpoms.org.uk/subscribe
- Bluesky: @pomscheme.bsky.social
- Email: poms@ceh.ac.uk

How to cite

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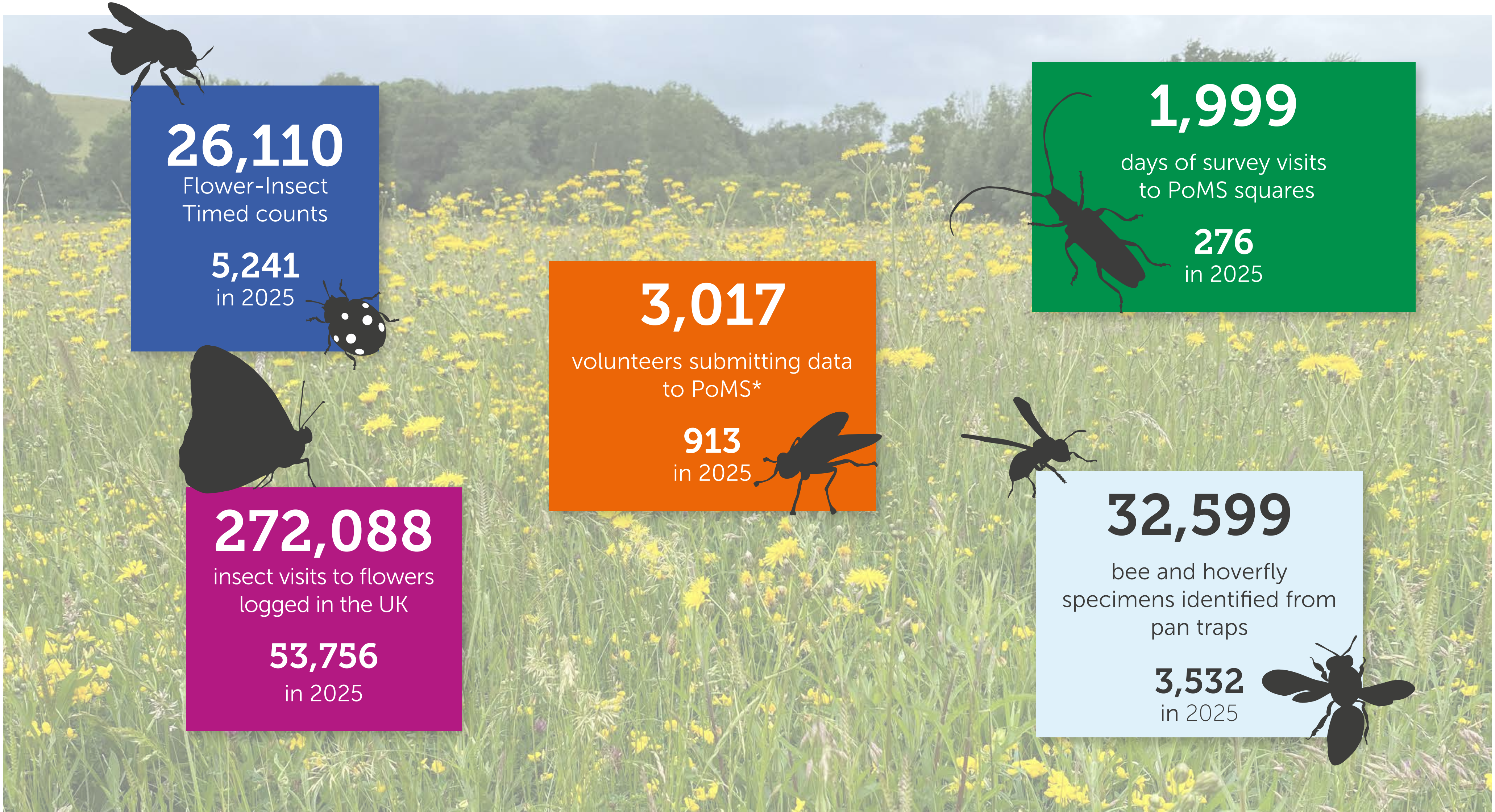
This report can be downloaded from ukpoms.org.uk/reports.

Contents

References to publications and websites are indicated with hyperlinks like this [1]. Reference list on pp 52-53.

Front: Pale-kneed Straightvein hoverfly, *Orthonevra geniculata* © Steven Falk.

Back: Rachel Richards (Buglife) delivering a FIT Count training session in Newcastle © Northumberland Wildlife Trust.



26,110
Flower-Insect Timed counts

5,241
in 2025

3,017
volunteers submitting data to PoMS*

913
in 2025

1,999
days of survey visits to PoMS squares

276
in 2025

272,088
insect visits to flowers logged in the UK

53,756
in 2025

32,599
bee and hoverfly specimens identified from pan traps

3,532
in 2025

PoMS in numbers

In each box, the first value is for all years (2017–2025) whilst the second value is for 2025 (the latest year).

*based on registered users who submitted at least one count via the FIT Count app or PoMS website.

Latest news from UK PoMS

Claire Carvell and Martin Harvey (UKCEH) provide a round-up of PoMS activities during the past year and look forward to the 2026 season.

The UK Pollinator Monitoring Scheme (PoMS) has continued to thrive in its ninth year. Progress has been made towards one of the schemes' core objectives: to generate new metrics describing trends in UK pollinator abundance and species richness. Alongside this Annual Report will be the first published "Official Statistics in Development" that have been produced from PoMS data collected between 2017 and 2024. See pages 20–31 for a full summary of these results across the PoMS surveys.

Key to the production of robust metrics from long-term monitoring schemes such as PoMS is the **consistent use of structured surveys following recognised methods**. Whilst all data are important for PoMS, having continuous time series within individual sites will become increasingly valuable to our analyses of change over time. There are **42 squares in the PoMS 1 km square dataset which have nine years of continuous data** and six volunteers who have conducted surveys every year since 2018, collecting 893 samples between them! We are incredibly grateful for their continued contribution to the scheme and hope that they and all the 1 km square volunteers and landowners enjoyed receiving their annual square report listing the bee and hoverfly species identified from their pan trap samples. Read more about survey coverage on both the 1 km square surveys and FIT Count on pages 7–19. And this year we have three fabulous contributions from Andrew, Edwina and Carys reflecting on their experience of volunteering on the PoMS 1 km square survey (pages 40–43).

Alongside this Annual Report also comes an updated publication of the PoMS dataset. The **2017–2023 dataset is now available for research** through the UKCEH Environmental Information Data Centre. Here you will find complete versions of both the pan trap survey data from PoMS 1 km squares, and the Flower-Insect Timed Count survey data collected on 1 km squares and as part of the wider citizen science FIT Counts from across the UK. Each dataset is published with a detailed 'metadata' document that describes the data collection methods and processing pipeline. In addition, species occurrence records of bees and hoverflies generated from the pan traps have been shared with the UK's National Biodiversity Network Atlas, enabling them to reach the relevant recording schemes and societies and become available for further research and policy development. We are always keen to hear from researchers interested in making use of PoMS data.

During 2025, interest in FIT Count surveys continued, the year ending with 21 FIT Count projects generating data and with the list growing to 27 projects set up at the start of the 2026 season. This years' report features updates from three local projects who have engaged volunteers in a variety of ways to meet their own aims for engaging with pollinator monitoring (pages 44–48).

Engaging with schools and colleges, the National Education Nature Park programme launched a simplified version of the FIT Count survey (named *Pollinator Count*) across England. Find out more in the update from Victoria at the Natural History Museum on pages 49–50. Finally, the team at UKCEH has also been busy in a new collaboration with the National Garden Scheme. This spring and summer, people have been invited to take part in The Big British Garden Survey, which includes FIT Counts, to celebrate the role that gardens play in providing space and resources for wildlife. Linking with the FIT Count season, this survey runs until 30 September 2026.

PoMS continues to link with the four pollinator strategies across the UK, each having monitoring as a core objective connected with improving evidence on the status of pollinators.

In **England**, we contributed to a review of Defra's National Pollinator Strategy (2014–2024) and are working with the Pollinator Advisory Strategy Group on a new Pollinator Action Plan. Claire Carvell was invited to join MPs at Westminster on two occasions, representing PoMS, as part of the new All-Party Parliamentary Group for Bees, Pollinators and Invertebrates, which is coordinated by the Royal Entomological Society and dedicated to facilitating insect science. Bees' Needs Week also continues to run annually, raising awareness of the importance of bees and other pollinators and celebrating the many conservation success stories from conservation groups, businesses and charities. In 2025, Defra awarded 23 Bees' Needs champions awards to people and organisations who have taken inspiring action, however big or small. Bees Needs Week will be held from 13th to 19th July 2026.

In **Scotland**, activities continue under the Pollinator Strategy for Scotland (2017–2027), coordinated by the team at NatureScot, with many initiatives and resources including PollMap, a mapping tool to understand the extent of pollinator-friendly habitats across Scotland and identify gaps. Don't miss a chance to appreciate the brilliant Pollinator Blog, featuring fascinating insights about all things pollinators, ranging from the highly complex biology of pollination itself to tales from volunteering work and other conservation endeavours. Sadly these posts are to come to an end, with Jim Jeffrey who founded and managed the blog leaving Nature Scot. The PoMS team would like to thank Jim for all his support and enthusiasm for PoMS over the years. Past entries will remain available on the blog online for a while, so don't miss out before it's too late!

“ ”

My PoMS square has become like an old friend. I get out in the sunshine in a beautiful part of Wales, safe in the knowledge that I'm contributing to something larger, providing information on how all our pollinators, especially those hoverflies, are faring.

- *Andrew Lucas, PoMS volunteer since 2021*

(See Andrew's feature on page 42)

© Andrew Lucas

Andrew's pan trap station in north Carmarthenshire.

In **Wales**, the Nature Recovery Action Plan: 2026 is a framework to embed and drive long term nature recovery in Wales. It includes continued support for the Action Plan for Pollinators (launched in 2013) which endeavours to provide diverse and connected flower-rich habitats to ensure healthy pollinator populations in Wales and raise awareness of their importance and management. The Action Plan for Pollinators in Wales is delivered by members of the Pollinator Taskforce. Their Bee Friendly initiative encourages communities and organisations to take positive action for all pollinators. During 2025, Richard Dawson (long-standing member of the PoMS survey team) led a series of pollinator ID training days and safaris from Flintshire to Carmarthenshire, which we hope will have inspired others to get involved in recording pollinators across Wales.

In **Northern Ireland**, PoMS works closely with the National Biodiversity Data Centre through delivery of the All-Ireland Pollinator Plan (AIPP) (2015–2025). They have recently been awarded new funding from the Government of Ireland's Shared Island Fund to help deliver the next phase of the Plan (2026–2030). The island-wide programme includes a module dedicated to monitoring, and the PoMS team is working with our partners in Northern Ireland to ensure we make the best of the network of PoMS squares already set up there. Meanwhile, this new video celebrates the brilliant work that has been done to help pollinating insects during the AIPP 2021–2025.

Finally a few reminders, starting with a link to sign up for the PoMS e-newsletter, which we aim to release quarterly with the latest updates on PoMS surveys, events hosted across the UK and online by PoMS partners and publications. PoMS remains active on social media through our Bluesky account (@pomscheme.bsky.social) and other channels including via UKCEH. Remember to check the map on the PoMS website for the current status of survey squares near you, as this may change during the season. Any new volunteers wishing to adopt a square will receive one-to-one training, equipment and everything you need to get going from our team of PoMS survey mentors at a time that suits you.

> *There is so much to love in one another and the natural world but if we don't pause to notice it, we will not love or value it. And if, like me, you are afflicted with the need to be constantly useful, here is an excuse to stop: getting involved with a citizen science project.*
>
> - *Guy Singh-Watson, founder of Riverford, on joining the FIT Count (in 'News from the Farm', Wicked Leeks newsletter, April 2026)*

© Kelly Widdicks

The PoMS 1 km square survey

The PoMS 1 km square survey is a systematic survey of pollinators and floral resources from a core set of sites across the UK. It generates species-level data for bees and hoverflies using pan traps, providing new records of occupancy and distribution, as well as data from pan traps and FIT Counts to detect changes in abundance of a range of insect groups. Here, Claire Carvell and Robin Hutchinson (UKCEH) summarise coverage up to and including 2025, our ninth consecutive year of sampling across the network!

The PoMS 1 km square survey was set up in 2017 across 75 randomly selected 1 km squares in Great Britain, stratified to represent the relative cover of agricultural and semi-natural land use in each country [1]. There are 36 squares in England, 22 in Scotland and 17 in Wales. In 2021, 20 squares were set up in Northern Ireland to expand the overall network to 95 squares (Figure 1). Sampling is conducted on up to four visits from May to September each year by a combination of volunteers and PoMS team surveyors. The ‘one-person-one-day’ protocol was designed to be implemented by non-experts and involves setting out five pan trap stations (each with three bowls painted UV-bright yellow, blue and white, mounted at vegetation height and filled with water) along a diagonal of each square for six hours. During this time the surveyor collects data on floral resources (number of flowers within a 2 m radius of the trap station) and habitats surrounding the pan traps and undertakes at least two FIT Counts (see pages 12–19 for more about the FIT Count survey). We specify temperature thresholds for conducting the survey

Top, left and right: Miranda Bane © UKCEH; Bottom left: Nadine Mitschunas © UKCEH; Bottom right: © Catherine Jones

Pan trap stations are set in a variety of habitats but always in the same position within a square on each survey. Bowls are attached using supporting wires and wing nuts to meet the height of the surrounding vegetation.

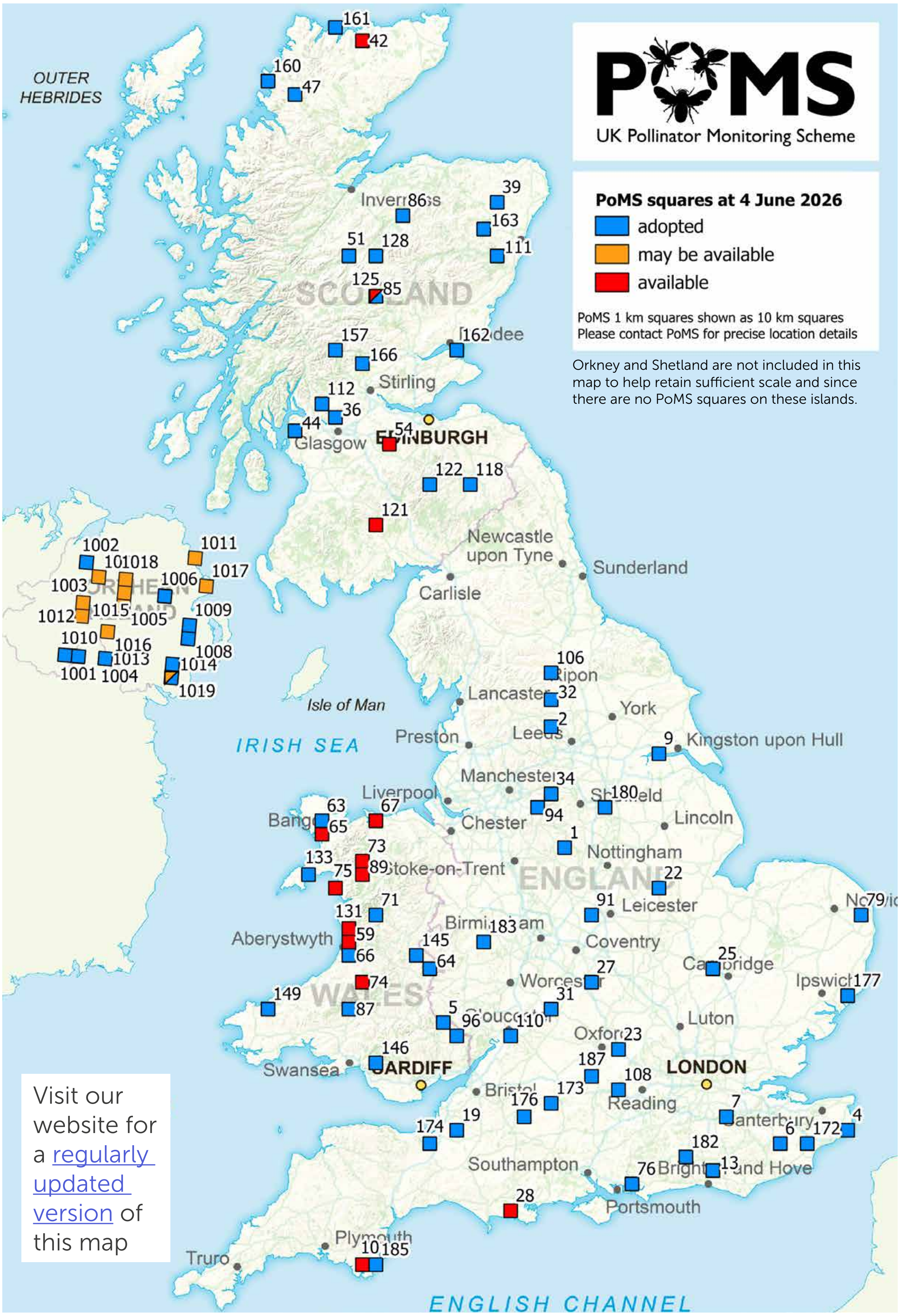


Figure 1. Location of 1 km square survey sites across the UK. Surveys on 'available' squares in red are covered by the PoMS survey team each year until they are adopted by volunteers. We are extremely grateful to the landowners who allow access for PoMS surveys, and to the volunteers who undertake them. Each year they receive a bespoke report which lists the bee and hoverfly species sampled and the flowering plants spotted in their 1 km square.

at a minimum of 13°C if the sky is clear (less than 50% cloud) or a minimum of 15°C if the sky is cloudy (cloud cover more than 50%), as with the FIT Count surveys, and these conditions must be met for at least 50% of the total six-hour pan trap exposure time (so a slight drop in temperature during the day is acceptable, as is a slightly cooler start when the day warms up later).

Collected samples are sent back to UKCEH (via Freepost) for sorting and identification, and surveyors enter their other survey data online via the PoMS website.

Survey coverage 2017–2025

In 2025, a total of 276 survey visits were made to 78 PoMS 1 km squares by a combination of volunteers and PoMS survey team members, generating 1,370 samples (Table 1). Volunteers were allocated to 78 squares across the UK (though a few were unable to complete surveys), with new

Table 1. Coverage of the PoMS 1 km survey and samples processed from 2017–2025.

Note: Surveys started in June and July 2017 following set up of the squares, and were suspended from April to early July 2020 due to the restrictions imposed during the COVID-19 pandemic. Figures for 2025 may be subject to minor changes following final processing and data cleaning.

Detail	Year	England	Scotland	Wales	Northern Ireland	Total UK
Number of 1 km survey days	2017	59	35	33		127
	2018	94	32	22		148
	2019	108	62	64		234
	2020	54	24	12		90
	2021	119	61	57	6	243
	2022	119	76	60	32	287
	2023	126	71	61	35	293
	2024	128	66	55	52	301
	2025	123	74	55	24	276
Number of squares surveyed	2017	36	19	17		72
	2018	33	17	15		65
	2019	33	21	17		71
	2020	32	18	11		61
	2021	33	18	15	5	71
	2022	34	21	17	13	85
	2023	36	22	17	18	93
	2024	34	21	16	15	86
	2025	33	21	15	9	78
Number of samples processed (One sample is from three bowls at a pan trap station)	2017	295	175	165		635
	2018	465	156	110		731
	2019	540	305	313		1,158
	2020	270	120	60		450
	2021	593	305	284	30	1,212
	2022	591	364	296	157	1,408
	2023	628	355	297	175	1,455
	2024	637	322	275	260	1,494
	2025	614	366	275	115	1,370

volunteers introduced to 14 squares during 2025. This year saw an increase in survey effort in Scotland, sustained effort in England and Wales, and a decrease in survey effort in Northern Ireland. Weather conditions were generally more favourable during 2025 than in 2024, meaning the temperature thresholds for conducting surveys were more likely to be reached at higher latitudes in particular.

Overall this brings us to a total of **1,999 PoMS 1 km square surveys undertaken since 2017**, with 9,913 samples having been collected and processed. As noted in our *Latest news* (pages 4–6), 42 squares now have nine years of continuous data. This level of survey coverage is only made possible by the collective contributions of both our long-standing and more recent volunteers, the fabulous PoMS 1 km survey team, taxonomists and data processors. The latter have the unenviable but critical task of ensuring all the incoming survey data are matched with samples and specimens to provide accurate datasets that are analysis-ready, so **if you are a volunteer with a 1 km square, please continue to ensure that you submit your survey data to the webform as well as sending in samples!** It is the complexity of this process which effectively means we are only able to report on survey coverage within a year of data collection, with analyses and results from the 1 km surveys being available within two years.

What's in a pan trap?

The PoMS pan trapping protocol has been carefully designed to minimise the number of insects caught, while still sampling enough individuals to measure changes over time [2]. Typically the traps catch three to four bees and hoverflies per set of three pans during a 6-hour survey, though these numbers vary considerably depending on factors including location and time of year. Once the samples arrive at the UKCEH labs for processing, we undertake a full count of all insects in each sample, broken down by species group. All bees and hoverflies are then identified to species level by expert taxonomists, while other groups are stored as 'by-catch' for potential downstream identification.

In 2025 the taxonomists identified a total of 1,857 bee specimens representing 103 species and 1,675 hoverfly specimens representing 72 species from across all 1 km square surveys. Note that where we refer to "species" this is based on the aggregated taxon names, and includes some taxa at aggregate or genus level. This brings the total number of identified specimens from PoMS to 32,599, representing **155 bee and 126 hoverfly species**.

Claire Carvell © UKCEH

Claire Carvell © UKCEH

PoMS taxonomists carry out detailed examinations to identify all bee and hoverfly specimens from the pan traps, cross-checking a proportion of each others' IDs for quality assurance.

At the level of 1 km survey squares, across all five pan traps through the year in 2025, the number of bee species per square ranged from 1 to 23 taxa (with an average of nine taxa), and hoverflies ranged from 1 to 22 taxa (with an average of 7.7 taxa) per square. As in previous reports, some of the more interesting species recorded are described on pages 32–34.

The pie chart shows the average composition of a PoMS pan trap by insect group (up to 2024). Samples are dominated by the 'other' non-hoverfly flies (at 76% on average), with bees and hoverflies making up on average 5% per sample. The follow-on DNA work carried out in 2024–2025 and reported in last year's report allowed us to explore in much more depth the species community composition of a sub-set of these samples, and we are developing this as a research paper for publication.

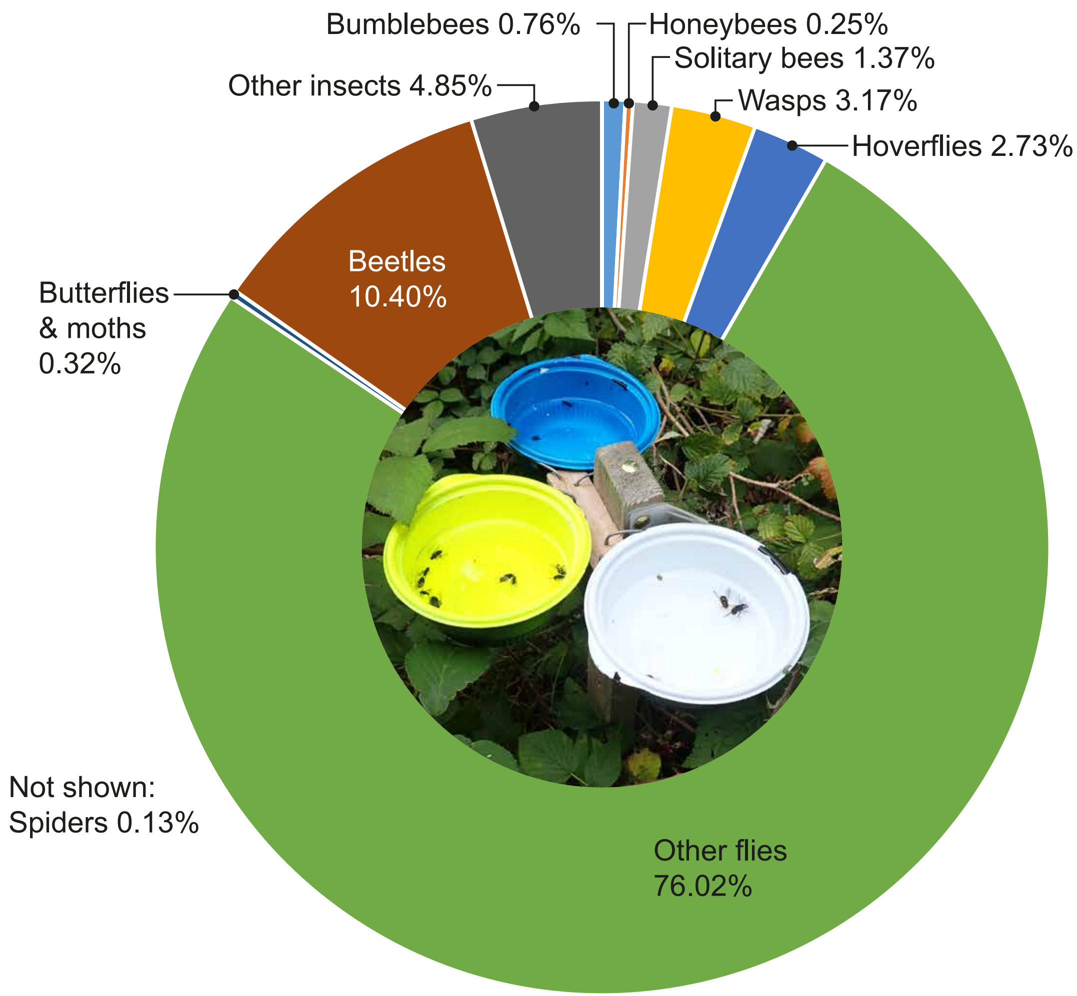


Figure 2. Average composition of a PoMS pan trap, taken from samples collected across the UK from all squares between 2017–2024.

Flower-Insect Timed Counts

Flower-Insect Timed Counts (FIT Counts) are simple systematic surveys collecting data on abundance of flower visitors across a variety of habitats and plant groups. Here, Robin Hutchinson, Claire Carvell and Martin Harvey (UKCEH) summarise coverage to date and highlight how the growing dataset is revealing differences in the insect assemblages visiting the different target flowers.

FITCount

FIT Counts were developed with the aim of encouraging a wide range of people to get involved in pollinator monitoring, whilst also generating structured data on flower visitation and plant-pollinator interactions that is not being collected by any other existing scheme. The recorder spends **10 minutes** counting the insects that visit the flowers of a chosen flower species within a **50 x 50 cm quadrat** (ideally from our list of 14 target flowers, although other flowers can be used). Information on flower abundance and habitats surrounding the FIT Count quadrat, and the weather, is also collected to help explain variation in the insect data and explore the effects of changes in these other variables over time, where the data allows.

FIT Count resources include survey guidance, a recording form, insect and flower guides, 2-minute video guides, online forms for data capture and the mobile app that was launched in 2021 with its own integrated guide to the insect groups. All are available in both English and Welsh through the PoMS website. New for 2026 is a **"FIT Count quick guide"** (see images on page 13) intended to introduce people to FIT Counts and to the different insect groups, to be used both at training or community events, and by individuals who will be able to access and print it from the PoMS website.

Overall, in the nine years since the survey began in 2017, a total of 26,110 FIT Counts has been submitted, representing an incredible 4,348 hours of observation and 272,088 flower-insect interactions (Table 2)! Thanks are due to the 3,017 recorders who have submitted counts from all corners of the UK. Throughout the 2025 season PoMS released a series of plots through our e-newsletter showing the cumulative increase in counts carried out each month. Counts during 2025 took an early lead thanks to the warm weather in early April (Figure 3). This trend continued across the 2025 season, with a record 5,241 FIT Counts being submitted.

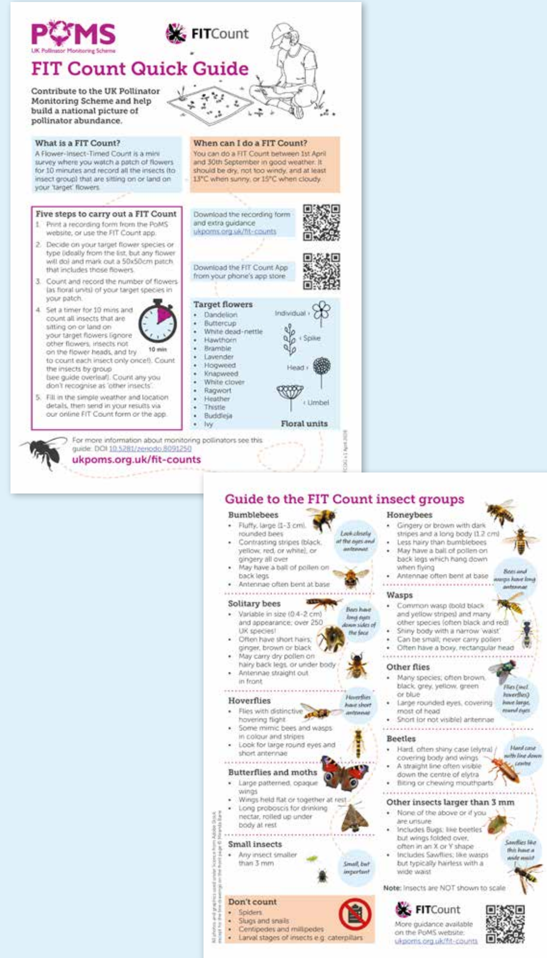
Claire Carvell © UKCEH

FIT Count at RHS Garden Rosemoor.

Detail	Years	England	Scotland	Wales	N Ireland	Total UK
Total number of FIT Counts	All-time total	19,633	3,338	1,934	1,183	26,110
	2025	4,081	691	322	144	5,241
Number of FIT Counts submitted by the public	All-time total	17,921	2,073	1,020	931	21,962
	2025	3,879	537	195	107	4,721
Insect visits to flowers logged	All-time total	215,394	28,569	17,929	10,041	272,088
	2025	42,553	6,247	3,176	1,736	53,756
Total number of recorders (1 km and public)	All-time total	2,408	327	194	133	3,017
	2025	712	106	58	46	913

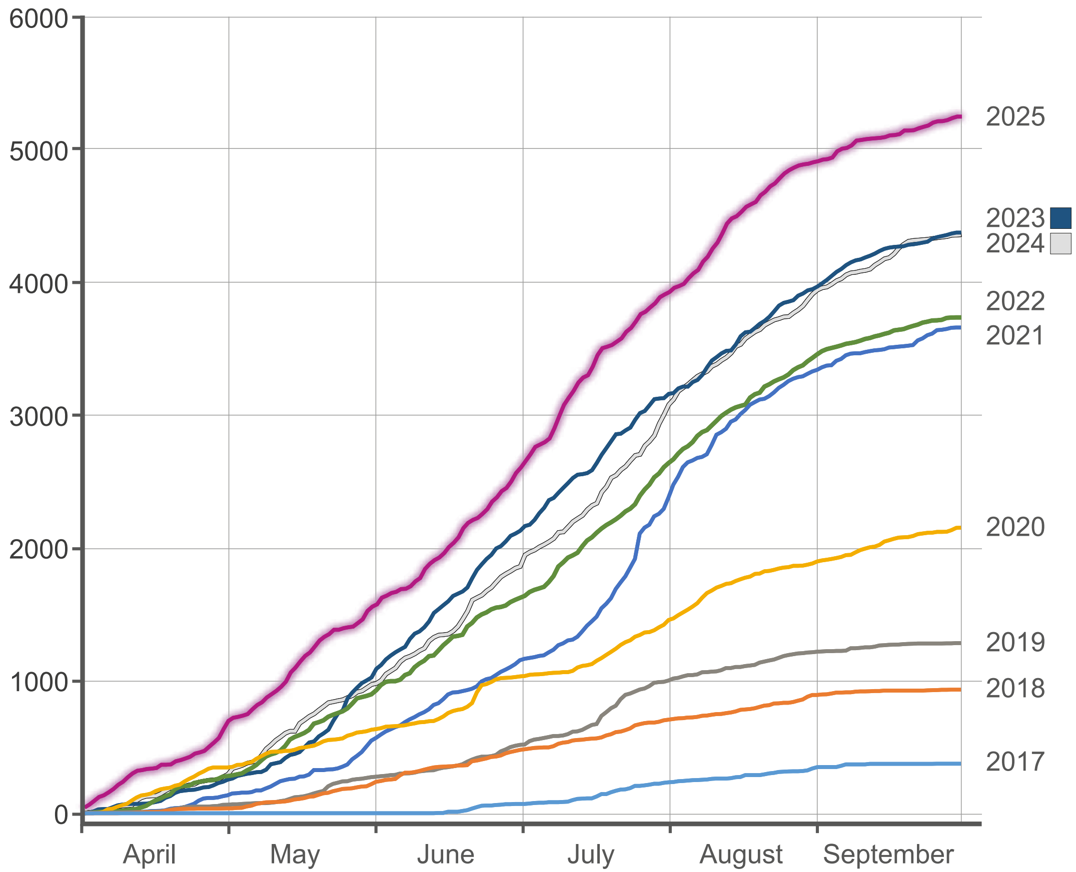
Table 2. Summary of survey coverage and uptake of Flower-Insect Timed Counts submitted to UK PoMS.

Note: The FIT Count was launched to 'the public' across GB in 2018 and opened in Northern Ireland in 2020. It runs every year between 1st April and 30th September. FIT Counts have also been carried out as part of the PoMS 1 km square survey protocol since 2017 and are included here. Counts for England include the Isle of Man. The UK totals in Table 2 include counts conducted at locations crossing country borders, which were not assigned within the country columns. Also, the "total number of recorders" in each country accounts for the fact that some people have submitted FIT Counts from more than one country. Note data for 2025 are still subject to further final processing and hence minor adjustments may be required prior to data publication.



New for 2026, the *FIT Count quick guide* features a summary of how to do a FIT Count plus brief information on recognising the different insect groups, with links to further information.

Figure 3. Cumulative total number of FIT Counts submitted each year, shown through the season from April to September.



Note: Chart based on data from all FIT Counts submitted from the UK and Isle of Man between 1 April and 30 September from 2017 to 2025. PoMS data are subject to review and totals shown here may differ from our published datasets and reports.

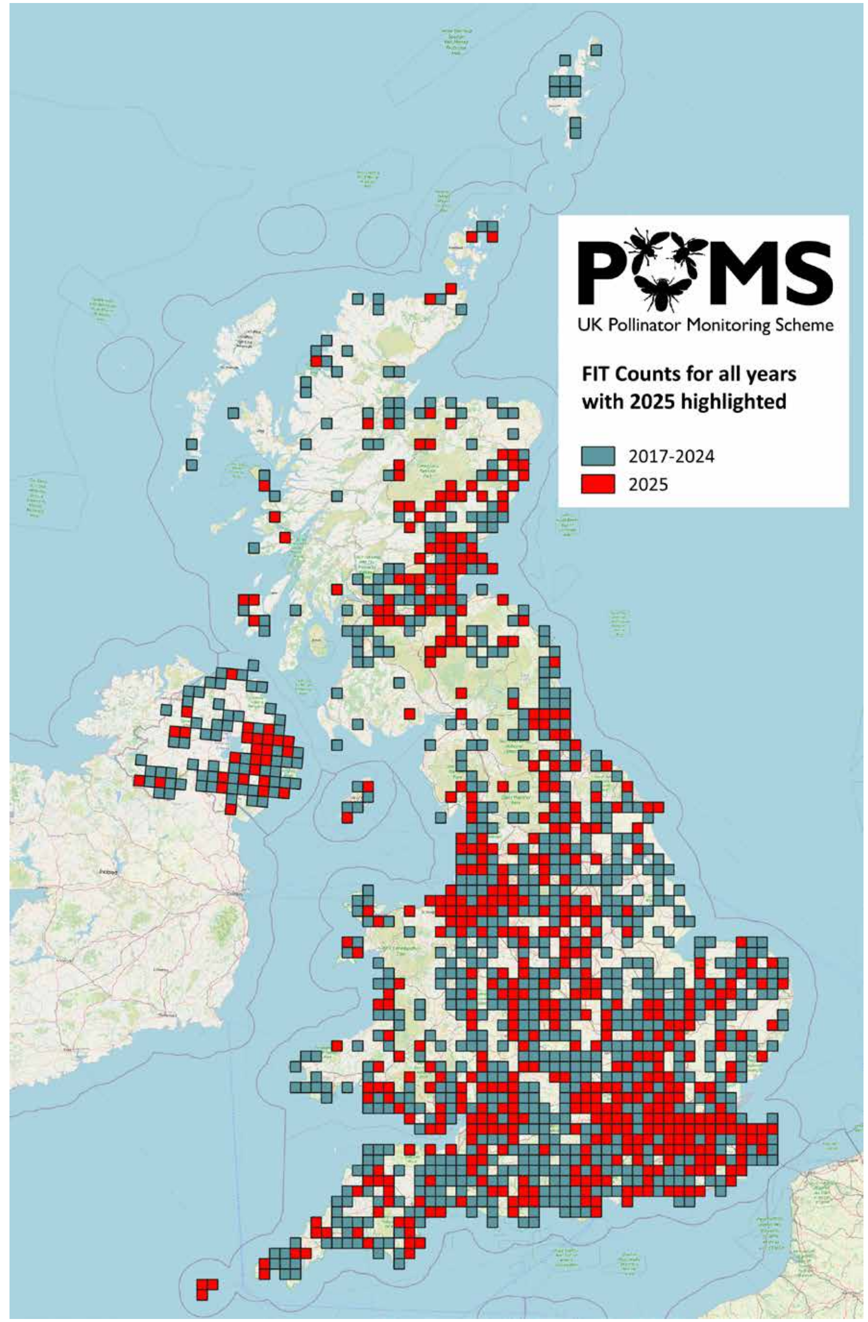


Figure 4. Map showing the location of 10 km squares in which one or more FIT Counts have taken place across the UK since 2017, both submitted by the public and on 1 km square surveys. Counts from 2025 are shown in red.

Across the four countries, 2025 saw an **increase of 27% in the number of recorders taking part** compared to 2024, especially in England and Scotland (Table 2, Figure 5). This allowed the mean number of FIT Counts per recorder to remain stable (5.7 FIT Counts per recorder in 2025, compared to 6.1 in 2024), while still seeing an increase in the total number of FIT Counts received. Read more about applications of our FIT Count projects feature on pages 44–48, and work to continue sending personalised recorder feedback (*Latest news*, pages 4–6), continuing in 2026, which we hope will support the recruitment and retention of new volunteers.

FIT Count target flowers and habitats

Across all FIT Counts to date, 59% have been carried out on target flowers from our recommended list and 41% from other flower types. For analysis purposes we classify all target flowers into plant Family and flower structure (open or closed florets) to standardise across species. Our updated league table featuring the 14 focal target flowers (Table 3), shows Buttercup, Dandelion and Ragwort as the current top three target flowers selected by FIT Count recorders, followed closely by Lavender and Thistle.

Ivy and Hogweed remain clear favourites for the insects, overall receiving the highest average number of visits per count, though it is important to note that these data are based on the raw counts, not corrected for target flower number within the quadrat. The results also continue to demonstrate the value of different flowers for different insect groups. For example the most common insect visitors to open flowers with short corollae are the hoverflies, other flies and small insects with short mouthparts, whereas flowers with more complex structure or long

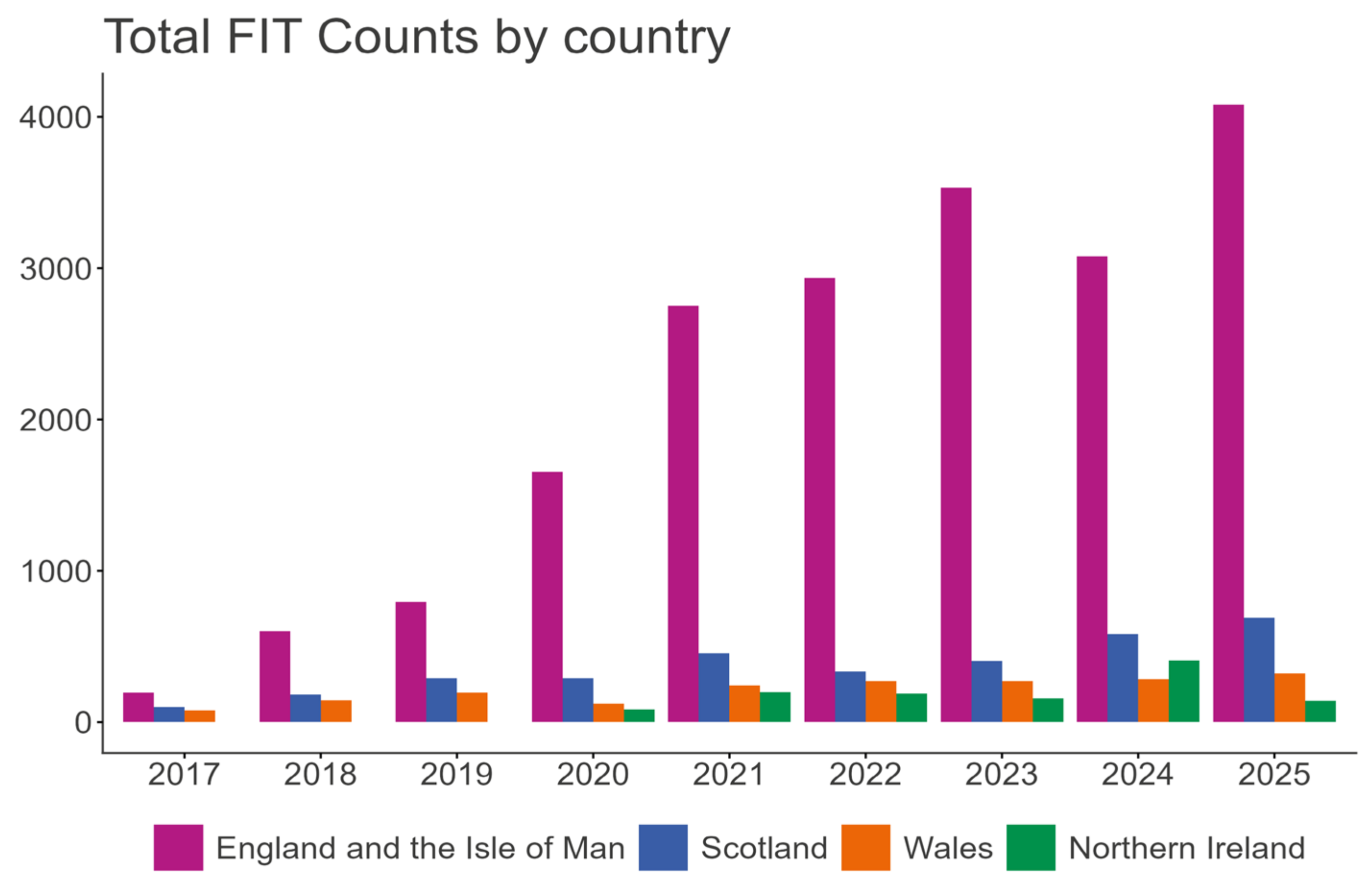


Figure 5. Total number of FIT Counts submitted in each country over the years.

corollae receive a higher proportion of visits from the bees. These are not new findings, but help to demonstrate that the FIT Count is picking up on patterns of insect flower visitation that we would expect to see in a large citizen science survey of this nature.

A series of live interactive charts is available on the PoMS website to showcase these data by target flower, and we have selected six examples here (Figure 6 a,b).

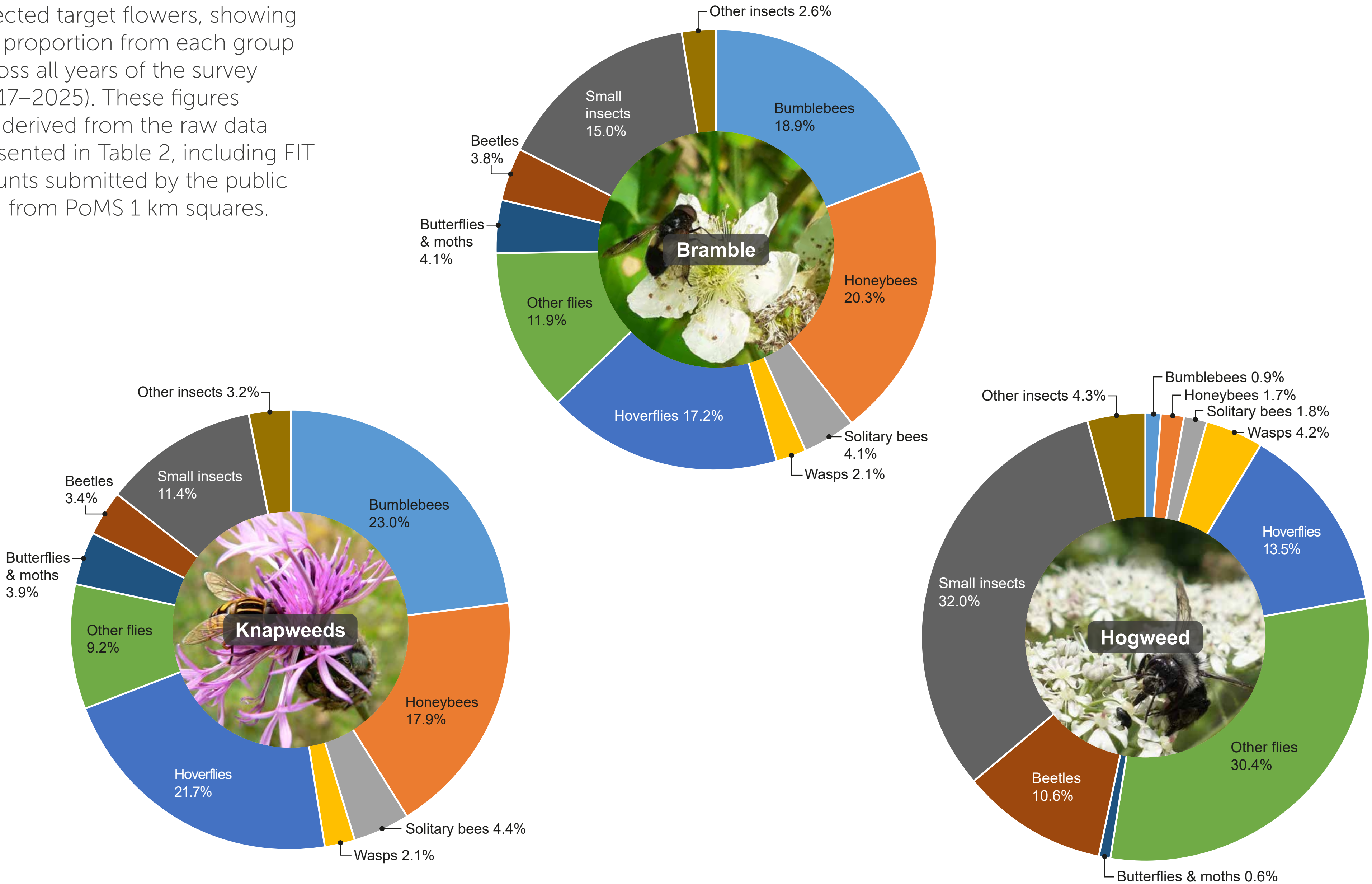
How have the FIT Count surveys fared in terms of the habitats covered over the years? It is important to understand whether our sampling effort is maintained over time and space, this being a key consideration in any long-term biodiversity monitoring scheme. As shown in Figure 7, habitat coverage in both the public FIT Counts and 1 km square FIT Counts has remained fairly consistent. While a high proportion of public FIT Counts tend to be carried out in gardens (average 50%), the survey is also covering areas of semi-natural (around 25%), agricultural and urban habitats. In the 1 km square surveys,

[continued on page 19]

Table 3. Summary of FIT Count results by target flower, showing the average total number of insect visits per 10-minute count across all years of the survey (2017–2025). Note: these figures are derived from the verified raw data rather than from modelled counts.

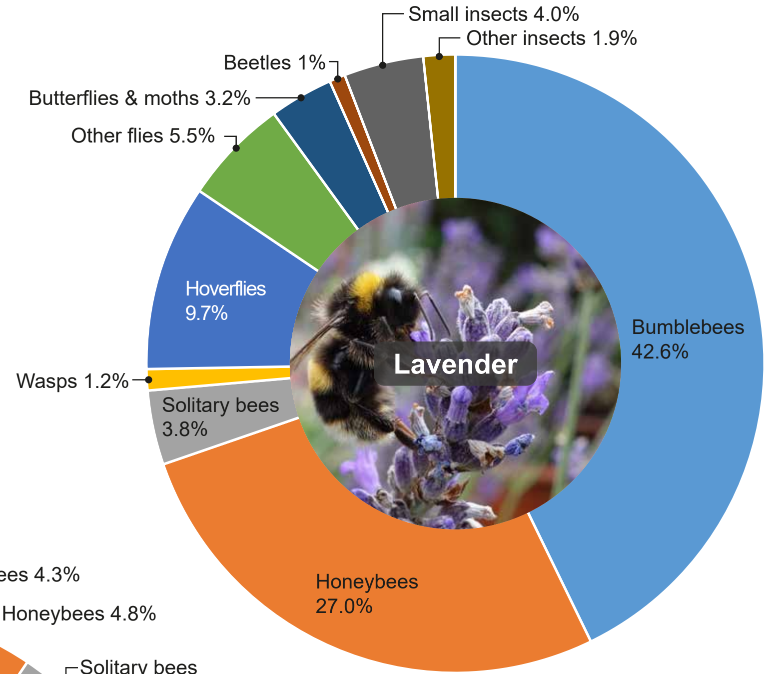
Target flower	Total insects	Total counts	Average per 10-min count	Most common insect visitors
Ivy *Hedera helix*	8,025	373	22	Other flies; hoverflies
Hogweed *Heracleum sphondylium*	17,614	868	20	Small insects; other flies
Bramble (Blackberry) *Rubus fruticosus* agg.	14,156	1,031	14	Honeybees; bumblebees
Buddleja *Buddleja davidii*	12,778	946	14	Honeybees; bumblebees
Knapweeds (Common or Greater) *Centaurea nigra s.l.* or *scabiosa*	17,450	1,279	14	Bumblebees; hoverflies
Thistle *Cirsium* or *Carduus*	17,361	1,334	14	Small insects; other flies
Lavender (English) *Lavandula angustifolia*	20,062	1,480	13	Bumblebees; honeybees
Ragwort *Jacobaea/Senecio* species	18,485	1,550	12	Hoverflies; other flies
Hawthorn *Crataegus monogyna* or *laevigata*	3,252	444	7	Other flies; small insects
Heathers *Calluna* or *Erica* species	2,251	417	5	Other flies; small insects
White Dead-nettle *Lamium album*	1,929	393	5	Bumblebees; small insects
White Clover *Trifolium repens*	6,218	1,306	5	Small insects; bumblebees
Dandelion *Taraxacum officinale* agg.	7,448	1,577	5	Small insects; other flies
Buttercup *Ranunculus* species	12,661	2,496	5	Other flies; small insects

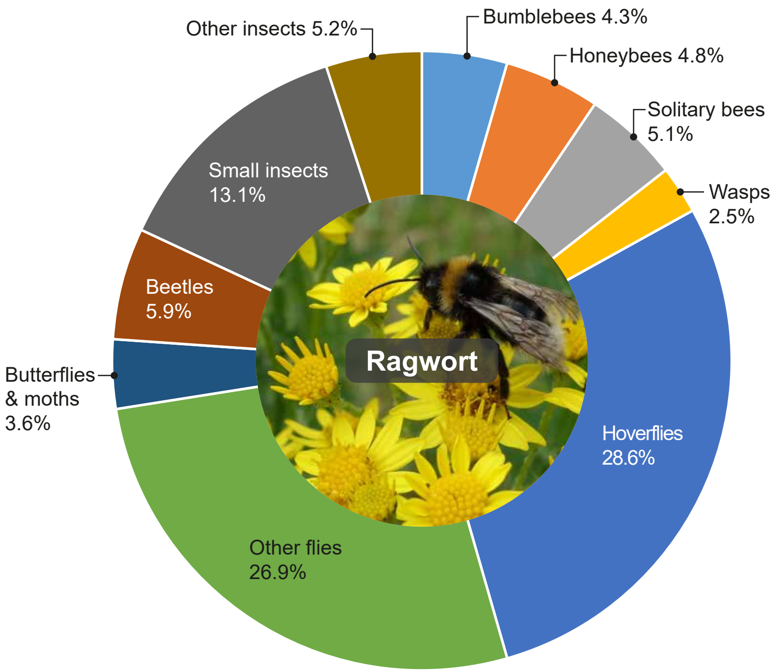
Figure 6a. Insects counted on selected target flowers, showing the proportion from each group across all years of the survey (2017–2025). These figures are derived from the raw data presented in Table 2, including FIT Counts submitted by the public and from PoMS 1 km squares.

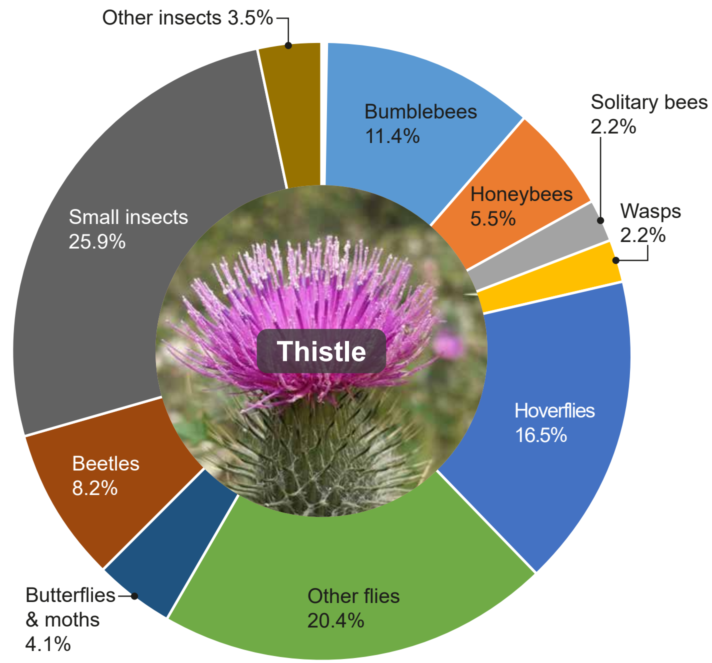


Photos, left to right: Lucy Hulmes © UKCEH; © Andy Sier; Nadine Mitschunas © UKCEH

Figure 6b. Insects counted on selected target flowers, showing the proportion from each group across all years of the survey (2017–2025). These figures are derived from the raw data presented in Table 2, including FIT Counts submitted by the public and from PoMS 1 km squares.







[continued from page 16]
a high proportion of counts are carried out in semi-natural habitats (average 73%), but with consistent representation of agricultural habitats. Aside from the increased focus on counts in gardens during 2020, these proportions have remained relatively similar, allowing for a more robust comparison of the data between years. As the dataset expands, we look forward to reporting on FIT Count results from within habitats or different target flowers, to investigate whether patterns of insect visitation may be changing at different rates.

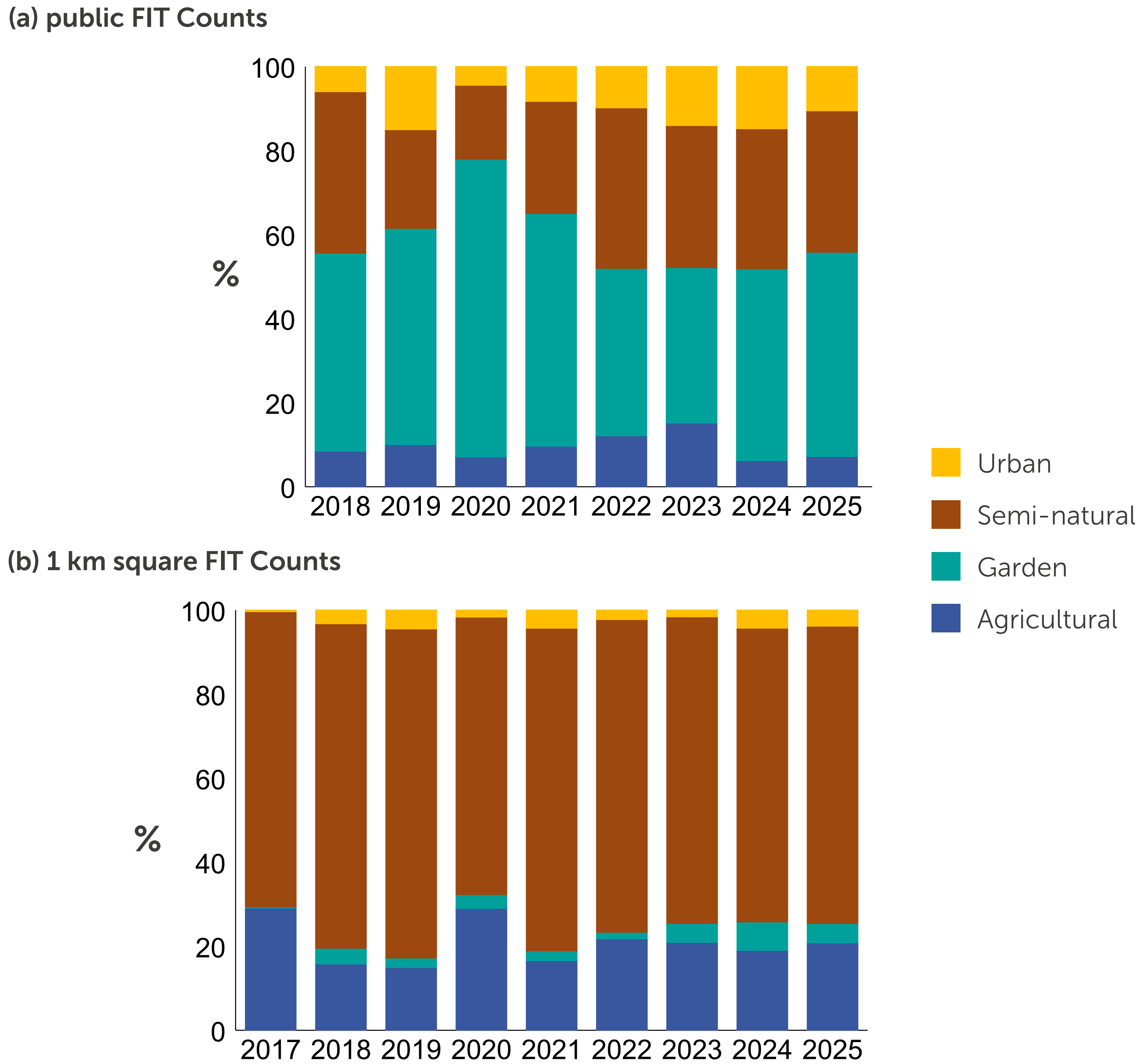


Figure 7. The proportion of habitats in which (a) public FIT Counts and (b) 1 km square FIT Counts have been carried out since 2017. Agricultural habitats include arable crops and intensive grass pasture; semi-natural habitats include unimproved or upland grasslands, woodland, heathland and moorland; urban habitats include amenity grassland, school grounds, churchyards and brownfield sites; garden habitats include gardens and allotments.

Eight-year results from PoMS

2026 marks the first year in which we publish Official Statistics on trends in abundance and species richness of pollinating insect groups from the PoMS surveys. The current eight-year time series from the 1 km survey and seven years for public FIT Counts (which started in 2018) is still relatively short, so the results reported here should be interpreted with caution. Nevertheless the modelled annual estimates of abundance and richness allow us to explore patterns of change across the different surveys and insect groups.

Results from the PoMS 1 km square survey highlight consistent declines for hoverflies and small insects, and declines in total abundance of all insects across all the reported metrics from both pan trap surveys and FIT Counts, with mixed patterns of change for the wild bees and other insect groups. Hoverflies also declined in the public FIT Count survey, but the results from public FIT Counts show increases in abundance of honeybees, 'other flies' and beetles visiting flowers. The publication is referred to as an 'Official Statistic in Development' so the underpinning methodology and the way in which trends are reported may change in future years. Claire Carvell and Francesca Mancini (UKCEH) provide an update on the results and links to further information behind the statistics.

Here, and within the published statistics, we report on the results for Great Britain using data generated from PoMS surveys in England, Scotland and Wales between 2017 and 2024, for each recorded insect group and an "all insects" metric (representing the summed total across all insect groups). In the case of the 1 km pan trap data, we term this summary metric "all invertebrates" since it includes the very few spiders sampled in the pan traps. Although the data from 2025 are available, they are still going through cleaning and quality assurance pipelines and are not ready to be included in the analysis.

A FIT Count survey - recorders collect information on environmental factors such as flower abundance, habitat type and weather conditions during the survey which can be included in models to account for variation in insect numbers.

Modelling the data and interpreting graphs

We use statistical models to account for variation in insect numbers due to some of the more local environmental factors measured on PoMS surveys and produce robust annual estimates of abundance and species richness. We model data from the 1 km square pan trap surveys and FIT Counts, and 'public' FIT Counts, separately, and include the following variables in all models: year, month, site, country, broad habitat type, wind speed and amount of sunshine during the survey. Flower count in the quadrat, floral context of the survey quadrat and flower structure of the target flower (categorised as open or closed) are included in models fitted to FIT Count data, with total flower count and species richness of plants in flower around the pan trap included in models fitted to the pan trap data (see the Technical Details box below).

Graphs are plotted showing the counts (or species richness) estimated by the model (on the vertical axis) for each year (the horizontal axis) for the key pollinating insect groups and "all insects" (Figure 8, pages 24–25). Each graph shows the trend in average number of insects or number of bee or hoverfly species counted per survey as a line with the associated uncertainty as shaded areas (representing the 95% confidence interval). We also present plots showing the average predicted results from each survey across Great Britain for 2024 against the average annual counts from across all previous years for all the insect groups (Figure 9, pages 26–27), to begin to assess whether 2024 was a notably "good" or "bad" year for pollinators.

In order to describe the results shown, we refer to three different metrics, as reported in the Official Statistic:

- percentage change in predicted abundance or richness between the first and last year of each time series (2018-2024 for public FIT Counts and 2017-2024 for pan trap and 1 km FIT Counts);
- average annual percentage change across the time series;
- change between the latest year (2024) and the average across all previous years.

Some significant changes were detected where the lower and upper confidence intervals of the change did not overlap zero. The changes we describe in the following text are all therefore statistically significant according to this criterion. Table 4 summarises the number of insect groups on each survey showing a significant increase or decline, and the number of groups for which no significant change was detected, for each metric. The metrics of percentage change between the first and the last year of PoMS surveys depend partly on whether there is a genuine underlying trend, but also on how "good" or "bad" those two specific years were for insect numbers. However, our model reduces much of that interannual variability by using a statistical tool (a spline) to smooth interannual fluctuations, and by accounting for a number of environmental variables that have an effect on insect abundance (e.g. weather conditions and flower resources).

The technical details

We use generalised linear mixed models with a negative binomial distribution to model counts and/or species richness of different insect groups. The effect of year is modelled as a natural spline with three degrees of freedom. We include a random effect for site for FIT Counts and a nested random effect for pan trap station within 1 km square for the pan trap data, to account for between site variation in insect numbers that is not accounted for by the variables in the model. The counts presented in the plots are estimated marginal means from the final model, which are averaged over all levels of the categorical variables in the model and weighted by the number of observations within each level, with continuous variables kept at the mean.

Summary of results reported in the Official Statistic in Development

Overall, pollinator numbers have continued to fluctuate across the PoMS time series (Figure 8 a–d). Often changes between individual years can be of greater magnitude than the overall trend. Most notably 2024 was a bad year for many insect groups (Figure 9; Table 4) including most groups in the pan traps on the 1 km survey; hoverflies, butterflies & moths, small insects and "all insects" in the 1 km FIT Counts and hoverflies, solitary bees and butterflies & moths in the public FIT Counts. On the other hand, insect numbers increased in 2024 compared to previous years for honeybees, beetles and "other flies" in the public FIT Counts and solitary wasps in the pan traps.

From the **pan trap surveys on PoMS 1 km squares**, 11 insect groups declined in abundance, one group increased and six groups showed no significant change between 2017 and 2024 (Table 4). The total abundance of "all invertebrates" declined by 37% between 2017 and 2024 (Figure 8a), with 2024 being a particularly bad year showing a decline of 24% compared to average counts across previous years. Hoverfly abundance in the pan traps declined by 35%, from 1.42 hoverflies per sample in 2017 to 0.94 in 2024. Richness of hoverfly species also declined across the time series by 33%. Other flies declined by 26% between the first and last years, with counts in 2024 17% lower than across all previous years.

Abundance and species richness of bumblebees declined significantly over time (by 27% and 25% respectively), while abundance and species richness of solitary bees increased in the same period from the pan trap surveys (by 21% and 17% respectively). The combined species richness of "all bees and hoverflies" (including the honeybee as a species) declined by 18%. Although 2024 was a bad year for wild bees overall (measured as the summed abundance of bumblebees and solitary bees), down by 16% compared with the average abundance across previous years, their overall abundance in pan traps did not change significantly in the other two metrics.

Other insect groups that did show significant declines in pan traps between 2017 and 2024 were the sawflies, parasitic wasps, moths, pollen beetles, small insects and other insects. The average annual percentage change metric confirms the same patterns of change as the first-to-last year metric for both abundance and species richness of all insect groups except for the abundance of moths, where the average annual percentage change is not statistically significant. The magnitude of change reflected in this metric is much smaller than the

[continued on page 28]

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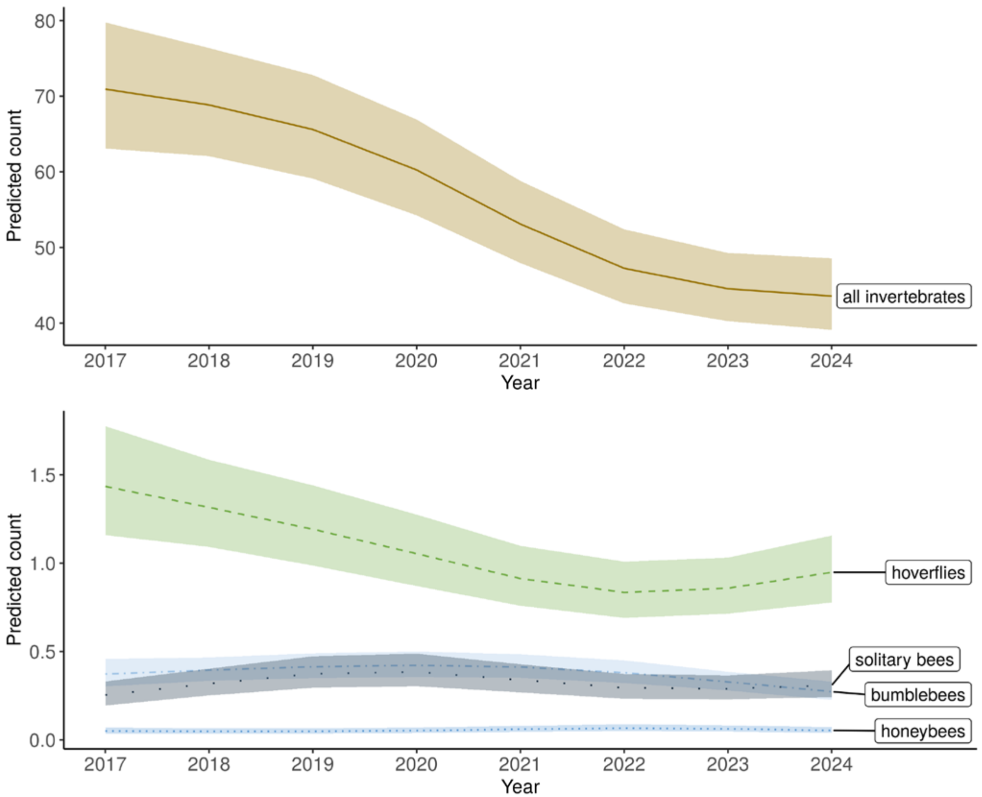
Hoverflies and small insects, shown visiting Hogweed, were both groups that declined in the 1 km FIT Counts.

© Martin Harvey

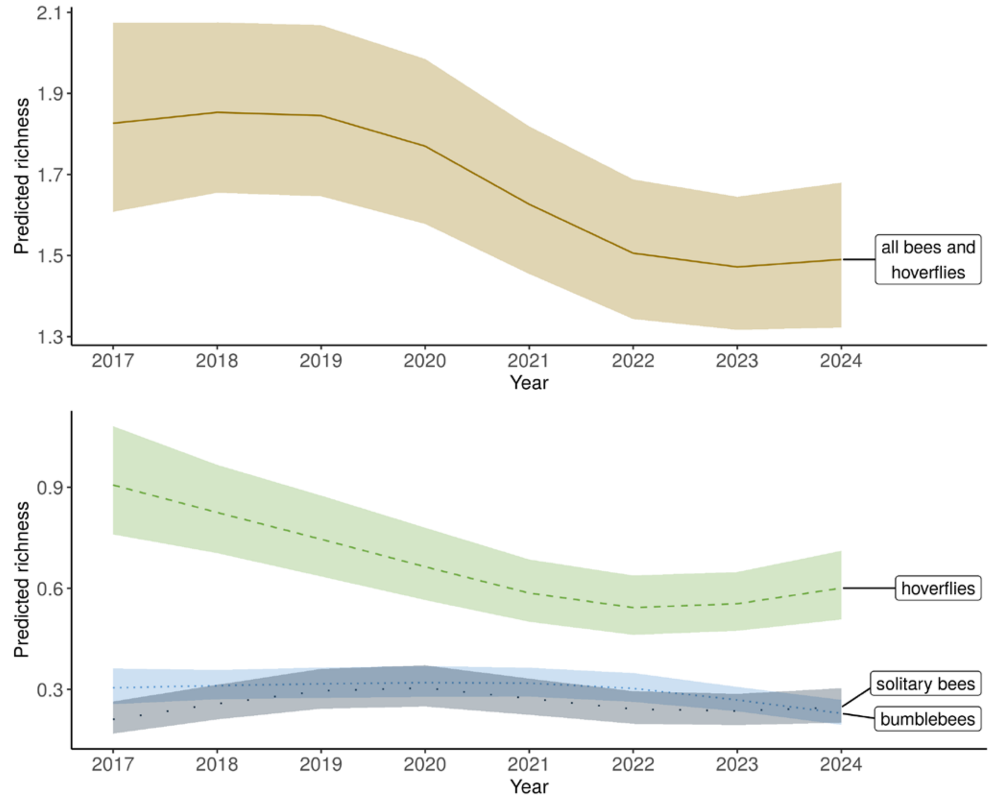
Honeybees increased in the public FIT Counts.

Survey and metric	Number of insect groups increasing	Number of insect groups declining	Number of insect groups with no significant change
Pan trap abundance (n = 18 groups)			
% change 2017–2024	1	11	6
Average annual % change	1	10	7
% change 2024 vs average 2017–23	1	12	5
Pan trap species richness (n = 4 groups)			
% change 2017–2024	1	3	0
Average annual % change	1	3	0
% change 2024 vs average 2017–23	0	3	1
1 km FIT Counts (n = 12 groups)			
% change 2017–2024	0	5	7
Average annual % change	0	3	9
% change 2024 vs average 2017–23	0	4	8
Public FIT Counts (n = 12 groups)			
% change 2018–2024	3	2	7
Average annual % change	3	2	7
% change 2024 vs average 2017–23	3	3	6

Table 4. Summary of headline trends across each of the PoMS surveys reported in the Official Statistic in Development. The different insect groups or summarised groups are listed in Figure 9.



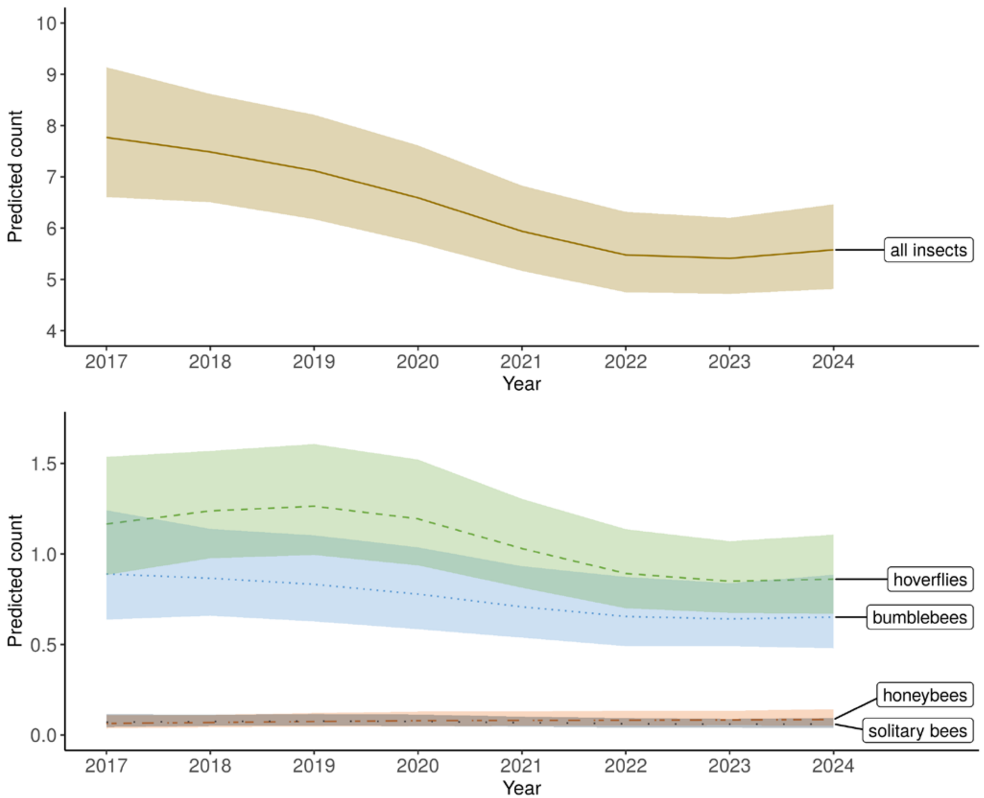
a) Insect abundance per pan trap station per survey visit



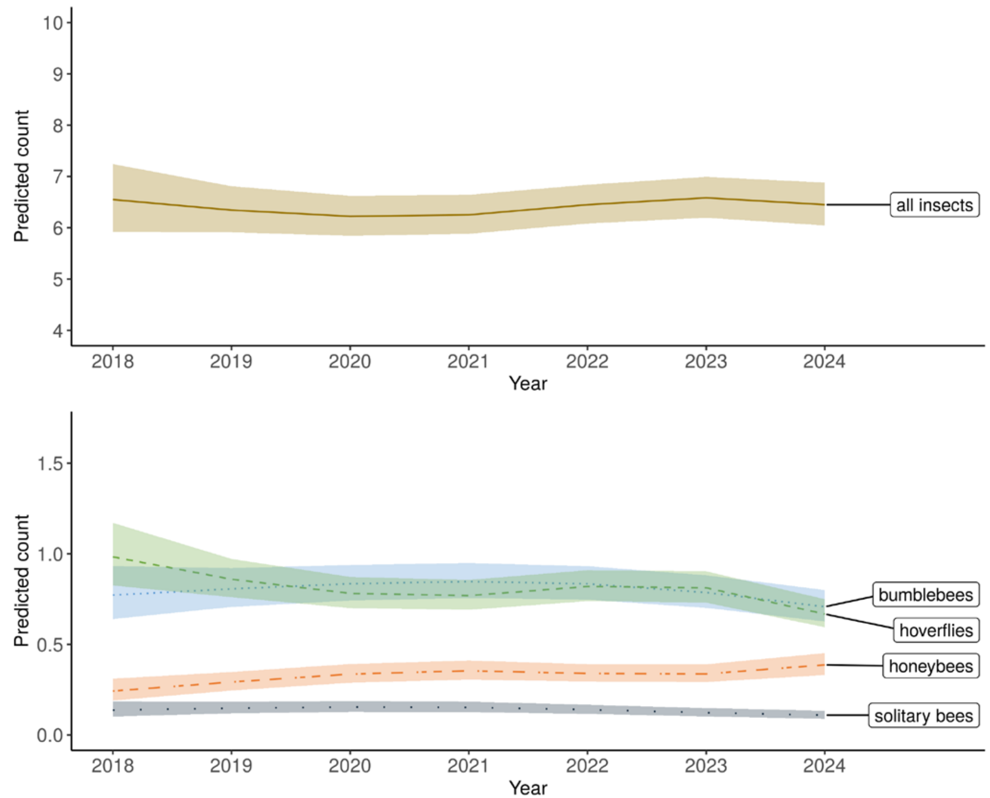
b) Richness of bee and hoverfly species per pan trap station per survey visit

Figure 8 a, b. Results showing predicted counts of key groups and species richness (number of bee or hoverfly species) from statistical models on PoMS pan trap datasets from 2017 to 2024.

Note: Where predicted counts are shown, numbers on the vertical axis represent the predicted number of insects per trap station. Top panels show the predicted counts (or species richness) for all invertebrates or all bees and hoverflies and bottom panels show predictions for the main groups of pollinating insects. Ranges of values on the vertical axes are different for each plot. The associated uncertainty around the trend (the 95% confidence interval) is shown as shaded areas. The summed species richness measure for "all bees and hoverflies" includes the honeybee as a species. See the text and Official Statistics pages for confirmation of which trends were statistically significant.



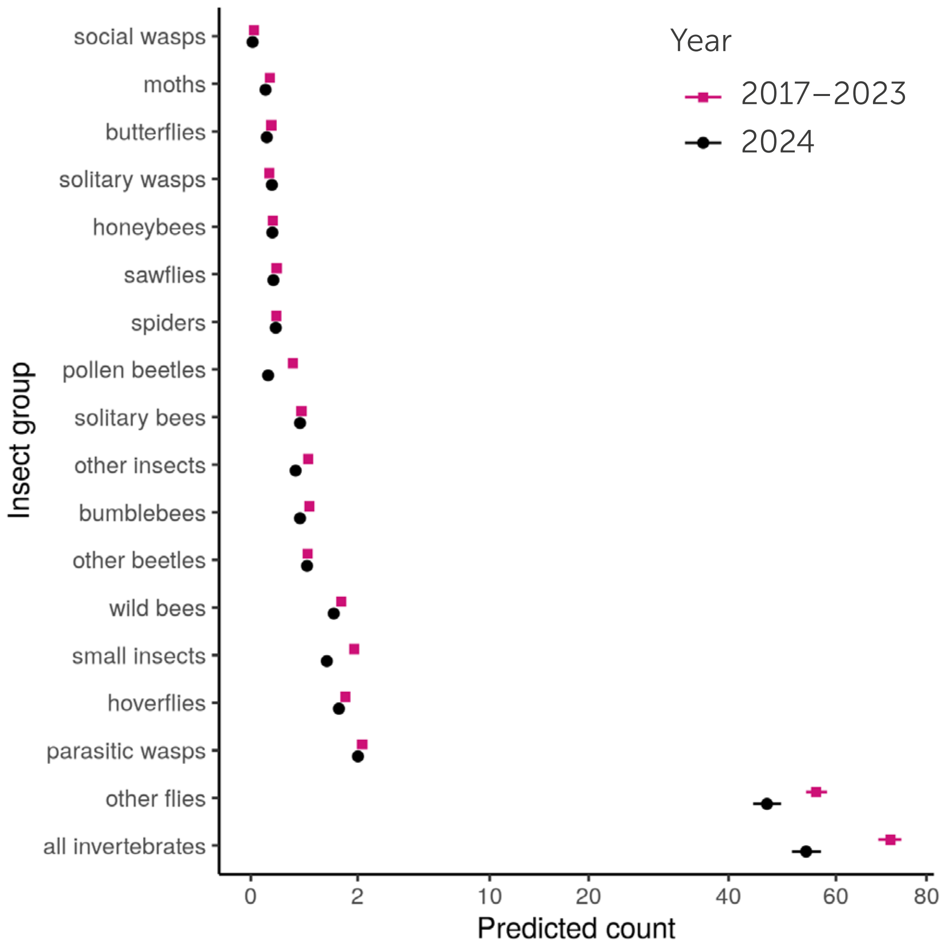
c) **Insect abundance per 10-minute count from the 1 km square FIT Counts**



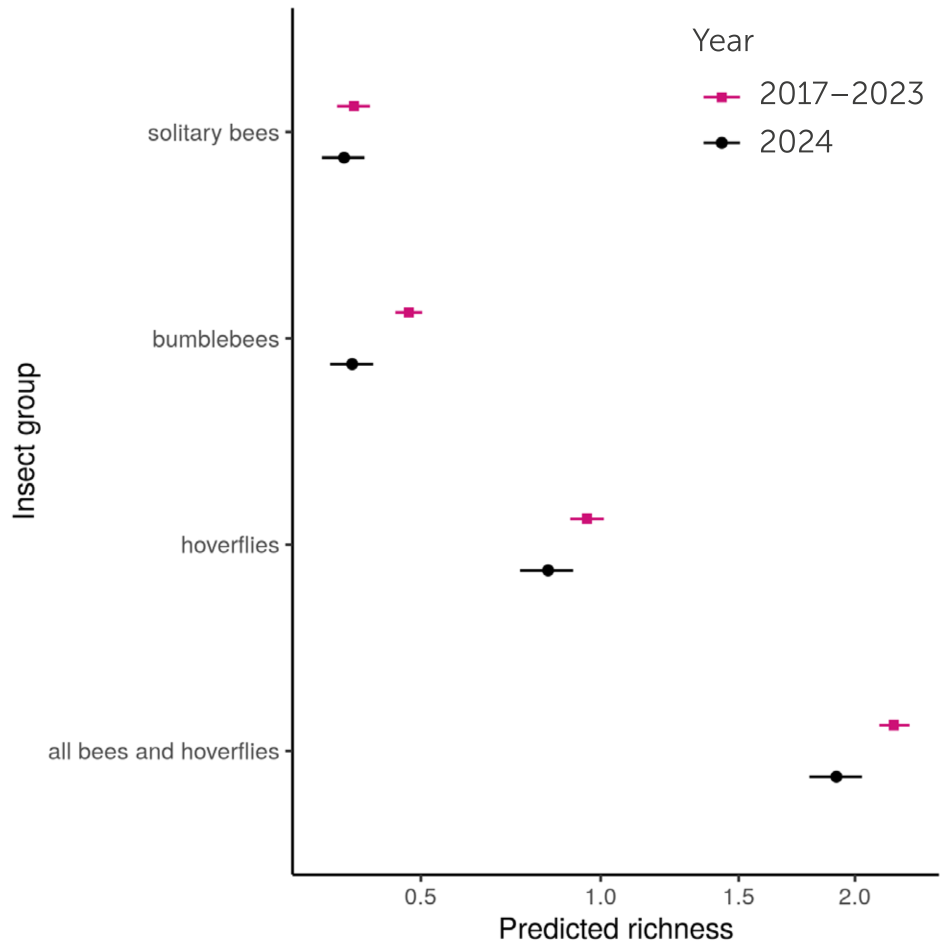
d) **Insect abundance per 10-minute count from the public FIT Counts**

Figure 8 c, d. Results showing predicted counts from statistical models on PoMS FIT Count datasets from 2017/2018 to 2024.

Note: Where predicted counts are shown, numbers on the vertical axis represent the predicted number of insects per FIT Count. Top panels show the predicted counts for "all insects" and bottom panels show predictions for the main groups of pollinating insects. The associated uncertainty around the trend (the 95% confidence interval) is shown as shaded areas. See the text and Official Statistics pages for confirmation of which trends were statistically significant.



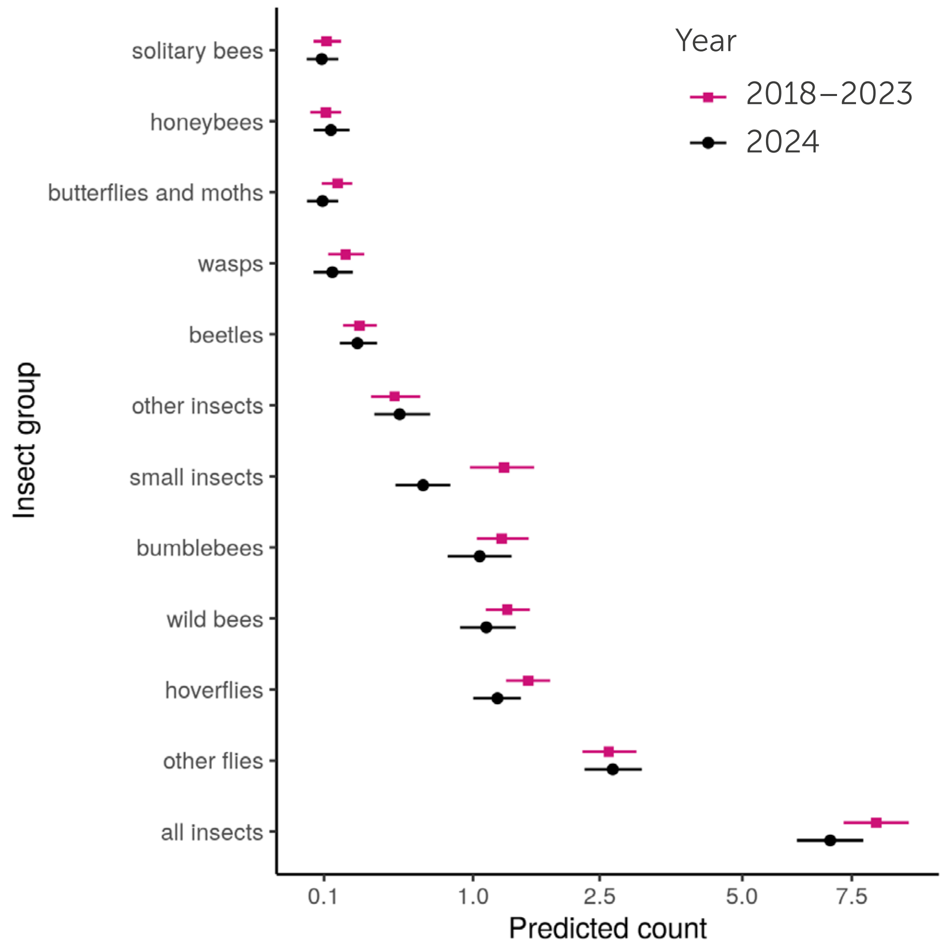
(a) Pan trap abundance



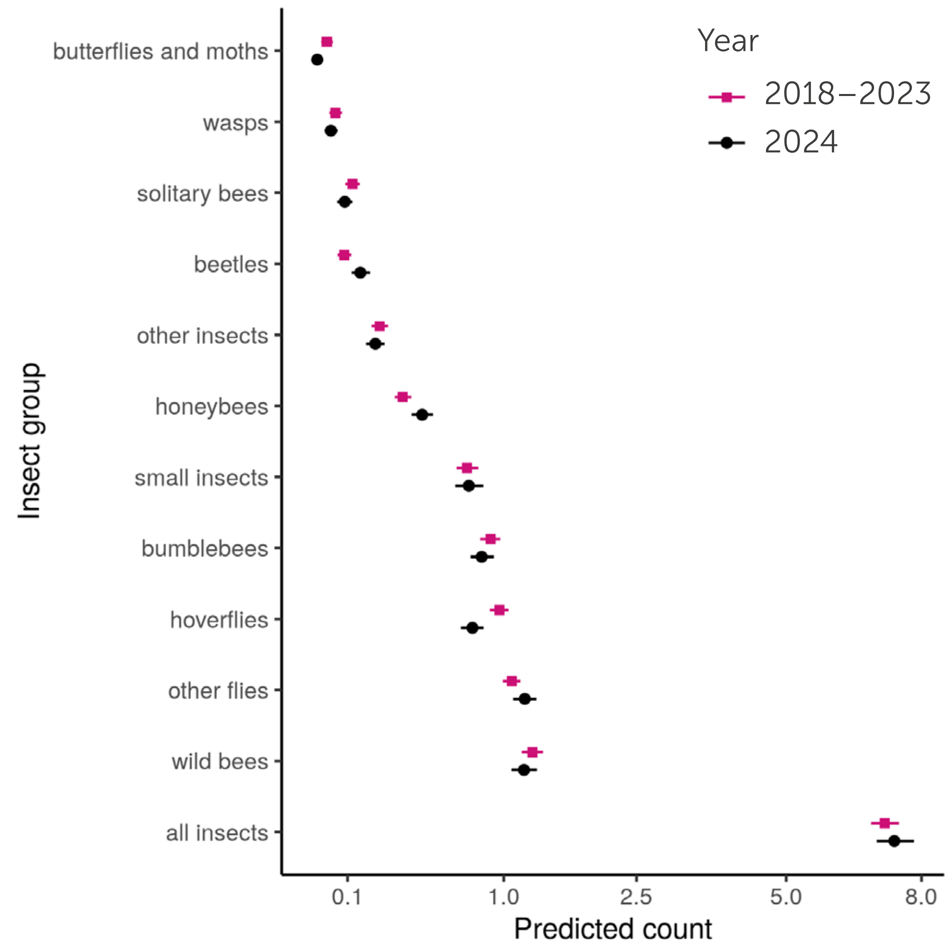
(b) Pan trap species richness

Figure 9 a, b. Comparison of abundance and species richness in pan traps from 2024 with the average across all previous years.

Note: Plots show average predicted counts or richness per insect group for 2024 (black dot) and the 95% confidence interval (black error bar), alongside the average annual count across all the other years for the pan trap surveys (2017–2023, pink square). Both the averages and the error bars were derived by bootstrapping. The summed species richness measure for “all bees and hoverflies” includes the honeybee as a species.



(c) 1 km square FIT Counts



(d) Public FIT Counts

Figure 9 c, d. Comparison of FIT Counts from 2024 with the average across all previous years.

Note: Plots show average predicted counts per insect group for 2024 (black dot) and the 95% confidence interval (black error bar), alongside the average annual count across all the other years (2017–2023 for the 1 km FIT Counts, and 2018–2023 for the public FIT Counts, pink square). Both the averages and the error bars were derived by bootstrapping. The horizontal axis is on a squared root scale.

[continued from page 22]
first-to-last year percentage change metric. For example, while bumblebees in pan traps declined by 27% between 2017 and 2024, on average they declined by 4% each year. This is expected as the annual percentage change metric reflects changes over a shorter period and is an average across all years, reflecting annual fluctuations in insect numbers.

In the **1 km FIT Counts**, five insect groups showed significant declines between 2017 and 2024, and seven groups showed no significant change. No insect group showed a significant increase on the 1 km FIT Counts in any metric (Table 4). Total abundance of "all insects" declined by 27%, with hoverflies declining by 26% and small insects by 67% between 2017 and 2024. Bumblebees and "wild bees" also showed significant declines of 28% and 24% respectively between 2017 and 2024 on 1 km FIT Counts (Figure 8c). The average annual percentage change metrics generally show a similar pattern of decline (hoverflies declining by 4%, small insects by 14%, all insects by 4% per year), but the declines in bumblebees and wild bees were not statistically significant.

The **public FIT Count** dataset shows a mix of trends, with three groups showing significant increases between 2018 and 2024, two groups showing significant declines and seven groups showing no significant change. Abundance of honeybees, other flies and beetles increased by 77%, 25% and 76% respectively between 2018 and 2024, while hoverflies and butterflies & moths declined by 37% and 44% respectively. Figure 8d suggests that solitary bees on public FIT Counts seem to have declined over the time series, but the first-to-last year change metric was not significant, while the change between the predicted count in 2024 and the average predicted count across previous years does show a significant decline of 20%, suggesting 2024 was a particularly bad year for solitary bees (Figure 9d). Similarly to the results reported for the 1 km survey, the average annual percentage change metric shows the same patterns of change as the first-to-last year percentage change metric in the public FIT Counts (Table 4), although the magnitude of change is much smaller.

Effects of environmental variables collected during PoMS surveys

Many of the local-scale environmental variables included in our models have significant effects on insect abundance and species richness. Similar findings have been described in other studies, providing a valuable independent confirmation on the reliability of the data and helping to demonstrate the importance of the environmental measures collected by PoMS volunteers and surveyors for interpreting the results:

From PoMS pan traps on 1 km square surveys:

- Overall insect abundance and abundance of bumblebees and hoverflies in the pan traps increased through the season to a peak in August. As shown in previous years, solitary bee abundance and richness were highest in May, gradually decreasing towards September, as we would expect given that many solitary bee species have spring flight periods.


Miranda Bane © UKCEH

Measuring out 2 m from a pan trap station to count the flowers of each species.

- The number of insects sampled does not appear to be significantly affected by the number of flowers (measured as the sum of all floral units) within a 2 m radius of the pan trap for most groups, except for the hoverflies (showing a significant negative effect) and other insects (a significant positive effect). We also found a negative effect of floral units on the species richness of hoverflies. However the abundance of a number of insect groups (solitary wasps, moths, other beetles, other insects, honeybees and all "wild bees") and both the abundance and the species richness of bumblebees, is positively related to the flower richness (number of plant species in flower) around the pan trap.
- Our models suggest that there are differences in insect abundance sampled in the pan traps in 1 km squares dominated by agriculture vs squares dominated by semi-natural habitats, where most groups are more abundant in agricultural than in semi-natural habitats. Further research will explore the extent of these differences, as well as the value of including larger-scale environmental variables in our models of PoMS survey data.

From FIT Counts:

- The number of floral units in a FIT Count quadrat has a positive effect on the number of insects seen, across nearly all groups in the public FIT Counts, with a similar result for the 1 km FIT Counts.
- Overall, more insects (and hoverflies and other flies in particular) are recorded visiting 'open' structure flowers, such as Hogweed and Bramble, than 'closed' structure flowers, but bumblebee numbers are higher on 'closed' flowers with long flower tubes, such as Lavender and Dead-nettle.
- From the 'public' FIT Counts, all bee groups, as well as all insects overall tend to be more abundant in garden habitats than in countryside locations. On the other hand, other flies, beetles, small insects and other insects tend to be more abundant on counts in semi-natural and agricultural habitats, while wasps and butterflies & moths have similar abundance in gardens as in the wider countryside FIT Counts. These results were similar in PoMS 1 km squares, however uncertainty around the abundance in gardens was much higher for all insect groups, due to the lower number of counts conducted in gardens in the 1 km survey. This often resulted in non-significant effects of habitat.
- More insects are counted on FIT Counts where the quadrat is 'entirely in sunshine' and when there is just a light wind, and fewest where the quadrat is entirely shaded and/or in windier conditions.
- Flower patches that are more or less isolated from other flowers tend to have lower numbers of insect visitors on FIT Counts than those patches that are within a larger patch of flowers.
- Most insect groups increase in abundance on FIT Counts through the early summer to reach a peak in July, August and September.

Gardens that offer a range of flower structures can support a diverse range of pollinator groups.

Interpreting the results and likely drivers of change

Insects are excellent indicators of environmental change due to their rapid and sensitive responses to habitat or climatic changes. This also creates challenges for modelling their abundance, meaning for example that more time points may be required to detect long-term trends than for vertebrates or plants. Further to this, the different insect groups monitored under PoMS, and different species within these groups, are known to respond to drivers in different ways, and therefore the results presented at group level may not represent trends in all species, or trends happening across all parts of Great Britain.

The PoMS results for abundance of the key pollinator groups (wild bees and hoverflies) broadly mirror those trends in species distribution (measured as occupancy of 1 km squares) reported for wild bees and hoverflies in the UK Biodiversity Indicator on "Status of pollinating insects", also classed as an Official Statistic in Development. The latest published Indicator suggested that the short-term trend for wild bees, measured between the years 2017–2022, was considered to be increasing, while the Indicator for hoverflies suggests that between 2017–2022 the overall trend in hoverfly distribution was declining. While the PoMS trends for hoverflies were also declining across all surveys, and bumblebees were declining across surveys in the 1 km squares, bumblebees on public FIT Counts showed no change, and the solitary bees showed either no significant change (on the FIT Count surveys) or an increase across the time series (in pan traps).

Given the large uncertainty and high inter-annual variability typical of insect numbers, we should remain cautious about interpreting these results in terms of overall declines or increases over this time period. However, there are several common factors considered to be driving the changes seen in pollinator populations globally and in the UK. These are briefly considered here in the context of the changes seen in the PoMS surveys. Over time, we hope the data collected through PoMS will help to better understand these factors and provide evidence to better support recovery of pollinator populations.

Weather and climate change:

- Weather conditions can lead to fluctuations in insect abundance from one year to the next as they impact both insect development and activity levels. According to Met Office Data [3] describing the weather experienced across the UK during 2024, this was a warm yet unsettled year with high rainfall and below average levels of sunshine. Exceptionally wet weather mid-May was reported in parts of England, Scotland, and north Wales, with some stations recording their wettest May day on record. This is likely to have negatively impacted most pollinator groups. The declines in 2024 compared with previous years recorded on PoMS surveys mirror results from the UK Butterfly Monitoring Scheme and BeeWalk scheme which showed 2024 to be one of the worst years on record for butterflies and bumblebees respectively in the UK. The hoverflies and some other fly groups may be less impacted by wet years, but are likely still recovering from the declines in abundance experienced during the hot dry summer of 2022.
- Climate change has longer term implications for insect populations, and is likely to result in different responses across species, which may be explored as the PoMS dataset grows.

Habitat loss, land-use and conservation action:

- Many natural and semi-natural habitats in the UK have been declining in both their extent and quality, especially in regard to the provision and connectivity of floral resources for pollinators, both as a result of change in land-use and increasing intensification of agriculture.
- There is strong evidence suggesting that pollinator populations declined prior to the beginning of PoMS in 2017 [4], with habitat loss being the major driver. However, targeted habitat restoration and re-creation can have positive impacts on species abundance of many mobile insect groups. While PoMS was not designed to measure the impacts of specific conservation or land management actions, the scheme may be able to detect national-level changes in response to these over time.

What's next

A key goal for PoMS is to see the data and trends become an important part of the evidence base that helps us understand how, where, and why pollinator populations are (or are not) changing. Publication of the Official Statistic in Development marks a major step towards this goal, with next steps to involve consulting on and evaluating the statistics produced, with a view to publication as Official Statistics once this evaluation is complete.

Development work will include the following, pending sufficient sample sizes within the dataset:

- Reporting country-level statistics and extending the geographic scope to include data from Northern Ireland;
- The feasibility of producing some species-level trends from the pan trap surveys, or trends in groups of species with similar ecological characteristics;
- Reporting pollinator trends by land-use type or habitat, or according to target flower species in the FIT Count survey, again where the datasets allow.
- Integration and alignment with the 'Status of Pollinating Insects' UK Biodiversity Indicator. This integration is not straightforward because it involves data collected through a variety of different methods.

Species highlights from the PoMS 1 km square survey

Martin Harvey (UKCEH) highlights four species found during the 1 km square surveys in 2025, all of which are new to the PoMS dataset, having not been seen previously in our surveys during 2017–2024. Although the main aim of the PoMS 1 km pan trap surveys is to gather consistent data on the abundance of common hoverflies and bees, it's always interesting to find some of the more unusual species, and this adds to our knowledge of species distributions.

Large Scissor Bee, *Chelostoma florisomne*

This bee is no more than a centimetre long, but is large in comparison to the more commonly found Small Scissor Bee. It is a widespread species in England and Wales, where it needs woodlands for nesting sites and grasslands for flowers [5]. Its first appearance in a PoMS pan trap was at square 2 in Yorkshire. The "Scissor" part of the name refers to the impressive mandibles of the female bees. It is also known as the Sleepy Carpenter Bee, referring to the males' habit of roosting in the flowerheads of buttercups, where they can sometimes be found immobile and apparently enjoying a snooze during bad weather. This behaviour is also reflected in the species name: "florisomne" can be translated as "flower sleeper".

Large Scissor Bees are relatives of mason bees, and build their nests in small cavities in dead wood. They often make use of old burrows left behind by beetles that have been inside the wood.

© Steven Falk

Large Scissor Bee, *Chelostoma florisomne*

Note: The square numbers mentioned in the species accounts refer to the numbers shown on the 1 km square survey map, see page 8.

Pale-kneed Straightvein hoverfly, *Orthonevra geniculata*

This hoverfly is small and dark-coloured, with metallic reflections on the body and pale bands on the legs. It is a species of fens and bogs, with records scattered widely in suitable habitats across the UK [6]. It does particularly well in Scotland, which is where the first records for the PoMS survey have come from (in square 128 in the Cairngorms). Its larvae are aquatic, feeding on bacteria filtered from the water around aquatic plants.

Bryony Mining Bee, *Andrena florea*

This bee is unusual in gathering pollen from just a single flower species, White Bryony (although it will visit a wider range of flowers for nectar). It is confirmed to south-east England, where it has been expanding its range in recent years [7]. During 2025 it was found for the first time in the PoMS surveys, at square 79 in Norfolk.

Like other mining bees, females excavate nesting burrows in sandy ground, and where conditions are favourable large numbers will nest in aggregations. If you are within its range in England it can be quite conspicuous on White Bryony flowers in hedgerows, parks, gardens and woodland, and the bee has vivid red markings on the abdomen.

Pale-kneed Straightvein hoverfly, *Orthonevra geniculata*.

Bryony Mining Bee, *Andrena florea*.

Dull-headed Blood Bee, *Sphecodes ferruginatus*

The ‘blood bees’ in genus *Sphecodes* are solitary bees that are parasitoids of other solitary bees. Female *Sphecodes* will enter the burrow of a mining bee, open up one of the mining bee’s nest cells, kill the egg or larvae that is in the cell, and lay one of their own eggs instead. After hatching, the *Sphecodes* larva will feed on the supplies intended for the larvae of the mining bee host.

The Dull-headed Blood Bee is a scarce species that was first recorded in the PoMS survey in England in 2019, and in 2025 a second individual was found in Northern Ireland (in square 1001 in the south of Northern Ireland). Across Ireland as a whole this species is known from very few locations and has been assessed as Endangered, and as a Priority Species in Northern Ireland [8]. The PoMS record adds a new site and confirms that the species is still present in the region. Its hosts are species of *Lasioglossum* mining bee, several of which are widespread, and it is not known why the Dull-headed Blood Bee is so much rarer than its hosts.

Dull-headed Blood Bee, *Sphecodes ferruginatus*.

Monitoring pollinators: Insights from the UKBMS and PoMS

By Prof. Richard Fox and Jo Milborrow, Butterfly Conservation

50 YEARS United Kingdom Butterfly Monitoring Scheme

In 2025–26, the UK Butterfly Monitoring Scheme (UKBMS) marked its 50th anniversary, celebrating fifty years of volunteer-led butterfly monitoring that contributes to one of the world's longest running invertebrate monitoring schemes.

The scheme officially began in 1976 with 39 transects established on nature reserves in England and Wales. Since then, it has grown into a nationally coordinated network with more than 3,500 sites monitored for butterflies each year throughout the UK (Figure 10). It now combines three monitoring methods; standard transects, Wider Countryside Butterfly Surveys and targeted counts for specific species. The scheme generates annual population trends for 58 of our 60 regularly occurring butterfly species. You can view the population trends for each butterfly species by visiting the [UKBMS website](#).

Since the scheme began, volunteers have counted over 44 million butterflies, which has told us a great deal about how our countryside has changed over the years. Long-term trends show that 22 of our

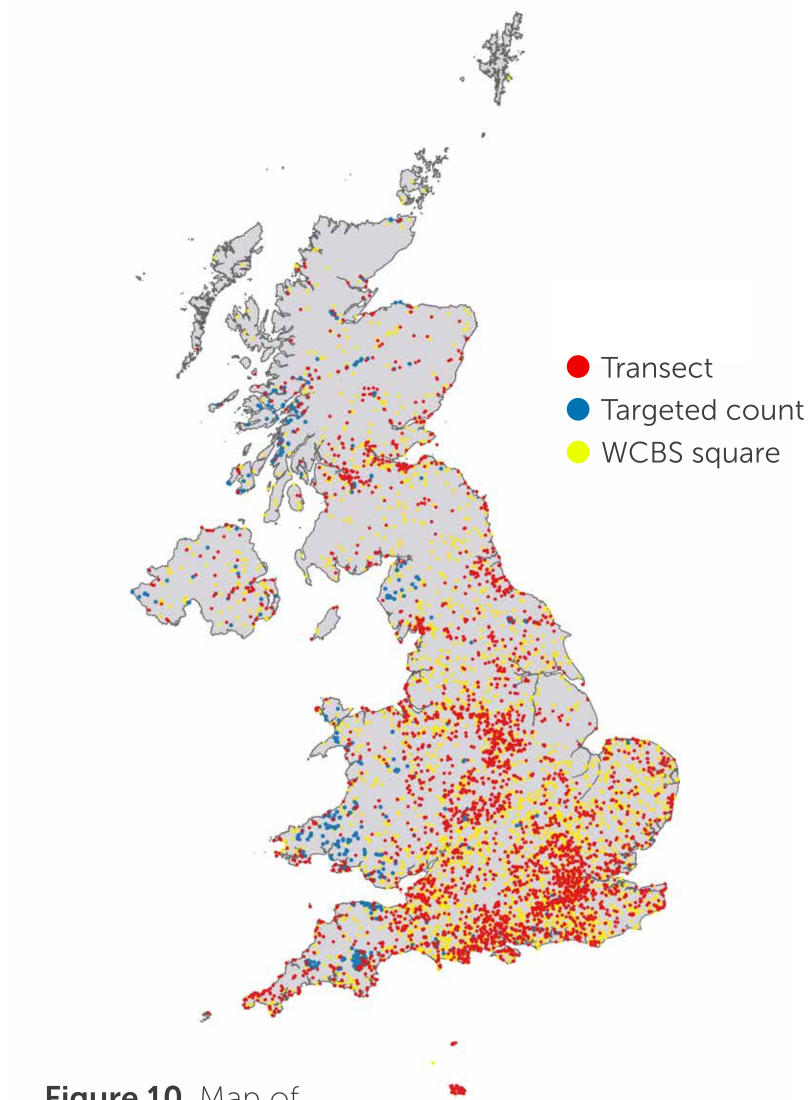


Figure 10. Map of UKBMS sites to 2024

butterfly species are in significant decline across the UK while 17 species have significantly increased since monitoring began. This has revealed that habitat specialist butterfly species are faring worse, showing significant long-term decreases across the UK, while figures for habitat generalists are stable (Figure 11). Further analyses also show significant declines for butterflies on farmland and woodland sites since 1990.

Whilst transects form the backbone of the UKBMS, these data are supplemented by additional methods, including targeted counts for priority species and, since 2009, data from the Wider Countryside Butterfly Survey (WCBS). The volunteers taking part in the WCBS can also choose to record other insects during their surveys.

In 2025, this included many records of other pollinating insects, with 81 moth species recorded, including many sightings of the striking Jersey Tiger. Bumblebees were also frequently recorded, with Buff-tailed Bumblebee, Common Carder Bee and Red-tailed Bumblebee being most abundant. Hoverflies were also recorded, with the Marmalade Hoverfly and *Syrphus ribesii* accounting for most of the observations. These records flow into the iRecord database for verification and are made available to county recorders and the relevant national recording schemes.

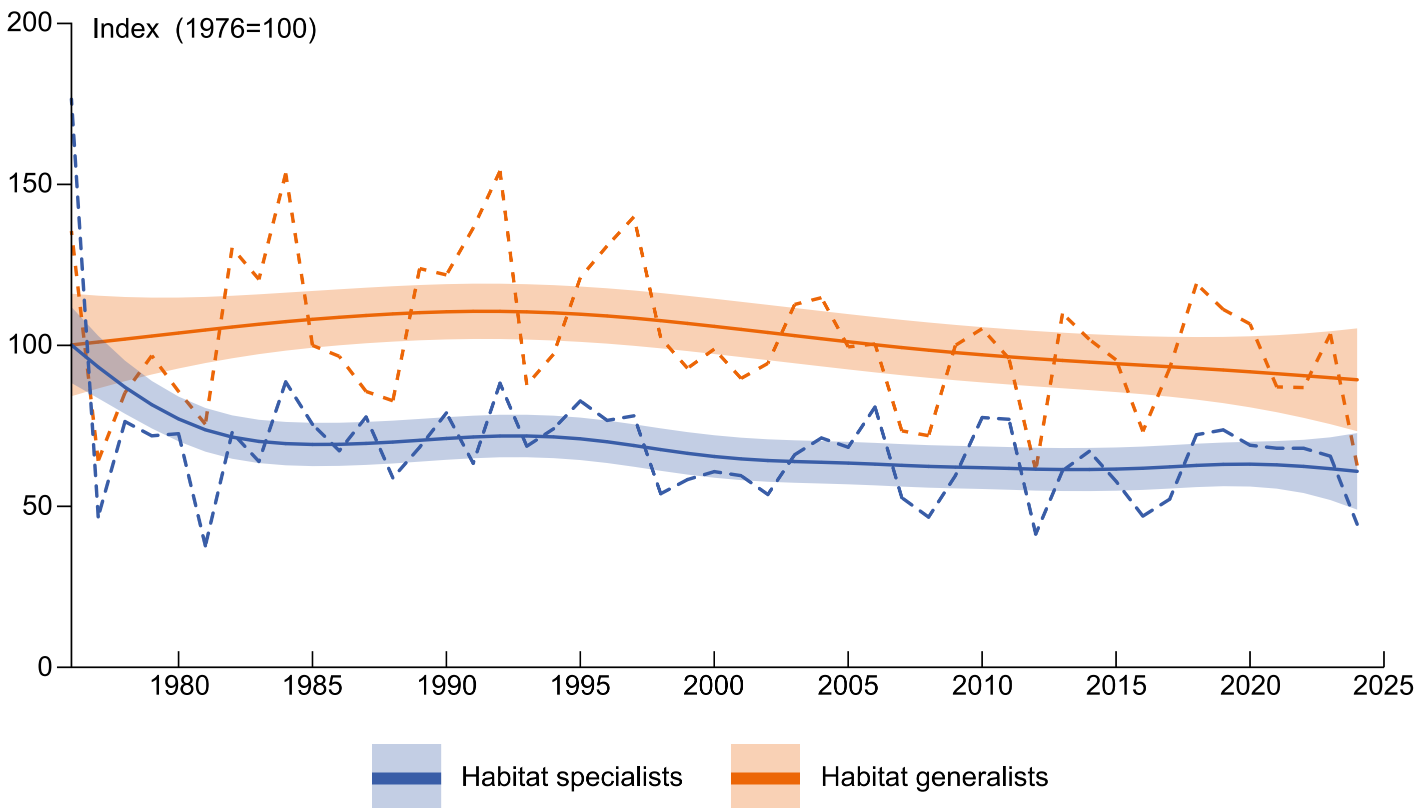


Figure 11. Trends for the abundance of habitat specialist butterflies (26 species) and generalist butterflies (24 species) in the UK, 1976 to 2024.

While the UKBMS provides 'gold standard' monitoring of butterfly populations, PoMS can also provide valuable data. The focus of FIT Counts on flower visits, for example, generates information that is simply not captured in the UKBMS i.e. which flowers attract butterflies and day-flying moths. While sightings of butterflies and moths make up only a small proportion of total insect abundance in FIT Counts (e.g. 4% of insects in garden counts) and they are only recorded on about one in six counts, the relative attractiveness of different flowers is clear from the data. Buddleja, for example, attracts almost four times as many butterflies and moths as other high-scoring flowers such as Bramble, Thistle and Knapweed. Perhaps surprisingly, such numerical evidence is largely lacking from the vast amount of available advice on gardening for butterflies, much of which is based on anecdote and personal experience.

Alongside our own research, for example showing that long grass in gardens is associated with greater abundance and variety of butterflies [9], Butterfly Conservation can use the FIT Count results to provide evidence-based advice to benefit pollinators overall. For instance, we promote flowering Ivy in part because it is an important resource for breeding Holly Blue butterflies and nectaring Commas and Red Admirals, but also because it ranks as the number one target flower for total pollinator abundance in FIT Counts across the years.

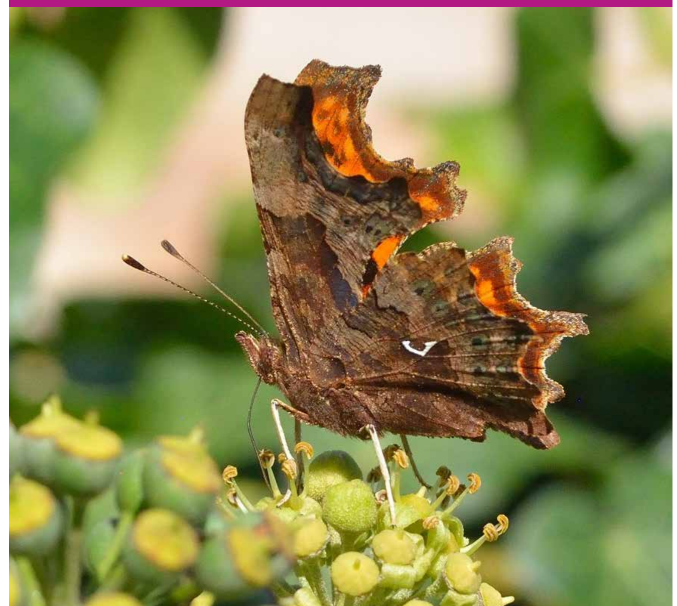
Of course, given the ever-growing evidence of the importance of nocturnal insects as pollinators [10],[11] perhaps the next step in flower-visitor monitoring should be nighttime counts!

Both the UKBMS and PoMS depend on the dedication and enthusiasm of volunteers to help us better understand and protect our pollinating insects. As the UKBMS celebrates its 50th survey season and PoMS approaches its tenth year, it's a fitting moment to reflect on just how vital this support has been.

A huge thank you to everyone who takes part in either scheme, or even better, both! Your time, expertise, and enthusiasm are fundamental to this work, making a vital contribution to our understanding of pollinating insects.

The UKBMS is supported and managed in partnership by Butterfly Conservation, the UK Centre for Ecology and Hydrology (UKCEH), the British Trust for Ornithology (BTO) and the Joint Nature Conservation Committee (JNCC).

Red Admiral on Buddleja.



Comma on Ivy.

BeeWalk: how did the bumblebees do in 2025?

By Dr Richard Comont, Bumblebee Conservation Trust

Bumblebee Conservation Trust

BeeWalk entered its 19th field season in March 2026 off the back of more records, more recorders, more sites, and more individual bees than ever before in 2025–984 BeeWalkers across 1,109 transects generated 53,867 records of 173,773 individual bees last year.

Of course, it helped that there were bees to find in 2025! For the first time in several years we had a warm, dry spring with ideal conditions for bumblebees to establish colonies. That made an immediate difference; the Garden Bumblebee (*Bombus hortorum*) had its best May on record, and other early-emerging, quick-nesting species like the Early Bumblebee (*B. pratorum*) and the Bilberry Bumblebee (*B. monticola*) were able to peak earlier than normal and in good numbers.

As spring turned to summer, the weather stayed hot and dry, which suited some species very well. The Shrill Carder (*B. sylvarum*) had its best year on record and the species actually peaked in July rather than August for the first time in the survey, showing what an early year it was (particularly in the south-east).

© Louise Gorrigan

Conducting a monthly BeeWalk transect to monitor the abundance of bumblebees.

Summer remained hot and dry through into July and August, and this may well have caused some issues for later-peaking species. The Moss and Common Carders (*B. muscorum* and *B. pascuorum*) had decent colony build-up in the spring, but didn't manage to kick on and peak in the way that they usually do. It's likely that drought conditions affected vegetation by late summer, reducing the number of flowers available at a time when the later-peaking species are in greatest need of large quantities of pollen and nectar.

For more information see the full BeeWalk Annual Report.

In 2026 we're piloting linking BeeWalk and PoMS more closely by asking BeeWalkers to carry out FIT Counts at the end of their transects, and by walking BeeWalk transects as part of the PoMS 1 km square survey. This should give us a better idea of how numbers compare across the different surveys, and help improve the analysis.

© Richard Comont

Moss Carder Bee (*Bombus muscorum*) on a Knapweed flower.

© Nadine Mitschunas

Common Carder Bee (*Bombus pascuorum*) visiting a White Dead-Nettle flower.

Volunteers' views from the field

Running since 2017, the PoMS 1 km square survey has been conducted primarily by trained volunteers who are supported by the PoMS team. Here Edwina, Andrew and Carys share their reflections on 'adopting' a square, with more than ten years of PoMS surveys between them!

Square #108 Goring Heath, Oxfordshire, England

Edwina Brugge

Although I followed a career into IT, the interest in insects was humming along in the background. After studying Zoology at university, I got persuaded to take up beekeeping. Over time, I realised it was not just honeybees that were important for the pollination of food crops, but other bees and flies were also helping in this role.

Quite by chance, a friend mentioned that UKCEH were planning some pollinator surveys and were looking for volunteers. I was by now working part time in IT and relished the idea of a 'field trip', instead of being indoors, creating database queries. I joined PoMS in 2018.

For one day a month, May to August, I visit the beautiful, peaceful beech woods at Goring Heath in the knowledge that I am contributing towards PoMS. Each additional year of sampling helps towards providing more useful, reliable data which can be analysed. It is also a great place for the dogs to accompany me on a survey day!

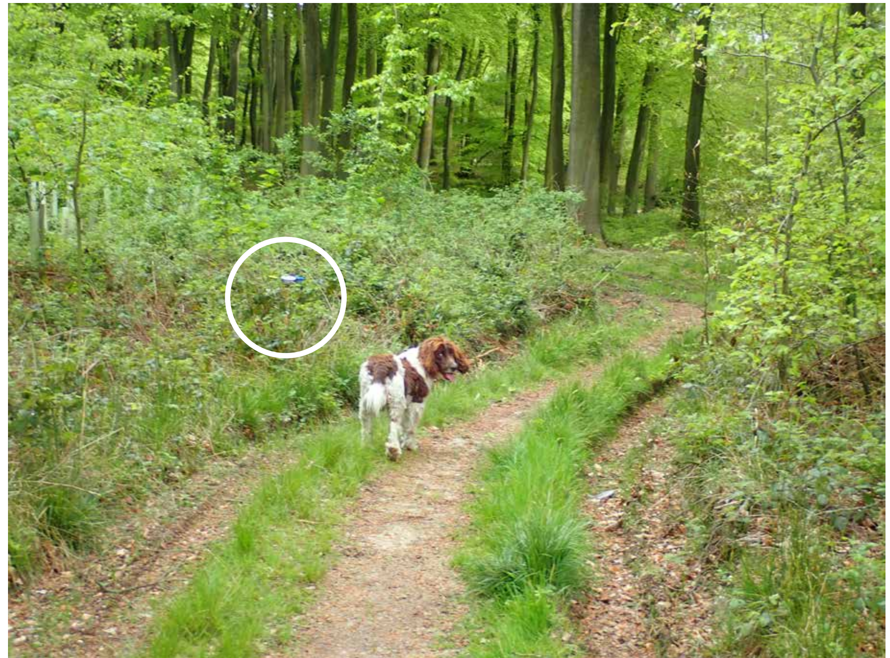
The PoMS team asked whether I had any interesting findings or feedback to report. The dominant flowers around the pan traps in my square are Bramble! Honeybees have been present every year and I have discovered that several beehives are present on the boundary of my allocated 1 km square.

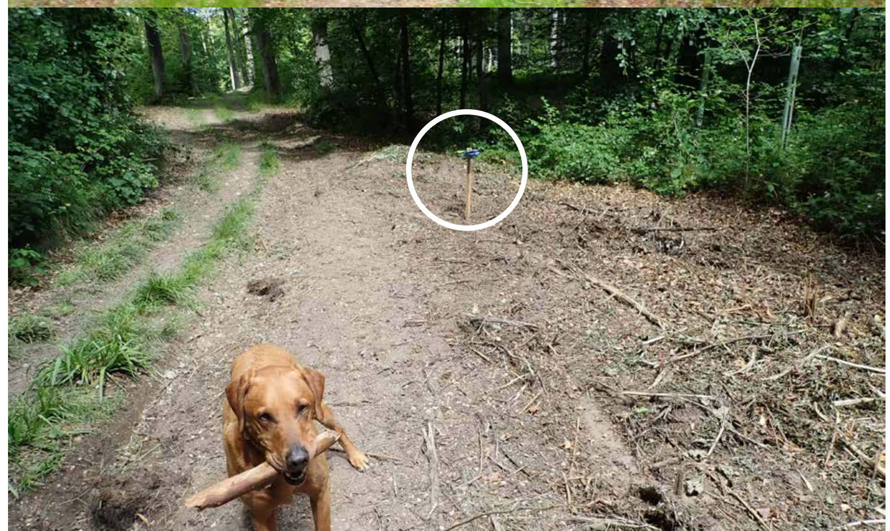
Goring Woods.

The last two years, foresters have been in and cleared the environment around two of the pan traps (as shown in the photos). The Bramble has recovered quickly and there is now more light reaching the woodland understorey. I am intrigued to find out whether this may have affected the species of bees and hoverflies present in the pan traps, and always look forward to the 1 km square report shared by the PoMS team with this information for my square.

© Martin Harvey

Meliscaeva cinctella, one of the hoverfly species found in Edwina's 1 km square surveys.





Both images © Edwina Brugge

Pan trap 3 (circled) in the Beech woods at Goring Heath, before (top, 2022) and after (bottom, 2025) the clearance of Bramble.

Square #87
Carmarthenshire, Wales

Andrew Lucas

My connection with PoMS stems from a conversation with my wife and a life-changing field-course.

Back in 2010, I was having one of my periodic whinges about never having completed a PhD, when my wife Beth suggested that I might actually do something about it. But what to study? I'd attended one of the brilliant hoverfly identification courses run by Roger Morris and Stuart Ball. Hoverflies are the perfect invertebrate group. Lots of species, but not too many. Excellent identification guides. A nice mix of easy species, and devilishly tricky. With supervisors at Swansea University and the National Botanic Garden of Wales, I enrolled on a PhD aged 48. And so my interest in pollinators began.

Having always taken part in projects like the BTO/JNCC/RSPB Breeding Bird Survey, PoMS seemed a natural next step. My square, in north Carmarthenshire, has grasslands that span the range that you might expect in rural Wales. Two pan-trap sites are in acid grassland with flowers such as Tormentil and Heath Bedstraw. The third is in some marshy grassland, with Ragged Robin and Whorled Caraway, the latter a little umbellifer that is the county plant of Carmarthenshire. The two remaining sample points fall in improved grassland, cut for silage or grazed by sheep. Roadsides provide Hogweed and Bramble, and the grounds of a disused chapel are always full of Black Knapweed and Bird's-foot Trefoil, all useful for FIT Counts.

I've visited my square annually since 2021, and it has become like an old friend. I get out in the sunshine in a beautiful part of Wales, safe in the knowledge that I'm contributing to something larger, providing information on how all our pollinators, especially those hoverflies, are faring.

Pan trap station in acid grassland on Andrew's square in north Carmarthenshire.

Carys May

I am entering my third year of volunteering for PoMS at a square in Cardiganshire, Wales. I first got involved following an email which came in via work having not previously taken part in any other 1 km square biodiversity surveys. The fact that there was a vacant square close to my hometown gave me the incentive to put myself forward to take it on, close enough that I have carried the survey out by bicycle, using a trailer to carry the equipment. I now take part in a few volunteer 1 km square surveys including the BTO/JNCC/RSPB Breeding Bird Survey. I found the training provided for the PoMS survey very thorough, with the in-person element particularly useful. It was also great that the land access permissions had already been organized, a potential barrier to volunteers taking part in these sorts of surveys.

Square #66
Cardiganshire, Wales

Having feedback on what was found in my PoMS square is a good motivator to continue to carry out the survey. I enjoy looking up the bee and hoverfly species online to build on my knowledge of the various groups of pollinators. I also look forward to taking part in a BeeWalk this year to have the incentive to spend more time on site and the opportunity to see and record more species.

© UKCEH

Pan trap 4 within wet grassland in square #66.

Showcasing your FIT Count projects

In 2024 we added a new option into the FIT Count recording page and app, allowing participants to link their count results to a named local project. This was in response to several requests from local coordinators who were keen to use FIT Counts as part of their work to conserve pollinators and engage people with watching and recording the insects involved. By the end of 2025, we had 19 FIT Count projects signed up. Between them, these projects contributed a total of 1,098 FIT Counts representing 21% of all counts submitted to UK PoMS for the year. We are especially grateful to the three projects based in Cambridgeshire, London and South Devon who have shared their aims and experiences here.

Kingston-upon-Thames, Greater London, England

Kingston University's *FIT for Wildlife* project

By Sivi Sivanesan

In 2023, as part of the continued work to improve and protect biodiversity on Kingston University landholdings, I knew that I wanted to get our community appreciating the importance of invertebrates in our habitats. This was not just as part of a vital goal towards providing food sources for much loved wildlife such as hedgehogs, badgers and nesting birds, but for their own right in their fascinating and complex diversity.

I had heard about PoMS and the Flower-Insect Timed Counts around 2021, during a talk at the London Day of Nature. This short format insect survey seemed to be one that anyone could undertake, being accessible to non-specialists and only requiring people to recognise and group insects into ten pollinator groups, similar to the Riverfly Monitoring Initiative work already being undertaken at the University. This also worked towards my other aim of using the simplified survey as a gateway to increase volunteer engagement with insects in general, to start to get species survey data collected alongside the FIT Counts.

A *FIT for Wildlife* project volunteer.

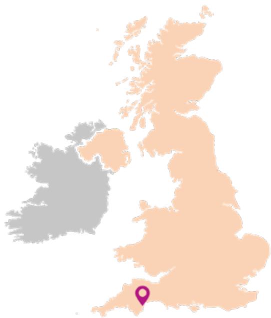
We use pollinators as a proxy for judging the overall quality of our habitats for invertebrates as a whole, based on the premise that increasing habitat quality would result in increasing pollinator numbers. Many of the monthly FIT Counts carried out by volunteers including University staff, students and the local community who attend our training sessions are in locations where we hope to show an increase in the numbers and variety of pollinators being recorded.

While we may not have sufficient FIT Counts to make these comparisons in a statistical sense, the FIT for Wildlife project has definitely resulted in benefits to biodiversity at the University. Habitats have been managed with a focus on the three stages of insect life (feeding, nesting and hibernation), flagging areas of ground-nesting bees, and making sure that any mowing isn't first thing in the morning when we often see the bees resting on plants as they warm up. We have generated new records of ground-nesting bee species and other invertebrates recorded using apps like iNaturalist and iRecord, and generally sparked an interest in invertebrates with those taking part.

FIT for Wildlife volunteers pause for photo.

We asked volunteers on the Kingston University FIT for Wildlife project for feedback on their experience of taking part in the FIT Count: **"After undertaking FIT Count surveys, has your interest in invertebrates as a wildlife group changed?"** Here is a selection of their responses:

- *Absolutely! It was fascinating to hear/learn about the invertebrates as pollinators*
- *It's made me more aware of pollinator diversity*
- *Yes, I have become more interested in the role of beetles as pollinators*
- *I hadn't particularly thought about which pollinators prefer different flowers. I enjoy being part of a meaningful survey and am glad to participate and grow my knowledge*
- *My interest in invertebrates has definitely increased and I appreciate how important they are not only as pollinators, but generally for the ecosystem*



Newton Abbot, Devon, England

FIT Counting in the Bradley Bug Project

By Andrew Rothery, Anita Gorst and Phil Sansum

The *Bradley Bug Recovery Network* is a citizen-science led initiative in Newton Abbot, south Devon, aiming to tackle the concerning decline in pollinators at a local level, with FIT Counts playing a central role.

Established by Green Futures Newton Abbot in Spring 2022, the project focuses on four specific monitoring locations: Bradley Barton Primary School, Kiln Orchard, Bradley Field Allotments and Bradley Manor. In each location baseline data were collected using the following approaches - a UKHAB Level 4 Walkover Survey (which gave us information about the habitat types and plant communities present) and an Invertebrate Habitat Potential Assessment Protocol (developed by John Dobson of MakeNatural and Jim Fairclough of BSG Ecology) with support from Devon Biodiversity Records Centre.

Local volunteers were trained to carry out FIT Counts in all four monitoring locations and between May and August 2022, 12 volunteers carried out 48 FIT counts, with results presented in the *People and Pollinators in the Bradley Valley Report*. The FIT Counting work has continued, with a particular focus on the Kiln Orchard site, due to the diligence and motivation of a single volunteer, with 60 counts completed in total across 2024 and 2025.

© Andrew Rothery

Some of the Bradley Bug Hunters.

We made people aware of the aim to focus on the Target Flowers listed within the PoMS guidance, but in practice most FIT Counts are carried out on the flowers that are most abundant in any given location, even if they're not a target flower.

The FIT Count approach has been easily accessible and usable for most people, producing relevant data sets showing the variety of pollinators at specific sites and contributing to changes in site management to improve the range of nectar and pollen resources provided. Crucially, we have also found that "FIT Counting" almost always results in an enhanced sense of relaxation and a connection with nature, opening up a whole new world of insects to people, and these are important wellbeing outcomes.

© Andrew Rothery

A Bradley Bug Project training session.

Oakington and Westwick, Cambridgeshire, England

APollOW - A Pollinator survey of Oakington and Westwick

By James Heywood, Jenny Prince and John Terry

In 2025, in the south Cambridgeshire village of Oakington and Westwick, two like-minded groups launched *APollOW – A Pollinator survey of Oakington & Westwick*. Like many local communities, residents are alarmed at the scale of biodiversity loss and want to take steps to improve local wildlife. They already include pond restoration and changing road verge management.

We wanted to include some form of monitoring to go alongside our efforts and the use of FIT Count surveys seemed like a multiple-win option. Accessible, contributing to both our local project and UK PoMS simultaneously, engaging people with the insects on their doorstep and encouraging pollinator-friendly action (if there are no flowers, you can't count!).

2025 was a pilot year and had 45 counts submitted by nine volunteer counters, ranging in age from seven to 77. Hoverflies were the most recorded of the 685 insects and gardens were by far the most popular habitat chosen by counters. Expanding beyond the comfort of our gardens is an aspiration for 2026. We hosted a training event in April and supported a local Pollinator Festival, held at the family run Oakington Garden Centre, the recipients of an RHS silver-gilt medal – in collaboration with the University of Cambridge – for their 'Pollinator Patch' display at the Chelsea Flower Show.

We promote the survey on local WhatsApp and Facebook groups, to go with some manned events in Oakington and neighbouring villages.

© James Heywood

The daughter of one of the authors completing a FIT Count (with assistance). Alongside training on how to complete FIT Counts, we also provide tips on pollinator friendly practices for the home like this hoverfly-friendly patch of Wild Carrot and Oxeye Daisy (aka unmown 'lawn').

Adapting PoMS FIT Counts for educational sites

Victoria Burton, Postdoctoral Researcher at the Natural History Museum, shares the story behind a new pollinator count developed as part of the National Education Nature Park programme.

The National Education Nature Park is a free programme commissioned by the Department for Education as part of its Sustainability and Climate Strategy to support schools, colleges and nurseries across England to empower every young person in England to take action for nature in their place of education. Led by the Natural History Museum, London, and the Royal Horticultural Society, along with many other partners, the programme has grown rapidly since its launch in 2023. More than 9,000 education settings have now joined, supported by over £12 million in grants, and together they have created more than 1,200 habitat enhancements.

Alongside improving their local environments, young people and educators are mapping their sites and recording wildlife. These records contribute to understanding biodiversity on educational land; one of the most under recorded types of land in England.

Because the Nature Park's community science team aims to build on existing methods wherever possible, the PoMS Flower-Insect Timed (FIT) Counts were a natural choice for our first wildlife survey, the Pollinator Count. FIT Counts had already been successfully used in school projects such as Poll:Nation, and UKCEH is one of the Nature Park's project partners.

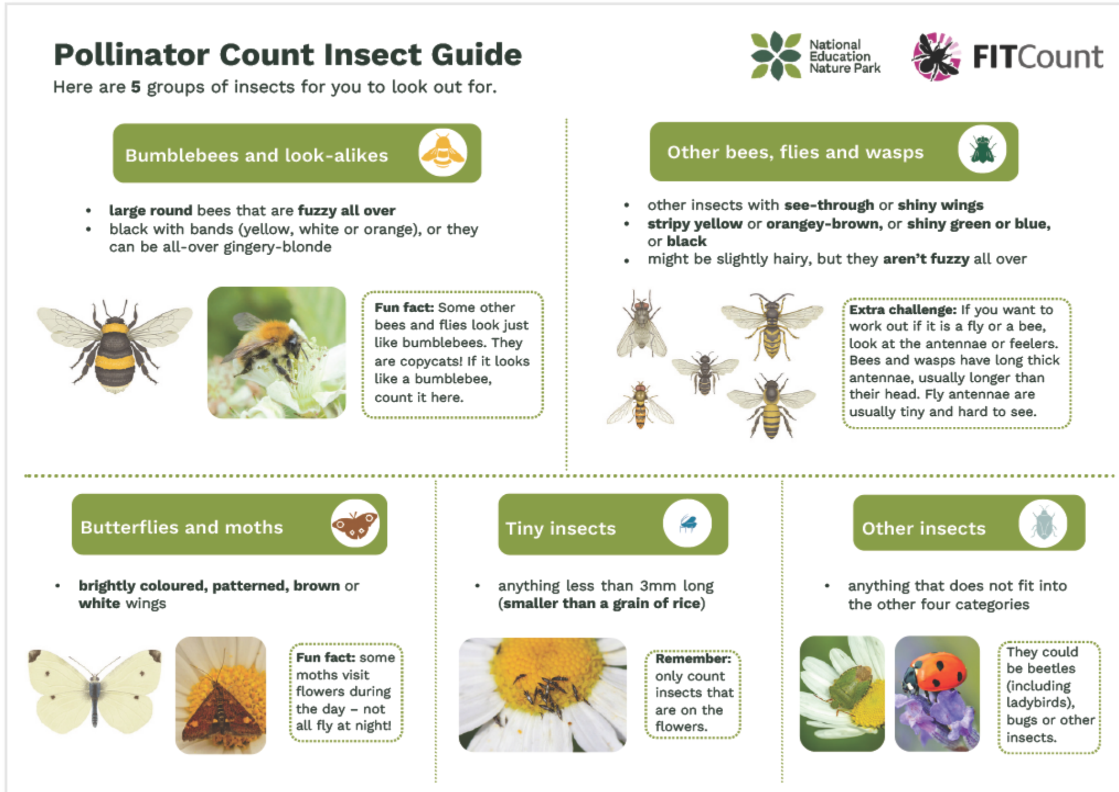
Young family taking part in the Pollinator Count.

In 2024 we ran the Pollinator Count using a version of the FIT Count protocol with minimal changes, collecting data through our own platform developed with Esri UK. We produced our own identification guide and survey form, allowing participants to choose any flower in bloom as their target flower. We also adjusted scientific terms such as antennae that would be unfamiliar to younger learners. However, feedback from educators and from our regional teams at RHS and Learning Through Landscapes still highlighted challenges. A ten minute observation period proved difficult to manage within a school lesson, and younger children often struggled to sit still for the full duration. Despite these challenges, teachers were enthusiastic about the survey's potential to support science and maths schemes of work and to help meet curriculum targets. Children themselves (from older primary classes through to secondary and college stages) consistently enjoyed being outdoors and observing insects, and many already had a good general understanding of pollination and its importance.

Ahead of the 2025 survey season, we worked closely with the PoMS team to develop an additional adapted version that addressed issues identified in the first year. The revised approach shortens the count time from ten minutes to five and combines the original ten pollinator groups into five. Deciding how to merge the groups in a way that balanced ease of recognition with scientific value proved challenging.

During summer 2025, we were fortunate to host an MSc student from University College London, who investigated how effectively young people count and identify the different pollinator groups and compared the two survey versions. We hope to continue this research in the coming year.

We are expanding the supporting resources available for educators, with new activities linked to the science curriculum – covering topics such as bumblebee lifecycles and pollination – as well as computing activities that use bumblebee identification to help explain how algorithms work. Finally, this year will also see the launch of the Nature Park Data Portal, which will allow educators to explore and download their own data to answer questions and inform improvements to their sites. Whilst data generated from the Pollinator Count are not included within the PoMS FIT Count dataset, we hope this will be a route by which students and their families can discover how to get involved with PoMS and other insect recording opportunities in their own time.



The simplified guide to pollinator groups developed to support the 5-minute Pollinator Count as part of the National Education Nature Park.

PoMS volunteer engagement and training

A summary of the volunteer and public engagement events and activities delivered collectively across the PoMS partnership during 2025, with many thanks to the hosts or partner organisations leading them.

PoMS on tour in 2025

- **54** training and engagement events*
- **7** meetings attended and presentations given
- Estimated audience reached: at least **16,000**

Claire Carvell © UKCEH

PoMS new quick guide

Our new quick guide to the FIT Count survey was released in April 2026. This two-page guide summarises how to do a FIT Count and gives pointers on how to recognise the different insect groups.

PoMS in videos

Video views since May 2021:

- Flower-Insect Timed Count (FIT Count): **3,696**
- Getting familiar with the FIT Count insect groups: **2,045**
- PoMS 1 km square survey: **1,284**

All how-to videos (in English and Welsh) and key training webinars are on YouTube [12] and the PoMS website.

PoMS one-to-one training

- Number of training days for new 1 km survey volunteers in 2025: **14**
- Total training days provided since 2018: **132**

PoMS in print

- **18** articles in print or online
- Total estimate of audience reached: at least **86,000**

*numbers relate to events led or co-led by members of the PoMS partnership. A **BIG thank you to all the FIT Count project coordinators** who have led independent training events with local groups!

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PoMS publications

For a full list of PoMS publications see:

- ukpoms.org.uk/reports
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Thank you

The UK PoMS Partnership

The UK Pollinator Monitoring Scheme (UK PoMS) is a partnership funded jointly by the UK Centre for Ecology & Hydrology (UKCEH) and Joint Nature Conservation Committee (JNCC) (through funding from the Department for Environment, Food & Rural Affairs, Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs for Northern Ireland). UKCEH's contribution is part-funded by the Natural Environment Research Council formerly as part of the UK-SCAPE programme (award NE/R016429/1) and now as part of the NC-UK programme (award NE/Y006208/1) delivering National Capability. UK PoMS is coordinated by UKCEH, with the following delivery partners: Bumblebee Conservation Trust, Butterfly Conservation, British Trust for Ornithology, Buglife, the Royal Horticultural Society, DAERA and Hymettus, and academic partners the Natural History Museum, the University of Reading and University of Leeds.

The members of the PoMS Steering Group in 2025 were Paul Woodcock, Azra Gordy and Rosie Hallatt (JNCC), Pauline Campbell (DAERA), Eleanor Andrews and Hannah Hoskins (Defra), Richard Smith (Natural England), Athayde Tonhasca and Jim Jeffrey (NatureScot), Kathleen Carroll (Welsh Government), Liz Halliwell and Bethan Beech (Natural Resources Wales), Una Fitzpatrick (National Biodiversity Data Centre, Ireland), Fiona Highet (Science and Advice for Scottish Agriculture) and Simon Potts (University of Reading).

The UK PoMS team

Martin Harvey is the PoMS coordinator at UKCEH and the first point of contact for queries via the poms@ceh.ac.uk email. Claire Carvell is the project manager for PoMS, also based at UKCEH Wallingford and responsible for strategic direction, overseeing delivery of the surveys, data management and reporting, and liaising with JNCC and other partners. Nadine Mitschunas leads the field team with Chris Andrews and Angus Garbutt, and Francesca Mancini leads on statistical analysis of PoMS data, with Robin Hutchinson working on data management and communications. Other UKCEH team members are Nick Isaac, Lucy Ridding, Marc Botham, Michael Pocock, Abigail Lowe and Helen Roy. Our partners are represented by Richard Comont and Bex Cartwright (BBCT), Richard Fox and Jo Milborrow (BC), Dawn Balmer, Susan Jones and Santiago Cárdenas (BTO), Rachel Richards and Jamie Robins (Buglife), Helen Bostock and Andy Salisbury (RHS), Pauline Campbell (DAERA), Rowan Edwards (Hymettus), Mike Garratt and Simon Potts (Reading University), Bill Kunin (Leeds University), Alfried Vogler and Victoria Burton (Natural History Museum).

Acknowledgements

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PoMS
UK Pollinator Monitoring Scheme

UK Pollinator Monitoring Scheme (2026).
The UK PoMS Annual report 2025
UK Centre for Ecology & Hydrology and
Joint Nature Conservation Committee

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The UK PoMS partnership

UKCEH Our planet. Decoded.

JNCC

Bumblebee Conservation Trust

Butterfly Conservation – Saving butterflies, moths and our environment

BTO Birds Science People

Hymettus

Natural History Museum

University of Leeds

University of Reading

buglife

RHS

Department for Environment Food & Rural Affairs

Scottish Government – Riaghaltas na h-Alba – gov.scot

Llywodraeth Cymru – Welsh Government

Department of Agriculture, Environment and Rural Affairs – www.daera-ni.gov.uk