

## Taking Ten, Protecting Pollinators – An introduction to the United Kingdom Pollinator Monitoring Scheme (PoMS) and Flower Insect Timed Counts (FIT Counts).

Richard Dawson



# FITCount



01. A simple and enjoyable way to get involved in monitoring and recording pollinators. UK PoMS.

Most people will be aware of the importance of pollinators to our environment: fewer people will have noticed the fantastic multitude of pollinators that we have in the UK. Pollination is the transfer of pollen from the (male) anther of a plant to the (female) stigma of a conspecific plant, ideally resulting in fertilization. A pollinator is any organism that transfers pollen between conspecific male and female flowers. This is an accidental by-product of other activities of the organism- most pollinators are 'accidental pollinators' (the exceptions being fig wasps and yucca moths).

This article aims to introduce a simple and enjoyable way for anyone to get involved in monitoring and recording pollinators (01) and by doing so contribute to the long-term understanding of insect declines and what needs to happen to conserve and protect these marvellous invertebrates.

But first a little background. The UK Pollinator Monitoring Scheme (PoMS) was established in 2017 and is the world's first monitoring scheme to generate systematic data on the abundance of bees, hoverflies and other flower-visiting insects at a national scale. PoMS does this by using two large scale surveys to produce long term records of species occurrence to track population changes across the UK.

### 1km Survey

These are systematic 1 km square surveys (02) that cover a network of 95 randomly stratified squares across the UK to detect national changes in pollinator groups. They utilize a six hour pan trapping protocol four times a year between April and September at each survey site. All specimens collected are identified to group level and hoverflies and bees are identified to species level by professional taxonomists. All specimens collected are archived for future research, including a currently-in-development project for DNA analysis. For more info please visit [ukpoms.org.uk/reports](http://ukpoms.org.uk/reports) & [ukpoms.org.uk/research](http://ukpoms.org.uk/research)

### FIT Count

The citizen science 'wing' of PoMS investigates broad flower-insect interactions at the insect group to plant species level, anywhere and everywhere across the UK. It is hoped that, with your help, the FIT Counts are destined to be as popular as the RSPB Big Garden Birdwatch, but as will become clear FIT Counts are much more fun!



02. 1km Square survey at Moel Penamnen, North Wales. Richard Dawson.

The PoMS protocols are now being rolled out into schemes around the globe with similar schemes already established in Cyprus, Argentina, Chile and beyond. Currently an EU PoMS is in the process of being launched ([www.ufz.de/spring-pollination/index.php?en=49053](http://www.ufz.de/spring-pollination/index.php?en=49053)). The Argentine and Chilean FIT Count app and pollinator guide, of which I am a little envious to be honest, also includes hummingbirds and bats. This joined-up use of comparable protocols means that data on pollinator abundance can be explored with equivalence across the globe, which is extremely valuable and very exciting!

### So how can you get involved?

Imagine you are out and about – perhaps on field work, a survey, a recording day or just visiting your local pub for a swift pint, if you have 10 minutes to spare (perhaps whilst you have lunch), there is a patch of flowers in bloom nearby (any species is fine) and you are

interested in getting involved then this is an ideal opportunity to undertake a FIT Count.

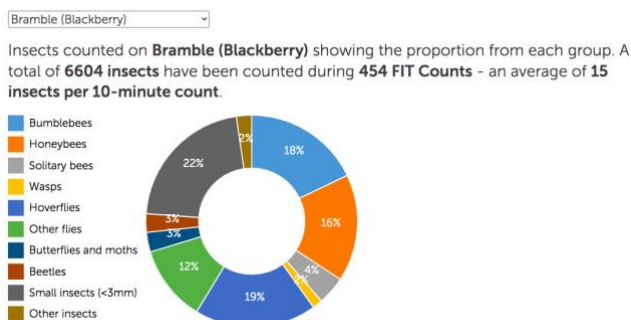
Carrying out a FIT Count is very easy and offers an opportunity to slow down, relax and focus your awareness down into the world at a different scale, the world of insects, invertebrates, flowers and pollinators. The FIT Count is also a brilliant engagement tool (especially for younger people) and an accessible way to connect to nature anywhere, at any time.

There are two basic ways to do your FIT Count, the traditional paper-based count or by using the FIT Count app (03) on your smart phone. All the resources required, recording forms, free downloadable ID guides for target flowers and insect groups and a link to the FIT Count app are available from ukpoms.org.uk.



03. The FIT Count app is now available for smart phones. UK CEH.

The first thing you should do is to sign up for an account at ukpoms.org.uk, doing so will allow you to enter your paper-based counts, access your app-based counts and explore other counts and view flower specific results (which are updated in real time) (04). You can also download your own FIT Count data as a .csv file allowing you to analyse and track changes to pollinator plant interactions on your own patch.



04. Flower specific results are updated in real time. UK PoMS.

When setting up your account please use a real first name - as the FIT Count data is a Biological Record it requires the standard Who, What, Where, When so the 'who' needs to be a real name rather than a nickname. I'd recommend signing up for the website and the app using the same login details as this means the two will automatically sync your data. At present you cannot download or access your completed FIT Counts from the app as it is a one-way connection.

The only equipment you will need to carry out a FIT Count is; a pen or pencil, a FIT Count form (or sheet of paper) or a smart phone / tablet with the FIT Count app plus a 50cm x 50cm quadrat. The quadrat can be a 'professional' style wooden or metal version or a gaffa tape or string version (05). As I prefer to carry more food and less equipment when out and about, my preferred option is a very lightweight string quadrat. My current one is made from boot laces knotted with a loop at each corner, 50cm apart. These allow me to easily pull the quadrat into a square and use tent pegs to hold it in place if required.



05. A simple 50cm x 50cm quadrat made from string is light-weight and easy to carry round. Richard Dawson.

Now you are ready to undertake your FIT Count.

The protocol is:

Check the date: FIT Counts can be done between the start of April and the end of September (otherwise known as pollinator season).

Check the weather: FIT Counts require 'good weather' which is: dry, above 13 degrees C if it is sunny, or above 15 degrees C if it is cloudy. Sunny weather is defined by less than 50% of the sky being cloud, cloudy weather is defined as greater than 50% cloud cover.

Pollinators (just like many Homo sapiens) prefer warm, dry weather and this is one of the appealing things about pollinator monitoring - you don't have to go out in wet weather.

Find a target flower: Where possible you should carry out your count on one of the target flowers listed in the app or in the downloadable Target Flower Guide. Choosing a target flower helps focus data analysis onto specific flowers and the results are updated in real time on the website (ukpoms.org.uk/flower-charts) but you can carry out a count on any flower, anywhere. Well, anywhere outside - please do not do a FIT Count on cut flowers in a vase on your dining room table.

Take a photo of your chosen flower: When using the app you can take a photo of your chosen flower into the app directly from your smartphone, if using the paper form and manually uploading your data you can upload a photo when you enter your count.

Mark out your patch using your quadrat: your 50cm x 50cm patch can be horizontal, vertical or anywhere in-between.

Count the number of individual flowers in your patch. If your chosen patch has more than one kind (or 'species') of flower present please only use one kind (or 'species') for each count (06). Flowers should only be counted if they are open and likely to provide a pollen or nectar resource to visiting insects, and are counted by Flower Unit. The Flower Unit relates to how pollinators interact with different flower types. If you choose one of the specified Target Flowers the app will automatically choose the correct Flower Unit and the Target Flower Guide will explain the different types and which to use for each target flower. If you are uncertain of the Flower Unit then uploading a picture of your chosen flower will allow the 'data analyst' to include your FIT Count in the correct category. For

Flower Units I like to think of ‘insect landing pads’ and imagine how an insect sees and uses the flower.



06. If more than one kind (or ‘species’ group) of flower is present in your patch, only use one kind of flower per count, e.g. in this image, record from ten daisies OR one dandelion. Richard Dawson.

#### Flower Unit Types

Individual flowers – each flower = one unit (e.g. Buttercup, Hawthorn, Ragwort)

Flowerheads – many tiny flowers making up one flower head = one unit (e.g. Dandelion, Knapweed, Thistle)

Flower Umbels – each umbel = one unit (e.g. Hogweed)

Flower Spikes – numerous flowers arranged along a single stem = one unit (e.g. White Dead Nettle, Heather, Buddleja)

Enter patch data: The app will guide you through this when you choose your flower type and the required info on the paper form is very straightforward: The area of your patch covered by your chosen flower (estimated from the flower heads rather than vegetative parts of the plant), the flowers (or lack of) surrounding your chosen patch.

Start your 10 minute timer. Each FIT Count quantifies flower visits within a ten minute period, the app has a 10 minute countdown built in.

Count all insects that visit your counted flowers and record them to broad group: As the FIT Count is focused on pollinators we only count insect visits that have the potential to facilitate pollination. So only insects that visit (land on) a flower are counted, insects passing-through or only landing on the ‘green / vegetative’ parts of the flower are not counted. If an insect makes multiple visits to different flowers within your patch, hopping from flower to flower, it is only counted once. If possible try to avoid ‘double counting’ insects that leave your patch and then return – although this is easier said than done on busy pollinator days and is especially challenging on ivy at the end of the season.

One important point I should mention is that zero counts, although frustrating, are vital and should be recorded and submitted. If we ignore zero counts and every submitted count shows insect visitors are present we will end up with a very skewed view of the distribution and numbers of pollinators across the UK. Also as tempting as it might be when adjacent patches are hooching with insects and your chosen patch is devoid of activity please do not attempt to herd insects into your patch – instead you could finish your count and then undertake another one on a busier patch!

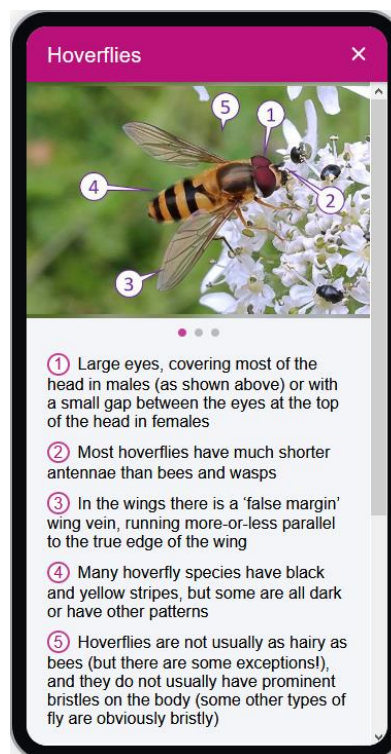
Identify each insect visitor to their broad group: The FIT Count is designed to be accessible to anyone as a public citizen science scheme so there is no need to identify insect visitors to species level (although if you can do so please add your records to iRecord or the relevant recording scheme). Insect visitors should, where possible, be identified to one of ten broad groups (07): Bumblebees, Honeybees, Solitary Bees, Wasps (including ichneumon wasps),

Hoverflies, Other Flies, Butterflies & Moths, Beetles larger than 3mm, Small Insects (less than 3mm), Other Insects.



07. Beetle on a thistle flower. Insects need only be identified to one of ten broad groups. Richard Dawson.

For this article I won’t go into how to differentiate between each group but hopefully newcomers will be able to identify at least four or five of these groups fairly confidently. There are brilliant ID resources for these groups built into the app (08) and downloadable from the website [ukpoms.org.uk/fit-counts](http://ukpoms.org.uk/fit-counts).



08. One of the ID resources available on the app. UK CEH.

I feel that the trickier groups are Honeybees due to their variability, solitary bees versus wasps, and hoverflies (especially non-typical ones) versus other flies. If in doubt you should record your insect visitor as OTHER INSECTS. If every count submitted treated all visitors as Other Insects we would still gain an amazing amount of important data about the number of insect visitors to flowers across the UK. Please do not worry if you cannot identify every visitor to their specific group. I generally treat any hoverflies that I am uncertain about as other flies. (Diptera are difficult!).

This approach to recording flower visitors also offers a great way to introduce newcomers to biological recording and to start becoming familiar with recognising the common groups of flower- visiting

insects. My advice is that alongside the ‘morphological’ differences between groups, behavioral differences are often easier to pick up initially: Flies (both Hoverflies and Other flies) ‘rub their hands together’, Solitary bees are ‘purposefully collecting pollen’ (at least non-kleptoparasitic females are), social bees (Bumblebees and Honeybees) collect pollen in ‘wet, clay- like lumps’ on their hind legs, Honeybees have dangly hind legs when approaching flowers (but so do some *Eristalis* sp. Hoverflies that are bee mimics). There is always an exception to any rule. But undertaking FIT Counts offers ideal opportunity to start observing all these fascinating variations and build your knowledge and experiences of flower-visiting insects.

OK, our ten minutes are now up! Time to enter some details of habitat and environmental conditions.

Every FIT Count requires the Who, What, Why, When of biological recording along with some basic weather and habitat condition information. The app will guide you through this step by step and the paper form has a space for each category. These are:

Habitat: where you undertook your count by broad category (eg; School, Grassy Verge, Parkland with Trees, etc)

Weather conditions: Obviously it’s nice, warm, sunny, pollinator friendly weather but we add a bit more detail: how much cloud cover was there above your patch, during your count was your patch in shadow at all? The shadow part is slightly tricky as even if there was cloud cover the patch does not count as shaded unless there was an object casting a shadow over the patch, ie: a wall or tree( but hopefully not the person or persons carrying out the FIT Count). Wind strength is simply assessed and recorded by how much the leaves and / or flowers were moving during the count.

The location of your FIT Count: This can be recorded directly into the app from your smartphone’s GPS or if entering your paper based count manually onto the website you can enter a location, postcode, grid reference or drop a pin directly onto the integrated map.

If you make an error filling in info on the app (I struggle with my chubby engineer’s fingers at times) you can go back over the details once the ten minutes are over and you have entered all your data but before you upload your FIT Count. On the website you can edit each of your FIT Counts easily once it is uploaded.

Entering your data: You should upload or enter your data to the PoMS scheme. The app will give you the option to do this directly when you have completed your count.

To submit a paper based FIT Count, log into your account at [ukpoms.org.uk](https://ukpoms.org.uk) and chose ‘Add your results’ from the menu dropdown. The ukpoms website follows the order of the paper form directly. It is also built on the same foundation as the iRecord system so may appear very familiar to more experienced biological recorders.

All done! Congratulations you have added your FIT Count and contributed to national and international monitoring of pollinators, helped to support conservation and influence environmental policy and, I hope, enjoyed observing some fascinating insect-plant interactions.

And there is even more you can do.

From the menu drop down at [ukpoms.org.uk](https://ukpoms.org.uk) if you click on view results you can explore FIT Count maps year by year and zoom in to see how many FIT Count have been undertaken where and when in your local area. Of course doing FIT Counts is not a competitive undertaking but it is very inspiring to see the number of blue dots grow in your area over the year.

If you go to view results and my results at the bottom right of the list of your FIT Counts there is a Download this report option which will

create a .csv file of all your FIT Counts. This is a brilliant resource, especially for community groups, community gardens and natural history societies which allows anyone to monitor changes in flower-insect visitors over time for a specific area. For example if you have an area of mown lawn and an area of wildflowers, you could systematically monitor the two by undertaking FIT Counts daily or weekly and comparing the results. You can also record changes in flowering plants present and which insect groups preferentially visit each one as the season progress, thereby assessing any gaps in nectar and pollen provision across the year. This facility offers a fantastic opportunity for longer term, individually focused monitoring (alongside supporting PoMS) which I feel could provide a fascinating project for STEAM subjects at a school or for a local environmental or ‘friends of’ groups. I’d love to hear from anyone who would be interested in undertaking such a project : it would make a great article for the PoMS newsletter next year!

Speaking of which, how do you keep up to date with the PoMS findings and outcomes and see what all your hard FIT Count work has contributed to?

The first PoMS annual report is due to be published very soon. Be one of the first to get a copy direct to your inbox and stay up to date with the project by signing up to the PoMS newsletter at [ukpoms.org.uk/subscribe](https://ukpoms.org.uk/subscribe).

All of the PoMS data will also be made available as an open access download to facilitate wider analysis and uses of the data for scientific research, go to [ukpoms.org.uk/data](https://ukpoms.org.uk/data) for more info.

Hopefully this ‘whistle stop’ tour of the PoMS scheme and FIT Counts has whetted your appetite to get involved. If you have any further queries I am contactable via [Richard@arthropods.co.uk](mailto:Richard@arthropods.co.uk) and am happy to answer questions, offer advice on engagement with the FIT Counts and it would be great to receive comments regarding your experience with the UK Pollinator Monitoring Scheme.

In brief the FIT Count collects data on abundance of flower visitors and plant-pollinator interactions across a variety of habitats and places. It can be carried out anywhere there are plants in flower, in warm, dry weather between April and September. You just count ALL insects that land on target flowers within 50x50cm patch during a 10-minute period. Identification is to insect group level. The main thing is to enjoy yourself whilst supporting and protecting pollinators and observing the wonders taking place at our feet

#### Reference

UK Pollinator Monitoring Scheme website. Available at: <https://ukpoms.org.uk/> [Accessed 26.05.23].

#### Images

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