

Pollinator Monitoring Scheme - K pros: P MS-

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Flower-Insect Timed Count

Many wild and cultivated plants depend on insects to pollinate their flowers, with successful pollination leading to successful seed or fruit production. There are concerns that numbers of pollinating insects such as bees and flies may be declining, but we need more data to be able to track changes in abundance across the country. The Flower-Insect Timed Count (FIT Count) was designed by a Research Team in the UK to collect new data on numbers of flower-visiting insects, as part of a wider set of surveys under the [UK Pollinator Monitoring Scheme](#) (PoMS). We have modified this to enable us to understand more about the pollinating insects in Cyprus for [Pollinator Monitoring Scheme – K pros](#) (PoMS-K ).



Solitary bee on Oxalis flower (photo by Pantelis Charilaou)

This document contains all the information you need to carry out a FIT Count. The Count is not difficult to do, but we need to collect data as carefully as possible so that it can be analysed to provide information on potential changes in insect numbers. Please do follow this guidance as closely as you can.

Planning your FIT Count

What will I need to carry out a survey?

- You need about 15 minutes of time – the count itself lasts for 10 minutes.
- Counts can take place all year, in dry and reasonably warm weather, see weather conditions below.
- You will need to find a location containing a target flower species to watch during the FIT Count. This can be in a garden or park, in the countryside or on a nature reserve – anywhere that has suitable flowers can be used. See below for the suggested target flower list but any species can be used.
- You need to watch insects in a 50cm by 50cm square patch – the easiest way to define this is to use a quadrat (see below).
- You are asked to take a digital photo of your target flower species, and on at least some of your counts to take photos of examples of the different types of insect you have seen.
- Print out the recording form, and make sure you have a pencil or pen to record your counts.
- If needed, print out the identification guides to plants and insects.
- After the count, please add your results to the PoMS form at www.ris-ky.info/poms-ky

What weather conditions are suitable?

A FIT Count can be carried out between 7 am and 6pm between all year around, as long as the weather is dry and warm (not raining or with very [strong winds](#)):

- If sky is clear (less than half cloud) the minimum temperature for a count is 13 C

- If sky is cloudy (half cloud or more) the minimum temperature for a count is 15 C   Do not record if it is more than 30 C as it will be too hot for the insects and you!

Please do not carry out counts when the temperature is outside of the above thresholds. You are asked to provide simple information about the amount of sun and shade during your count, and the wind conditions. See the recording form for details.

What location can I use?

Your location can be anywhere where there are flowers to attract pollinating insects. An urban garden or park is suitable, or in more rural areas it could be on farmland, on a nature reserve – anywhere where suitable flowers are growing, where you have permission to be, and where it is safe to go (see the Stay safe section below).

You can carry out a FIT Count as a one-off exercise at any suitable site, but we are keen to have counts repeated on different dates and times at the same site, so places that you can easily gain access to (such as gardens or nearby parks) are ideal for this.

The target flowers

Which target flowers do I need to find?

Whenever possible we would like you to find one of the flower species listed in the table below (see also the separate flower identification guide for more information). You don't have to find a particularly large patch of the target flower, and the target flower can either be growing in a patch all of the same flower, or among different flower species. We ask you to record how many of your target flowers are in your quadrat (see below) to help us understand how many insects have been attracted to the flowers.

Counting the flowers

To get an idea of the amount of flower resources in the area you are surveying we ask you to give counts of the number of target flowers **within the 50x50 quadrat** using the following number categories:   1-5   6-20   21-50   >50

Depending on the plant species you will record the number of target flowers using different units as follows:



In some cases you may have very many flowers to count (e.g. in a dense patch of lavender). If so it is fine to make an estimate, e.g. by counting flower 'units' in a quarter of the quadrat and multiplying by four to get a total for the whole quadrat. Only count flowers that are reasonably fresh and that are likely to attract insects – 'dead-head' flowers and seedheads should not be counted.

In addition, we also ask you to record how much of your 50x50 quadrat the target flower covers. As with the above count of flowers, this is for flowers of your target flower species only. Do the target flowers:

Less than  About More  than half the 
 half the  half the  the 
 quadrat quadrat quadrat

Finally, we ask you to record whether your target flowers within the quadrat are growing:

- Within a larger patch of flowers all of the same species
- Within a larger patch of flowers of different species
- In an isolated patch that does not extend beyond your quadrat

See the separate target flower guide for more information.

Common name	Cypriot name	Latin name	Status	Flowering from	Flowering to	Flower type
Chrysanthemum	Χρυσάνθεμο	<i>Glebionis coronarium</i>	Native	Jan	Dec	Flower head
African Boxthorn	Φραμός	<i>Lycium ferocissimum</i>	Non-native	Jan	Dec	Ind.flower
Tree Tobacco	Γιατρός	<i>Nicotiana glauca</i>	Non-native	Jan	Dec	Ind.flower
Common Winter-Cherry	Μερτζανιά	<i>Withania somnifera</i>	Native	Jan	Dec	Ind.flower
Rock-roses	Ξισταριές	<i>Cistus spp</i>	Native	Jan	Jun	Ind.flower
Anemone	Ανεμώνη	<i>Anemone coronaria</i>	Native	Jan	Apr	Ind.flower
Hopseed-Bush	Δωδόνεια	<i>Dodonaea viscosa</i>	Non-native	Jan	Apr	Ind.flower
Spiny Broom	Ρασή	<i>Calicotome villosa</i>	Native	Jan	May	Flower spike
Primrose Jasmine	Κίτρινο γιασεμί	<i>Jasminum mesnyi</i>	Non-native	Feb	Sept	Ind.flower
Common Lantana	Λαντάνα η καμάρα	<i>Lantana camara</i>	Non-native	Feb	Sept	Flower head
Acacia	Ακακία	<i>Acacia saligna</i>	Non-native	Feb	May	Ind. flower
White Mustard	Λαψάνα	<i>Sinapis alba</i>	Native	Feb	July	Ind.flower
Poppies	Παπαρούνες,	<i>Papaver spp.</i>	Native	Feb	Jun	Ind.flower
Waterbush	Μυοπόρο	<i>Myoporum tenuifolium</i>	Non-Native	Feb	Apr	Ind.flower
Bindweed	Χωνάκι	<i>Convolvulus spp.</i>	Native	Mar	Jul	Ind.flower
Judas Tree	Δέντρον του Ιούδα	<i>Cercis siliquastrum</i>	Non-Native	Mar	May	Ind.flower
Lavender	Λεβάντα	<i>Lavandula stoechas</i>	Native	Mar	May	Flower spike
Camel's Foot	Παθκία του καμήλου	<i>Bauhinia variegata</i>	Non-native	Mar	May	Ind.flower
Bottlebrush	Καλλιστήμων ο λογοχειδής	<i>Callistemon lanceolatus</i>	Non-native	Mar	May	Flower spike
Chinese Hibiscus	Ιβίσκος	<i>Hibiscus rosa sinensis</i>	Non-native	Apr	Jan	Ind.flower
Heliotropes	Ηλιοτρόπιο	<i>Heliotropium spp.</i>	Native	Apr	Nov	Flower spike
Common Passion Flower	Ρολογάκι	<i>Passiflora caerulea</i>	Non-native	Apr	Oct	Ind.flower
Fennel	Αναθρήκα	<i>Foeniculum vulgare</i>	Native	Apr	Sept	Flower umbel
Myrtle	Μερσινιά	<i>Myrtus communis</i>	Native	Apr	Aug	Ind.flower
Olive	Ελιά,	<i>Olea europaea</i>	Native	Apr	Jun	Flower spike
Silky Oak	Γρεβιλλέα η ισχυρή	<i>Grevillea robusta</i>	Non-native	Apr	May	Flower spike

Sharpleaf Jacaranda	Τζιακαράντα	<i>Jacaranda mimosifolia</i>	Non-native	Apr	Oct	Ind.flower
Blue Plumbago	Πλουμπάγο η ωτοειδής	<i>Plumbago auriculata</i>	Non-native	May	Nov	Flower head
Silk Tree	Αλμπίτσια	<i>Albizia julibrissin</i>	Non-native	May	Sept	Ind.flower
Spanish Jasmine	Άσπρο γιασεμί	<i>Jasminum grandiflorum</i>	Non-native	Jun	Jan	Ind.flower
Lesser Bougainvillea	Βουκεμβίλια, Γιαννής	<i>Bougainvillea glabra</i>	Non-native	Jun	Nov	Ind.flower
Jerusalem Thorn	Παρκινσόνια	<i>Parkinsonia aculeata</i>	Non-native	Jul	Aug	Ind.flower
Yellow Elder	Βιγνόνια	<i>Tecoma stans</i>	Non-native	Oct	Jan	Ind.flower
Bermuda buttercup	Ξινάκι	<i>Oxalis pes-caprae</i>	Non-native	Nov	May	Ind.flower

If you cannot find any of the flowers from our list at your location, it is fine to choose another flower that is attracting insects. Ideally this will be a flower of a species that you recognise so that you can tell us which species you used, but if your only option is to use a flower that you don't recognise you can tell us that and provide a photo. (There is a list of flowers that attract good numbers of pollinators in the target flower guide.)

Some of the plant names on our list of target species apply to groups of species, for example "poppies" or "rock-roses". These are groups of similar-looking plants that are attractive to pollinators, so you can choose any one of the group without having to worry exactly which species it is. However, if you do know the species please add that information to the recording form. See the target flower guide for more information.

If you chose to record pollinator visits to a species of wild plant native to Cyprus, this species should be in the drop down list on the online form if you click on 'I recorded a wild plant' and begin typing the first few letters of the plant name in the box that appears. You can then select the correct plant species from this list. If you chose a garden plant that is not native to Cyprus it is likely it will not be on this list so you should click on 'I recorded a garden plant' and enter the name of the plant species manually.

For each FIT Count that you do, please add one or two photos of your target flower. This will allow us to double-check the flower species used for the counts. For distinctive species one photo of a flower will be sufficient, but for less distinctive species, or species that you are not sure of, please provide a photo of the

flower and a

second photo of the stem and leaves.

How do I use a quadrat?

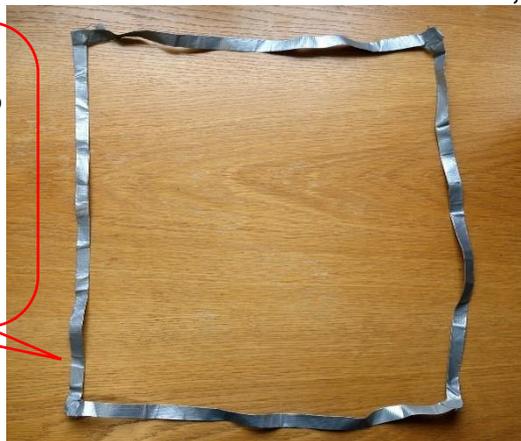
You are asked to count the insects visiting your target flowers within a 50cm by 50cm square patch. The easiest way to do this is to set up a 'quadrat' to define the square. A quadrat can be made using stiff cardboard or wire, or lengths of cane etc., cut to be 50cm on each side. Or you can make one using a 2-metre length of string, with knots tied in at each 50cm interval to allow you to arrange it in a square, or with folded gaffer tape (see below). It is also possible to buy 50cm quadrats (e.g. <http://www.nhbs.com/title/159625/q1-quadrat>).



Using a quadrat with White Dead-nettle as the target flower

Each side of the quadrat can be made from a strip of gaffer tape, about 54cm long (to allow for overlaps at the corners).

Fold each strip back on itself so that it is no longer sticky.



Cut a small strip of gaffer tape to bind the corners together.

For plants growing at or near ground level the quadrat can be positioned over the area being counted, as shown in the photo above. For tall plants/shrubs, such as Hawthorn or Ivy, the quadrat can be positioned vertically or at a convenient angle in the shrub, as long as it clearly marks out the area of flowers that you are going to use for your count.

Counting insects

How do I count and identify the insects?

The actual count should last for ten minutes – if you have a mobile phone with a timer or alarm that is an easy way to ensure you count for exactly the right length of time. You should stand close enough to the flowers so that you can see visiting insects easily, but try not to lean right over the top of the flower patch as this can prevent insects from visiting.

During the ten minutes, use a tally count (e.g. ||||) on your recording form to count every insect and other invertebrate that you observe in the 50x50cm square patch (quadrat):

- Count insects that **land on** flowers of your target plant species, **within** the patch as 'on the flower'.
- Count insects that you observe within your **patch** but that **do not land** on your target flower eg on the ground, leaves or other flowers (ie not your target flower) species as 'not on the flower'.

- Each insect should only be recorded once where possible (sometimes it may be difficult to follow the same individual).
- If an insect is observed both on the flower and off the flower, only record it as ‘on the flower’ in the appropriate column. Similarly, if an insect visits several different flower species and one of those is the target flower species, only record it as ‘on the flower’
- Tiny insects (up to 3mm long, including pollen beetles) should be counted as “Small insects under 3mm long” – there is no need to distinguish which insect group these tiny insects belong to
- Other insects and other invertebrates (over 3mm), such as spiders, that are not in the listed target insect groups should be recorded in one of the ‘Other insects or invertebrates rows on the recording form.
- Where the type of insect/invertebrate is known then use the ‘Other insects or invertebrates (known)’ row and specify the identity of that insect/invertebrate type (see PoMS-K y FIT count checklist).
- Where the type is not known use the ‘Other insects/invertebrates (unknown)’ row (see PoMS-K y FIT count checklist).

You are asked to identify insects into different groups (e.g. bumblebees, hoverflies), and you do not need to say which actual species you have seen. Identifying insects into groups is not always straightforward: some are fairly obvious (for instance many people are familiar with what a bumblebee looks like), but others can be tricky (such as the smaller hoverflies and solitary bees). Refer to the insect identification guide for tips on what to look out for.

In order to get consistent totals it is important that you count EVERY insect that you observe in the patch within the 10 minutes, even if that means putting a lot into the “Other” categories! It is also important to make sure that the recorded insects/invertebrates are correctly assigned to the ‘on flower’ or ‘not on flower’ categories as this is crucial to determining which insects/invertebrates are involved in pollination.

If you have a lot of insects flying in and out of your quadrat it can be very difficult to keep track of whether or not you are seeing the same insect over and over again, and we know that the counts won’t always be perfect. All we ask is that you do your best to count every insect that visits your target flowers, and to count each individual insect only once, during the ten minutes.





*For this Hogweed flower, your tally would be eight hoverflies and two other flies. If one or more of these subsequently visited another flower within your target patch, it should not be counted a second time, but if a 'new' insect landed on the flower it would be counted.
(Photo by Martin Harvey.)*

How are the identifications checked?

Everyone makes occasional mistakes when identifying insects, and this will be taken into account when analysing the data. To help us allow for possible misidentifications we ask you to participate in two additional activities:

- After you have finished your count, if possible spend a few minutes taking photographs of examples of the different insect groups that you have seen. There is no need to take a photo of every different species you see, but if you can provide one or two photos to show examples for each insect group that you record that will be very helpful. There is no need to take photos every time you do a FIT count, but if you are doing lots of counts it would be good to have some photos for at least some of the counts.

Sending in your count data

To enter your data you need to go to <http://www.ris-ky.info/record/fit-count>.

The online form should match the field recording form, so all you need to do is to transfer the information you wrote down in the field onto the online form. (There are two optional additional questions at the foot of the online form that ask for your feedback from carrying out the survey.)

Can I record any individual species that I recognise?

We do not need you to record particular species for the FIT Count itself, the focus here is on the species groups. But if you have identified any insects to species level, either during the count or at any time while you have been at your location, then we would encourage you to submit your records to iNaturalist.

How many counts should I do?

All counts, even just a single one, are useful to the project and can be included in our analysis, so please don't forget to add your results to our recording form!

If you are able to carry out multiple counts during the year that would be fantastic, and will add value to your data when we come to analyse it. Ideally we would like counts that are repeated over time at the same location (or very nearby). You can use different flowers at different times of year (and it's fine to move the quadrat around a small area to target different flowers).

If you are able to carry out counts at several locations that is also very useful, but where possible we would prefer more counts at fewer locations, rather than just one count at lots of locations. If you are able to do one count a month, or one a week, throughout the year that would provide a really good set of data to add to the project.

Stay safe

As a volunteer, you are under no obligation to participate or continue with this survey. Volunteers are responsible for their own health and safety, and should not put themselves in a position that could place them, or others, in danger. You should never undertake any activity if you have concerns about your own or others' health and safety. If you have any such concerns, you should stop the count.

When selecting a location for a FIT Count we would ask that you keep to areas that are publicly accessible, or along public footpaths, or in locations where you have access arrangements with the landowner.

You can carry out the count at any location with suitable flowers, and there is no need to seek out remote sites. But if you are travelling away from home for your count, always leave a note of your whereabouts with a responsible person. This should include: a date and time of survey visit, expected time of leaving the site and return to home, and vehicle identification details. The person to whom these details are given should be told who to contact if you do not return and at what time to raise the alarm. If possible, do not work alone. It is advisable to carry a fully charged mobile phone in case of an emergency. Before undertaking any survey activity, every surveyor should consider the particular health and safety risks associated with their individual survey sites and whether their individual circumstances and medical conditions expose them to particular risks. Think about what precautions are needed to minimise risks, including wearing appropriate footwear and protection from the sun.

Who is organising this project?

The FIT Count is part of the Pollinator Monitoring Scheme – K ypros (PoMS-K y) within the Researching Invasive Species in K ypros ([RIS-K y](http://www.ris-ky.info)). This protocol has been modified from the methods designed by the UK Pollinator Monitoring and Research Partnership, coordinated by the Centre for Ecology & Hydrology (CEH).

For further information about PoMS-K y please visit <http://www.ris-ky.info/poms-ky>



Please see here <https://www.ris-ky.info/terms-of-use> and here <https://www.ris-ky.info/privacy-notice> for terms and conditions for the privacy notice for Mini-PoMS-Ky

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