

Canberra Urban Biodiversity Surveys

Citizen Science Guide to Monitoring Insect Pollinators



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Summary

Urbanisation can have significant impacts on native insect pollinators. As the city of Canberra grows and native vegetation is cleared for development, pollinator populations may decline due to loss of food or nesting resources and exposure to pesticides. Urbanisation also fragments habitats, creating barriers to pollinators moving between patches of suitable habitat. This can lead to diminished pollination services for native flowering plants and reduced genetic diversity in pollinator populations. Citizen science provides an effective way to collect data that contributes to our understanding of how urbanisation impacts insect pollinator populations, so we can implement measures that support the conservation of these important species.

Canberra Urban Biodiversity Surveys

The Canberra Urban Biodiversity Surveys (CUBS) is a new program from the ACT Government's Office of Nature Conservation. The objective of CUBS is to find urban green spaces used as habitat by native wildlife and identify the habitat features that support these species' persistence. This information helps prioritise restoration efforts to enhance ecological connectivity and maximise biodiversity benefits in Canberra's urban landscape.

The CUBS *Citizen Science Guide to Monitoring Insect Pollinators* is designed to provide a comprehensive guide for individuals and groups interested in contributing to insect pollinator conservation in Canberra. Conducting CUBS insect pollinator surveys involves using timed plot-based surveys in urban green spaces. CUBS volunteers photograph insect pollinators and flowering plants within a dedicated monitoring plot and upload the records to Canberra Nature Map (CNM) for identification by experts. Before contributing to a CUBS insect pollinator survey, volunteers will need to attend a training session. Once familiar with the survey methods, volunteers are ready to start searching for insect pollinators.

In addition to providing information on how to conduct plot-based surveys and record your observations on CNM, this guide also includes some tips for photographing pollinators and best practices for conducting pollinator surveys.

Let's get started and help protect our valuable pollinator species!

Summary checklist for surveys

- Pick your time of day appropriately
- Locate central point
- Walk around the area briefly to determine the best places to look
- Record weather and start time of survey.
- Start timer (remember to pause if you spot something)
- Pause at each flowering plant within a 50m radius
- Record the **end time of your survey**
- Submit your survey through Canberra Nature Map (CNM)
- Submit any additional photos via individual sightings, including reference to your survey site

Volunteering

Registering as a volunteer

If you would like to register as a volunteer for the CUBS Insect Pollinator Surveys, click the "Contact" button on [this page](#). This will prompt you to send a message to the survey organisers.

After registering, you will receive a confirmation email. You can then register your attendance at one of our mandatory training sessions on [this page](#). Those who have registered will receive email updates about future surveys.

Volunteer training

Volunteer training is important to ensure all CUBS volunteers consistently use the same methods to collect comprehensive and reliable data on the insect pollinators found in Canberra's urban green spaces.

Free training in the correct survey methodology and pollinator identification will be provided to volunteers registered to participate in the CUBS Insect Pollinator Monitoring Program. You will also have the opportunity to ask questions. For details and to RSVP, please visit the [Eventbrite page](#). Please bring a notebook and pen. **Note:** Group training has concluded for 2023, however if you have not been and would like to participate, please get in touch using the contact details below.

General information

If you are unable to attend a site **for an extended period**, as a result of a planned absence or on short notice (e.g., due to illness) this is ok. Please let us know as early as possible by email and/or phone on the contact details below.

Useful Contacts

Emma Collins (CUBS Project Officer) – woyapp@hotmail.com; 0423 512 775

Emmeline Norris (ACT Government Ecologist) – CNCP@act.gov.au

Ginninderra Catchment Group coordinator - landcare@ginninderralandcare.org.au

Southern ACT Catchment Group coordinator - info@sactcg.org.au

Molonglo Catchment Group coordinator - coordinator@molonglocatchment.com.au

Survey Methodology

Monitoring frequency

Insect pollinator activity can vary depending on the species and the time of year. While some native insect pollinator species may be active year-round depending on the availability of floral resources and suitable habitat, many species are physiologically limited by external temperatures and are only active during the warmer months, from October to March.

However, different plant species flower at different times of year, and this may vary annually depending on the local climate. Therefore, to obtain an accurate representation of insect pollinators in urban Canberra, we ask that volunteers visit their assigned site fortnightly between October and March to monitor flowering, although we understand if this is not possible (see details above regarding arrangements for extended absences). **Surveys should be conducted at least once per month from October to March**, although we encourage volunteers to conduct surveys more frequently if possible.

Insect pollinator surveys should only be conducted when flowers are in bloom, since floral resources are necessary to detect pollinators in these surveys, and on a day with suitable weather conditions (see below).

Note: Please submit a survey record via Canberra Nature Map (CNM) to record each site visit, even if there were no flowers present and hence no survey was conducted. This helps us later determine if surveys were not completed due to no flowers being present, or for other reasons.

Weather and timing of surveys

Weather has a strong effect on the detectability of insect pollinators, and they are less likely to be active in overcast, cold, or windy conditions. **The best time of day to monitor insect pollinators is in the morning on warm, sunny days with little to no wind.** To optimise sightings, conduct surveys when the outside temperature is at least 18°C, wind speeds are less than 10 km/h, and there is enough sunlight to see your shadow (typically between 9am and 3pm).

To ensure you monitor during optimal conditions, you can adjust the time of day when monitoring occurs depending on the season and prevailing weather. For example:

- In early spring when temperatures are cooler, it can be better to sample your plot during the late morning (between 10am and 11am).

- On hot days in late spring and summer, sampling earlier (between 8am and 10am) is preferable as many insects seek shelter in the hottest part of the day.
- Late afternoon can be good for observing pollinators in summer as some species become more active as temperatures decrease.

We recommend checking the Bureau of Meteorology (BOM) website or mobile app ahead of time to determine when the best day of the week will be to conduct surveys.

If you are unable to find a time to conduct your monthly survey in optimal conditions, please still complete a survey. Choose the day with the best weather in the timeframe you are available.

Arriving at your monitoring plot

Monitoring plots will be established in woodlands, grasslands, and urban parks in Canberra that are known to have flowering plants present. You will be assigned one of these plots and given the GPS coordinates of the central survey point for that plot. Input these coordinates into Google Maps and it will give you directions to your plot. It may be helpful to do this before your first day of monitoring to ensure you know how to get there and can complete the survey efficiently.

Surveys will be conducted within a 50-metre radius of this point. To help you stay within this area, you will also be given a Google Maps link that will show a 50-metre radius around all survey points. Navigate to your survey location to see your location (blue dot) in relation to the 50-metre radius.

Google Maps may take a moment to update your location.

Before starting your survey, it is recommended to first walk around the plot area to determine the variety and location of flowers, so you can target your survey to these areas.

Recording observations in the datasheet

When you arrive at your plot, please note the weather conditions in the datasheet provided on the last page of this monitoring guide. Although not mandatory, we recommend taking a copy of this datasheet with you when surveying to record the start and end time of your surveys and any additional comments.

If you have a reliable mobile internet connection, you may choose to record your survey directly to Canberra Nature Map via your mobile browser rather than the paper data sheet.

It is not possible to upload a survey using the NatureMapr mobile app. See 'Uploading a survey to Canberra Nature Map' below for more details.

Plot-based surveys of insect pollinators and floral resources

Surveying insect pollinators

Once you have found your central survey point and are ready to start surveying, **start your timer** (a stopwatch or mobile phone will do) and begin your 30-minute survey, noting your start time on the datasheet. Staying within an approximately 50 m radius of your survey point, walk throughout your plot looking for any plants in flower. Pause at any flowers and check for visiting insects on or inside the flower, ignoring insects that fly overhead without landing or that are on the stems or leaves of the plant.

If you see an insect visiting a flower, take a photograph of the insect, ensuring that the image is in focus and free of shadows. ***Flowers on trees should be included in the survey, however only those at/around eye level.***

As we want to establish a standard sampling duration for all monitoring plots, and volunteers' experience and photographic equipment will vary, **please pause your timer when taking a photograph and take your time to get a clear photograph of the pollinator.** This helps us guarantee that sampling effort is uniform between observers and sites and for each sample period and year and increases the chances of CNM moderators being able to successfully identify insects to species level.

Once you have a clear photo of the insect, restart your timer, and continue surveying your plot. When you reach the end of the 30-minute time limit, stop your timer, and record your end time on the datasheet provided.

Doing a practice survey can help you gauge what speed you need to search your plot to complete the survey within the 30-minute survey period (excluding pauses). However, if you decide to do this, make sure you do it on a different day to minimise disturbance to insect pollinators.

Any photos of insect pollinators and flowers that were taken as part of the survey should be uploaded to CNM and will form part of your survey submission (see page 9 "Uploading Data to Canberra Nature Map" for more details).

If you see any additional insect pollinators when walking back through your plot, you may photograph them and upload them to CNM as separate sightings. However, please **do not** include them in the Monitoring Insect Pollinators survey submission as they were not recorded during the 30-minute survey period, and this will compromise the integrity of the data.

Note: you do not need to photograph the same species of pollinator multiple times if you see it visiting different flowers. Instead, you can estimate the total abundance of that species throughout the site when uploading your initial sighting to CNM. If you are not sure if it is the same species, record it as a new observation.

How to observe pollinators at flowers

The following points should be kept in mind when collecting observational data on insect pollinators:

- **Be patient.** If the site you are monitoring has only recently been planted with flowering plants, it may take some time for the plants to establish, produce flowers, and attract pollinators. Do not be disheartened if you do not see any pollinators during the first year.
- **Focus your photography exclusively on insect pollinators visiting flowers.** We are interested in determining the availability of floral resources for pollinators at each site. Therefore, please refrain from documenting pollinators on plant leaves or stems. Our goal is to identify the flowers that are present and being utilised by pollinators.
- **If you encounter an insect on a flower that you couldn't photograph** but believe it belongs to a different species from those already documented, make a note on the data sheet. Specify the group of insects you think it belongs to and indicate the number of un-photographed species from that group.
- **Do not photograph flying insects** unless you have seen them at a flower and were unable to photograph them there.
- **Do not photograph ants or spiders.** You may see ants and spiders on flowers. However, they are being recorded as part of the survey at this time, so please don't record them.
- **Try to identify pollinators to at least group level.** Don't worry if you record a fly as a bee or make other misidentifications, as sightings will be checked by an expert team. If in doubt, please photograph and load a sighting of the insect in question.
- **Look closely for all types of flowers.** Insect pollinators often visit flowers that may not be easily noticeable to humans but possess unique ultraviolet colour patterns that attract and guide them towards pollen and nectar. These flowers may be small or lack vibrant colours.
- **Pay attention to the inner parts of flowers.** Smaller pollinators often forage deep within flowers, near the anther and stigma. In cone or funnel-shaped flowers, it may be challenging to spot pollinators initially. If you are unable to capture a clear photo of a

pollinator due to obstruction, simply make a note of the pollinator group you believe it belongs to and proceed. Avoid damaging the flower to access the insect.

- **Avoid disturbing insect pollinators before you can photograph them.** To increase your chance of detecting pollinators, move slowly and quietly and do not stand too close to the flowers you are observing. Try to avoid casting a shadow over the flowers you are observing as this can also cause pollinators to fly away before you can photograph them.
- **Try and photograph all different species of insects you see at flowers in your plot.** As you go, make a note of the number you see of each insect type and enter the total number (or number range, i.e., 1-3, 4-15, 16-100, 100-1000) for each species for the whole plot.
- **Take clear photographs of insects from different angles to aid in species identification.** Multiple photos capturing anatomical details such as wing patterning, venation, and antennae will be helpful. While a perfect photo is not necessary, even a blurry image can provide valuable information and allow identification to a major taxa group. Focus on accurately indicating the abundance and diversity of pollinators within your plot rather than striving for perfect photos of a few species.
- **If possible, use a zoom or a macro camera lens.** Although not necessary to capture a good photo, using a zoom or macro lens on your camera can assist with pollinator identification by Canberra Nature Map moderators. Affordable macro lenses are also available for mobile phones if you do not have a handheld SLR or mirrorless camera.

Uploading a survey to Canberra Nature Map

After completing your survey, you are ready to upload a survey submission and associated sightings to CNM.

Your survey submission will include survey details and weather conditions. All photographs and species identifications will be recorded as sightings. Please also see associated video for assistance. It is useful to report sightings first, as you can enter the “Sighting ID” (numbers at the end of the sighting URL, once submitted) into your survey form notes.

1. If needed, upload your insect pollinator photos from your camera to your computer. We recommend putting your survey photos into a folder labelled with the survey site code and date on your personal drive to keep them separate from your other photos.
2. From the main page of CNM, click “+Add a sighting”
3. On the sighting form, attach up to five insect pollinator photographs into the “**Media**” box at the top of the page.

4. As shown in the image below, for “**Location**”, select the “Survey point” tab and from the first drop down choose “Monitoring Insect Pollinators”. In the second drop-down that appears, select the name of your survey site. GPS coordinates of your central survey point will be auto-populated.

Location

Map Survey point Coordinates

Survey

Monitoring Insect Pollinators

Private property

Suppress the location of this sighting from public view?

Survey point

Please select...

Please select...

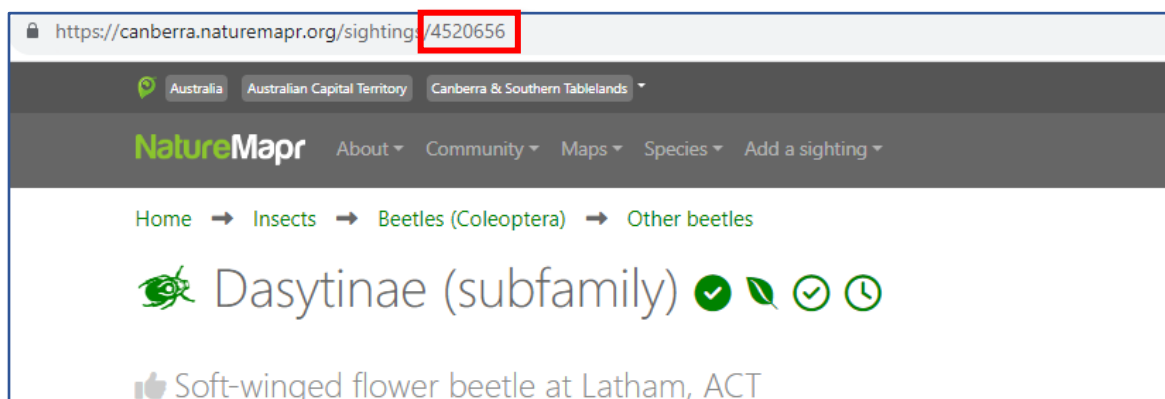
Ainslie Volcanics Grassland (AGQ)

Black Mountain NR (BMS)

Black Mountain Peninsula (PEN)

Blue Devil Grassland, Umbagog Park (BDG)

5. Update date and time to match that of your survey, if needed. You can do this by clicking on the “**Recorded on**” box and changing date and/or time.
6. Record the abundance for this sighting. Either enter an abundance range from the drop-down menu or an exact abundance value if you know exactly how many individuals of that species you saw.
7. Under “Identification” you will have the option to search for the species in the search bar or select from suggested classes. You can select anywhere from Order to Species, or anywhere in between. You can leave the identification at Order and your best guess is fine as these will later be confirmed by expert moderators.
8. Repeat until you have uploaded sightings of all the pollinators you observed in your survey.
9. Once reported, you can copy your “Sighting ID” (shown in below image) and enter this into the Survey form (instructions in next steps)



Notes on sightings:

- Each sighting record will be limited to one pollinator species.
- If you are familiar with the “Collections” feature, this could be a useful way to copy multiple sighting links into your survey.
- If you have multiple of the same species, on the same flower, this is considered one sighting. Include as many photos as you are able to help moderators identify the insect.
- If you identify the same species, on a different flower, please list this as a separate sighting.
- Abundance can be used to record multiple instances of the one species.
- Please ensure you have included sightings for all pollinators in your original survey.
- We will be able to associate these observations with your main survey entry using the date, time, and survey point information, so please take careful note of the survey point you select for your additional sightings.

Complete a “Monitoring Insect Pollinators” survey submission on Canberra Nature Map

10. Go to the following link: <https://canberra.naturemapr.org/surveys/types/8>
11. Click the “**Add a survey**” button.
12. Under “**Location**” in the “Survey point” tab, select your site code from the “**Survey Point**” drop-down menu. The GPS coordinates of your central survey point will be auto-populated.
13. Next, under the “**Date & time**” field, click on the “**Recorded on**” box and select the date and time your survey was conducted (enter the start time of your survey if you are unsure when the photos were captured).
14. Enter in your survey information including weather conditions and numbers of unphotographed insects.
15. Into the Description (public) field, enter the following information:
 - a. Start and End time of your survey (if recorded) inclusive of time spent photographing
 - b. List of insect pollinators observed on flowers (i.e. the number of sightings we should expect to see) and (if possible) the sighting IDs for your sightings.

For example:

“Start time: 10:00. End time: 10:52

1 x moth – sighting ID 34654
2 x butterflies – IDs 45666 and 12883
1 x bee – ID 45660”

Note: If you report your sightings *after* reporting your survey, you will be able to edit your survey to include this information later.

16. Click the “Report this survey” button to submit your survey!
17. Check [this page](#) to ensure your survey has uploaded. Noting that surveys can take up to 30 minutes to show here and that the list is in descending date order of the survey date (not today’s date).

Congratulations on participating in the CUBS Insect Pollinator Surveys!

Your participation and valuable contributions will have a positive impact on the conservation of insect pollinators in the ACT.

CUBS Insect Pollinator Datasheet

Use this sheet to record site details for your surveys.

Survey details				
Site name:				
Site code:		Date:		Start time:
Observer/s:			End time:	

Weather conditions	
Cloud cover:	<input type="checkbox"/> No clouds <input type="checkbox"/> Scattered clouds (< 25%) <input type="checkbox"/> Broken clouds (< 75%) <input type="checkbox"/> Overcast (< 100%)
Wind:	<input type="checkbox"/> Still (< 1 km/h) <input type="checkbox"/> Light breeze (1 - 5 km/h) <input type="checkbox"/> Light wind (5 - 25 km/h) <input type="checkbox"/> Windy (> 25 km/h)
Temperature (°C):	

Numbers of un-photographed insects							
Bees:		Wasps:		Butterflies:		Moths:	
Beetles:		Flies:		Hover flies:		Bee flies:	

Additional comments

