



X-Polli:Nation Survey Booklet

For more information and to submit your data
www.opalexplorenature.org/xpollination



Introduction

You can create a buzz for pollinators by taking part in the X-Polli:Nation project.

This project was inspired by the original Polli:Nation Survey and has been combined with other tools and approaches to improve the quality of data collected, monitor interactions between plants and visiting insect pollinators, and collect information in new countries. As a citizen scientist you can:



Learn about pollinators and use our X-Polli:Nation digital training tool to help identify different species



Record pollinators using this X-Polli:Nation Survey Booklet



Create habitat for pollinators using our species-specific Planting for Pollinators digital guide



Spread the word about conserving pollinators by using our Polli:Promise campaign as inspiration

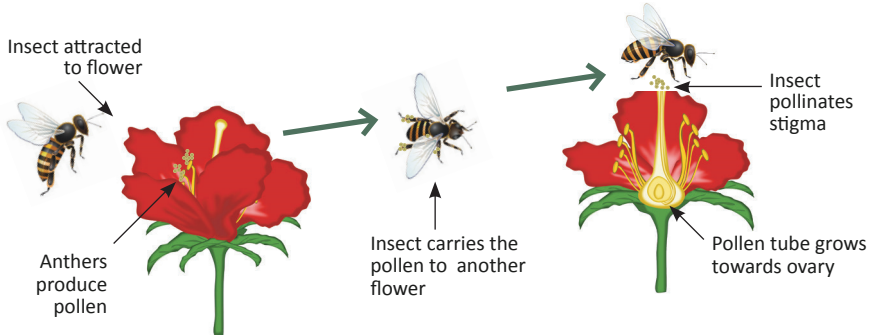
For more information on each of these activities, see:
<https://www.opalexplorenature.org/xpollination>

What are pollinators?

Pollinators are animals that move pollen from one flower to another, and in doing so, fertilise plants to make seeds and reproduce.

Pollinators come in many forms across the world (including birds, bats and lizards), but it is often insects that plants rely on for pollination. These insects include **bees, butterflies, flies and beetles.**

More than 4 in 5 European crops benefit from animal pollination. This process produces the wide variety of plants we see, feeds our wildlife and provides much of the food that we eat. Pollinators are important for our economy; **the loss of pollinators could cost Europe around €15 billion in lost crops alone.**



Pollinators need different habitats (places to live) in order to feed, nest and shelter. However, human activity has put these habitats under pressure.

How are pollinators affected by a changing environment?

Human activities are affecting the total number of pollinating insects, the number of different types of pollinators and where they are found.

What is causing this?

- Habitat loss
- Pests and diseases
- Climate change and extreme weather
- Pesticide use
- Competition from invasive species



Survey preparation

Thank you for taking part in the **X-Polli:Nation Citizen Science Survey**. This survey enables you to monitor habitats and pollinators in your **local patch**. You will have the opportunity to make positive improvements to your outdoor space by planting three different types of seed mix and surveying before and after making the changes.

This survey is split into two parts and each part should be conducted in the season between **April and September**. We recommend a minimum of **three pollinator surveys be completed each season** (more recording sheets are available on the webpage).

PART Before habitat changes

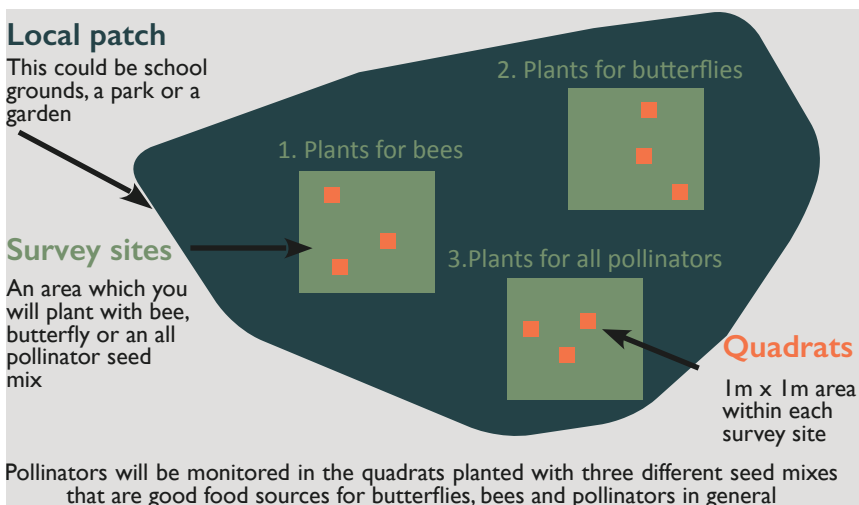
1

This part looks at feeding, nesting and sheltering habitats as well as pollinating insects found **before** changes have been made.

PART After habitat changes

2

Once you have planted three **survey sites** with different seed mixes you are ready to re-survey the plants and insects in your **quadrats** **after** the changes have been made.



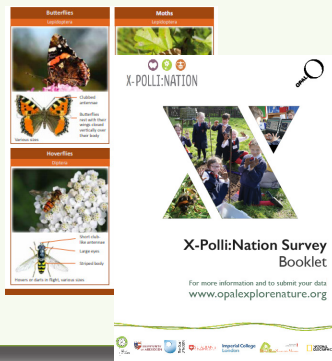
Everyone can take part

This survey is for everyone, but there are a number of registered schools taking part in the X-Polli:Nation Project. If you are not one of these schools but you would like to make changes to pollinator habitats in your outdoor patch we encourage you to do so! Please see the X-Polli:Nation webpage below for simple ways to improve your site, the plant species in these mixes and information about our seed suppliers:



What will you need?

- This X-Polli:Nation Survey **Survey Booklet**, providing background information and recording sheets
- The **Habitat, Plant and Pollinator Identification Guide**
- **Tape measure**
- **Quadrat** (or four sticks & string)
- Waterproof **labels for quadrats**
- **Trowel**
- **Thermometer**
- **Stop clock** (or phone for timing)
- **Camera**
- **Seed mixes** created for bees, butterflies and all pollinators
- **Water** for seeds



Wherever you see this symbol you can find extra help and survey guidance in the **Group Leader Support Guide**. This can be found on the X-Polli:Nation webpage:

<https://www.opalexplenature.org/xpollination>



It is your responsibility to assess the potential risks when carrying out any kind of fieldwork. Hazards may include sharp objects or stinging insects or poisonous plants. Ensure that those taking part can call upon emergency services if needed.

I. Before habitat changes

Choosing your survey site

Choose **three survey sites** within your **local patch** where you would like to plant your seed mixes.

We recommend that you plant as large an area as possible. Schools registered with X-Polli:Nation will be provided with seed packs that contain enough to plant 10m x 10m plots of each mix, with spare seeds for your community. You will need to plant a **minimum of 1m x 1m for your quadrat**. It will need to be an area that will not be mown over during the survey period.

The **before and after surveys should take place in the same location**, therefore mark out the four corners of the 1m x 1m quadrats (using sticks or other markers) as well as the sides (using string or other tape to make a square) before you start surveying and leave these in place until you have finished both parts of the survey. While you may just monitor one set of quadrats, as a school, you can create more quadrats in each seed mix (we recommend 3).

The Seedball seed mixes we are using have been selected to be particularly attractive to (1) bees, (2) butterflies and (3) a range of pollinators. We want to see if they just attract these pollinators or whether other insects visit these plots too. To help us with data analysis, please **label each quadrat with a unique reference code** ('School_Seed mix_Quadrat number'):

- **Bee quadrat:** e.g. 'StA_Bee_2' (if this is the 2nd quadrat on the bee site at St Alban's School)
- **Butterfly quadrat:** e.g. 'StA_Butterfly_3'
- **All pollinator quadrat:** e.g. 'StA_All_1'

Please take three pictures at the different stages of the survey below:

Before changes:

When you have marked out the quadrats and are about to start Part 1



During changes:

When you have dug out the quadrats & scattered the seeds



After changes:

When the plants have grown and you are about to start Part 2



A. Introductory questions before habitat changes

Let us know when, where and who you are doing the survey with today.

1. Today's date. _____



2. Record the location of your survey site (postcode, grid reference or lat/long).

Further help is available on the online survey submission form to help you select the exact location

3. Who are you doing the survey with today (circle one)?

primary school	secondary school	youth group	family or friends
college / university	adult volunteer group	other	

4. Are you conducting this survey at your school as part of the X-Polli:Nation project?

yes	no
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5. Have you identified insects before?

yes	no
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B. Habitats found before habitat changes

6. For each quadrat within your survey site, please give each a unique code (see p5) and tick (✓) the relevant box in the table if a habitat type is found: (a) inside the quadrat and (b) outside (within 3m of) the quadrat.

		Bee Quadrat		Butterfly Quadrat		All Pollinator Quadrat	
Habitat type		a. Inside	b. Outside	a. Inside	b. Outside	a. Inside	b. Outside
Unique quadrat code							
Feeding habitat	Flower beds or pots						
	Wildflowers						
	Trees						
Nesting and shelter habitat	Long grass						
	Bare ground						
	Man-made pollinator homes						
	Damp places						
Other habitat	Bare walls or fences						
	Concrete or tarmac						
	Short grass						
	Other						

C. Pollinators found before habitat changes

7. Which of these best describes the weather at the moment?


☐

☐

☐

8. What is the temperature at the moment? _____ °C

Use a thermometer to record the air temperature. To do this, place the thermometer in a shaded area, about one metre above the ground. It is important to leave the thermometer for at least 10 minutes before you take the reading.

9. How windy is it at the moment?

☐

Leaves still

☐

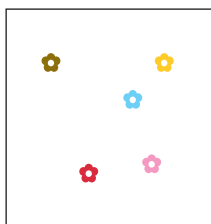
Leaves moving gently
all the time

☐

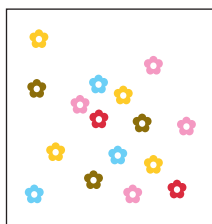
Leaves moving strongly

10. Complete the table on page 8.

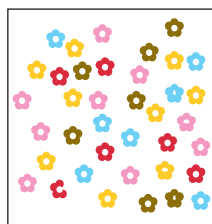
Stand next to your first quadrat. Look at the images below. Which most closely matches your quadrat? Record 1, 2 or 3 in the first row of the table on page 8.



1 flowers occupy
less than half



2 flowers
occupy half











3 flowers occupy
over half

If known, record the name of the most common flower in your quadrat in the second row in table on page 8.



We are interested in finding out how many insects visit each of the quadrats. For each quadrat, one person start your clock and time 5 minutes, another person count the number of insects that enter the quadrat and the third person tally results in the table on page 8. You can pause the clock while you identify the species and record the result.

		Example	Bee Quadrat	Butterfly Quadrat	All Pollinator Quadrat
Unique quadrat code		StA_Bee_2			
Floweriness (1, 2 or 3)		2			
Most common flower		Daisy			
Pollinator groups	Bumblebees 				
	Honeybees 				
	Solitary bees 	o			
	Butterflies 				
	Moths 				
	Hoverflies 				
	Other flies 	o			
	Beetles 	o			
	Unidentified insects	o			















11. Complete the table on page 9 and if possible, take a photo of all the pollinator species you find.



As well as the pollinator groups, we are interested in finding out about the species which you find in the different quadrats. For each quadrat, one person start your clock and time 5 minutes, another person count, identify and take a photo of the insects entering the quadrat, and the third person tally results in the table on page 9. You can pause the clock while you take a photo, identify the species and record the result.




		Example	Bee Quadrat	Butterfly Quadrat	All Pollinator Quadrat
Unique quadrat code		StA_Bee_2			
Hymenoptera	Red tailed Bumblebee				
	Honeybees				
	Common Carder Bee				
	Ashy Mining Bee				
Lepidoptera	Red Admiral				
	Meadow Brown				
	Brimstone				
	Holly Blue				
	Six -Spot Burnet				
Diptera	Marmalade Hoverfly				
Coleoptera	Thick-legged Flower Beetle				
	Red Soldier Beetle				

12. If you found any other species, please tell us what you found if you can name them.

**Thank you for taking part in the first part of the
X-Polli:Nation Survey. Your results are important to us so
please upload your data to**

<https://www.opalexplornature.org/xpollination>

 You are now ready to dig up your 1m x 1m quadrat (and larger site) to plant your seeds.
Make a record of the date that you plant seeds as you will need this for Part 2.

2. After habitat changes



In Part 1 of the survey, you selected where you wanted to plant seed mixes and then recorded the habitats and pollinators you found. After the survey, you then planted three seed mixes and labelled your quadrats according to the insects they are most likely to attract:

- Bee quadrat: 'StA_Bee_2' (if this was the 2nd quadrat on the bee site at St Alban's School)
- Butterfly quadrat: 'StA_Butterfly_3'
- All pollinator quadrat: 'StA_All_1'



Now it is the following year, you should have pollinator friendly plants growing in all three patches. In Part 1 you took two pictures, before you made changes and immediately after planting, now take your photo of your quadrat filled with plants. Remember to photograph and survey the quadrats with the same unique codes in Part 1!

You are now ready to re-survey the 1m x 1m quadrats you marked out to discover the types of plants and pollinators present after planting.

A. Introductory questions after habitat changes

Let us know when, where and who you are doing the survey with today

13. Today's date. _____

14. Record the location of your survey site (postcode, grid reference or lat/long).

Further help is available on the online survey submission form to help you select the exact location

15. Who are you doing the survey with today (circle one)?

primary school	secondary school	youth group	family or friends
college / university	adult volunteer group	other	

16. Are you conducting this survey at your school as part of the X-Polli:Nation project?

yes	no
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17. If you have planted 1 x1 m quadrats with seed mixes, circle which ones you have created.

seed mix for bees	seed mix for butterflies	seed mix for all pollinators
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18. What is the total area that you have planted of each mix?

_____ m ² for bees	_____ m ² for butterflies	_____ m ² for all pollinators
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19. Date of planting seeds.

B. Habitats found after habitat changes

20. Tick (✓) all the plants that you can see inside each of the Bee, Butterfly and All pollinator quadrats (1m x 1m areas).



Common Toadflax

Bee	Butterfly	All pollinator
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Cornflower

Bee	Butterfly	All pollinator
-----	-----------	----------------



Cowslip

Bee	Butterfly	All pollinator
-----	-----------	----------------



Meadow Cranesbill

Bee	Butterfly	All pollinator
-----	-----------	----------------



Oxeye Daisy

Bee	Butterfly	All pollinator
-----	-----------	----------------



Red Campion

Bee	Butterfly	All pollinator
-----	-----------	----------------



Musk Mallow

Bee	Butterfly	All pollinator
-----	-----------	----------------



Forget-me-not

Bee	Butterfly	All pollinator
-----	-----------	----------------



Purple Loosestrife

Bee	Butterfly	All pollinator
-----	-----------	----------------



Yarrow

Bee	Butterfly	All pollinator
-----	-----------	----------------



Birdsfoot Trefoil

Bee	Butterfly	All pollinator
-----	-----------	----------------



Red Clover

Bee	Butterfly	All pollinator
-----	-----------	----------------



Foxglove

Bee

Butterfly

All pollinator



Viper's Bugloss

Bee

Butterfly

All pollinator



Wild Marjoram

Bee

Butterfly

All pollinator



Chamomile

Bee

Butterfly

All pollinator



Corn Marigold

Bee

Butterfly

All pollinator



Ragged Robin

Bee

Butterfly

All pollinator



Common Poppy

Bee

Butterfly

All pollinator



Bellflower

Bee

Butterfly

All pollinator



Meadow Buttercup

Bee

Butterfly

All pollinator



Meadowsweet

Bee

Butterfly

All pollinator



Borage

Bee

Butterfly

All pollinator



Evening Primrose

Bee

Butterfly

All pollinator



Greater Knapweed

Bee

Butterfly

All pollinator

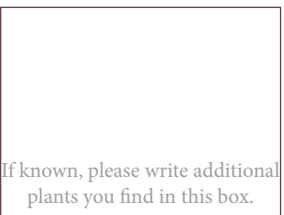


Cow Parsley

Bee

Butterfly

All pollinator



If known, please write additional plants you find in this box.

Other

Bee

Butterfly

All pollinator

C. Pollinators found after habitat changes

Weather conditions

21. Which of these best describes the weather at the moment?


☐

☐

☐

22. What is the temperature at the moment? _____ °C

Use a thermometer to record the air temperature. To do this, place the thermometer in a shaded area, about one metre above the ground. It is important to leave the thermometer for at least 10 minutes before you take the reading.

23. How windy is it at the moment?

☐

Leaves still

☐

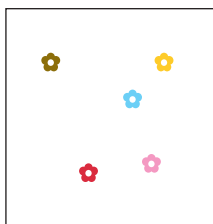
Leaves moving gently
all the time

☐

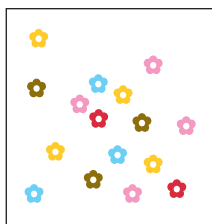
Leaves moving strongly

24. Complete the table on page 14.

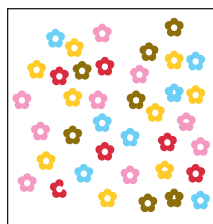
Stand or kneel next to your first quadrat and look at the images below. Which most closely matches your quadrat? Record 1, 2 or 3 in the second row of the table on page 14. If known, record the name of the most common flower in your quadrat.



1 flowers occupy
less than half











2 flowers
occupy half



3 flowers occupy
over half

For each quadrat, one person start your clock and time 5 minutes, another person count and identify the insects that enter the quadrat and the third person tally results in the table on page 14. You can pause the clock while you identify the insect group and record the result.

			Bee Quadrat	Butterfly Quadrat	All Pollinator Quadrat
Unique quadrat code	StA_Bee_1				
Floweriness (1, 2 or 3)	2				
Most common flower	Daisy				
Pollinator groups	Bumblebees 				
	Honeybees 				
	Solitary bees 	o			
	Butterflies 				
	Moths 				
	Hoverflies 				
	Other flies 	o			
	Beetles 	o			
	Unidentified insects	o			

Recording
sheets



25. Complete the table on page 15 and if possible, take a photo of all the pollinator species you find as they land on the plants.



For the Bee and Butterfly Quadrats, one person start your clock and time 5 minutes, another person count and identify and take a photo of the pollinator species you find landing on different flowers that enter the quadrat, and the third person tally results in the table on page 15. You can pause the clock while you take a photo, identify the species and record the result.

Thank you for taking part in the second part of the X-Polli:Nation Survey. Your results are important to us so please upload your data to

<https://www.opalexplenature.org/xpollination>

Recording sheets

Bee Quadrat Code:



Species name	Red-tailed B'bee	Honeybee	Common Carder B'bee	Ashy Mining Bee	Red Admiral	Meadow Brown	Brimstone	Holly Blue	Six-spot Burnet	Marmalade Hoverfly	Thick-legged Flower Beetle	Red Soldier Beetle
Common toadflax												
Cornflower												
Cowslip												
Meadow cranesbill												
Musk mallow												
Oxeye daisy												
Red campion												
Other												

Butterfly Quadrat Code:

Forget-me-not												
Musk mallow												
Purple loosestrife												
Red campion												
Yarrow												
Oher												