Learning through Landscapes

Practitioner Guidance for Surveys

Introduction

Welcome to the Natural Nations survey project and thank you for participating.

This resource is a guide to assist in conducting the four individual surveys you will complete with Natural Nations. Whenever a survey says 'see guidance' please refer to this guide.

Firstly, it addresses general survey information and tips that can be applied to all surveys. Then it focuses on each survey individually. Some of the information provided is important to follow closely to ensure accurate data collection. Other information is intended to help facilitate extended learning.

Not all surveys have to be completed by a single class, they can be shared between different classes and teachers.

Remember: This guidance and the corresponding surveys are intended to support outdoor learning. The priority here is to engage young people with nature. So have fun!

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Funders and partner organisations

Green Recovery Challenge Fund

Department for Environment Food & Rural Affairs

The National Lottery Heritage Fund

Environment Agency

Natural England

Leicester City Council

Wildlife Gardening Forum

Co-funded by the European Union

BirdLife Malta

SEO BirdLife

Lund University

Naturskolan i Lund

Lunds Kommun

Please note: the order in which the surveys are discussed in this document reflects the order in which we advise surveys should be completed in your school grounds. The order and their respective abbreviations are summarised below:

S1	S2	S3	S4
School grounds and habitat survey	Bird survey	Pollinators and flowering plants survey	Minibeast and leaves survey
Spring	Spring	Spring/Summer	Spring/Summer

Now that's out of the way – let's begin!

1. General information for surveys

Essential

- Survey sheets printed (one per group)
  - S1 – School Grounds and Habitat
  - S2 – Birds
  - S3 – Pollinators and Flowering Plants
  - S4 – Minibeasts and Leaves
- Pen, pencil and eraser
- 1-metre-long stick(s) and/or 5-metre rope
- Timer (one per group)
- Thermometer (one only)
- Clipboards/suitable alternative
- Spare paper

Helpful

- Identification aids
- Gloves (for stinging plants/leaf litter rifling)
- Camera (can use mobile phones if suitable)
- Sampling pots (one per child)
- Pre-prepared 1x1m squares (one per group)
- Binoculars
- Coloured pencils/crayons
- Suitable tool for creating right angles
- Rulers

About you

- Please complete the 'about you' section at the top of each survey. This helps us validate your data and is useful for later analysis and communication.

Time of day and weather conditions

- Note down survey start time and weather conditions as this might affect the numbers of birds or pollinators you record.
- We advise that all surveys should be conducted during daylight hours.
- **Note:** If you consider the weather to be 'extreme' compared to usual weather in your region (extremely hot, windy, or wet), then please avoid surveying as this could impact the survey.

Time of year

- **Bird surveys** should be conducted in Spring. This is when birds are most vocal which makes locating them a bit easier!
- **Both insect surveys** can be conducted in Spring and Summer.

Group sizes

- We suggest that groups should be up to half a class size (roughly 15 students), unless the individual surveys state differently.

Respecting Wildlife and Code of Conduct

- When surveying encourage children to respect and be patient with nature.
- Discourage chasing and disruption.
- Please refrain from encouraging wildlife on the day of the survey (e.g. throwing bird seeds on your grounds, or sugar solutions for insects) as this will bias results.
- However, we do encourage establishing long term school grounds changes.

Useful Definitions and Terms

Organism: A living structure which is capable of growth and reproduction.

Species: A useful unit of biodiversity, the term is used to separate different organisms from one another. Often this term separates organisms which cannot produce fertile offspring with one another.

Biodiversity: The variety of 'life'/organisms (e.g. plants and animals) within a particular habitat or wider area. One measure used is the total number of species.

Habitat: The physical environment which organisms can occupy. We can classify these environments into categories (e.g. trees, ponds, flower beds etc.) which you will do here (i.e. a habitat is effectively a 'home').

Ecosystem: The system of interactions which includes both organisms and their habitats in a particular area. Can refer to multiple habitats, (i.e. an ecosystem is a street of 'homes' (habitats) while also including the people (organisms) that live in them).

Survey Site: The total survey area from which you will be establishing your sample area and from which you will be taking a sample. (e.g. 20x15m football field).

Sample area: A subset of the survey site from which you take your sample. (e.g. 5x5m area inside football field).

Sample: The data collected from inside the sample area used to represent the whole survey site (e.g. number of insect individuals, number of different insect species, number of leaves etc. from within your 5x5m area as per above example).

Coverage: The area taken up by one specified habitat type as a proportion of a sample area, or survey site.

Floweriness: An approximate measure of the proportion of the sample or total survey area occupied by any flowering plants.

Quadrat: A tool (usually square frame) used to take a standard sample of the natural environment which organisms can occupy. This sample can be of a specified size.

Resource: Any substance or object in a habitat which can be consumed or used by organisms (e.g. flowers for food, nesting materials for raising offspring).

Ecological function: The role an organism plays in the ecosystem (e.g. pollination).

Behaviour: The way in which an organism responds to a particular situation or stimulus (i.e. hunger). This can be one action, or a sequence of responses.

Foraging: The behaviour of an organism which specifically relates to the action of collecting resources (i.e. food, which may be in response to hunger).

Scientific method: This is the technique used in the creation and testing of scientific hypotheses. It begins with observations, measurements and asking questions, which are then formalised into hypotheses. Scientific experiments are designed to test these hypotheses. Actual 'observed' results from experiments are compared with what was 'expected'. Conclusions are drawn. If conclusions cannot be drawn, hypotheses are then refined and retested.

2. School grounds and habitat survey information

What you will need

- See survey sheet

Survey preparation

This is an opportunity to develop maths outside the classroom.

Co-ordinates

1. Practitioners are perhaps best to do this before the survey session.
2. When asked, you can extract the coordinates via Google Maps, for example.
3. Zoom in until you can see your school building(s) on the map. Right-click near the centre of the school grounds to extract coordinates, e.g., 55.714203, 13.207879.
4. This can be done on a computer or smartphone.

School grounds size

5. There are two ways you can approach this task with students:

   1. Discuss how to find out the size of your school grounds. Estimate its size and confirm with school maintenance staff.

   OR

   2. Print a map of the grounds. School grounds could be broken down into squares, for example, which students can approximate by measuring it in steps.

   For an average 10 year old child their height is ~140cm (4ft 6) and therefore stride length is ~50cm (20-21 inches). One stride is two steps. So, for every 4 steps this is 1 metre. Children can then draw their measurements onto the map and find the total area of the squares and add them together.

6. **Practitioners may wish to use an online tool instead.**
7. School grounds size can be estimated using a simple tool available here: https://www.daftlogic.com/projects-google-maps-area-calculator-tool.htm
8. **Find your school**, then draw out polygons to measure your grounds like below:

Survey method

Habitat learning

- Before conducting surveys, encourage discussion about habitat types with students.
- Talk through relevant concepts in advance, so students have a shared understanding of language. Some examples are included in 'Useful definitions and terms'.
- Do not worry if you lack green spaces at your survey site. Students can plan and implement changes to their school grounds after surveying.
- Each group could create a rough map of the entire school grounds. This is practice for the more detailed map in **S3**.
- Think about making links to mapping skills e.g. using cardinal directions (N, S, E and W) to orientate yourself.

Habitats

- Man-made homes can be wide ranging, though only some are relevant to pollinators and minibeasts, while others are relevant to birds.
- Learn about the different kinds of homes and what may live in them before conducting the survey.

Bird homes:	Bird boxes or houses	Small birds, however this depends on the size of the home and nest hole
Honeybee homes:	Hives/apiaries	Honeybees only
Wild bee homes:	Bee hotels	Cavity-nesting wild bees
	Hollowed stems and dead wood	Cavity-nesting wild bees
	Artificial banks of bare ground	Ground-nesting wild bees
	Artificial large ground cavities	Bumblebees
Other:	Lagoons (e.g. bathtubs or large containers with water)	Hoverflies and other flies
	Rubble walls	Shelter for a variety of wildlife e.g. lizards, bumblebees
	Cob brick walls	Certain wild bees (e.g. hairy footed flower bees)
	Wellington boots on their side	Bumblebees

Survey of trees and bushes

- Students should prepare for this survey by discussing the ecological function of plants, for example as food resource, providing protection, nesting places.
- For identification support with trees and bushes/shrubs we recommend locally relevant online resources and/or the use of the plant identification apps (for example Plant ID) which are very powerful tools. **It may be worth testing the apps yourself. Keep in mind they are not always accurate.**

Photos taken during the survey can be both used for species identification and later turned into a wonderful art exhibition.

3. Bird survey information

What you will need

- See survey sheet.

We strongly encourage practioners to try this survey beforehand to get familiar with bird identification and the survey method.

Also, we encourage a lot of identification practice – the more practice you do with your students the better the actual survey will be!

Survey preparation

- You should complete the bird survey early in the morning when birds are most active in their calls before they are busy hunting.
- Note the time and the weather conditions on your survey sheet. See **General Information** in Section 2, regarding extreme weather.
- Before you start, please ensure that students have completed the 'School grounds and habitats' survey. Co-ordinates and school ground size will be used for submitting data.
- Before you start, students should decide on the route together, so they know where to go when surveying.
- By walking around the school grounds, you can survey different areas of habitats.
- **Ensure students are quiet while surveying so they do not disturb any birds.**
- The survey must take 10 minutes.
- Allocate one person to record the information on the survey sheet.

Survey method

What to look for

- All students should look for birds together.
- One person however should focus largely on the survey and be given the survey sheet (and clipboard).
- Look out for rustling in bushes and flashes of colour and movement.
- Get students to point at sightings in their groups while keeping a low noise level.
- These should only be birds within the school grounds, either flying above or in the school grounds (e.g., in trees, on the ground, on a feeder). If you can see a view beyond the school ground, do not include birds in that space.
- Try not to double count the birds.
- **Diversity** is most important, encourage students to focus on differences rather than just counting birds.

There are many online resources and quizzes with birdcalls and bird pictures. These may be a fun classroom activity prior to surveying or if the weather is poor.

What to listen for

- Each student can listen for bird calls.
- Try to identify if the call is in or outside of the school grounds.
- Use the sound to visually locate and then record the bird in question.

'BirdNET' is a powerful app this tool that lets you record bird sounds, select a soundbite and it suggests the bird. It is worth you having a go at this and then integrating its use as a separate activity to reinforce learning.

4. Pollinators and flowering plants survey information

What you will need

- See survey sheet.

Survey preparation

Time of day and weather

- Please complete in Spring or Summer.
- This part of the survey is very dependent on weather conditions and time of day. You should do the survey when it is dry and above 16°C because insects like to fly in warm and sunny conditions. Please try and complete when conditions are appropriate.
- Please ensure you have completed your survey of school grounds habitats and recorded the coordinates and the size of your school grounds.

Choose the location for your survey

- Choose the location for your 5x5 m survey site with care. Discuss with students what they think is typical of the green environments in your school grounds.
- If you are planning to make changes in your grounds, survey the site where this will take place.

Surveying before and after changes

- You can survey the site twice, once before the change and once after – it is best to do this in the Spring or Summer **the year after** the changes have been made.
- **If you do survey the site twice** please repeat all surveys and indicate this in **S1**.
- These **before and after surveys must be in the exact same area**. Carefully document where your survey site is located and what is nearby and/or leave markers.

Survey method

Mapping your survey site

- An accurate mapping of your 5x5m sampling area is also needed for a later survey of minibeasts and leaves.
- Please try to stay outside of your sampling area if possible, to avoid stepping on plants and scaring away insects.
- Examples are included on the following page, colours are useful. Encourage the use of a key. **For colourblind students**, patterns rather than colours may be better.

Observing pollinators

- Discuss with the students how to distinguish the different species groups of pollinators before surveying.

- Feel free to use the educational resources developed by the Natural Nations project.

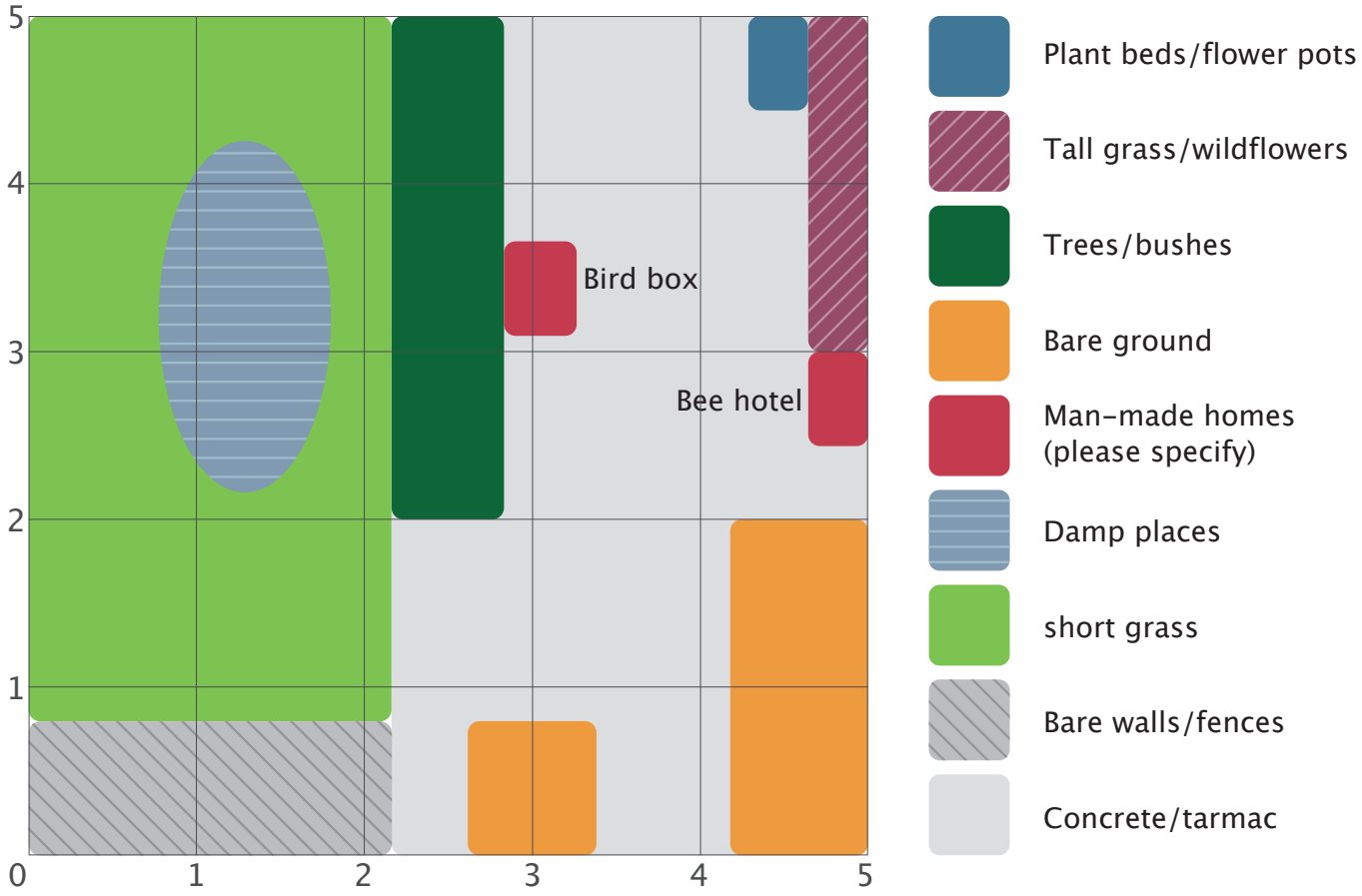
Flower survey

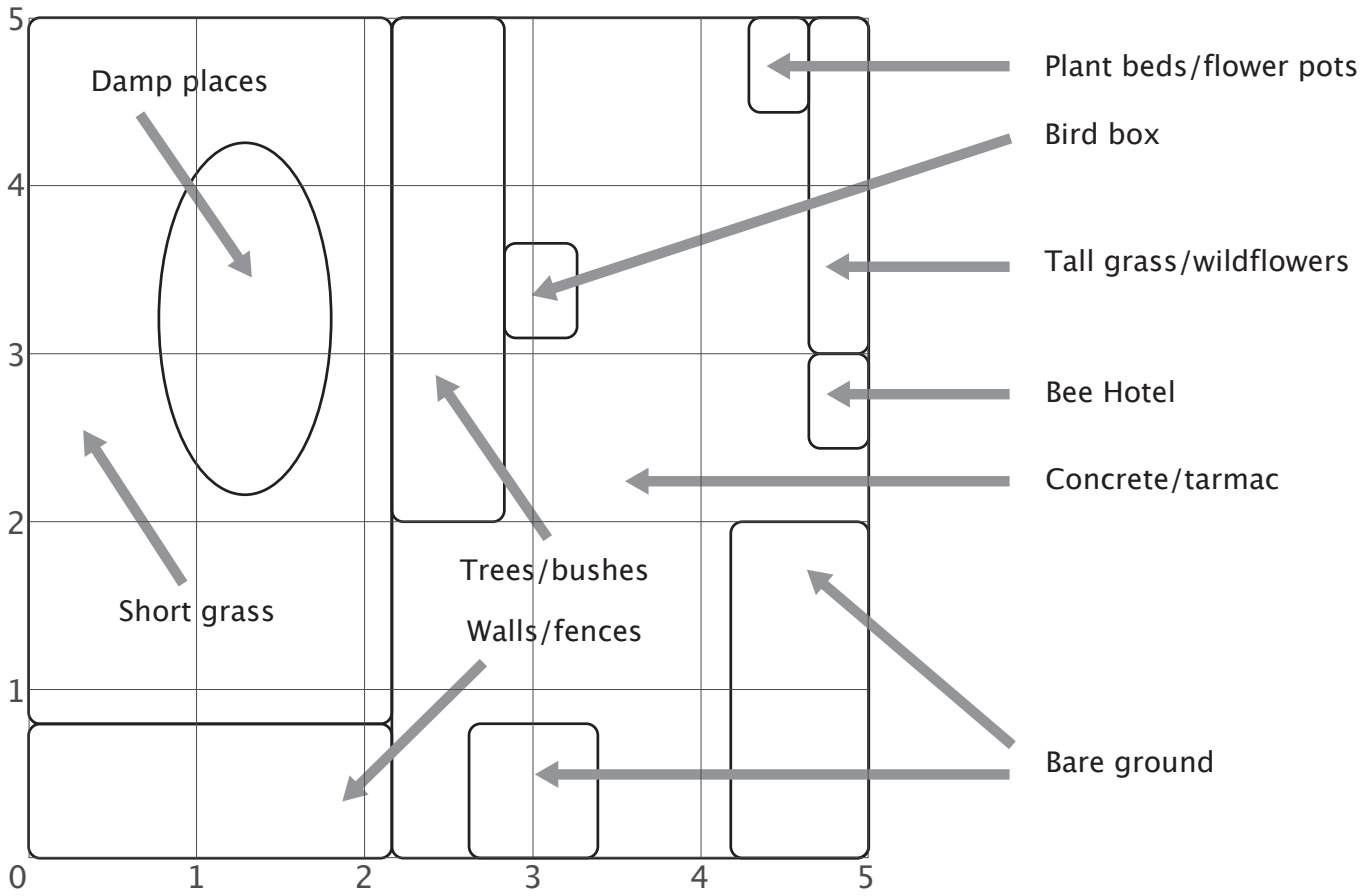
- For plant identification support we recommend locally relevant online resources and/or the use of the 'PlantID' app. Same as for S1.

Code of Conduct

- Encourage students to be quiet and patient and not to disturb insects.

Habitat map examples





5. Minibeast and leaves survey information

What you will need

- See survey sheet.

Survey preparation

- Please complete in Spring or Summer.
- Ensure you have completed the school grounds habitats survey and have recorded the coordinates and the size of your school grounds.
- You should use the same 5x5 metre survey site as for the survey of pollinators and flowering plants. Use your previous mapping with photos and coordinates to help you find the site. Hopefully you have made your way back to the correct location (or as close as possible).

Time of day and weather

- This part of the survey **is not as dependent on weather conditions** as the survey of birds or pollinators.
- If you consider the weather to be 'extreme' compared to usual weather in your region (extremely hot, windy, or wet), then please avoid surveying as this weather will impact the number of minibeasts that appear.

Mark out square metres in your survey site

- Re-establish the same 5x5 metre survey site as in the pollinator survey S3.
- Students should be divided into groups of 3-4 students per group. Each group should survey their own 1x1 square metre within the 5x5 metre survey site.

Survey method

Observing minibeasts

- It is a great advantage to have discussed with the students how to distinguish the different species groups of minibeasts before the survey is done.
- The OPAL minibeasts guide for KS2, available at www.tes.com under 'teaching resources', will support this.
- Minibeasts can be photographed or even carefully collected. If you are concerned about the unlikely event of minor bites or stings then use of gloves is encouraged when sifting through leaf litter.
- We encourage exploration and moving features within the square metre area to uncover minibeasts, but no rocks above the size of the palm should be lifted.

Leaf counting

- Please note that students do not need to identify any plants in this final survey. This is just a matter of being able to discuss which leaves look the same and which differ.
- This can be difficult and may require some help from the practitioner.
- Being able to distinguish between vascular plants and mosses is difficult. Therefore, encourage discussion about the differences.

Thank you so much for participating in the Natural Nations Survey!