

Biodiversity unit: Bringing birds back

Level 3 and 4

May 2022

About this unit

The objective of these lessons is to plan and conduct a scientific investigation into the abundance of birds and learn about their habitat requirements. Through the observation of different bird species students can develop an appreciation for native birds and the role that they play in a healthy ecosystem.

This unit focuses on bird species.

Students will learn

- How to make observations, describe features and animal interactions
- The adverse impacts of introduced bird species
- The importance of native birds in a healthy ecosystem
- To use a range of methods to collect and represent data
- To consider a range of factors when planning and designing a garden

Suggested sequence of activities

1. Finding out about introduced birds
2. Finding out about native birds
3. Bird survey
4. Bird data analysis
5. Design a bird bath
6. Extension – Design and create a bird friendly garden

Developed by:
Gould League for Cardinia Shire Council



Victorian Curriculum links

| Domain | Content description |
|--|---|
| Design & Technologies / Creating Designed Solutions / Producing | Select and use materials, components, tools and equipment using safe work practices to produce designed solutions (VCDSCD030) |
| Design & Technologies / Creating Designed Solutions / Evaluating | Evaluate design ideas, processes and solutions based on criteria for success developed with guidance and including care for the environment and communities (VCDSCD031) |
| Design & Technologies / Creating Designed Solutions / Planning and managing | Plan a sequence of production steps when making designed solutions (VCDSCD032) |
| Digital Technologies / Data and Information | Collect, access and present different types of data using simple software to create information and solve problems (VCDTDI021) |
| English / Literacy / Creating texts | Plan, draft and publish imaginative, informative and persuasive texts demonstrating increasing control over text structures and language features and selecting print and multimodal elements appropriate to the audience and purpose (VCELY266) |
| Geography / Geographical Knowledge / Diversity and significance of places and environments | Types of natural vegetation and the significance of vegetation to the environment, the importance of environments to animals and people, and different views on how they can be protected; the use and management of natural resources and waste, and different views on how to do this sustainably (VCGGK082) |
| Health and Physical Education / Personal, Social and Community Health / Contributing to healthy and active communities | Participate in outdoor games and activities to examine how participation promotes a connection between the community, natural and built environments, and health and wellbeing (VCHPEP096) |
| Mathematics / Measurement and Geometry / Using units of measurement | Compare objects using familiar metric units of area and volume (VCMMG166) |
| Mathematics / Statistics and Probability / Data representation and interpretation | Collect data, organise into categories and create displays using lists, tables, picture graphs and simple column graphs, with and without the use of digital technologies (VCMSP149) Construct suitable data displays, with and without the use of digital technologies, from given or collected data. Include tables, column graphs and picture graphs where one picture can represent many data values (VCMSP179) |
| Personal and Social Capability / Social Awareness & Management / Relationships and diversity | Identify the importance of including others in activities, groups and games (VCPSCS0022) |
| Personal and Social Capability / Social Awareness and Management / Collaboration | Demonstrate skills for effective participation in group tasks and use criteria provided to reflect on the effectiveness of the teams in which they participate (VCPSCS0023) |
| Personal & Social Capability / Social Awareness & Management / Collaboration | Identify conflicts that may occur in peer groups and suggest possible causes and resolutions (VCPSCS0024) |

| Domain | Content description |
|---|--|
| Science / Science Understanding / Science as a human endeavour | Science knowledge helps people to understand the effects of their actions (VCSSU056) |
| Science / Science Understanding / Biological sciences | Different living things have different life cycles and depend on each other and the environment to survive (VCSSU058) |
| Science / Science Inquiry Skills / Planning and conducting | Safely use appropriate materials, tools, equipment and technologies (VCSIS067) |
| Science / Science Inquiry Skills / Recording and processing | Use formal measurements in the collection and recording of observations (VCSIS068) |
| Science / Science Inquiry Skills / Analysing and evaluating | Compare results with predictions, suggesting possible reasons for findings (VCSIS070) |
| Science / Levels 3 and 4 / Science Inquiry Skills / Communicating | Represent and communicate observations, ideas and findings to show patterns and relationships using formal and informal scientific language (VCSIS072) |

Activity 1: Finding out about introduced birds

Learning outcomes

Students will learn about introduced species of birds and some of the reasons why they are common in the school grounds.

Resources

- Poster paper
- Pens, pencils, art materials
- Optional - Bird call recordings

Instructions

1. Ask students to name some of the birds that they know. For example:
 - You could begin by using the alphabet to see whether students could name a bird whose name begins with each letter of the alphabet.
 - You could play a recording of different bird calls/song and see if students are able to identify the bird e.g., cockatoo, magpie, kookaburra etc.
2. Ask students if they know anything about introduced birds. Chances are that students won't realise that many of the birds commonly seen are not Australian native species. Many of these 'feral' birds are often attracted to schools because of the availability of food scraps. The most common introduced birds that students are likely to see include:
 - Indian Myna
 - Common Blackbird
 - House Sparrow
 - Rock Dove (often known as the feral pigeon)
 - Starling
 - Spotted Dove
3. Ask students to create a poster about one of these birds.

A good way for students to start their research on introduced birds is the Birds in Backyards website.
<https://www.birdsinbackyards.net/birds/featured/Introduced-birds>

Posters could be displayed in the school's reception to inform visitors about introduced bird species. The poster should include the following information:

 - A colour illustration
 - Size
 - Diet
 - Method of introduction to Australia
 - Description of the bird's call
 - Interesting facts



Activity 2: Finding out about native birds

Learning outcomes

Students will learn about native species of birds and the importance of biodiversity in a garden habitat.

Resources

- Bird bingo sheet
- Writing materials
- Local bird guide

Instructions

To familiarise students with a) the local species of birds in the school grounds and b) how to make observations, there is a bird bingo activity on the bird in backyards website which is a useful warm-up activity.

1. Take students outside and give them 10-15 minutes to make as many observations as they can in that time period. Encourage students to make any additional observations than those on the activity sheet.



www.birdsinbackyards.net/sites/www.birdsinbackyards.net/files/page/attachments/Backyard%20Bird%20Bingo.pdf

Note: This is a fantastic opportunity to discuss the importance of biodiversity, noting that there are other living and non-living things pictured on the activity sheet that birds require to thrive in a habitat.

2. Back in the classroom, ask students to find a bird species that is endemic to the local region using the Local Bird Guide – Cardinia Shire Council, in the reference list below and do some research. Students may like to choose a bird that they recognise but don't know much about. Make sure that there is a spread of different birds across the class. Students should collect information on size, colour and diet. Each student can then become an expert in their chosen bird which will help with 'field work' later.

Activity 3: Bird survey

Learning outcomes

Students will learn about native birds and the role they play in a healthy ecosystem. They will be able to identify the features of a preferred habitat for birds and some of the threats to native bird survival.

Resources

- Map of the school i.e. existing site plan or google map image
- Clipboards useful for field work
- Pencils
- Binoculars (optional)
- Bird survey data sheet
- Access to field guides in the reference list
- Optional - Museums Victoria Field Guide App
- Optional - Birddata App
- Optional - iNaturalist App

Teachers note

As many as 20% of bird species in Australia are in decline and there are many things that we can do to help with this problem. One important factor is the collection of data about bird numbers and distribution. Students can make an important contribution by collecting and sharing data on bird distribution. You can also find out what is going on in the school grounds by conducting a simple survey. This information can help you decide whether there is enough habitat available to support native birds or whether some strategic planting could help bring native birds into the school grounds. Birds have a few simple requirements and it's easy to create habitat suitable for a range of beautiful native species.

Decline in bird numbers is most significant in small birds such as Fairy Wrens and Eastern Spinebills. As urban areas expand these smaller birds are displaced by larger more aggressive native and non-native birds such as the Noisy Miner, Pied Currawong and Common Myna. These birds are the bullies of the backyard! Larger birds are better able to thrive in the limited habitat available in urban areas and they can drive out small birds such as wrens, spinebills and pardalotes.

The objective of these activities is to give students an appreciation for biodiversity and to gain an understanding of the role those different organisms play in a healthy functioning ecosystem. Students will learn about introduced species of birds and some of the things that we can do to create habitat that favours native birds to help them thrive. Don't worry if you are not a bird identification expert, there are loads of great resources to help with this.



The birds in backyards program was developed specifically to address the loss of small birds from our parks and gardens by providing tools that people can use to:

- learn about birds and the natural environment in their areas and
- to help them make changes to accommodate birds.

Instructions

Students will conduct a bird survey within the school grounds to assess the range and diversity of birds that call your school home. You can use the simplified survey method (Appendix 2) to investigate biodiversity at your school or you can use the birds in backyards program.

The advantage of using the birds in backyards website for your survey is that it provides information about the birds commonly sighted in your area which will assist students with bird identification, and the data is stored centrally for public access.

Alternatively, you could use the bird survey data sheet to record observations while conducting the survey and later enter the observations into the birds in backyards website. Data is logged using the bird data web portal and App <https://birddata.birdlife.org.au/>

Instructions on how to record data www.birdsinbackyards.net/ (click on bird survey on right side menu)

There is also a video showing how to enter bird data www.youtube.com/watch?v=DT2-Mkx1yI4

Finally, there is also a set of lesson plans and resources available here: <https://www.birdsinbackyards.net/content/article/Birds-Schools-Free-lessons-available>

1. In the classroom, develop a map of the school grounds and divide the area into different sections to be surveyed, ideally in a grid format (required for data analysis). There may be an existing school plan that can be adapted for this purpose or use satellite image from google maps. Include all areas of the school so that students can make comparisons between the numbers/types of birds found in different areas of the school. This will then enable students to make inferences about birds feeding and habitat requirements.
2. Divide students into small groups or pairs. Make sure they have all the required equipment to conduct the survey, i.e. data sheet, bird data app etc.
3. Send each group to a different part of the school grounds to make their observations. Students will need to be quiet so as not to disturb the birds. Students should spend 5 – 15min in quiet observation. They should note number of birds, species and any observations of behaviour such as feeding or perching. Note: To simplify this activity students can just observe whether the bird is a native or introduced species. Students could also note whether it's a small, medium or large bird.



These observations can then be pooled so that students can draw conclusions about which areas of the school provide the best habitat, in the next activity.

Citizen science

Aussie backyard bird count

The #AussieBirdCount is a great way to connect with the birds in your backyard no matter where your backyard happens to be – a suburban backyard, a local park, a patch of forest, down by the beach, or the main street of town. Or even your school playground.

You can count as many times as you like over the week, we just ask that each count is completed over a 20-minute period. The data collected assists BirdLife Australia in understanding more about the birds that live where people live. <https://aussiebirdcount.org.au/>

Birdlife Australia provides lesson plans and resources for teachers to make it easy to get your students involved in meaningful citizen science activities.

The resources are intended for teachers of students in Years 5 and 6 working towards Stage 3 outcomes in the Australian Curriculum. However, they may be adapted for younger students as well. There are also posters and colouring pages available for download.

To get involved all you need to do is to register your school <https://aussiebirdcount.org.au/teachers/>



To participate in citizen science surveys all year round

Your students might be inspired to get involved with <https://inaturalist.ala.org.au/>. There is a downloadable app and an opportunity to be involved as citizen scientists by contributing to data about birds in your local area. This could be done as a class, with an excursion to a local park, or students can even do it from their own back yards with their family members.

Activity 3: Bird data analysis

Learning outcomes

Students will use a variety of methods to represent data and identify patterns and trends indicating suitable habitat for native bird species.

Resources

- Completed bird survey data sheet and/or bird data app
- Heat mapping tool – Maply <https://maply.com/help/heatmap>

Instructions

1. Students will identify bird distribution across the school grounds.
Pool the data collected by all students using the whiteboard and total up the number of introduced birds found in the school grounds. Compare this figure to the number of native birds observed.
2. Students will identify areas in the school best suited to native bird species.
Create a heatmap using the location data gathered by students to show which areas of the school grounds are most frequented by non-native and native species of birds. A heatmap is a simple way to display abundance and spatial distribution. They are now commonly used in the analysis of football play, for example. A simple internet search will bring up examples.

Use a colour grading system with an appropriate scale to denote the number of birds found in each grid. For example, Dark blue 10-20 birds, blue 10-15 birds, pale blue <5 and white no birds.

Students can work in groups to make 2 heat maps - one for native birds and one for non-native species. The two heat maps can then be compared to see where native birds find the best habitat in the school grounds.

The same exercise could be done in a nearby park if there are few birds observed at school.

Some birds are sticky beaks!

Many species of native birds rely on nectar from flowers as their main source of food. Many of these birds have specially adapted beaks that enable them to access the nectar from plants. The Eastern Spinebill has a long needle-like beak that is gently curved to allow it to extract nectar from tubular shaped flowers such as correas. There are more than 180 species of Australian Honeyeaters and they are all characterised by a brush-tipped tongue which enables them to gather nectar from flowers. These birds will also feed on insects, pollen, berries and manna (sap from trees).

There is a range of native plants that help to attract nectar feeding birds and there is a plant list included in the references listed below. It is important to provide dense prickly shrubs to enable small birds to find refuge from predators including cats and foxes. It is also important to provide dense shrubs so that the small nectar feeding birds are not pushed out by larger more aggressive species.

Students can survey plants in the school ground to see whether there are any of these nectar producing plants. If so, use the heat map data to see whether more birds were found around these nectar feeding plants. Use the plant list and a web search to help identify these bird friendly plants.

Nectar feeding birds are important because they pollinate many native flowers. They can also be important in the control of insects as many species feed on insects when nectar is scarce. In Autumn Wattlebirds use their nectar feeding tongues to lick aphids off plants. To protect birds and insects it is important to minimise the use of pesticides and rely on nature's pest control, birds.

Activity 5: Design a bird bath

Learning outcomes

Students are given the opportunity to carefully consider what is required when designing a suitable bird bath.

Instructions

A well-positioned bird bath can be a haven for birds all year round and it can provide the opportunity to watch the bath time activity. A source of water in the garden is vital for birds, insects and lizards especially during summer. Birds that eat seed need to drink water twice daily, because their diet tends to be dry.

1. Ask students to think of 3 things that would be important factors for a user-friendly bird bath. Their ideas could include:
 - Clean water
 - The right depth – shallow
 - Protected from predators
 - Shade from midday and afternoon sun
 - An overhanging perch or branch
 - A prickly shrub nearby so that birds can quickly hide if disturbed.
2. Refer to Council's Gardens for Wildlife fact sheet on bird baths. Based on the needs of birds identified in the previous activity, ask students to design their own bird bath. You can make this exercise more challenging by asking students to make their bird bath from recycled materials. For example, using an old plant saucer or baking dish to hold water and second-hand bricks for a stand.

Activity 6: Extension – Design and create a bird friendly garden



Learning outcomes

Students will learn what people need to create a successful bird garden and how to promote biodiversity in the school grounds.

Instructions

1. Select a suitable area away from high traffic flows
2. Determine soil type, average rainfall and aspect
3. Select plant species suitable for the site (expert advice can be found at specialist nurseries)
4. Try to choose plants that flower at different times to provide the greatest feeding opportunity for birds
5. Measure the area to estimate the number of plants needed
6. Enlist specialist help from the school community (landscapers and keen home gardeners)
7. Organise tools
8. Plan implementation, consider inviting parent helpers
9. Plant the garden (late Winter and Autumn are the preferred times for planting)
10. Maintain watering during plant establishment
11. Continue bird surveys to see which birds move into the new habitat

Additional resources

Local bird guide - Cardinia Shire Council www.cardinia.vic.gov.au/localbirdguide

Museums Victoria Field Guide App <https://museumsvictoria.com.au/apps/field-guide-app-to-victorian-fauna/>

The Field Guide to the Birds of Australia by Graham Pizzey and Frank Knight Angus and Robertson www.angusrobertson.com.au/books/the-field-guide-to-the-birds-of-australia-frank-knight-graham-pizzey-sarah-pizzey/p/9780732291938

Australian Parrots by Gould League www.gould.org.au/product/australian-parrots-archive/

Common Garden Birds of Southern Australia by Gould League www.gould.org.au/product/common-garden-birds/

Urban Birds of Southern Australia by Gould League www.gould.org.au/product/urban-birds-of-southern-australia-loving-reproduced-from-archive-stock/

List of local indigenous plant nurseries www.cardinia.vic.gov.au/downloads/download/359/local_indigenous_plant_nurseries_-_cardinia_shire_council

Appendix 1: Suggested planting list

Table 1. Plants to attract small honeyeaters

| Common name | Species name |
|--------------------|----------------------------|
| Common Correa | <i>Correa reflexa</i> |
| White Correa | <i>Correa alba</i> |
| Hairpin banksia | <i>Banksia spinulosa</i> |
| Silver Banksia | <i>Banksia marginate</i> |
| Mountain Grevillea | <i>Grevillea alpina</i> |
| Furze Hakea | <i>Hakea ulicina</i> |
| Yellow Hakea | <i>Hakea nodosa</i> |
| Scented Paperbark | <i>Melaleuca squarrosa</i> |
| Swamp Paperbark | <i>Melaleuca ericoides</i> |

Table 2. Dense shrubs (*denotes prickly plants)

| Common name | Species name |
|-----------------------|----------------------------------|
| Hedge Wattle* | <i>Acacia paradoxa</i> |
| Sweet Bursaria* | <i>Bursaria spinosa</i> |
| Prickly currant bush* | <i>Coprosma quadrifida</i> |
| Prickly Moses* | <i>Acacia verticilata</i> |
| Spike Wattle* | <i>Acacia oxycedrus</i> |
| Burgan | <i>Kunzea ericoides</i> |
| Swamp Paperbark | <i>Melaleuca ericoides</i> |
| Silver Banksia | <i>Banksia marginata</i> |
| Hairpin Banksia | <i>Banksia spinulosa</i> |
| Woolly Tea-tree | <i>Leptospermum lanigerum</i> |
| Heath Tea tree | <i>Leptospermum myrsinoides</i> |
| Prickly tea-tree | <i>Leptospermum continentale</i> |
| Scented Paperbark | <i>Melaleuca squarrosa</i> |

Table 3. Small dense shrubs

| Common name | Species name |
|--------------------------|--|
| Common Correa | <i>Correa reflexa</i> |
| Hop Goodenia | <i>Goednia ovata</i> |
| Victorian Christmas Bush | <i>Prostanthera lasianthos var. lasianthos</i> |
| Dusty Miller | <i>Spyridium parvifolium</i> |

Table 4. Small trees

| Common name | Species name |
|------------------|---------------------------------|
| Blackwood | <i>Acacia melanoxylon</i> |
| Lightwood | <i>Acacia implexa</i> |
| Muttonwood | <i>Rapanea howittiana</i> |
| Hazel Pomaderris | <i>Pomaderris aspera</i> |
| Bayalla | <i>Pittosporum bicolour</i> |
| Myrtle Wattle | <i>Acacia myrtifolia</i> |
| Golden Wattle | <i>Acacia pycnantha</i> |
| Black She-oak | <i>Allocasuarina littoralis</i> |
| Austral Mulberry | <i>Hedycarya angustifolia</i> |

