Tūhura koutou wāhi matomato rohe

Explore your local green spaces

Green spaces are areas made up of grass, shrubs, trees and other vegetation that provide rich habitats for various plants and animals. They range from large forests to backyards, school grounds, and small patches of bush in urban areas. Green spaces are used for various recreational and aesthetic purposes, such as camping, picnicking, bike riding and walking.

People need green spaces for survival and our wellbeing. Green spaces are important for the natural systems that sustain us, and for the survival of native plants and animals.

New Zealand Government

Department of Conservation
Te Papa Atawhai

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Activity sheets


Photo: Brendan Bombaci (www.kairologic.com)

Introduction

Trees produce oxygen for us to breathe and absorb carbon dioxide. This makes them valuable 'carbon sinks' to help counter climate change. Bush patches provide habitat, food (leaves, nectar, berries and seeds) and shelter for our native animals. They help to provide a 'wildlife corridor' that allows animals to move easily from one feeding and/or nesting area to another.

The type, number and variety of plant and animal species present – the **biodiversity** of a green space – determines the health of the area. For example:

- The presence of particular plant species in a green space can enhance biodiversity. Many native trees, shrubs and climbers provide shelter and food for wildlife.
- The presence of native bird species is a good indicator of the abundance of key pests in forests throughout the country. The kōkako is used as an indicator of rat and possum densities in North Island forests. Because of its sensitivity, it is only found in pest-managed sites.
- Birds and lizards play an important role in keeping green spaces healthy because they disperse the seeds of native plants and help pollinate flowers.
- Invertebrates – animals without a backbone, such as insects, wētā, snails, beetles, and worms – can be used as indicator to assess the health of a green space

Detecting the health of a green space

Healthy green space	Unhealthy green space
Insects, such as cicadas, can be heard during the day.	The forest is silent during the day.
Insect calls can be heard at night (e.g. wētā make a rasping sound at night).	The forest is silent at night.
Leaf litter is thick with bugs visible when leaves are disturbed.	Leaf litter layer is thin, with few or no bugs.
High proportion of native invertebrates (e.g. wētā and slaters).	High proportion of introduced invertebrates (e.g. garden snails).
Pollinator species are present (e.g. bees and butterflies).	Pollinator species are absent, resulting in slower regeneration of the forest.

Factors affecting the health of green spaces

New Zealand's unique biodiversity is at risk from **pests**, **weeds** and other threats.

- Pests such as possums, rats and stoats compete with our native birdlife for food and habitat. They also eat the eggs and young, and attack the adults.
- Garden plants escape into forests and become weeds. Plant pests like Old Man's Beard smother trees. Other plants like Wandering Willie carpet the ground, preventing new native plants from growing.
- Fires also threaten our forests, and kauri dieback disease is a relatively new threat to kauri forests.

For more information about New Zealand's green spaces, visit:

www.doc.govt.nz/nature/habitats/forests

www.doc.govt.nz/nature/native-plants


Photo: Brendan Bombaci (www.kairologic.com)

How to use this resource

KEY CONCEPTS: Biodiversity Invertebrates Mammals Pests Weeds

This resource provides various activity ideas that can be adapted to your context. It could be used to support outdoor exploration during/leading up to Conservation Week, or as an inquiry unit.

The intention is for you to choose activities based on your students' prior knowledge, and the time and equipment you have available.

Curriculum links	Learning intentions (WALT...)	Success criteria (Students can...)	Activity
Nature of Science – Investigating in science (L3) Living World – Ecology (L1–3) Living World – Life processes (L1–3) Mathematics – Statistics (L1–3) English – Speaking, Writing, and Presenting (L3)	Investigate the health of a local green space by carrying out scientific tests.	Explain what biodiversity is and how it helps us to understand the health of a local green space. Gather data/information to determine the health of a local green space, and share findings.	Introduction activities Investigation activities Sharing and presenting findings
Social Sciences (L3–4) Health and Physical Education (L2) Nature of Science – Participating and contributing (L3-4)	Decide what conservation actions would improve the health of a local green space. Understand that people have social, cultural and economic roles, rights and responsibilities.	Use our new knowledge, understanding and skills to take action to improve the health of a local green space.	Planning for action


Photo: Shellie Evans

Science	**Nature of Science – Investigating in science** → Ask questions, find evidence, explore simple models and carry out appropriate investigations to develop simple explanations. **(L3)** **Nature of Science – Participating and contributing** → Use their growing science knowledge when considering issues of concern to them. **(L3–4)** → Explore various aspects of an issue and make decisions about possible actions. **(L3–4)** **Living World – Ecology** → Recognise that living things are suited to their particular habitat. **(L1–2)** → Explain how living things are suited to their particular habitat and how they respond to environmental changes, both natural and human-induced. **(L3)** **Living World – Life processes** → Recognise that all living things have certain requirements so they can stay alive. **(L1–2)** → Recognise that there are life processes common to all living things and that these occur in different ways. **(L3)**
Mathematics	**Statistics** → Conduct investigations using the statistical enquiry cycle. **(L1–3)**
English	**Speaking, Writing, and Presenting** → Integrate sources of information, processes and strategies with developing confidence to identify, form and express ideas. **(L3)**
Social Sciences	→ Understand how people view and use places differently. **(L3)** → Understand that events have causes and effects. **(L4)**
Health and Physical Education	**Healthy Communities and Environments – Social attitudes and values** → Explore how people's attitudes, values and actions contribute to healthy physical and social environments. **(L2)**


Photo: Brendan Bombaci (www.kairologic.com)

Dive in: Introduction activity ideas

ACTIVITY

Class discussion

- What are green spaces? Brainstorm and write a class definition.
- Think, Pair, Share – Think of a green space you have recently visited. Share where this was, what you saw and did there.
- Where are the green spaces in our neighbourhood? Map the location, and describe how to get there from school.
- Focusing on green spaces in the school grounds:
  - Are there areas of gardens and native trees in our school grounds? Locate green spaces on a school map.
  - How do you use green spaces in the school grounds?

ACTIVITY

Determining the health of a local green space

Understanding Biodiversity

1. Introduce the idea of variety by giving students a one-minute challenge to write down the names of all the plants, animals and insects they've seen and/or heard in the green spaces in their school grounds and/or in their own backyards.
2. Explain that 'diversity' is the name that we give to this variety. Develop the idea that this diversity is what makes life interesting.
3. Introduce students to the concept of variety in nature.
   - Can you imagine a world where there was only one type of tree or bird?
   - Can you imagine a world with only buildings and roads and no green spaces in our towns and cities?
   - What would it be like to live in this type of environment?
4. Class discussion
   - What do insects, birds, other animals and plants need to survive in a green space?
   - What could be preventing animals from living in a green space?

Preparing for your green space investigation

Explain to students that they are going to carry out scientific investigations to learn about the biodiversity of a local green space, in order to help determine its health.

Class discussion

- How are we going to gather information about the biodiversity in our green space? What tests and/or equipment can we use to gather this information?
- How will we determine whether our green space is healthy or unhealthy?

Ask students to predict how healthy they think their local green space is. Their **hypothesis** (prediction) could be based on surrounding land use/human activity.

Before going outdoors to explore, have students:

- Complete the 'Identifying New Zealand Forest Birds' (birds also commonly seen in gardens) online activity. This activity will familiarise students with the 10 native birds most commonly seen/heard in 5 minute bird counts. Students will learn what they look like, their characteristics, and the calls they make.
- In small groups, students could do a mini inquiry to familiarise themselves with plant and animal species they might find in their local green space. Findings could be presented to a particular audience through a variety of tools (e.g. blogs, school newsletters, website, PowerPoints, picture books, artwork and drama).

To help with research, refer to:

- The Garden Bird Guide.
- Landcare Research's 'What is this bug?' identification guide.
- Identifying Lizards photo gallery on the DOC website.
- Andrew Crowe's 'Mini guide to the identification of New Zealand insects'.
- Andrew Crowe's 'The life size guide to native trees and other common plants of New Zealand'.


Photo: Shellie Evans

Time to explore: Investigation activity ideas

These activities aim to encourage exploration and learning IN your local green space. The information students collect will enable them to determine the health of their local green space, and support them to uncover potential solutions to local environmental issues.

On completion of their investigation, students complete the conclusion statement about the health of the green space, and justify their findings – see the data collection sheet. Encourage students to take photographs to document their key findings.

Ensuring safe and fun exploration

A pre-visit site inspection by the teacher is recommended to evaluate hazards, plan for safety, and to verify that planned activities are feasible. A template to assist with this can be found at http://eotc.tki.org.nz/EOTC-home/EOTC-Guidelines (see *Tool Kit Sample forms › download Sample form 19*). Important factors to consider include:

- Plan where the different activities will take place, and form groups before you reach the site. Ensure that there will be adequate adult supervision.
- Before visiting the site, develop a list of guidelines with students to ensure that the plants and animals they find are not harmed, and that the green space is left the way they found it.
- Complete a RAMs form and other school-required risk management procedures.

Five-minute bird count (5MBC)

Equipment needed:

- Pens/pencils
- Blank A4 paper
- Stopwatches
- Binoculars (optional)
- Data collection sheet

Five-minute bird count studies have been used to:

- *Help determine the presence of native and rare bird species.*
- *Argue for the protection of forests. For example, in the 1980s, 5MBCs demonstrated the importance of West Coast and Central North Island forests when they were at threat from logging.*
- *Monitor changes in bird populations over time (e.g. whether kererū in Northland forests decrease over time, and whether pest control helps stop the decline).*
- *Monitor progress in ecological restoration projects (e.g. the Rotoiti Nature Recovery Project, St Arnaud Mainland Island).*

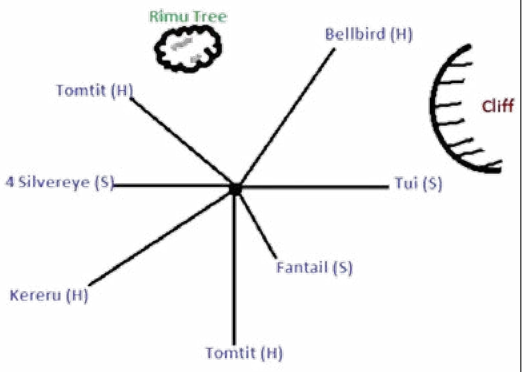
1. Select a sample area within your green space (school grounds or local park) with multiple 'stations' approximately 200 m apart, where students can conduct the bird count individually, or in pairs.
2. Sit or stand quietly for 5 minutes recording all the birds seen or heard using a **bird count diagram**. Birds identified by sound only are noted as 'heard'. All others (those that are heard and seen, or just seen) are recorded as 'seen'.

- On a blank sheet of paper, mark a point in the centre. This is the station where you are standing.
- Mark major landscape features (e.g. a road, building or large tree) in relation to the point where you are standing.
- When you start the count, draw a straight line from your station to each bird you see or hear.
- Write the species name, the number if more than one, and if it was seen (S) or heard (H).
- Repeat this drawing of lines each time you hear or see a new bird.
- Complete the tally on the data collection sheet.
- For birds you cannot identify, note down their characteristics (e.g. size, colour, description of their call). Back in class, visit http://www.nzbirds.com/birds/gallery.html to help identify unknown birds seen or heard.

Reflect – What will encourage birds to your green space? What will discourage birds?

Species	# seen	# heard
Silvereye	IIII	
Tūī	I	
Fantail	I	
Tomtit		II
Bellbird		I
Kererū		I

TOTAL: 10 birds



Example of a bird count diagram. *Image sourced from* www.wildaboutnz.co.nz/2010/12/5-minute-bird-counts

ACTIVITY

Photo: Kerry Weston

Mini beast hunt (15–20 minutes)

Equipment needed

- Pens/pencils
- White cloths or white tote trays
- Data collection sheet
- Magnifying glasses (optional)
- Insect identification guide

Insects

1. In small groups, select a tree, bush or area of leaf litter within your green space.
2. Gently shake the branch/bush over the cloth/tray, or scoop up some leaf litter into the cloth/tray (remove large leaves). You will notice things dropping onto the cloth/tray.
3. Place the cloth on a flat piece of ground and look carefully to see what is on it. Using the Landcare Research's insect identification guide or Andrew Crowe's Mini Guide to the identification of New Zealand insects, count and list the insects that you see on the data collection sheet.
4. Carefully return the insects back to where you found them.

Lizards

5. On a sunny day, look in cracks in rocks or walls and on rocks, shrubs or trees. Lizards are **exothermic** so all need to sunbathe to maintain body temperature.

Reflect – What will encourage insects and lizards to your green space? What will discourage them?

ACTIVITY

Photo: Herb Christophers

Plant identification (15–20 minutes)

Equipment needed

- Pens/pencils
- Data collection sheet
- Bags for storing leaf samples

1. In groups, select a site within your green space.
2. Count and list the names of plants you find on the data collection sheet.
3. Take a photo or collect a leaf sample of plants you don't know. Call it species X/Y/Z until you find out its name back in class.

Reflect – Are any of these plants weeds? Are any of them special food/medicine plants for people or animals? Which plants may attract birds?

Tracking pests

*It is important to know which **mammals** are in your local green space. Possums, rats, mice, cats, ferrets, stoats and hedgehogs are predators that can harm native plant and animal species. Pests like tunnels so they will scamper in to a tracking tunnel to get the bait and then leave their footprints on the paper as they pass through.*

1. Instructions on how to make a tracking tunnel can be found here: www.kcc.org.nz/sites/kiwiconservationclub/files/file/TrackingTunnel.pdf. Since all these pests are nocturnal animals, it is best to leave tracking tunnels out overnight in strategic places and see which footprints are visible the next day.
2. Use the Footprint Identification Sheet to help identify animal pests.

Reflect – What impact will mammals have on the biodiversity of your local green space?


Photo: DOC

Sharing and presenting findings

Ask students to share their key findings and conclusions.

- Was your hypothesis about the health of the green space correct?
- Were any of your findings surprising or disappointing? Why?

The data collected could be presented in various ways:

- Collate and graph bird and insect count data to identify different sites of high and low biodiversity within your green space.
- Create a whole class bird count diagram.
- Use the photographs taken with explanations and descriptions of findings.
- Write a report – share key findings and conclusions on your class blog, school website or school newsletter.

Encourage students to conduct this activity in their own backyards and/or at a local park, and compare results.


Photo: DOC

Planning for action: How can we improve the health of our local green space?

As a group, identify one issue that is impacting the health of your local green space.

The action plan template to the left can be used to plan how to address this issue.

* Contact DOC and/or your local council, and visit the Nature Space website to learn about groups, individuals and landowners undertaking ecological restoration in your area.

Action ideas

You can increase biodiversity in a local green space by creating suitable habitats for species to live in.

- Build a pollinator palace
- Build a wētā motel
- Plant native species to attract birds
- Attract lizards to your garden by creating an inviting home for them
- Watch Meet the Locals video and find out how we can help native geckos and skinks in our own backyards.

Going further

Education resources and programmes to support further learning about, and exploration in your local green spaces include:

- Possum picnic activity is a fun outdoor activity that introduces ideas about the impact of introduced animal species.
- Keep Kauri Standing is a kauri dieback resource designed for the New Zealand Curriculum levels 1–5. The activities included are designed to create awareness and extend understanding of the threat to kauri trees from kauri dieback disease, and what we can do to protect kauri.
- Weedbusters is a programme dedicated to working together to stop weedy plants taking over New Zealand's natural environments. Visit the Weedbusters website to help identify weeds in your local green space.

Green space data collection sheet 1: Five-minute bird count

Location name:

Date and time: Name of group/observers:

Hypothesis (prediction)

We think the health of the green space and the life within will be excellent / ok / poor because ...

Five-minute bird count

Species	# seen	# heard

Total number of birds:

Images sourced from www.wildaboutnz.co.nz/2010/12/5-minute-bird-counts

Coming to conclusions

We think the health of this green space, and the life within is excellent / ok / poor because ...

We can improve the health of this green space by ...

Green space data collection sheet 2: Mini beast hunt

Location name:

Date and time: **Name of group/observers:**

Hypothesis (prediction)

We think the health of the green space and the life within will be excellent / ok / poor because...

Mini beast hunt

List/describe/draw the insects and lizards that you see

Total number of insects:	Total number of lizards:

Coming to conclusions

We think the health of this green space, and the life within is excellent / ok / poor because ...

We can improve the health of this green space by ...

Green space data collection sheet 3: Plant identification

Location name:

Date and time: Name of group/observers:

Hypothesis (prediction)

We think the health of the green space and the life within will be excellent / ok / poor because...

Plant identification

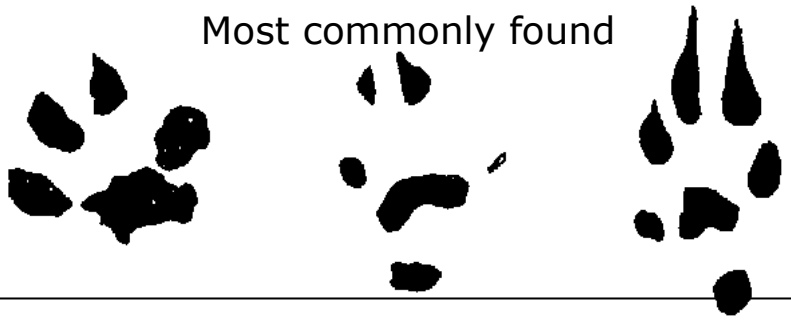
Plant Species	# seen

Coming to conclusions

We think the health of this green space, and the life within is excellent / ok / poor because ...

We can improve the health of this green space by ...

Footprint Identification

Ferret	Most detailed 	Most commonly found 
Stoat	Most detailed 	Most commonly found 
Hedgehog	Most detailed 	Most commonly found 
Rat	Most detailed 	Most commonly found 
Mouse	Most detailed 	Most commonly found 

Adapted from Ratz (1997) Identification of footprints of some small mammals. *Mammalia*, 61, No. 3 : 431-441.