Kākāpō Recovery

EDUCATION RESOURCE

Kākāpō RECOVERY

Department of Conservation *Te Papa Atawhai*

Meridian.

A national partner of the Kākāpō Recovery Programme

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Young kākāpō. *Photo: Dianne Mason*

INTRODUCTION

Why are birds important?

Birds are an important part of our ecosystems and communities. They rely on trees, plants and other animals for food, shelter and their basic needs. An incredible range of birds is found in New Zealand: from large, flightless, ground-dwelling birds like the kākāpō and kiwi, to tiny, delicate songbirds like the grey warbler/ riroriro.

Both endemic and native birds are an important part of balanced, healthy ecosystems. They pollinate plants and disperse their seeds, spread nutrients, and keep populations of insects and other living things stable. In Te Ao Māori, endemic and native birds enhance the **mauri** (life force/vitality) of an area and are part of whakapapa links (connections and ancestry).

For more information, classroom activities and outdoor investigations about birds that can be found in your school grounds, backyard and local park or reserve, check out the 'Experiencing birds in your green space' resource – **www.doc.govt.nz/education-experiencingbirds**.

Why teach/learn about kākāpō?

The kākāpō is one of our unique birds, and a precious **taonga** (treasure), only found in New Zealand. It is not closely related to any other parrot, and in fact has biological features not shared with any other species. It is one of our most vulnerable bird species with fewer than 160 known surviving birds.

Without help, the kākāpō would most likely be extinct within our lifetime. Countless people from around the world, including hundreds of hard-working volunteers, give their time and energy to save the kākāpō from extinction. The more people and communities who know about kākāpō and are empowered to help them, the more likely the kākāpō will survive, and for its population to increase.

HOW TO USE THIS RESOURCE

The information in this resource and accompanying activities are intended to support further research on kākāpō, based on students' interests and inquiry learning focus.

Information sheets introduce students to:

- **Kākāpō ecology:** where they live, what they eat, their adaptations, and how they stay alive
- **Kākāpō challenges:** kākāpō threats and how people contribute to these
- **Kākāpō conservation:** the role of people in protecting kākāpō.

Curriculum links

Achievement objectives

(Levels 1–4)

Science

Living World: Ecology
Recognise that living things are suited to their particular habitats

Living World: Life processes
Recognise that living things are suited to their particular habitats

Nature of Science: Investigating in science Ask questions, find evidence, explore simple models and carry out investigations to develop simple explanations

Social Sciences

Understand how people make decisions about access to and use of resources

Understand how formal and informal groups make decisions that influence communities

Mathematics

Statistical Investigation: Conduct investigations using the statistical enquiry cycle: gathering, sorting, and displaying multivariate category and whole-number data and simple time-series data to answer questions; identifying patterns and trends in context within and between data sets

Science capabilities Gather and interpret data, Use evidence, Interpret representations, Engage with science

Minor curriculum links

English: Reading and Viewing

Learning outcomes

Students are learning to:

Build knowledge and understanding of kākāpō

Raise awareness of the current situation for kākāpō

Understand how people are involved in kākāpō recovery

Contribute to a positive future for kākāpō.

Kākāpō in nest with chick. *Photo: Don Merton*

WHAT IS A KĀKĀPŌ?

The kākāpō is a large, flightless, **nocturnal** parrot with mottled and barred moss-green feathers. Kākāpō is an **endemic** bird – it lives only in New Zealand. 'Kākāpō' (pronounced '*car-car-paw*') is the Te Reo Māori word for 'night parrot'.

For information and activities about the difference between **endemic**, **native** and **introduced** animals see: **Endemic, native or introduced? – Science Learning Hub**.

- Kākāpō are the heaviest parrots in the world. Males can weigh over 2 kg. They can store large amounts of energy as body fat – a unique trait among land birds.
- Kākāpō are possibly the oldest living bird species in the world. They may have a life expectancy of 90 years!
- They are **herbivores** and eat a variety of foods such as roots, leaves and fruit.
- Kākāpō have evolved to freeze (keep absolutely still, hoping to blend into the background) when disturbed or threatened, to hide from predators.
- Not all kākāpō behave the same way. Department of Conservation (DOC) staff and volunteers get to know some birds well, and find that each has its own personality. Some are friendly, others are grumpy, and several are big eaters!
- All known kākāpō have names and are like one, big extended family – see **www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kakapo/key-kakapo**.

For more interesting facts and photos, visit **www.doc.govt.nz/kakapo**.

ACTIVITY 1: KĀKĀPŌ ARE PRECIOUS TAONGA

Learning intentions	Success criteria
Begin to identify what makes kākāpō unique birds.	List some reasons why kākāpō are special and worth protecting.
Begin to ask questions about kākāpō.	Ask appropriate questions about kākāpō.

Using the information above, students could brainstorm reasons why kākāpō are special and worth protecting.

Reflecting on knowledge

Share ideas about what students would like to find out next about kākāpō. Use students' questions as a basis for starting a learning inquiry.

KĀKĀPŌ HABITAT

A habitat is a place where a plant or animal normally lives.

Where do kākāpō live?

Kākāpō used to live throughout New Zealand: near the tops of mountains, in forests and in tussock grasslands. We know this because **fossil** remains have been found, along with discoveries in **Māori midden** (kitchen-waste pile) sites.

But now, due to habitat destruction and animal pests, kākāpō are found only on **three offshore islands**: Codfish Island/Whenua Hou, Little Barrier Island/Te Hauturu-o-Toi and Anchor Island/Pukenui – protected areas of natural, dense forest and bush, free from **animal pests** (cats, stoats, rats, ferrets, dogs).

If there are any kākāpō left on mainland New Zealand – which is unlikely – they will be in the remotest corners of the wilderness, in places like **Fiordland National Park**. Until **Predator Free New Zealand** is achieved, kākāpō need islands like these, free of predators, to survive.

An old kākāpō habitat: Scollays Flat, Stewart Island/Rakiura. *Photo: Greg Lind*

Kākāpō habitat needs:

Kākāpō mum feeding her chick in their nest. *Photo: Don Merton*

Food for breeding – provided by a 'masting' (mass-fruiting) tree species that kākāpō breed in response to. The best-known species is rimu, but other podocarps (eg kahikatea and kauri) and beech trees also provide this.

Sirocco the kākāpō munching on mānuka. *Photo: Chris Birmingham*

Forested habitat – free from animal pests (cats, stoats, rats, ferrets, dogs).

Safe nesting sites – usually hollow logs, trees and rock crevices.

A good food supply – kākāpō prefer areas with a wide range of vegetation types – eg around slips and forest edges.

High ground – male kākāpō require high points (ridges and peaks) from which their 'boom' calls can be heard at long distances.

Kākāpō bowl, Anchor Island. *Photo: DOC*

Lots of space – kākāpō have large territories (up to 50 ha); birds can walk up to 5 km a night.

ACTIVITY 2: WHAT IS SUITABLE HABITAT FOR KĀKĀPŌ?

Learning intentions	Success criteria
Identify habitat suitable for kākāpō, where they will meet their needs. Explain how changes to their environment affect kākāpō.	List requirements of kākāpō habitat. Discuss how changes to their habitat affect kākāpō.

View the following videos from the **Kākāpō LEARNZ field trip (Term 3, 2009)** on Whenua Hou, and ask students to look out for what they notice about kākāpō habitat.

1. **Gulliver's Bowl** – hike up the track to Observation Rock and enjoy the view. Discover why this is the perfect spot for a male kākāpō bowl.
   - What islands can be seen from here on a clear day?
   - Why is this a good spot for a male kākāpō to boom from?
   - Why does a kākāpō boom?
2. **Hoki's nest** – see where Hoki (a female kākāpō) has her nest, and find out how DOC staff monitor nest sites.
   - Why does the nest have two entrances?
   - What is monitored at a nest site?
   - Why do kākāpō leave the nest?
3. **Paradise for kākāpō** – discover why Whenua Hou is the perfect place for a kākāpō to live and what food is on offer.
   - Where do kākāpō go during the winter?
   - What do kākāpō eat?
   - Why are feed stations set up for the kākāpō?
4. **Pest-free Whenua Hou** – discover how the island was made into a safe place for kākāpō to live.
   - How long did it take to eradicate pests?
   - How many possums were there?
   - What bird had to be taken to another island?

Reflecting on knowledge

Think-Pair-Share – discuss ideas about where kākāpō live and why they live in those habitats.

Extending learning

Explore the history of your area and find out if kākāpō ever lived in your neighbourhood. What changes to the land over time have made it a suitable or unsuitable habitat for kākāpō, native birds and other animals?

KĀKĀPŌ SUPERPOWERS!

‘SPECIAL FEATURES’/ADAPTATIONS

Animals or plants evolve 'special features' to help them cope with the conditions of their particular habitat – on land, in rivers and at sea.

Why do kākāpō need special features?

Kākāpō are suited to life in forested habitats. Their special features and adaptations help them find food and protect themselves from **threats** in a forested environment.

What special features do kākāpō have?

- **Large and strong bill**, used for climbing trees, fighting and eating. Grooves on the inside of their bills allow them to chew fruit (eg rimu berries) and extract juice.
- **Large and strong tongue** to allow tough plant material to be crushed against the bill.
- **Zygodactyl feet** (two toes pointing forward, two pointing back) for perching and climbing, with **large, sharp claws** for climbing, digging and fighting.
- **Large wings and tail** for balance when feeding in tall trees. They also use their wings to break their fall when tumbling from treetops.
- **Large ears** (hidden beneath feathers) hearing is especially important for a nocturnal bird.
- **Soft feathers** provide good insulation to keep them warm.
- **Mottled and barred moss-green and black feathers** – for **camouflage** among the forest floor and in trees.
- **Boom sac** – in breeding seasons, male kākāpō develop a series of large air cavities (sacs) in their chests. They inflate these to make their characteristic mating ‘boom’ sound.
- **Strong scent**, produced from the uropygial gland near their tails. This is very strong in males in breeding season. Kākāpō have an excellent sense of smell, so this scent is very important.

Photo: Jake Osborne

ACTIVITY 3: KĀKĀPŌ SPECIAL FEATURES LABELLING ACTIVITY

*(adapted from the Whio Forever education resource – **www.doc.govt.nz/education-whio**)*

Learning intentions	Success criteria
Identify special features and adaptations of kākāpō. Explain how adaptations help kākāpō to live and survive in their habitat.	Label and act out some kākāpō adaptations.

View the kākāpō special features/adaptations Google slideshow – **docs.google.com/presentation**

- **Slide 1:** Ask students to list body parts kākāpō have. Discuss the names of bird body parts – eg head, bill, body, feet, eye, wing, tail.
- **Slide 2:** Using the special features listed on the left, ask students to label each special feature on the kākāpō image.
- **Slide 3:** This slide shows the correct labelling of the special features. Ask students to think about and share how each feature might help kākāpō survive.

Action game about kākāpō superpowers

*(adapted from the Whio Forever education resource – **www.doc.govt.nz/education-whio**)*

1. Make up actions representing each special feature. For example:

- Large and sharp claws (for climbing, digging and fighting): curved fingers
- Large ears (for excellent hearing and moving around at night): hands curved next to your ears.

2. Make a circle. Take turns standing in the middle to call out one of the features. Students on the outside of the circle copy the student in the middle.

3. The middle student chooses another student who was quick to copy them, or is expressing the action well, to come to the middle to call out the next action. Repeat until all students have had a turn in the middle.

Reflecting on knowledge

- What have students discovered about how kākāpō are suited to their environment?
- Why do kākāpō need special features?

THE KĀKĀPŌ LIFE CYCLE

Breeding

Kākāpō do not breed every year – it depends if there's enough rimu fruit for them to eat. But when they do breed, they do it differently to most!

Kākāpō are the only parrots in the world to have a **'lek' mating system**. In summer (December onwards) male kākāpō compete for 'track and bowl systems' (specially dug-out bowls in the earth linked with tracks, operating as calling posts), and call ('boom') each night to announce to any females their readiness to mate. This sound travels several kilometres. The males compete with each other, and can release thousands of 'booms' per night. **Listen to the kākāpō 'boom'**.

After 20–30 booms they then make a high-pitched call ('ching'). This sound pinpoints a male's position, to direct the females to him. The booming and chinging **serenade** can last for 8 hours non-stop, every night for 2–3 months in breeding seasons when nesting occurs.

Listen to the kākāpō 'ching'.

Kākāpō bowl, Anchor Island. *Photo: DOC*

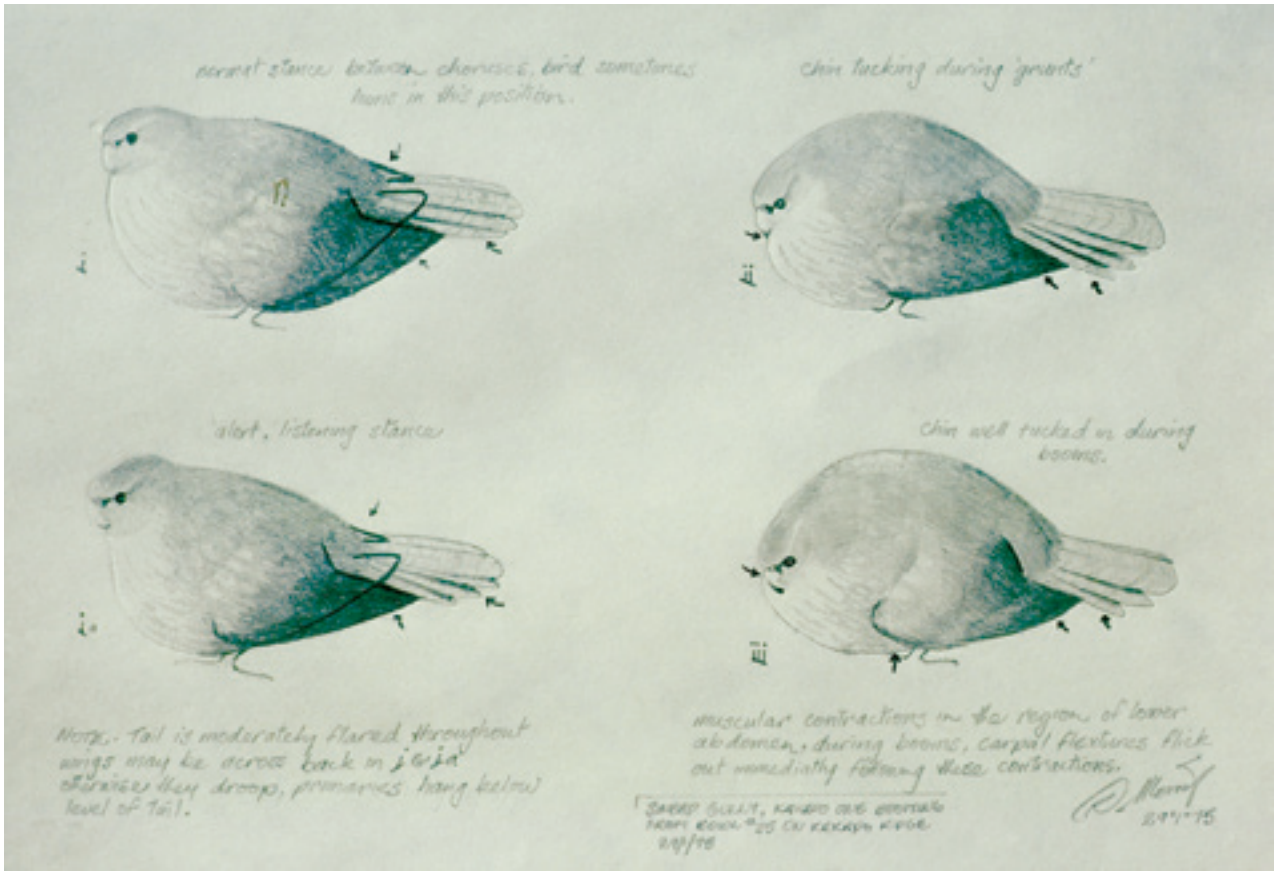


Illustration by Rod Morris showing a male kākāpō booming postures. *Photo: Don Merton (1975)*

Nesting and raising chicks

Another difference between kākāpō and many birds is that kākāpō don't form pairs to raise their chicks. The females make their nests, sit on the eggs, and raise their chicks on their own. They lay between 1 and 4 eggs the size of a bantam's (or small hen's) egg. The eggs hatch after about 30 days.

Chicks typically leave the nest (fledge) after about 10 weeks – but the mother may keep feeding the chicks for up to 6 months.

For more information about the 'lek' mating system, watch **Meet the Locals – Meet the kākāpō**.

Kuia (female kākāpō) on nest with eggs. *Photo: Theo Thompson*

Ruapuke (male kākāpō chick) hatched in 2014. *Photo: Andrew Digby*

ACTIVITY 4: WHAT WOULD LIFE BE LIKE AS A KĀKĀPŌ?

*(adapted from the Whio Forever education resource – **www.doc.govt.nz/education-whio**)*

Learning intentions

Find information about the life processes (breeding, feeding and nesting) of kākāpō.

Select relevant information from a range of sources to better understand the life of a kākāpō. Present this new learning to others.

Success criteria

Find information about kākāpō from texts/other sources.

Express their learning/new understanding about the life of a kākāpō in an interesting presentation format.

- Using the information above, LEARNZ videos, websites and books, students can work in groups to find and record information about kākāpō life processes (breeding, feeding and nesting).
- Students can then use their notes to create a slideshow, poster, book, blog post, website story, newsletter update or presentation to reflect their learning.
- Share your presentations with the Kākāpō Recovery team by emailing them to **kakaporecovery@doc.govt.nz**.

ACTIVITY 5: COMPARISON ACTIVITY – HOW IS LIFE FOR KĀKĀPŌ DIFFERENT TO OTHER PARROTS?

Learning intentions

Find information about different parrot species and compare them to information gathered about kākāpō.

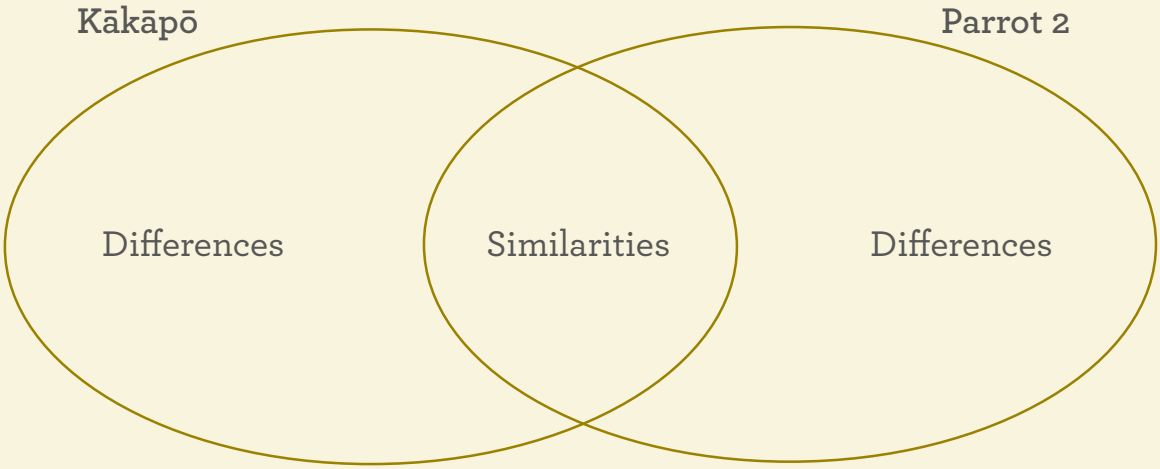
Success criteria

Identify similarities and differences between kākāpō and another parrot species.

Students could research a different parrot species (eg **kea,** **kākā** or **kākāriki/New Zealand parakeet**).

For information about the kākāpō's closest relatives, see ***Strigops habroptilus*** **(kākāpō) family tree.**

Findings could be recorded using a Venn diagram or a compare and contrast chart:



Core vocabulary

- **Breeding** – reproducing or having babies
- **Camouflage** – animal camouflage is when the body of an animal blends into its background
- **Endemic** – animals that have evolved in New Zealand and are only found here
- **Herbivore** – an animal that feeds on plants
- **Nocturnal** – active at night

THREATS TO KĀKĀPŌ

INTRODUCED PREDATORS

The greatest threat faced by kākāpō (and other native birds) is introduced predators/animal pests – animals brought to New Zealand, either accidently or deliberately, that now prey on our native wildlife.

- **Cats** eat kākāpō adults and chicks.
- **Rats** eat kākāpō chicks and eggs.
- **Stoats** eat kākāpō adults, chicks and eggs.

Without our help, kākāpō could easily become extinct – probably within our lifetime. There are fewer than 160 known surviving birds, and they have no defence against these animal pests.

To further investigate the impact of animal pests on New Zealand's natural environment and native species, see – **www.doc.govt.nz/education-animalpests**

HOW PEOPLE ARE HELPING KĀKĀPŌ

Many groups, organisations and individuals are helping to save kākāpō: DOC, Meridian Energy, tangata whenua, zoos and environmental organisations are all helping kākāpō survive and thrive in the wild.

Te Ao Māori and kākāpō

Māori are regarded as tangata whenua ('people of the land'). Tangata whenua are tied to the land in many ways: through birth, whakapapa and ancestral links, spirituality and other relationships. In Te Ao Māori (a Māori worldview) the natural world is seen as being connected. People, animals, plants and the environment are connected through mauri (a life force that exists in all living things). These things are also interconnected through whakapapa (genealogy/ancestry). In whakapapa traditions even natural features, such as forests, are tūpuna (ancestors). Kākāpō are a part of this web of connections to the forest and to people.

Kaitiakitanga (guardianship) is a way of thinking about – and looking after – the environment, to help maintain the balance of everything within it. In Te Ao Māori, humans have a responsibility to keep the physical and spiritual balance of the environment intact. Traditional ways of managing hunting and fishing were able to ensure enough resources were passed to the next generation, to maintain the mana and mauri of ancestral land. Kaitiaki represent the tangata whenua who are responsible for maintaining mauri in their rohe (tribal area). They act to restore ecosystems through a holistic approach, recognising that all things are interconnected.

Ngāi Tahu is the main iwi (Māori tribe) in the South Island. They are Kaitiaki and have strong cultural, spiritual and traditional connections with kākāpō. See **www.doc.govt.nz/our-work/kakapo-recovery/meet-the-people/maori** for more information.

The Kākāpō Recovery Programme – the Department of Conservation and Meridian Energy
DOC manages the Kākāpō Recovery Programme, one of its many species recovery initiatives. Ten dedicated DOC staff make up the Kākāpō Recovery team. See **www.doc.govt.nz/our-work/kakapo-recovery/meet-the-people/kakapo-recovery-team** for more information.

Meridian Energy became a national partner of the programme in 2016. This partnership contributes to kākāpō population growth by helping DOC fund research and pioneer conservation techniques in genetics, nutrition, disease management, and in finding new habitats. Meridian Energy will also help raise awareness of the kākāpō plight. For more information, see **DOC's partners and supporters page** and **Meridian Energy's kākāpō recovery page**.

The Kākāpō Recovery Programme is constantly adapting as new research and technology offer more tools for kākāpō conservation.

Every known kākāpō wears a radio transmitter on its back, which allows the recovery team to find the birds more easily than relying on tracking dogs or good fortune. Some of the ideas and tools developed in recent years have been useful to other conservation projects. Find out more about these technological developments at **www.doc.govt.nz/our-work/kakapo-recovery/what-we-do/technology**.

Mahina Walle and a kākāpō named Faulkner on Whenua Hou/Codfish Island. *Photo Leigh Joyce*

The role of volunteers

Volunteers assist on the islands during breeding seasons in several roles. The three main roles are Supplementary Feed Out, Cook, and Nest Minder.

- Feed Out volunteers walk all over the islands emptying, cleaning and refilling kākāpō feeding stations. The amount fed to each bird is carefully calculated to help keep them in the best possible breeding condition, and to help female kākāpō feed their chicks.
- Cooks are responsible for keeping everyone on the island fed during the busiest parts of the season when everyone else is busy monitoring the birds. They are responsible for preparing dinner every night and helping keep huts clean and tidy.
- Nest Minders are used on Whenua Hou and Te Hauturu-o-toi, but Anchor Island is too remote for nest minder volunteers to be feasible, as camping near nests is often impossible on Anchor Island. They sleep in tents near a nest and monitor the kākāpō mother and her chick(s) with a video camera. Minders are woken by a loud chime every time the mother leaves; they are responsible for recording how long she's away, and checking on chicks to make sure they are healthy.

For more information, see **www.doc.govt.nz/nature/native-animals/birds/birds-a-z/kakapo**. For more information about the role of other groups in conserving kākāpō, see www.doc.govt.nz/our-work/kakapo-recovery/meet-the-people/partners-and-supporters.

ACTIVITY 6: THINKING ABOUT GROUPS OF PEOPLE AND THEIR ROLES

Learning intentions	Success criteria
Investigate how and why different groups of people are helping kākāpō.	Explain how groups of people are involved in kākāpō recovery. Identify why they are helping kākāpō.

6a) Kaitiakitanga/guardianship

- Using the information above, and through further research, explore the concept of **Kaitiakitanga** (protection/guardianship).
- Come up with a class definition for **kaitiaki**.
- Find out about kaitiaki in your local area. Are they involved in restoring mauri around forests? How could you support their work?

6b) Differing roles and responsibilities

- Using the information and websites above, students research the roles various groups play in protecting kākāpō.
- Students could present the information about their group through a presentation, mime, rap, song, dance or role play.

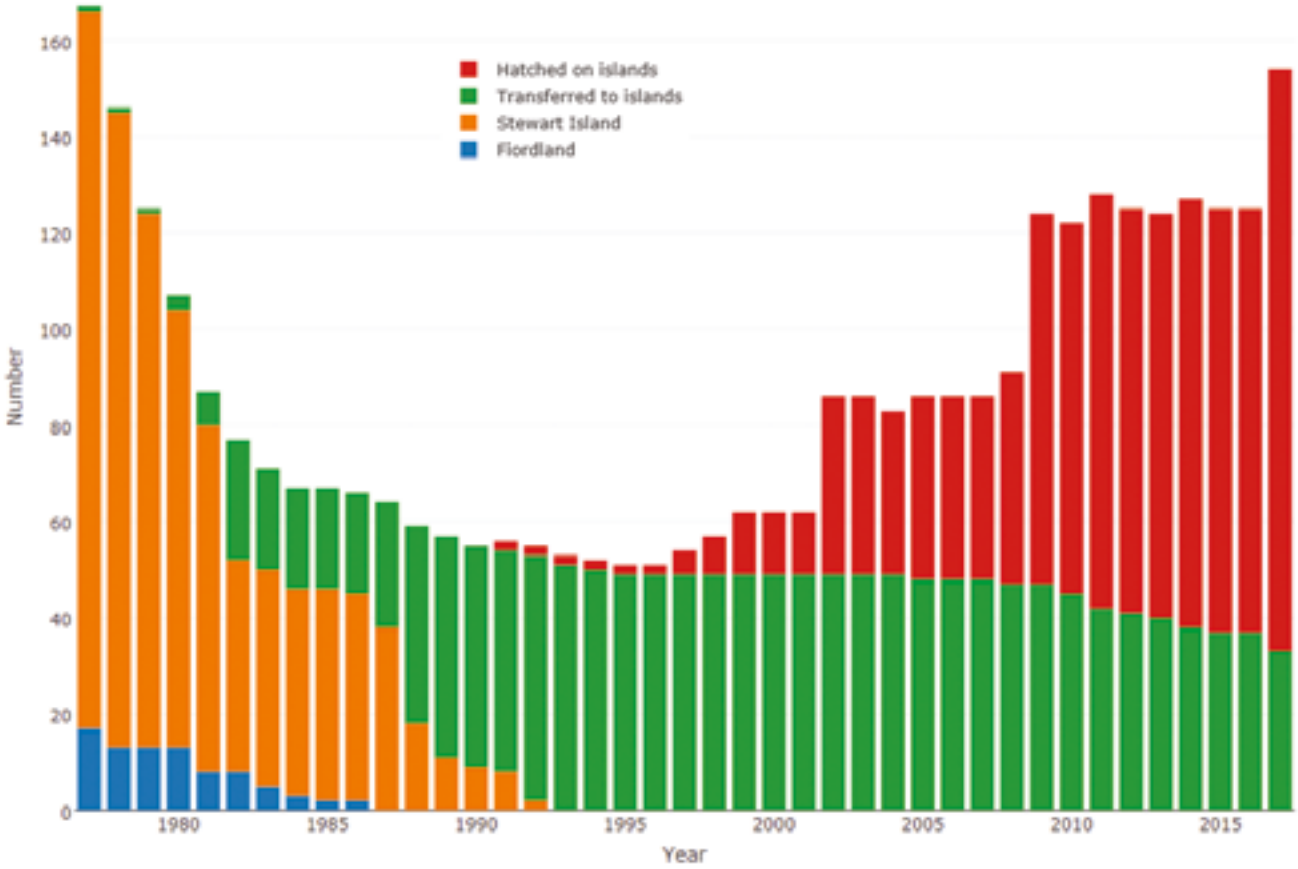
6c) Research and technology for conservation

Students could choose and research one of the technologies listed on **www.doc.govt.nz/our-work/kakapo-recovery/what-we-do/technology**. Who is involved in developing the technology? What are their roles?

KĀKĀPŌ POPULATION

Kākāpō population 1977–2017

*Numbers are recorded on 1 January each year



For an interactive version of this graph that shows the underlying data, see **here**.

Kākāpō population on Stewart Island/Rakiura

This video explains why moving kākāpō from Stewart Island/Rakiura was essential to their survival.

Meet the Locals – saving the kākāpō (view 00:00-3:00)

Kākāpō population change, 2007–2017

Year	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total	86	91	124	122	128	125	124	127	125	125	154

ACTIVITY 7: INTERPRETING KĀKĀPŌ POPULATION NUMBERS

Learning intentions

Interpret graphs to understand how events and actions cause changes to kākāpō populations.

Success criteria

Identify events or actions affecting kākāpō populations.

1. Students can answer the following questions by interpreting the graph and table above:

   a) In what year were the first kākāpō chicks hatched on offshore islands?

   b) How many kākāpō were found on Stewart Island/Rakiura in 1977?

   c) How many kākāpō were transferred to offshore islands in 1982?

   d) How many kākāpō have hatched on offshore islands in 2017?

2. Using the data from the 'Kākāpō population change, 2007–2017' table above, draw a line graph showing the population data over the past 10 years.

3 What is happening to kākāpō numbers over time? Why is this?

Answers

1a) 1991 – 2 hatched
1b) 149
1c) 25
1d) 121

LET'S HELP KĀKĀPŌ!

How can we help kākāpō?

Every little bit of help for kākāpō counts! Your location does not matter – even though kākāpō live far away you could concentrate on raising awareness, or work to solve an issue for kākāpō that may affect other native birds in your area.

ACTIVITY 8: ACTION IDEAS

Learning intentions	Success criteria
Carry out informed, meaningful action for kākāpō.	Take part in meaningful, informed action for kākāpō.
Evaluate the success of your action.	Reflect and evaluate the success of your action.

Contribute to a predator-free New Zealand by 2050

Predator Free 2050 is an ambitious, nationwide goal to rid New Zealand of possums, rats and stoats by 2050. Achieving this goal will require new techniques and a coordinated team effort across communities, iwi, and the public and private sectors.

Imagine a country without introduced predators! How can your school help create a predator-free New Zealand?

- Gathering data about animal pests in your green space will help you understand the problems facing native animals and plants. Eliminating and controlling pests will significantly enhance the biodiversity of your local environment, and allow our native plants and animals to thrive. This education resource can support your investigation – **www.doc.govt.nz/education-animalpests**.
- For ideas for further pest control and action, see **www.doc.govt.nz/predator-free-2050**.
- For case studies and examples of what other schools have done to achieve a predator-free community, see **www.predatorfreenz.org/category/profiles/schools**.
- Organise a **school fundraiser** (eg bake sale, mufti day, etc.) to **donate** to the Kākāpō Recovery Programme, or **adopt a kākāpō**. Donations and adoption money help conserve this precious species by funding scientific studies, and improvements to technology and monitoring equipment.

Raise awareness about kākāpō in your community by sharing your learning and spreading the word about kākāpō conservation. The more people who know about the issues kākāpō face, the more likely we can improve the future outlook for kākāpō. Share your learning through artwork, film, blog posts, the school newsletter, role plays, etc. For example:

- **Make your own kākāpō** using cardboard, and share key facts/messages for your community.

- Jack Levine, an 11 year-old student from California, USA, created a movie to share his learning – **watch it here**.

If you live on Stewart Island/Rakiura or around Fiordland, you could **keep an eye out for kākāpō**. A few kākāpō might still survive in these areas.

ACTIVITY 9: FUTURE-FOCUSED THINKING

(from the Whio Forever education resource – **www.doc.govt.nz/education-whio***)*

Learning intentions	Success criteria
Use their knowledge of kākāpō to consider an issue for kākāpō, and the future of this issue.	Research an issue of concern and describe the possible futures that could happen for this issue.
Examine how people have been involved in the focus issue.	Describe how people have been involved in an issue for kākāpō.

- What will the future be like for kākāpō? Students can imagine they are 10 years into the future.
- What might be the main challenges for kākāpō in the future? Imagine there are multiple futures available to us (depending on the choices we make). Record these possible futures, from the worst possible imagined future to the absolute best outcome for kākāpō.
- Share ideas and form a collective picture of what this future could look like. This could be expressed as a shared drawing, description or role play.