INVESTIGATING INTRODUCED PREDATORS IN YOUR GREEN SPACE

Education resource

Department of Conservation
Te Papa Atawhai

Ship rat in fantail nest.
Photo: Copyright Nga Manu images

Contents

A. Introduction

What is an introduced predator?

Introduced predators are animals that have come from another country and are threatening our living things and environment. Introduced predators have been brought to New Zealand in the past by people: via ships and by transporting goods.

Possum and rat preying on a thrush bird's nest. *Photo: Copyright Nga Manu images*

Why are introduced predators a problem for New Zealand?

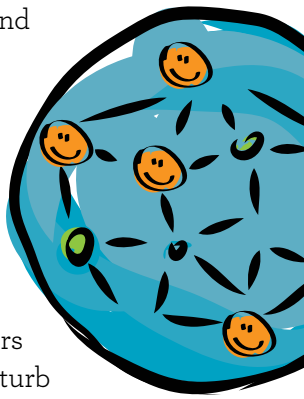
Since people arrived here and brought predators with them, 58 species of native birds have become extinct. Many other native species are in danger of having the same fate. New Zealand has the highest number of threatened species in the world. Introduced predators also prey on our native invertebrates, frogs, lizards and other animals.

Why gather data about introduced predators in your green space?

Gathering data about introduced predators in your green space will help you to understand what problems are present for native animals and plants. Eliminating and controlling introduced predators will significantly enhance the biodiversity in your local environment and allow birds, lizards and invertebrates to thrive. Sharing your data about introduced predators through citizen science projects like iNaturalistNZ: **inaturalist.nz** will also assist scientists and the community to better understand predator patterns and trends throughout New Zealand.

Big picture

You, the insects, birds and trees, your school and neighbourhood are part of a bigger ecosystem. A healthy ecosystem has few introduced predators.



Introduced predators can change and disturb the connections between native invertebrates, trees, birds, and the environment. These disturbances can have devastating consequences for New Zealand plants and animals.

Key concepts

Using this *Investigating introduced predators in your green space* resource students can:

- Gather and interpret data about introduced predators living in a local green space
- Identify and learn about introduced predators and how they affect endemic and native plants and animals
- Begin to understand how introduced predators have an impact on the environment and wider ecosystem.

Key vocabulary

Predator	An animal that naturally preys on something else
Threat	Something that can harm or kill
Ecosystem	An ecosystem is all of the plants, animals and other living and non-living things interacting with each other in a particular place
Endemic	Animals that have evolved in New Zealand and are only found here
Native	Animals that have arrived in New Zealand by themselves and are found here as well as in other countries
Introduced	Animals that were brought to New Zealand by people
Competition (in biology)	Living things competing with each other for resources

Curriculum links

Science

Living World: Planet Earth and Beyond

L1 and 2: Interacting systems: Describe how natural features are changed and resources affected by natural events and human actions

Living World: Ecology

L3 and 4: Explain how living things are suited to their particular habitat and how they respond to changes, both natural and human-induced

Nature of Science: Investigating in science, Communicating in science, Understanding about science, Participating and contributing

Science capabilities

Gather and interpret data, use evidence, understanding about science, participating and contributing

Social studies

L1: Understand how the past is important to people

L2: Understand how places influence people and people influence places, Understand how time and change affect people's lives

L3: Understand how people make decisions about access to and use of resources

L4: Understand that events have causes and effects

Minor curriculum links

English, Technology, Maths: statistics

B. Suggested learning sequence

1. IDENTIFY A LOCAL GREEN SPACE in your school or community

Explore the local green space using the **Exploring your local environment resource**

2. EXPERIENCE BIRDS IN YOUR GREEN SPACE

Explore and investigate birds living in your green space using the **Experiencing birds in your green space resource**

3. EXPERIENCE INVERTEBRATES IN YOUR GREEN SPACE

Explore and investigate invertebrates in your green space using the **Experiencing invertebrates in your green space resource**

4. EXPERIENCING NATIVE PLANTS IN YOUR GREEN SPACE

Explore and investigate native plants in your green space using the **Experiencing native plants in your green space resource**

YOU ARE HERE

5. INVESTIGATING INTRODUCED PREDATORS IN YOUR GREEN SPACE

Explore and investigate introduced predators in your green space using this resource.

Introducing predators in your green space

Individual students have personal experiences to spark their interest in introduced predators and start to think about impacts.

Planning an investigation and learning more about introduced predators in NZ

Start or continue a learning inquiry. Students reflect on knowledge and then ask questions about introduced predators. They make predictions and plan an investigation to learn more about introduced predators.

Gathering and reflecting on data about introduced predators in your green space

Monitor introduced predators in your green space through constructing and placing a monitoring tool such as tracking tunnels.

Extending thinking about introduced predators

Continue the learning inquiry: Investigate patterns and themes and form new ideas about introduced predators. Explore Māori perspectives.

Sharing knowledge and next steps

Students share their findings with the community and then take the next steps in exploring their green spaces.

6. INVESTIGATE WEEDS IN YOUR GREEN SPACE

using the **Investigating weeds in your green space resource**

7. ENHANCE BIODIVERSITY

and come to conclusions about issues in your green space using the **Enhancing biodiversity in your green space resource**

8. FORM AN ACTION PLAN

to target an environmental issue in your green space using the **Tools for action resource**

Symbols used in this resource

This symbol represents New Zealand Curriculum links included in the resource.

This symbol represents a hands-on, outdoor learning experience. These experiences encourage student connection to the natural world.

This symbol represents student activities to learn about introduced predators and reflect on their hands-on, outdoor learning experiences.

This symbol represents inquiry-based learning experiences.

This symbol represents learning experiences around Mātauranga Māori (Māori knowledge and perspectives).

C. Introduced predators in your green space

Hands-on learning

Establish prior knowledge of students with these hands-on outdoor learning experiences

On the trail of introduced predators

Use your powers of observation to look for evidence of introduced predators living in your green space and in your school. Look for any evidence of introduced predators.

Signs of introduced predators include:

- Droppings
- Footprints and tracks
- Burrows, hair or fur
- Damage to trees, plants, fruit, flowers
- Remains of other animals, their eggs or young (especially natives).

NB: Some introduced predators (eg possums, mice and hedgehogs) are nocturnal – meaning that they usually only come out at night. Go out with your family and a torch in the cooler months and look for these introduced predators in your home garden. Learn more about signs of introduced predators in the **Who's that introduced predator?** presentation.

Further information about introduced predator tracks and droppings can be found in the **Introduced predator information sheets**

People and introduced predators

Have you ever seen a rat in your local environment? How about a hedgehog?

Share prior experiences of introduced predators (e.g: rats, mice, hedgehogs or possums) at home or school.

Head outside to look for real introduced predators. Why are they so hard to find? Ask other students, teachers and local people about sightings of introduced predators and investigate the sightings.

Record any observations. Write recounts, reports or articles about any introduced predator sightings.

Norway rat burrow. *Photo: Jon Anda*

Possum damage (leaves eaten) on pūriri tree. *Photo: Shan Walker*

Hedgehog. *Photo: Shan Walker*

D. Planning an investigation about introduced predators

Learning more about introduced predators: integrated information sheets

Find out more about introduced predators using these information sheets:

- Mice
- Rats
- Stoats and other mustelids
- Hedgehogs
- Possums
- Cats


Mice

Mice are small, grey/ brown rodents. The head and body are about 10cm long. Mice may be tiny but they are a big problem for our native birds, plants and insects. They live in almost every area of New Zealand.

Why mice are pests

Mice eat some native species as well as the foods they eat. They take foods that birds would normally eat like berries and seeds. they can affect every part of an ecosystem. Without mice, we would have a lot more New Zealand animals and plants around!

Mouse Facts:

- Mice will eat just about anything! They eat invertebrates, seeds, fruits, leaves, birds' eggs, fish eggs, chicks and insect larvae
- "When mice first arrived in NZ, people had never seen them before and called them "Henriettas" after the ship they came from.
- All mice and rats are called kiore in Te Reo Māori

Why did people bring mice to New Zealand?

People brought mice to New Zealand on ships, probably by accident. The first mice came here in 1824, on a ship from Australia called 'Elizabeth Henrietta'."

INVESTIGATING ANIMAL PESTS IN YOUR GREEN SPACE

These information sheets can be used as part of a literacy programme to introduce the context of introduced predators before students go on to start their own learning inquiries.

They could also be used:

- as part of your reading programme
- as prompts for writing reports/explanations
- as an information source for group research activity
- for an integrated science lesson.

Introduced predator mystery solving

Students can attempt to solve the introduced predator mysteries in the **Who's that animal pest presentation**

Use the **Introduced predator information sheets** to help solve the mysteries. Each case involves a different introduced predator culprit. You're the introduced predator investigator- you solve the crimes.

Start or continue a learning inquiry

After the introductory activities, students can record what they know or think about introduced predators and what they would like to find out next (their 'wonderings'). See **Introduced predator: predictions and wonderings** on page 24.

Students can reflect on their inquiries from previous resources (1–4) and then ask relevant questions resulting about introduced predator. They can make predictions about possible introduced predators in their green space and plan an investigation to learn more about them and collect more evidence about which are present.

E. How introduced predators change an ecosystem

Introduced predators cause changes in an ecosystem and can disturb its connections.

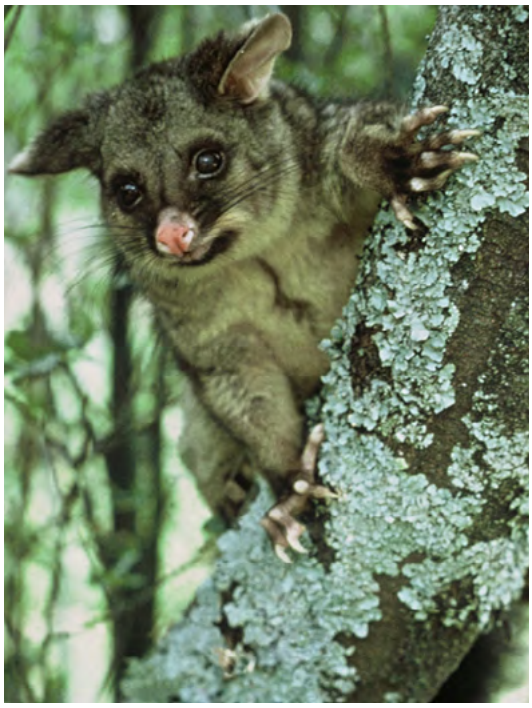
Examples of changes to an ecosystem because of introduced predators

Possums

Possums eat a varied diet, mostly made up of leaves. They can cause significant damage to individual trees in a forest because they have favourite trees such as: rātā, kāmahi, tree fuchsia and five-finger. This can mean that these types of trees are less likely to survive and are often replaced by other species of trees. Possums also eat eggs and chicks of endemic birds such as the kererū and kōkako. They will also eat the fruit and flowers of plants and invertebrates, preferred foods for many endemic and native birds. Therefore with possums around, an ecosystem can change dramatically – making it less likely for endemic birds to successfully feed and breed.

Rats and mice

Rats and mice are very common in green spaces where there is no introduced predator control. Like possums, rats and mice can also eat the seeds, flowers, leaves and fruits of plants. With fewer flowers, fruits and seeds around there are less foods for birds, invertebrates and other native animals. If introduced predators eat seeds this also causes problems for the native plants – they cannot reproduce and the forest will not regenerate.



Possum. *Photo: DOC*

Ship rat. *Photo: DOC*

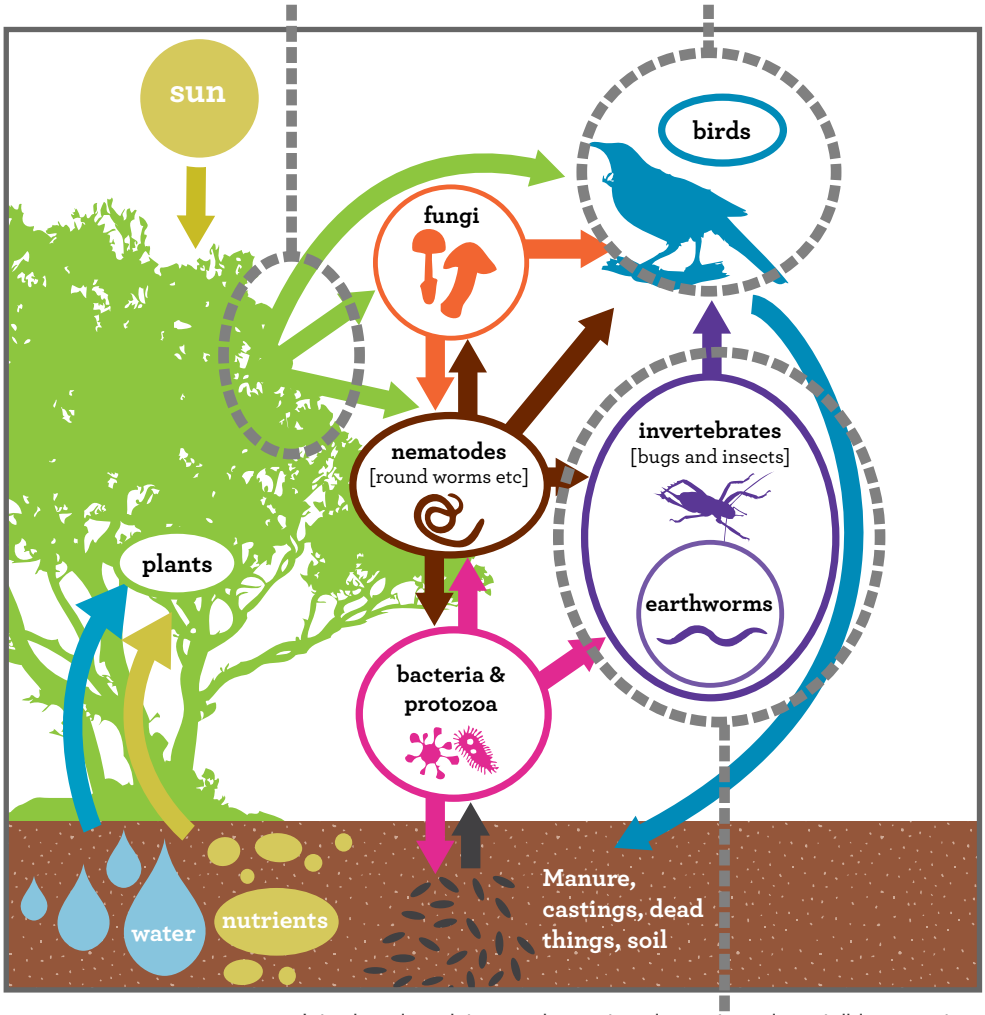
Introduced predator changes to an ecosystem

Students could draw, describe and label potential effects of introduced predators on an ecosystem diagram like the one pictured below [non-annotated copy].

See example answer below:

Rats, mice and possums can eat seeds, leaves, fruits and plants, removing plant foods for other animals in the ecosystem. This may affect the numbers of birds and invertebrates.

Introduced predators such as rats, cats and mustelids can remove some birds from an ecosystem through eating eggs, chicks, and adults. Reducing bird numbers can alter the balance of other living things eg invertebrates and plants.



Introduced predators such as rats, mice, cats and mustelids can eat large numbers of invertebrates. This can affect the whole ecosystem.

These changes can cause many other disturbances. For example: if the invertebrate numbers drop there will be less food for some birds and therefore fewer birds may be able to survive and breed.

Discuss what other possible changes could occur with fewer invertebrates in the ecosystem (this change could possibly have consequences anywhere in an ecosystem eg plants could be affected in different ways – some may have lost pollinators nutrients, and others may lose browsers).

See: **doc.govt.nz** for further information on how introduced predators affect the ecosystem in beech forests.

F. Gathering and reflecting on data

Gathering data: tracking tunnels and introduced predator monitoring

Which introduced predators are in your area? You can trace introduced predators with a variety of methods, including tracking tunnels. Tracking tunnels are plastic tunnels with bait, ink pads and paper/card inside them which are designed to collect evidence of introduced predators. Introduced predators are tempted to go inside the tunnel to get the bait, step on the ink and leave their footprints behind. The ink footprints can then be used to identify which animals have been in the tunnel. Your local council or environmental organisation may be able to help with sourcing tunnels.

Tracking tunnels [the Black Trakka] from Gotcha traps (pictured on right) can be ordered through **gotchatraps.co.nz**. These tracking tunnels are tough, long-lasting and have effective ink cards which can record very detailed introduced predator prints for accurate identification. Contact **info@gotchatraps.co.nz** for more information or to order tunnels, pre-inked tracking cards, or traps. Schools can be eligible for a discount on purchases.

Large model of the 'Black Trakka' tracking tunnel

Milk bottle tracking tunnel

Tracking tunnel with prints

Making your own tracking tunnels

Tracking tunnels can alternatively be constructed by students from household materials. Students could also design and build their own versions and work on a prototype to improve it. These homemade designs will not work as effectively as purpose built ones, but will give some indication of what might be living in your area.

Discuss the needs of all animals (food, water, shelter, safety, etc.) and brainstorm which of these needs of animals could be used to help to attract introduced predators to your tunnel.

For ideas about how to construct tracking tunnels for your green space, see:

sciencelearn.org.nz

Important considerations when designing a tracking tunnel

- The tunnel should be waterproof in case of rain, made of something light but strong and big enough for a ferret but not big enough for a cat to get through.
- It should also be weighed or pegged down so it doesn't blow away.
- Make sure your tunnel is the same width throughout. If using milk containers, cut them and align to make all the same width.
- Tracking tunnels can be placed in different areas of your green space to detect what is living in those areas.
- Human scent can be a deterrent for some introduced predators – wear gloves when putting the bait into the tracking tunnel.

Setting up tracking tunnel

Experimenting with other predator detection methods

New methods of predator detection are becoming available all the time. Students may want to experiment with other methods of monitoring. This could add to information given from the tracking tunnels.

Wax tags and bait stations

An alternative method used by some groups to detect introduced predators is the 'wax tag'. A wax tag is a block of wax, sometimes flavoured with bait to attract the predators. Chew cards are also sometimes used. These cards are made from a soft material that holds its shape when chewed, so that tooth marks from the introduced predator can be used to identify it. See: **landcare.org.nz** for more ideas and information about wax tags, introduced predator monitoring and interpreting results. Interpreting the tags and cards can be difficult, so expert help is advised.

You could also experiment with possum bait stations. See this article from Science Learning Hub **sciencelearn.org.nz**. These could possibly be used to detect possums as well as later on used as bait stations to deliver bait.

Reflecting on data, using evidence

Use the ID guide on the following page and the link to the Rotokare brochure to help to identify which animal left the tracks in your tunnels **rotokare.org.nz.**

Experiment (test your ideas) with different baits to see which introduced predators are attracted by which foods. Keep records of your results.

Use this evidence to make statements about which baits and which locations are most successful for attracting different introduced predators. This may help to inform any trapping later on.

Ideas for baits:

- For stoats: try meat and eggs
- Rats and mice: peanut butter, chocolate, cheese, egg
- Possums: jam, apple, peanut butter
- For more information about tracking and trapping, visit

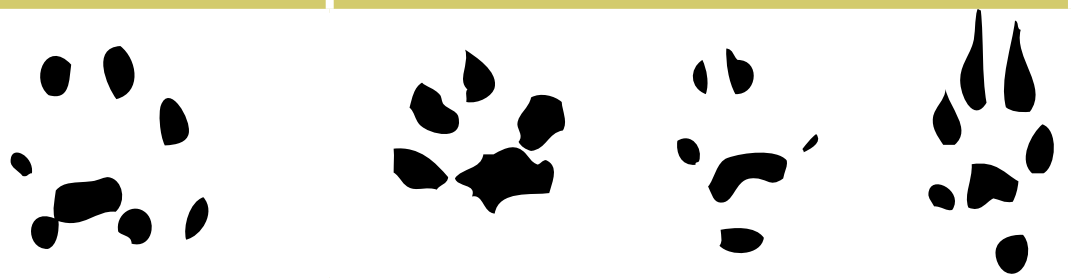
predatorfreenz.org

Hedghog prints.

Footprint identification

Ferret

Most detailed | Most commonly found



Stoat

Most detailed | Most commonly found

Hedghog

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. DUNEDIN BOTANIC GARDEN LEOTC 2002.

Organising, displaying and making sense of data

Collate and organise your tracking/monitoring data. Putting data into tables makes it easier to create graphs as a next step. Students could create bar charts or other graphs using your data to help make sense of results.

Looking at your results:

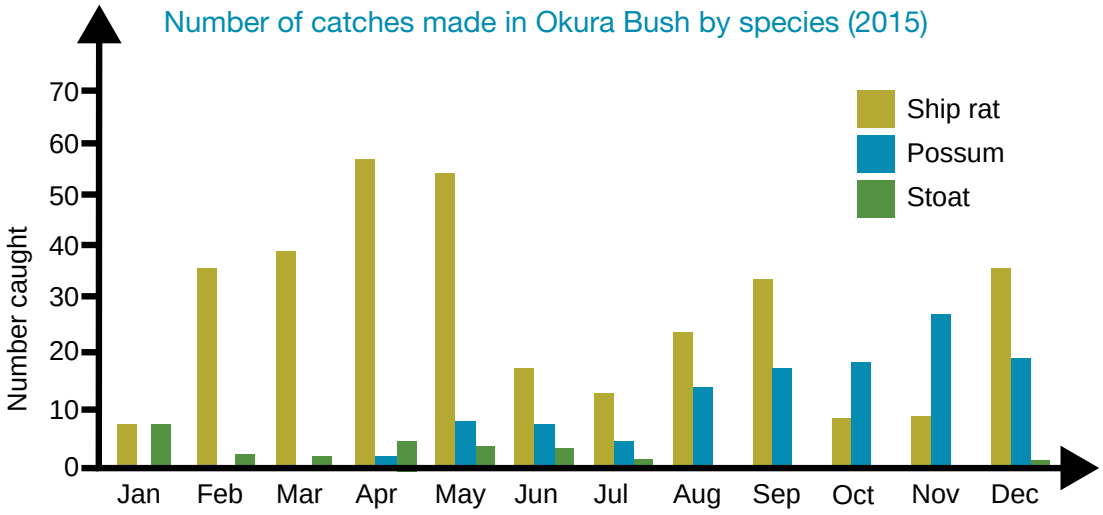
- How many different introduced predators did you find?
- Look at the data you collected as a whole class/school. Which introduced predators were most common? Why do you think this was?
- Are there any patterns or themes you can see from your results so far?
- Reflecting on your graphs and information: have you answered any of your questions?
- Has this information/data brought up any new questions?

University of Auckland and CatchIT – tools for data management

The University of Auckland has developed tools for the community to keep track of their data about tracking and trapping introduced predators, see: **stat.auckland.ac.nz**

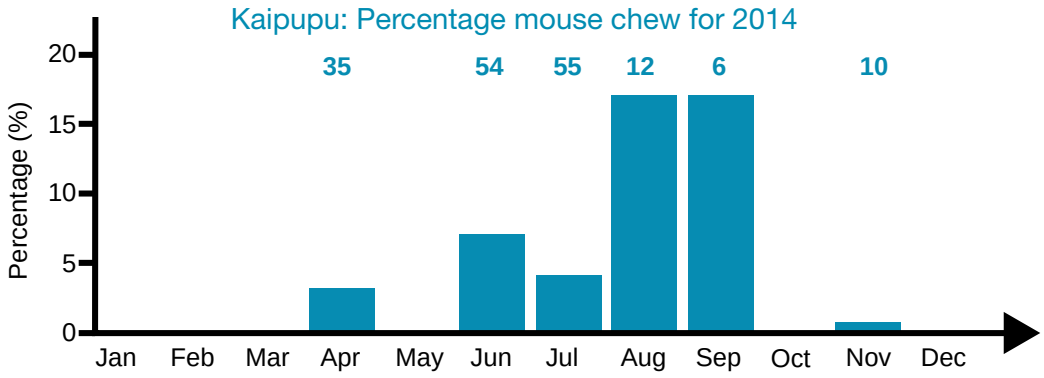
They have created an online app which can convert your data into bar charts for easy interpretation of results: **crimdev.stat.auckland.ac.nz**

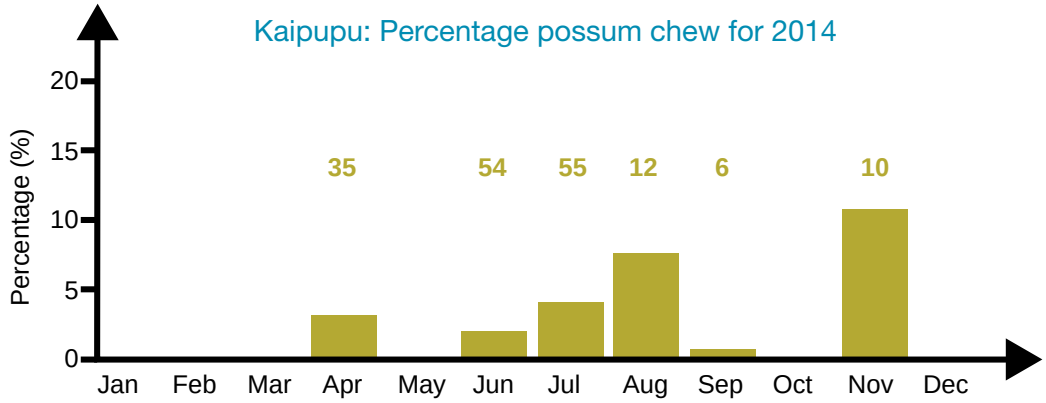
Below is an example of a graph from the app, showing catches of ship rats, possums and stoats in Okura Bush, Auckland:



The CatchIT graphs (on the next page) from Kaipupu sanctuary (**kaipupupoint.co.nz**) show the percentage of wax tags chewed by mice and possums within the sanctuary.

How do the results for mice monitoring differ from the possum results?





The numbers on the top of each bar are the total number of wax tags checked during that month (eg in April 2014 35 wax tags were checked and out of these approximately 2.5% were chewed by mice and 2.5% were chewed by possums).

Critiquing evidence

Students can review the data and information they have gathered about introduced predators. Did their observations support or challenge their ideas and predictions from **Introduced predators: predictions and wonderings?** on page 24.

It may help to create a presentation or report to aid their reflection.

The following questions could prompt students to critique their evidence:

- Were the results different in each location? Why/why not?
- Were there areas where you found no evidence of introduced predators or lots of them? Why do you think this was the case? (some areas will be more attractive to certain introduced predators than others. Consider factors such as food sources, shelter, and predator preferences)
- If you had used a different method to monitor introduced predators, do you think you would have had the same findings? (different monitoring tools will attract and repel different introduced predators, so you would probably get varied results)
- Do you think you found every introduced predator in the survey area? What were the limitations of your surveying methods? Think about how your observations and results may have been influenced by different factors such as the weather, the type of survey, knowledge of observers and other factors (monitoring can never pick up all predators in an area. Results will vary depending on factors such as weather etc.).
- How can you make sure your data is more accurate in future?

G. Extending thinking about introduced predators

Curriculum links

English: Listening, reading and viewing: Ideas

Social Science: Social studies

Minor link: Science: Living world

Science capabilities: Gather and interpret data, Use evidence, Critique evidence, Interpret representations

Learning outcome

Students are learning to:

- Begin to understand how green spaces change over time and what introduced predators have been introduced into their green space
- Begin to understand how introduced predators influence green space

Success criteria

Students can:

- Find and record information about how an introduced predator has been introduced in their green space
- Give an example of the effect an introduced predator has had in the green space

Finding out more about how introduced predators can influence a green space

Thinking about your green space over time

Discuss with students and talk to your community about these ideas:

- Reflect on which introduced predators are likely to be the most common in your green space. Have they been brought here by people? How did they end up in your green space?
- How and why have people changed your local landscape over time? Which species of animals have come and gone and why could this be? Find historic photos of your green space or neighbourhood, and compare them to more recent images
- Ask your elders, kaumatua or grandparents/great-grandparents about changes they have seen in their landscape during the time they have lived there. What are their ideas about which animals have come and gone?
- Write an article describing the changes to your green space over time, which animals have been introduced and how they may have influenced endemic/native animals

Ferret, showing upper body and head.

Stoat, close up of male head in tussock, Otago Peninsula, October 1982. Photo: Rod Morris

Your community and the impact of introduced predators

- What has been done so far to deal with predators in the green space or surrounding areas? Find out by conducting a survey with your community.

Also look on **naturespace.org.nz/groups** to view details of environmental groups operating in your local area. Contact them or see their websites/data for information on their introduced predator control efforts. Most environmental groups do some form of predator monitoring and control

- What impact are introduced predators having on the endemic and native birds, invertebrates and plants/trees in your green space? (see also page 23 **Changes to the ecosystem**).

What are the different points of view on introduced predators?

Do Māori have different ideas and perspectives about introduced predators in the community? Talk to local iwi about their ideas about introduced predators and changes in the ecosystem from their point of view.

Kiore – Pacific rat

For some Māori, kiore are thought of as a taonga (a special treasure that has cultural and historical value). Māori settlers introduced kiore in around the 10th century. They were used as a food source when food was very hard to come by at the time. Local iwi need to be consulted about kiore control, but kiore are now rare in most parts of New Zealand. Check with your local council about kiore control protocols. For more information see **doc.govt.nz**


Kiore. *Photo: DOC*

Possums

Read Too many possums (Gold 1) Ready to read. Audio version:
esolonline.tki.org.nz

This article is an explanation about why possums are pests in New Zealand. After reading students can write about their views/opinion on possums eg why possums are a problem in NZ but not in Australia.

Going further

- Are all students' questions answered?
- Do you need more information or investigations?
- How can you show what you have learned so far?

Contributing to a predator free NZ by 2050

Predator Free 2050 is New Zealand's biggest conservation challenge. It demands that we all work together – DOC, iwi, regional councils, conservation organisations, other government agencies, scientists, businesses, schools and communities – to rid New Zealand of the most damaging introduced predators (most commonly rats, stoats and possums) that threaten the naturalenvironment.

If we achieve Predator Free 2050, we:

- will have forever preserved some of the world's most unique flora and fauna
- will leave a priceless environmental legacy for future generations of New Zealanders
- will no longer worry about rats or possums invading our homes and gardens, and about the diseases these pests can spread
- won't continue to spend billions of dollars each year on pest control
- will be even more attractive to visitors to New Zealand, because of our conservation story and respect for the land.

Check out the **Predator Free Community Toolkit** on DOC's website for more information on how your school can help contribute to this conservation challenge. See **predatorfreenz.org** for case studies and examples of what other schools have done to achieve a predator free community.

DOC's introduced predator control methods and programmes

DOC is responsible for introduced predator control on land that it manages. Some of the methods used include ground control methods such as traps, bait stations and aerial control (bait dropped from the air) – see: **doc.govt.nz.**

Specially trained dogs are also used by DOC staff to detect predators of threatened endemic species. Dogs can find introduced predators that escape other methods of detection. See *Conservation Dogs programme:* **doc.govt.nz.**

Battle for our Birds is DOC's successful national introduced predator control programme that protects our most vulnerable native species. See *Battle for our Birds:* **doc.govt.nz.**

Why control predators in New Zealand? How can we do this humanely?

Before beginning predator-control activities like trapping, we must understand why New Zealand needs to control predators, and how to do this with respect.

New Zealand has the highest rate of threatened species in the world. About 81% of our birds, 88% of our reptiles, and 72% of our freshwater fish are endangered. Approximately 800 species are in serious trouble, and if we don't act now they will face extinction.

Introduced predators kill millions of native birds every year. To give our wildlife a chance to survive and thrive, we must remove the threat.

We need to use the tools and techniques that will most effectively protect our threatened species today, but that will also take the welfare of predators into account.

When trapping, we should encourage people to think about the animal's life that has been taken. It's not easy to kill another living thing, nor should it be. Many indigenous cultures pay respect to the animal they have killed; by encouraging others to respect a deceased animal, we encourage them to respect our native wildlife too.

True kaitiakitanga (guardianship) of our native birds, reptiles and invertebrates is making sure they can live in safety; the key to getting this right is to hold onto empathy for other living things along the way.

For more information, see Nicola Toki's (DOC's Threatened Species Ambassador) **blog post**.

H. Resource list

School Journals

Too many possums – Ready to read (Purple-Gold level)

Audio version: **esolonline.tki.org.nz**

A very clever possum – Ready to read (Orange)

Catching mustelids – Junior Journal 43

The wild deer debate – SJSL 2011

Border security – Connected 3 2011

Cats – Who Needs Them? – School Journal Level 2 2014

Books

A bird in the hand: keeping our wildlife safe by Janet Hunt, Random House Publishing, 2003

Invaders – animals from elsewhere that are causing trouble here by Nicola Toki, New Holland Publishers, NZ 2009

Video clips

Natural born killers (footage of introduced predators): **youtube.com**

Returning the bird song **youtube.com**

Other resources

Conservation Dogs education resource – Use this resource to learn about conservation dogs, Predator Free 2050, biosecurity and how to take conservation action in your local community.

www.doc.govt.nz/education-conservation-dogs

I. Sharing knowledge and taking next steps

Citizen science

Citizen science enables students to participate in the scientific community and contribute to increasing our knowledge about New Zealand's introduced predators.

For citizen science projects suitable for NZ primary students see: **pond.co.nz**

Examples of citizen science projects involving introduced predators

These projects are particularly relevant if you are monitoring or planning to trap introduced predators with your community.

iNaturalist

inaturalist.nz
Record your observations of introduced predators via this well-known citizen science hub. Students can take photos of introduced predators and enter their observations onto the website to share information with science communities. You can also enter results for **iNaturalNZ** on the **iNaturalist app**. Teachers will need to register at **inaturalist.nz** before you can enter observations.

For more information on how to use iNaturalist, see the **Exploring your local environment resource**

See the introduced predator-related projects below:

inaturalist.nz/projects/animal-footprints-in-nz (enter photos of your tracks from tracking tunnels here)

inaturalist.nz/projects/whose-poo-new-zealand (enter photos of introduced predator droppings here

Sharing other findings

Students could create presentations, speeches, assembly items, newsletters or blogs to share information about which introduced predators they have found in their green space. They may want to contact community groups in the area and share information. Sharing findings can lead to new opportunities for insight and environmental action.

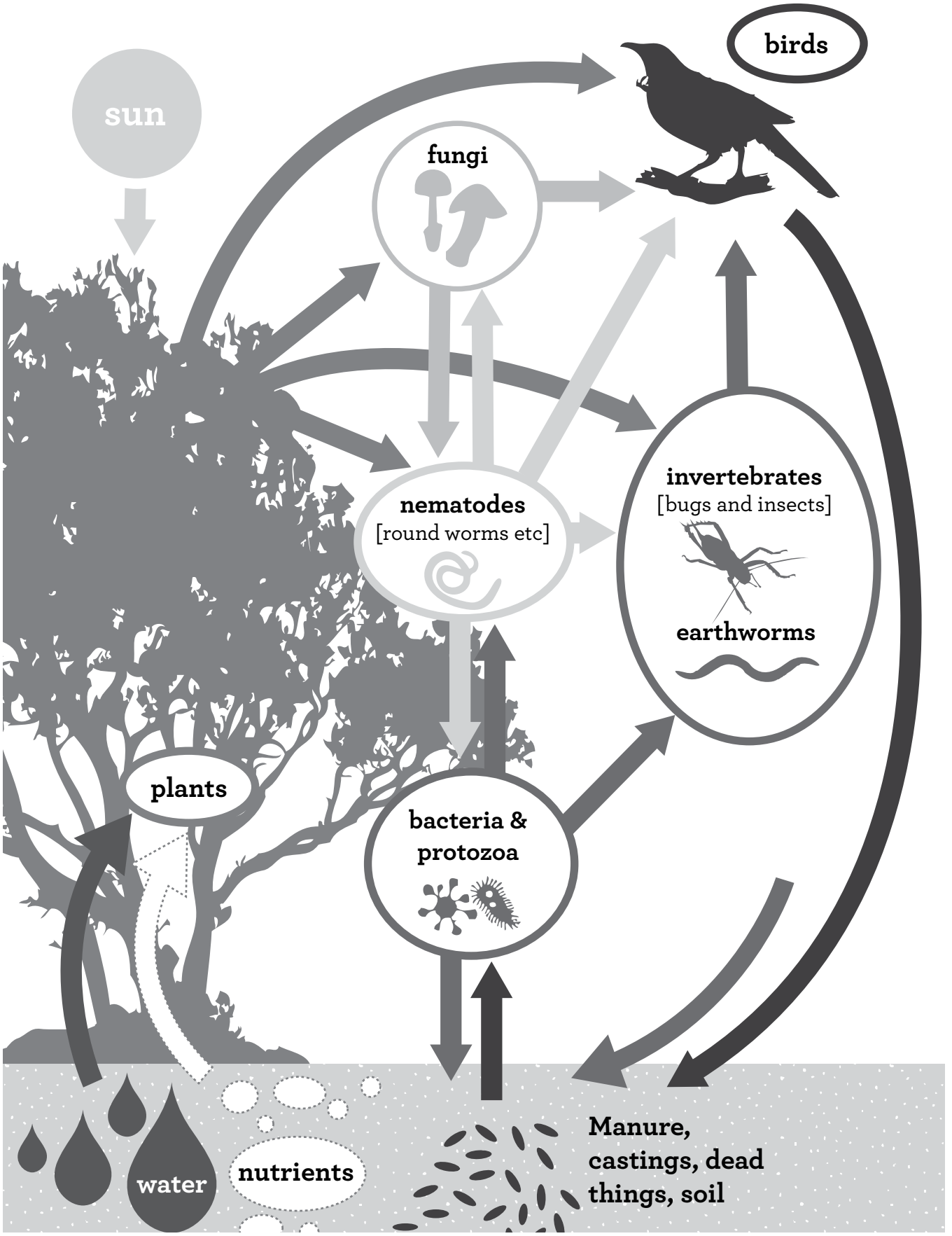
Take the next steps and form an action plan

Continue learning about introduced predators. Network with others who are involved with predator control and conservation.

Use resource **7: Enhancing biodiversity in your green space** to reflect on the species found in your green space and to form a plan for which species you will target for increasing biodiversity and eliminating introduced predators.

Use the **8.Tools for action** resources to organise and plan an environmental action which could deal with predator issues and enhance the native animal and plant life in your green space. This could include increasing habitat, foods or shelter in your green space and/or dealing with introduced predators.

Introduced predator changes to an ecosystem



Department of Conservation
Te Papa Atawhai

Introduced predators – predictions and wonderings

What have we noticed about introduced predators in our green space?

What we know already about introduced predators:

What do we wonder about introduced predators?

Our prediction about introduced predators is:

Main question:

How can we find out the answer to this question?

Department of Conservation
Te Papa Atawhai

Stoats and other mustelids

Stoats, ferrets and weasels belong to a group of animals called mustelids. Mustelids are carnivores with long, thin, furry bodies. Stoats have a black tip on the end of their tail.

The impacts of mustelids

Stoats and other mustelids will eat native and endemic birds, their chicks and eggs, invertebrates, rodents, lizards, hedgehogs and fish. They are carnivores and only eat other animals. Stoats can climb trees and swim a few kilometres, and they hunt day and night.

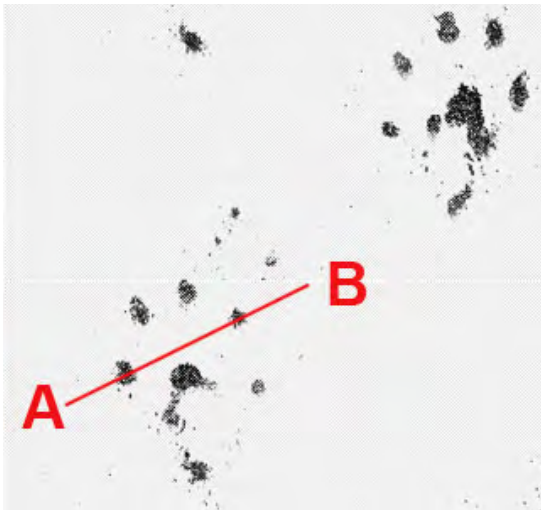
Ferret, showing upper body and head.

Why did people bring mustelids to New Zealand?

Mustelids were brought here in the 1870s and 1880s to try to deal with the huge number of rabbits at the time. Mustelids' favourite food is rabbit but unfortunately people back then didn't understand how dangerous these animals would also be for our New Zealand birds.

Mustelid facts:

- Weasels are the smallest mustelids and ferrets are the biggest
- Stoats are the number one enemy of our native birds because they kill so many of them
- In Te Reo Māori stoats are known as Toriura
- If you draw a line from the first to the fourth toe of a stoat footprint the line will be in front of the foot pad



Stoat footprints (top) and stoat droppings (bottom).
Photos: DOC

Hedgehogs

Hedgehogs are small brown creatures with sharp spines covering their bodies. They are nocturnal (come out at night) and cause problems for native NZ animals.

The impacts of hedgehogs

Hedgehogs eat native lizards, snails and invertebrates. Hedgehogs also eat the eggs and chicks of birds, especially those that nest on the ground eg dotterels and terns.

Why did people bring hedgehogs to New Zealand?

Hedgehogs were brought here by early settlers to help to make them feel more at home. It was thought that they would eat slugs and snails from vegetable gardens. Now hedgehogs can be found all around New Zealand.

Hedgehog droppings. *Photo: Astrid Van Meeuwen-Dijkgraaf*

Hedgehog facts

- Hedgehogs were named after pigs (hogs) because of the grunting noises they make
- They can't see very well and rely on their sense of smell and hearing
- In Te Reo Māori hedgehogs are known as tuatete
- Hedgehogs are known to eat wētā and giant centipedes. One hedgehog was found with 283 wētā legs in its stomach!

Hedgehog footprints. *Photo: Liz Maire*

Department of Conservation
Te Papa Atawhai

Mice

Mice are small, grey/brown rodents. The head and body are about 10cm long. Mice may be tiny but they are a big problem for our native birds, plants and insects. They live in almost every area of New Zealand.

The impacts of mice

Mice eat some native species as well as the foods they eat. They take foods that birds would normally eat like berries and seeds. They can affect every part of an ecosystem. Without mice, we would have a lot more New Zealand animals and plants around!

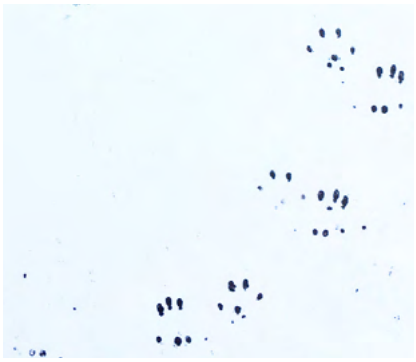
House mouse with young in a nest. *Photo: DOC*

Why did people bring mice to New Zealand?

People brought mice to New Zealand on ships, probably by accident. The first mice came here in 1824, on a ship from Australia called 'Elizabeth Henrietta'.

Mouse facts:

- Mice will eat just about anything! They eat invertebrates, seeds, fruits, leaves, birds' eggs, fish eggs, chicks and insect larvae.
- When mice first arrived in NZ, people had never seen them before and called them 'Henriettas' after the ship they came from.
- All mice and rats are called kiore in Te Reo Māori.



Mouse footprints. *Photo: Liz Maire*

Mouse droppings. *Photo DOC*

Rats

Rats are furry rodents with short legs, pointed noses and long tails. They are bigger than mice. Before people arrived in New Zealand there were no rats here. There are now three types of rat found in New Zealand: ship rat, Polynesian rat/kiore and Norway rat. All mice and rats are called kiore in Te Reo Māori.

The impacts of rats

Rats are not fussy – they will feed on whatever foods are around at the time: including birds, invertebrates, lizards, fruits and seeds. They will eat the chicks and eggs of native birds and sometimes eat adult birds

Ship rats

Climbing up to nests is easy for a ship rat and they like to hang out in trees. In ship rats the ears are large and the tail is longer than the body. Because they are such good climbers these rats are the biggest threat to birds, eggs and chicks. They also eat fruit and plants, competing with our birds for food. Ship rats are the most common and widespread species of rat found in New Zealand.

Ship rat in a fantail nest. *Photo: DOC*

Why were rats brought to New Zealand?

Rats were brought here on boats and ships by early settlers. Most probably came here by accident!

Rat footprints. Photo: *Liz Maire*

Rat droppings. *Photo: DOC*

Norway rats

Norway rats are the largest rats in New Zealand. In Norway rats the ears are small and the tail is shorter than the body. Norway rats spend more time on the ground, so will eat invertebrates like wētā, beetles, spiders and stick insects, ground nesting birds and lizards.

Norway rat. *Photo: DOC*

Kiore. *Photo: DOC*

Kiore

Kiore are the smallest type of rat in New Zealand. They eat animals living on the ground like invertebrates, seabirds and lizards.

Cats

Cats are large predators compared to most of our New Zealand native birds. They are great hunters, and they will eat even large birds like kiwi, kakapo and takahe.

The impacts of cats

Cats eat native birds, invertebrates and lizards. In the 1940's, cats wiped out most forest birds and at least two types of seabird from Mangere Island where they were taken to try to control rabbits.

Hunting cat. *Photo: DOC*

But my cat is a pet...

Wild cats are more of a problem than pet cats, but pet cats can still kill native birds, lizards and insects. Put a bell on your cat and try to keep them inside as much as possible to decrease the chances of them killing native animals. Cats should be well looked after and not left to hunt for themselves.

Why are cats in New Zealand?

Cats were brought to New Zealand with people as pets. They were also put into the wild back in the 1800s to try to deal with rabbit and predator problems.

Feral cat paw print. *Photo: Jon Anda*

Cat dropping. *Photo: DOC*

Possums

Possums are native to Australia. In Australia possums are not a problem, but in New Zealand they are causing a lot of trouble for our native trees and birds. They find some of our New Zealand trees super tasty. Possums love to eat rātā, tree fuchsia, broadleaf, mistletoe and pōhutukawa trees.

The impacts of possums in NZ

Possums eat mainly leaves (most often from our native trees). They will also eat the eggs and chicks of many native birds, such as kererū, kiwi and tūī, as well as native invertebrates like wētā and large land snails. Possums can do a lot of damage to New Zealand native animals and plants.

Possum facts

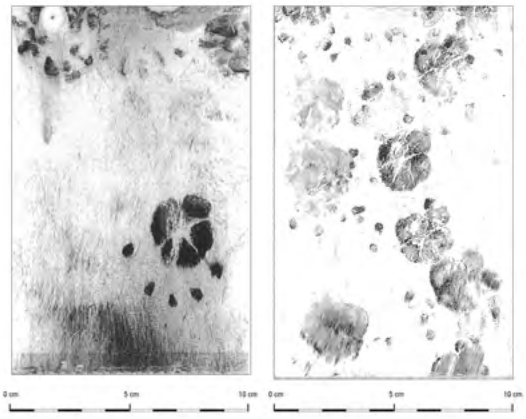
Possum in tree. *Photo: DOC*

- One possum will eat about 3 shopping bags full of leaves in one night.
- Because they find some trees more delicious than others, possums can wipe out certain trees from areas where they are living.
- Possums can carry a disease called TB and spread it to farm animals.

Why did people bring possums here?

Possums were brought to New Zealand in 1837 by people who wanted to farm and hunt them for their fur. What people didn't realise was how many plants, birds and insects possums would eat without any large predators around to eat them.

Possum droppings. *Photo: Astrd Van Meeuen-Dijkgraaf*



Possum footprints. *Photo: Greater Wellington Regional Council*