



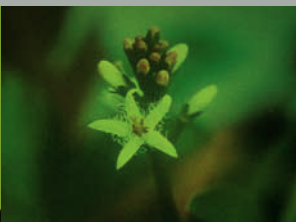
Department of Conservation
Te Papa Atawhai

WHAT A PEST!

INVESTIGATING THE IMPACT OF PEST SPECIES ON BIODIVERSITY

STUDENT READING BOOKLET

A YEARS 7-8 INQUIRY LEARNING PROGRAMME FOR CANTERBURY SCHOOLS



THIS BOOKLET IS USED IN ASSOCIATION WITH SESSIONS 5 AND 6 OF THE PEST EDUCATION KIT.

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Everything is connected



**Environment
Canterbury**
Regional Council
Kaunihera Taiao ki Waitaha



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PESKY PESTS! WHY NEW ZEALAND IS ONE OF THE 'PESTIEST' COUNTRIES IN THE WORLD

SPECIFIC LEARNING INTENTIONS	SUCCESS CRITERIA
<p>I will:</p> <ul style="list-style-type: none">• learn about the specific problems caused by several invasive species in Canterbury and across NZ• be able to identify issues related to interdependence, ecological sustainability and human impact• be able to discuss the implications of invasive species for both ecosystems and human systems• use and interpret graphs.	<p>I can:</p> <ul style="list-style-type: none">• describe what impact some pests have had on Canterbury's and New Zealand's environment• identify how these problems could affect other species, humans and long-term sustainability• imagine what the ongoing impact could be on native biodiversity and human society should pest species take over• discuss with others what I think the implications may be.

PESKY PESTS! WHY NEW ZEALAND IS ONE OF THE 'PESTIEST' COUNTRIES IN THE WORLD

A. HOW DID THEY GET HERE?

Different waves of settlers to New Zealand, particularly 19th Century European settlers, introduced numerous plants and animal species to Canterbury. Many of them became 'pests'. For example, the possum was imported from Australia for the fur industry, and stoats, ferrets and weasels were imported to control the imported rabbits! A number of plants introduced by British migrants were thought to be useful for farm hedging such as boxthorn and gorse, or were reminders of home. Some have had a significant impact on native plants and animals and, alongside land clearance for farming and urban areas, have changed the landscape dramatically.

Acclimatisation Societies were set up in various regions of New Zealand to improve the successful naturalisation of introduced species. Many of those involved saw New Zealand's native plants and animals as being somewhat lacking, particularly in terms of animals for hunting and fishing. Since the late 1800s a variety of species such as deer, trout, carp and stoats have been introduced into New Zealand. The effects of these introductions have been far-reaching as both habitat and populations of native plants and animals have been modified and/or lost forever. Many ecosystems have changed so much that they would be almost unrecognisable to someone who lived there in the 1700s.

Te Ara: The Encyclopaedia of New Zealand website has useful background to Acclimatisation Societies in understanding why settlers introduced the plants and animals that they did.

www.teara.govt.nz

LET'S FIND OUT MORE!

Use the Te Ara site to answer the following questions:

- Why did Māori and Pakeha settlers to Aotearoa New Zealand bring plants and animals with them to a new land?
- What were some of the first animals and plants released in NZ and where are they still found today?



- What were some of the more unusual animals brought to Aotearoa New Zealand?
- What role did the Acclimatisation Societies play in acclimatising the plants, fish and animals they introduced? What methods did they use to establish the various species in our environment?
- What did some naturalists do to record and preserve native species of plants and animals?
- What are your thoughts about the role the Acclimatisation Societies played in transforming the landscape?

DID YOU KNOW?

Ferrets engage in “spree killing” where they slaughter more prey than they can eat



DID YOU KNOW?

There was a strong belief among early European naturalists that New Zealand’s bird-dominated fauna was a rare example of Nature going astray (i.e., whole animal groups like mammals were missing). Some of the animal introductions from Europe were motivated by a sense of duty to correct Nature’s mistake.

A small number of naturalists in the mid to late 1800s were deeply concerned about the importation of new animals but their warnings about effects on native fauna were not heeded. Richard T Henry was a rare example of one who tried to do something about it before it was too late (others simply devoted themselves to obtaining the last specimens of rare species – ‘for science’ - before it was too late).

Other naturalists: Walter Buller, Thomas Potts, Charlie Douglas.



REFLECTION OPPORTUNITY

- * What did I learn that was new to me today?
- * What didn't I understand today?
- * What made understanding this topic difficult?
- * What more would I like to know about this topic?
- * How interested am I in this topic?
- * How can I show what I have learnt today to others?
- * How could I have been supported to learn better today?

Read this story. As you do so note down any new words or terms you may wish to add to your definitions chart e.g. exterminate.

B. PESTS GALORE!

The Ministry for the Environment estimates that more than 25,000 plant species, 54 mammal species, and about 2,000 invertebrate species have been introduced to New Zealand since it was settled. We live in “one of the world’s weediest countries” according to Landcare Research, with over 2,000 non-native plants growing in the wild, many of which are considered pests and a threat to native biodiversity. And each year up to seven new weed species are added to this list! Many people often don’t recognise pest plants as a problem.

For example, Pampas grass, a fluffy spear like plant, is often mistaken for native toetoe. It is found all over New Zealand and is really difficult to get rid of. Other weeds, like old man’s beard, can smother native forests and suppress their regeneration.



Native toetoe



Pampas grass

THE GOOD AND THE BAD

Some of the introduced animals, such as sheep and cattle, are important for our agricultural industry but others pose a threat to what is left of our native biodiversity. Browsing pests such as goats, deer, and possums change the look of our forests and grasslands. Some animal pest, such as stoats, possums, and mice, are found nearly everywhere in New Zealand.

DID YOU KNOW?

Rats can jump 1 metre vertically and 1.5 metres horizontally.



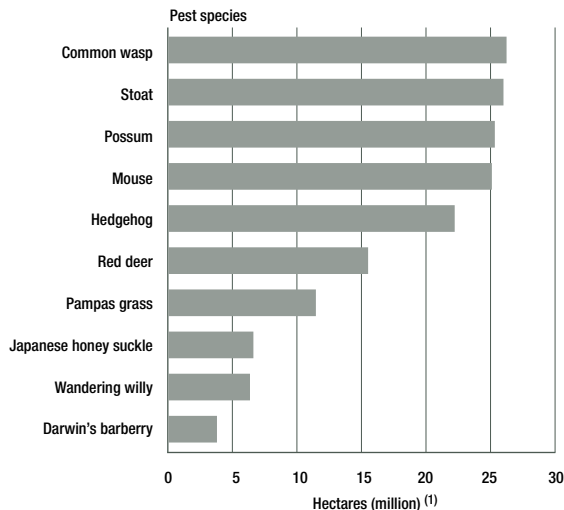
WHAT THE ...!

While stoats and ferrets may have initially knocked rabbit numbers as planned, they found our native birds, insects and bats easier to catch. As they spread, our forests became ever-more silent. As Department of Conservation records, “forty-four birds have become extinct since human colonisation brought pests, such as stoats, to New Zealand”.

FIGURE 1

Distribution of selected exotic weeds and pests

At 1 July 2007



Source: Department of Conservation

(1) The total New Zealand land area is 26.8 million hectares.

What is often forgotten is that pest species invade the water as well. There are at least seven species of fish that cause lake health to decline and a significant number of our waterways now battle aquatic weeds such as egeria and the algae didymo.

DIVIDE AND CONQUER – CONTROLLING PESTS!

Most people seem to believe that we have a problem with certain pest species, particularly animal pests such as possums and rabbits. But the perception as to how we should deal with these pest species is mixed, ranging from extermination to control as a resource. There are always different opinions when people consider our relationships to living things e.g. trout and salmon are highly valued by anglers but have done terrible damage to New Zealand's unique native fish fauna.

The value people place on some pest species prevents New Zealand from eradicating them completely, even though their persistence may threaten the survival of unique New Zealand species (e.g., Himalayan tahr, wapiti). The arguments for keeping pest animals as, say, a hunting resource, are made by people who place a greater value on their own recreational activities than on what is good for everyone (the so-called 'public good').

DISTRIBUTION OF SELECTED PEST ANIMAL AND WEED SPECIES (INDICATOR 2.5).

Source: Measuring New Zealand's Progress Using a Sustainable Development Approach: 2008 Topic 2: Biodiversity

Stats NZ

www.statistics.govt.nz/Publications/NationalAccounts/sustainable-development/biodiversity.aspx



DID YOU KNOW?

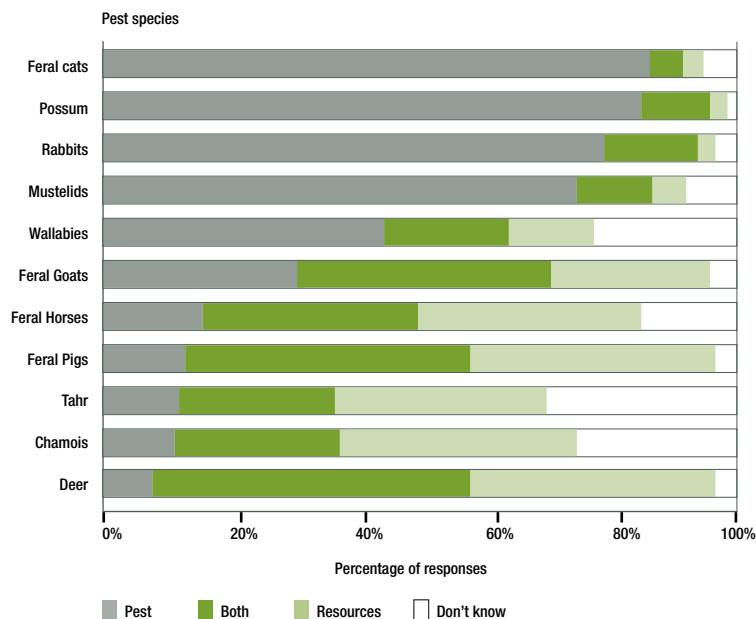
The Department of Conservation rates the introduction of stoats as “one of the worst mistakes ever made by European colonists in New Zealand.”

Without sustained control of such pests, many of New Zealand's protected ecosystems are at risk of continued biodiversity loss.



FIGURE 2

Perceptions of introduced wildlife as pest or resource
(Fraser 2001 : 24).



A telling indication of the values conflict many people have is how we make a distinction between domestic and feral cats. In fact, all cats kill native wildlife (if any are available to kill) and domestic cats will travel very large distances to forage – far, far further than their owners believe them capable of travelling.

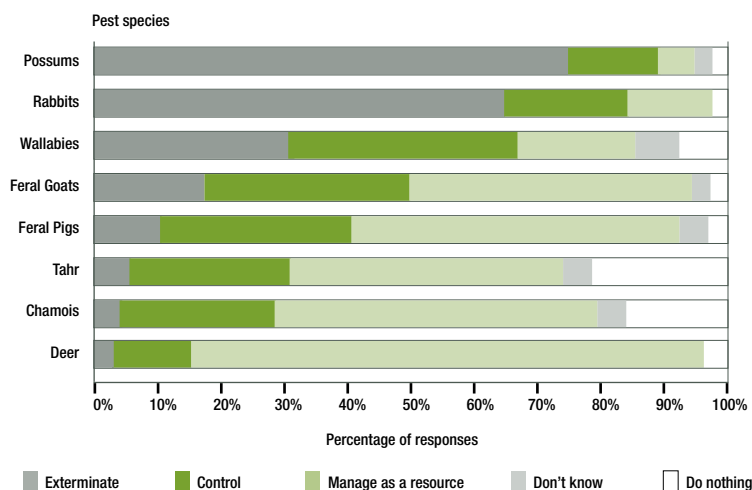
DID YOU KNOW?

Tom cats can travel 11km per night and queen's 8km.



FIGURE 3

Views of appropriate management for introduced wildlife animals
(Fraser 2001 : 24).



DID YOU KNOW?

An adult rat can squeeze into your home through a hole as small as a 50 cent piece.



Source: Fraser, A (2006) Public attitudes to pest control -A literature review

Department of Conservation research report www.Department of Conservation.govt.nz/upload/Department of Conservation/units/science-and-technical/drds227.pdf

DIVIDE AND CONQUER – CONTROLLING PESTS! CONT

To rid our country of these pest species we need to spend large amounts of money. The money needs to be targeted on controlling those pests that most threaten native biodiversity such as mustelids, rodents and possums, or those that severely affect agricultural activities.

It is estimated that as a nation we spend over \$50 million per year just on mammal pest management, yet we still face the potential extinction within a decade of wild populations of iconic animals such as the mohua and grand skink, and the ongoing decline of many others. Department of Conservation currently spends about \$14 million of its pest management budget on possum control alone, not counting that spent on rabbit, goat, deer, rat and mustelid control. In 1993, in the agricultural sector around \$150 million was spent on pesticides, including \$90 million to control weeds (estimated to cause about \$340 million in lost agricultural production each year), and \$20 million to control roundworm parasites (which cause losses of around \$260 million in reduced animal production). Most of the remaining \$40 million was spent on fungicides to control fungal pests in gardens and orchards.

In Canterbury just about all of the spending of the regional council's biodiversity group will go into what are called 'Operations' or the implementation of pest and biodiversity management programmes, with some money being spent on communicating, educating and advocating. This is about informing the community about pest and biodiversity issues and working with relevant groups. The graph shows where the money comes from that is allocated to the pests and biodiversity group of activities. As you will see, most of the money comes from general rates (funded by the community as a whole) and is topped up by "targeted rates" which are collected for specific projects in defined areas. In the 2008/09 year \$5,319,000 was spent, with \$6,250,000 budgeted for the 2009/10 year. You will see on the graph that the amount budgeted goes up each year.

Source: p85 LTCCP 2009-19: Pests and Biodiversity group of activities

ENVIRONMENT CANTERBURY

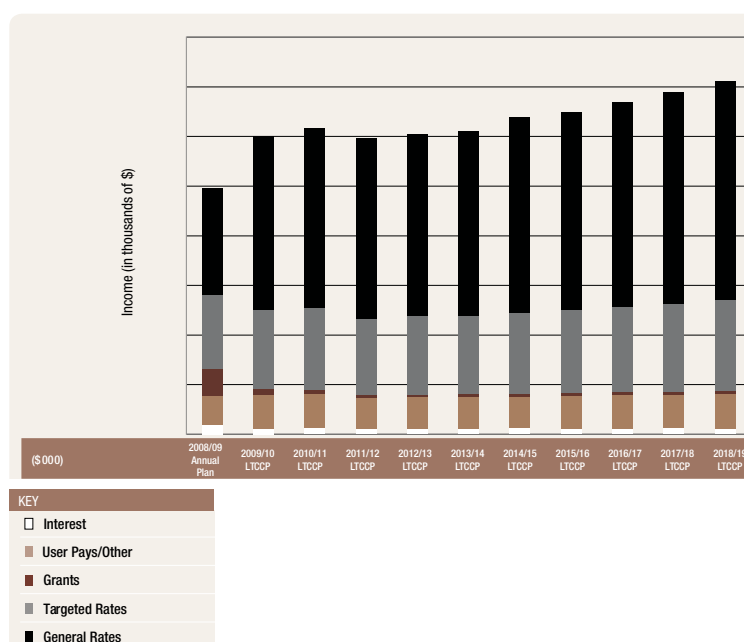
The pests and biodiversity group of activities contributes to the following community outcomes:

- A strong economy
- Business and farming activities do not harm the environment
- Environment, in general, is to be looked after
- Native plants and animals can thrive.

Environment Canterbury works closely with the community and other partners as the lead agency for managing and controlling pests specified in the Regional Pest Management Strategy and undertaking small-scale management programmes (Biosecurity Act 1993). It is also responsible for controlling the use of land to maintain indigenous biodiversity (Resource Management Act 1991).

Source: www.EnvironmentCanterbury.govt.nz/publications/Plans/LTCCP200919Pests.pdf

HOW PEST CONTROL IS FUNDED



A MOVING TARGET

Across New Zealand, different plant and insect pests are problems in different regions therefore the target programmes will be different. Controlling plant and insect pests usually involves an arsenal of poisons: insecticides, herbicides, fungicides and parasite-killing drenches, collectively referred to as 'pesticides'. We also need to deepen our understanding of the impact of possible control techniques, not only on the target pests but also on our native flora and fauna.



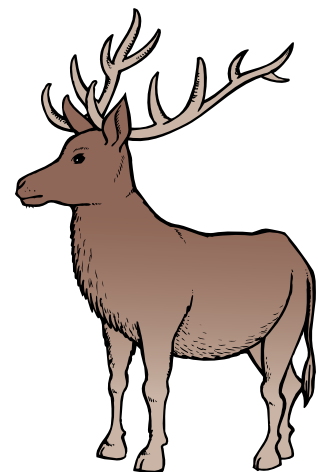
VIDEO BITES

Your teacher may show you short video clips of action against pest species as presented by Department of Conservation in the Meet the Locals series or from Bush Telly. These show what different groups or individuals are doing to combat pest species.

C. REVIEW AND DISCUSSION

Now that your class has together read the story of change, let's review and discuss the information.

- Thinking about all that you have read and heard, why has New Zealand become one of the 'pestiest' countries in the world?
- Looking at Figure 1,
 - (a) which two pests are most widespread and why do you think that might be so?
 - (b) which weed species is the most widespread? What is the likely reason for that spread implied in the reading?
- Compare Figure 2 and Figure 3. What do they suggest to you about the level of concern people have about controlling major pest animals?
- How do you think feral cats could be managed – exterminate or control?
- How would you feel about exterminating wild cats and how may that be done?
- What do you think 'manage as a resource' means in relation to possums, goats and deer?
- When do you think control of a pest should occur? Should pest control occur before or after it is a 'problem' in a particular area?
- Look at Figure 4. Who do you think should pay for pest control? Should it be the role of national and local governments to pay for pest control? Should owners of properties with a pest problem pay for eradication or control?
- How do you think the cost of pest control could be reduced?



DID YOU KNOW?

No matter how well fed at home, domestic cats still catch and eat wild prey.





D. IMAGINE - IN GROUPS

This is a chance to think about how the landscape would change if human beings no longer existed. While imagining this future, consider how both introduced and native plant and animal species may survive in this 'new world order'.

Undertake a PMI of possible effects on the Canterbury environment if humans disappeared tomorrow but the pest species still existed. You have 10 minutes to consider what could be the positive and negative outcomes and the interesting possibilities.

IF HUMANS DISAPPEARED BUT PESTS WERE STILL HERE IN CANTERBURY...		
PLUS	MINUS	INTERESTING



REFLECTION OPPORTUNITY

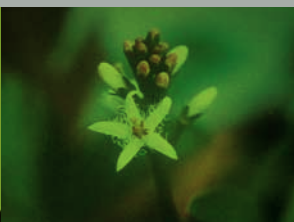
Consider also what pests should be allowed into NZ if we were to turn the clock back.

- * What would we introduce and why?
- * What would we definitely NOT introduce?
- * How would our choices change the way people see valued 'pests' today?

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