

PROTECTING NEW ZEALAND'S NATIVE SPECIES

SCIENCE/SOCIAL SCIENCE BASED CROSS-CURRICULUM ACTIVITIES

based on the investigations of James Russell

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ALLAN WILSON CENTRE
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INTRODUCING BIODIVERSITY AND ITS VOCABULARY

- Your students have probably heard of the word *biodiversity*. Do they know that it is a shortened way of saying biological diversity? Does this help them explain what biodiversity is? Brainstorm and list student ideas.
- Tell students that before we visit a New Zealand website that explains biodiversity, we should first know the meanings of the following words often used when talking about biodiversity. Ask Google and/or use dictionaries to find out:
 - what is an *organism*? - what is a *geographic region*?
 - what are *species*? - what is an *ecosystem*?
 - what does *variability* mean? - what is *genetic variability*?
- www.biodiversity.govt.nz/picture/biodiversity/what/index.html *
As a shared class reading exercise, have the class visit the above website to ensure students understand the following:
 - *biodiversity means the variety and number of organisms found within a certain geographic area*
 - *varied genetic make-up between individuals of a single species - the thing that makes each member of that species unique*
 - *the variety of species within a geographic area - birds, fish, plants...*
 - *the variety of ecosystems and all the communities of organisms that live within them*
 - *species diversity relates to the number of the different species and the number of individuals of each species within any one community.*
 - *species richness is the number of different species present in an area.*
 - *the more species present in a sample the 'richer' the area.*
- Do students know that New Zealand has both native (belonging to) and exotic (from overseas) biodiversity? Can they give examples? Which to they think is the most important? Can they give reasons?

NEW ZEALAND'S UNIQUE BIODIVERSITY

- Do students know that New Zealand has a rich biodiversity of plants and animals that are unique to New Zealand? Through class discussion, make a short list of plants/trees, animals and birds that are found only in New Zealand and those that are found only in Australia? Have students speculate on reasons why the two close countries have such different plants and animals. Play the following animation on the formation of New Zealand from Gondwana to the class at:

Social Science and Science Indicative Achievement Objectives

- Understanding and being able to explain the concepts of biodiversity with particular reference to our native flora and fauna.
- Understanding how New Zealand developed unique biodiversity free of mammalian predators and the consequences for our flora and fauna when predators arrived in New Zealand.
- Being able to identify our main predators, what they prey on, their effects and how/why they arrived in New Zealand.
- Understanding the different methods to monitor and control predators and to compare the effectiveness of each method and where best used.
- Researching the restoration and predator work being carried out by volunteer groups and becoming involved in a class and/or community conservation project - at school, at home and/or in the local district.

Yrs 5-10. Links to Technology, Sustainability and English

www.sciencelearn.org.nz/Contexts/Hidden-Taonga/Sci-Media/Animations-and-Interactives/Tectonic-plates-animation



TRIASSIC 200 million years ago

- Have groups conduct research at: www.sciencelearn.org.nz/Contexts/Hidden-Taonga/Looking-Closer/New-Zealand-s-unique-ecology and be able to explain the following:
 - the theory of continental drift
 - the time frame when New Zealand broke away from Gondwana
 - the ancient ancestors of some of our bird species
 - the consequences that developing in isolation had on the development of our native flora and fauna
 - how further species found their way to New Zealand after it separated from Gondwana
 - probable cause of the mass extinction of 85% of the Earth's species
 - the species that now dominated as the major predator and how New Zealand was different to any other part of the world
 - the only land mammal that developed in New Zealand
 - what became the main predators in the absence of land mammals
 - why many New Zealand birds lost the ability to fly.

THE ARRIVAL OF PREDATORS IN NEW ZEALAND

- Do students know a predator is the name we give to an animal that kills and eats other animals? Focus on mammal predators in New Zealand that kill birds and insects and reptiles. Can they list any of these predators? *eg*
 - rats, stoats, weasels, ferrets, possums, hedgehogs, mice...

FROM INTRODUCED PREDATORS



- Did students also know that domestic and feral cats and even dogs can also have a major effect on our bird population?
- Have students 'guesstimate' the number of New Zealand birds that are killed by predators every year. Are they shocked to know that it is about 26 million? Play the 26 million video at: www.baybushaction.org.nz/Videos.aspx and discuss why people greatly underestimate the number of birds killed by predators and how we have managed to find out who kills them and the number of birds killed.
- Remind students that New Zealand was once free of mammalian predators. If this was the case, have students speculate how these predators arrived in New Zealand. Divide the class into research groups - one group per predator, and have groups conduct research at: www.doc.govt.nz/conservation/threats-and-impacts > select Animal Pests A-Z > select a predator (ferrets, hedgehogs, pets, rats, stoats, possums, weasels) Have students discover and report back to the class:
 - how/why they were introduced to New Zealand
 - how/why they became pests
 - how they pose a threat to our wildlife and native plants.

PREDATOR DETAILED RESEARCH AT:

www.kcc.org.nz/pest-animals

- Tell students that predators are often called pest animals. For a more detailed understanding of our predator problem, visit the above website for class shared reading and discussion, **eg**
 - what was the first introduced species in New Zealand (rats)?
 - why is the life of a predator in New Zealand described as 'bliss' and what threats don't they have to worry about?
 - as well as being eaten by these predators, what else do our native animals have to compete against the predators for?

RATS AT: www.kcc.org.nz/rats

- how have rats been spread world-wide
- name the three species of rats we have
- how did the kiore or pacific rat arrive?
- why did Māori like eating kiore and for what other purposes did Māori use kiore?
- why are they now only found in Fiordland and on offshore islands?
- how did Norway rats arrive in New Zealand?
- apart from bird's eggs and chicks, what else have rats developed a taste for and how do they affect our native forests?
- where do ships rats usually live?
- in New Zealand, how wide-spread are ships rats?
- what other predators do rats attract and why are they attracted?



STOATS AT: www.kcc.org.nz/stoats

- why is the introduction of stoats described as our biggest mistake?
- what effect do stoats have on kiwi chicks that are born in the wild?
- why can stoats have such a devastating effect on offshore islands?
- where can stoats be found in New Zealand?
- physical and visual differences between stoats, ferrets & weasels.



FERRETS AT: www.kcc.org.nz/ferrets

- as well as eating our native birds, how are ferrets a danger to our dairy cows?
- physical and visual differences from stoats and weasels?
- whereabouts can ferrets be found in New Zealand?



WEASELS AT: www.kcc.org.nz/weasels

- why are they less common than stoats and ferrets? Describe their differences.
- as well as being a threat to bird life, what effects do they have on invertebrates and native lizards such as our threatened Whittaker's skink?



POSSUMS AT: www.kcc.org.nz/weasels

- about how many possums do we have and where did we bring them in from?
- why do they have such a devastating effect on our forests?
- why were possums brought into New Zealand and why are they a pest here and not in Australia (where they are protected)?
- what do possums really like to eat and the two ways that they have such a deadly affect on our native bird life?
- how do possums pose a threat to our farming industry?



CATS AND DOGS AT: www.kcc.org.nz/cats

- although we love our cats and dogs, how do they pose a threat to wildlife?
- what wildlife is in danger from cats?
- how do dogs pose a threat to native birds?
- read the true stories about the terrible effects on wildlife that cats and dogs have had. Locate these locations on Google Earth.



Share this information on hedgehogs with the class.



Hedgehogs were first brought to New Zealand to remind settlers of their homeland, but the hedgehog is not the cute little creature we have been led to believe. They eat our lizards, native insects and even the eggs of ground nesting birds and they carry diseases.

AND THE ACTIONS WE CAN ALL TAKE TO HELP



DOC 200 rat and stoat traps are widely used by volunteer groups

WHAT CAN BE DONE TO PROTECT OUR NATIVE SPECIES?

- Did students know that the Department of Conservation and many other organisations such as Forest and Bird are very concerned about protecting our birds and forests from predators such as rats, stoats, weasels and possums. They, along with many businesses and hundreds of conservation groups throughout New Zealand, are carrying out work to protect, preserve and improve our biodiversity. Have groups brainstorm actions these groups could take to help protect native species.
- Visit: www.sciencelearn.org.nz/Science-Stories/Conserving-Native-Birds > *select Methods of predator control* and download the Power Point presentation to play to the class. Through discussion of the pros and cons of each method, which method(s) do they think would be most effective to use in different areas and by different groups of people. Students could consider the following:
 - how effective is hunting in targeting the full range of predators?
 - what method would be suitable for covering large amounts of country – especially large native bush and hilly areas?
 - where and when would trapping be an effective method?
 - are there any disadvantages to using predator-proof fences?
 - why off-shore islands play such an important role.
- Have students visit the DOC website at: www.doc.govt.nz/conservation/threats-and-impacts > *select Animal Pests* > *select Methods of control* to find out about the methods DOC uses for predator control. Students will be interested to learn that 9 out of 10 kiwi chicks don't survive to breeding age (1 year) in areas without predator control and 7 out of 10 survive to breeding age in areas with predator control.
- Remind students that predator control not only helps save birds, animals and insects but also helps protect our native forests.

VOLUNTEER PREDATOR CONTROL GROUPS

- Did students know that there are hundreds of volunteer groups and thousands of people throughout the country that work with the support of DOC to trap predators and plant native trees?
- Play these videos as examples of volunteer groups at work.
 - <http://tvnz.co.nz/meet-the-locals/s2011-e20-video-4091651> (Friends of Oakley Creek in central Auckland)
 - <http://tvnz.co.nz/meet-the-locals/2007-episode-24-video-1538415> (Lake Rotoiti volunteer trappers in Nelson Lakes National Park)

Discuss the following:

- what the volunteers are using to trap predators and the predators they are targeting; what the volunteers are seeing as a result of their efforts and why volunteers enjoy planting and trapping.

GETTING THE STUDENTS/COMMUNITY INVOLVED

- For motivation for your students to become involved in a conservation project, play the following DOC video to the class at: www.doc.govt.nz/features/everyone-has-a-role-to-play-in-conservation
- As a class, visit: www.naturespace.org.nz/groups and click on the map to find if there are volunteer groups are active in the district closest to your school. Find out what they do, how many volunteers are involved and the success they are having. If there is no group listed as active in your area contact your local DOC office and/or district/city council or visit: www.doc.govt.nz/getting-involved/volunteer-join-or-start-a-project/join-a-group or: www.forestandbird.org.nz/whats-on-in-your-area for further information.
- Invite a member of a local volunteer group to talk to the class about the conservation work they are carrying out. Have the students prepare questions to find out about the work they are doing, eg
 - what motivated them to start and what do they hope to achieve
 - how many people are involved and what are their tasks
 - what success have they had and what rewards do they get . . .Have students ask if there is anything they can do to help this project, eg they may be able to walk a trapline and report back any catches.
- As a class, brainstorm ideas of conservation projects that they could start that would improve the school and/or the local district, eg
 - planting natives to attract birds and beautify the school grounds or planting natives beside a local stream
 - restoring an area in the district such as a wetland or bush area
 - planning fund raising activities to purchase plants and/or traps
 - combining planting with trapping predators by getting parents and older friends involved to bait and service the traps
 - establishing a school nursery to grow native plants
 - invite a DOC representative to talk to the class about conservation and restoration projects being carried out locally – can they help?

CONCLUDING ACTIVITY: FOCUS ON THE BIRDS

- As a family, a class (or full school) project find out how to attract birds into the school grounds or home garden. the 'Home and Garden' section at: www.doc.govt.nz/getting-involved
- Monitoring tunnels and chew cards also provide a fun alternative. Footprints give students something to look at and guess the species. Visit the 'Guide to Prints' section at: www.gotchatraps.co.nz



A volunteer trapper clears a possum killed by an A12 gas-fired trap (on tree)