**Unit plan: Making a case for possum biocontrol**

**Overview**

Students collect information from the public about methods of controlling possum numbers and then present a report on the use of biocontrol.

**Purpose**

To demonstrate the complexity of the possum control problem. To show that biotechnological solutions involve input from a wide range of sources and that a successful outcome cannot be implemented without extensive consultation with the public.

## Background

### Suggestions for a scenario

The school’s environmental committee are concerned about the possum problem. However, they cannot agree on a method for controlling possum numbers. Develop and present to the environmental committee a case for future possum biocontrol that would be acceptable to the wider community.

### Where's the Biotechnology?

Biocontrol of possums in New Zealand is still in the research phase. Before any planned release of a biocontrol agent can be considered, information needs to be gathered about the environment, the pest, and possible effects of such a biocontrol agent. This unit provides an opportunity for students to discuss the introduction of biocontrol in relation to the other possum control strategies that are in place in New Zealand.

## Curriculum focus

### Technology

Biological solutions to pest control are complex and require input from a diverse range of sources. Beliefs, values and ethics of individuals and groups promote or constrain technological developments. The development of an effective system must take into account environmental pressures and societal attitudes in order for it to gain acceptance by the community.

### Science

Understanding the complex interactions within the ecosystem are central to the development of an effective biocontrol system.

### Focus of skill & strategy

To develop a method for accessing, recording and incorporating a wide range of views and perspectives in the presentation of a report that provides some solutions for possum control.

### Health and Safety

Live possums have the potential to harm students. They are wild animals. Dead possums may carry TB and other potential pathogens. They should not be handled.

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| UNIT PLAN: MAKING A CASE FOR BIOCONTROL |
| **Suggested learning intentions** | Suggested learning experiences*The following learning experiences will provide you with starting points for an exploration of this topic. You may decide to narrow your focus to one component, or include most of the ideas in a unit that incorporates science and/or technology themes.*  | Possible teaching/assessment activities |
| There are a range of indicators that signify possum damage in New Zealand forest. For example leaf damage, bark damage, lack of plant diversity, bird population numbers. | **Introduction**Identification of the problem *(choose from the following ideas)** Visit from a member of [Forest and Bird](http://www.forestandbird.org.nz/) to provide information about possum damage.
* Watch a video on the problem of possums, for example *Wild South: Possum - A New Zealand Nightmare*
* Identify a possum’s eating habits and why possums are a pest. Get article: [Biological control of possums](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums)
* The local context: Is there a possum problem in the local area?
* Visit a local area of bush and look for possum damage or other indirect evidence of possum damage (bird populations, plant diversity, plant damage). Interview a MAF employee, local possum trapper or farmer to establish if there is a possum problem.
 | Write a letter to a newspaper that sets out the case for possum control in the area. |
| A biocontrol strategy for the control of possums requires the biotechnological community to take into account a wide range of expertise and opinions from the community. | **Introducing the scenario** Identify the dimensions of the perceived problem and the groups that are required to develop the case for a particular possum control solution. | Develop a plan to investigate the dimensions of the problem. For example the class could be divided into groups that investigate separate components (which need to be identified at this stage). For example evidence of possum damage, ecological niche of the possum, identification of control methods, identifying community views. |
| The scientific case for possum control requires careful monitoring and the indirect measurement of possum numbers.The New Zealand ecosystem provides an ideal habitat for the possum. The ecological niche of a possum enables it to be a successful pest of New Zealand native forest.There are a range of methods for controlling possums, each with merits and drawbacks.The community’s views are important and there are a variety of ways of accessing and recording their input in order to find out the acceptability of different possum control strategies. The development of a plan for possum control must present a range of solutions that reflects the community’s opinions. | **Developing expertise**Before embarking on this research view the [Biological control of possums](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums) resources. Talk to local people with experience of the problem, such as:* [Ministry for Primary Industries](http://www.mpi.govt.nz/)
* [Department of Conservation](http://www.doc.govt.nz/)
* [Forest and Bird](http://www.forestandbird.org.nz/)
* Possum trappers.

Each of the following areas of study could provide the starting point for a smaller, more specialised study. Suggested groups:**(A) Providing evidence for possum damage in the area*** Sampling the effects of possums in an area of local bush, for example effects on plant diversity and density, damage to leaves.
* Sampling numbers of possums – direct and indirect.

**(B) Know your enemy: knowledge of possums*** Research details of possum biology, life history (reproductive rates) and adaptations (i.e. its ecological niche).
* Talk to people who track possums, look after possums.

**(C) Control methods*** Identify ways that possum numbers are currently controlled. Get article: [Biological control of possums](https://www.sciencelearn.org.nz/resources/1082-biological-control-of-possums).
* Research biocontrol as a method of controlling pests. Identify possible ways of using biocontrol to control possum numbers.
* Find out more about how possum biocontrol research is regulated. Get article: [Possum biocontrol: Regulations controlling the research](https://www.sciencelearn.org.nz/resources/1084-possum-biocontrol-regulations-controlling-the-research).

**(D**) **Research** **community views**Develop and trial, and then collect and analyse data from a questionnaire/focus group to find out the community’s views about the possum problem, existing control methods, and the possible use of a biocontrol strategy.*Each of the components (A) - (D) could provide the basis of a unit that involved different groups in the class being responsible for different components. In each case, the groups would work through the following technological process:** **Introduction to a specialised scenario with brief development.**
* **Developing expertise.**
* **Planning for practice.**
* **Developing and modifying the solution/outcome.**
* **Presentation of the outcome and evaluation against the brief.**

For example: * Developing and implementing a plan of action to present a case for possum biocontrol in your area.
* Presentation of a report to the school’s environmental group on possum control in your local area.
* Evaluation of the development of the proposal that includes feedback from the environmental group.
 | Develop a forest drawing, construct a, transect, or develop annotated photographs of leaf and /or tree damage to show the effect of possums. Present the information on a poster board. Develop an interactive poster (e.g. a computer page with questions and answers) that describes the ecological niche of the possum which enables this animal to be such a potent pest. Present the case for a range of possum control methods i.e. merits and drawbacks. Present the viewpoints of the community using a range of strategies, for example: analysis of questionnaires, interviews with a significant number of members of the community through focus group interviews.These viewpoints may be recorded as a storyboard, case studies or with a film or radio interview.The solution is presented in a way that demonstrates that the community has been consulted, and the outcome reflects this consultation.A formal presentation to an environmental group/Board of Trustees demonstrates that ongoing feedback and consultation will take place during the implementation of the plan. |