

Risk assessment of new technologies: identifying non-target invertebrates important to Māori



Mahina-a-rangi Baker, Louise Malone, Libby Burgess

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HortResearch 

Overview

- » **Introduction and background – Louise Malone**
- » NZ research on the environmental impacts of GM plants
- » Why we are interested in Māori views of invertebrates

- » **MEnvtSt project – Mahina-a-rangi Baker**
- » Objectives
- » Methodology
- » Māori worldviews of the living environment
- » Māori view of Ngā Ngāngara
- » Ngā Ngāngara as a resource
- » Ngā Ngāngara as environmental indicators

Environmental impacts of GM plants

- » Royal Commission on Genetic Modification 2001
- » Recommended more research on potential ecological impacts of GM plants:
- » Impacts on plants
- » Impacts on soil
- » **Impacts on insects and other animals**
- » Insects and other invertebrates are numerous and play important roles in ecosystems:
 - » pollinators
 - » nutrient cycling: decomposers, natural enemies of pest insects
 - » food for fish, birds



Pre-release tests with invertebrates in lab

- » Pre-release tests in laboratory important – learn about what might happen in field
- » Every ecosystem has 100s, if not 1000s, of invertebrate species
- » We cannot study every one; we have to choose
- » We chose species with obvious ecological roles to begin with:
 - » honey bees
 - » predatory beetles



Which species should we test?

- » Wanted to be more systematic
- » Looked to HSNO Act for guidance
- » New Zealand's environmental management goals
- » Must take into account:
 - » intrinsic value of ecosystems
 - » sustainability of all native and valued introduced flora and fauna
 - » relationship of Māori with their ... valued flora and fauna..
- » Consulted with ERMA
- » Identified need for more readily accessible information on invertebrate species of value to Māori
- » Compiled list of insect species with Māori names
- » Provided to ERMA

- » Mahina-a-rangi's project



Objectives

*“Ehara te toa taua, he toa pahekeheke.
Te toa ngaki kai, he toa mau roa.”*

*“The brave in war are but transitory braves.
The brave in cultivating endure forever.”*

- » Explore how species are valued by Māori
- » Conduct comprehensive research and collection of information regarding invertebrate species of value to Māori
- » Enter data required into database of NZ invertebrate species
- » Thesis discussing findings to be completed by February 2010

Methodology

- » Systematic searches for references to species and their significance to Māori using
 - » Publications
 - » Online databases eg Journal of Polynesian Society
 - » Historical records and manuscripts held at National Library
 - » Māori newspaper
 - » Audiovisual media
- » Oral interviews with kaitiaki and kaumatua
 - » Means of including oral tradition
 - » Issues of difficulty with interviewing;
 - » Who gets interviewed?
 - » How many are interviewed?
 - » Are interviewees evenly spread across iwi?

Māori worldviews of species

- » Origin of life with the separation of Ranginui and Papatuanuku
- » Concept of mauri encompasses the life-essence of all living things in the Māori notion of creation. It is passed down from Rangi and Papa, to Tane and beyond.
- » All terrestrial species are offspring of Tane and one of his many wives. Collectively known as 'Te Wao-Tapu-Nui-a-Tane.'
- » Species 'classified' within Māori genealogy or Whakapapa
 - » *Whakapapa Māori* acknowledges our relationship to other species
 - » Whakapapa varies considerably amongst iwi

How do Māori view Ngā Ngāngara?

- » Various names for insects/invertebrates; Ngāngara, ngārara, pepeke, Te Aitanga a Punga
- » Classification differs to that of Western world
 - » Insects, invertebrates, reptiles all grouped together
 - » Insect groups classified differently, for example, native bees are grouped within *ngaro* or fly *whanau*
- » *Whakapapa* of ngāngara disputed; Tane Tangaroa, Peketua. Haumia all given ancestors

How do Māori view Nga Ngāngara?

- » Often indistinguishable from taniwha
 - » *‘Ngārara or taniwha are queer creatures and apt to change their form in a most hapahazard and perplexing manner.’*
(ref)
 - » *‘The word ngārara occurs widely in Māori thought and legend and would appear to have been the more dreaded creature (than taniwha), existing in a greater variety of form. Ngārara could actually exist as a guardian spirit of Atua.’*

How do Māori view Nga Ngangara?

- » Progeny of Whiro, the evil brother of Tane
 - » Insects were sent as a war party by Whiro to kill Tane on his ascension to receive the baskets of knowledge
 - » Tane succeeded and on his descent took the insects with him to dwell on the ground under his care
- » Story of Rata describes ngāngara as guardians of the forest who teach Rata that he must ask Tane permission to cut down a tree.
- » Also used as pets eg; large forest snails



Nga Ngangara as a resource

» Kai

- » Huhu grub
- » Honey used as a condiment (1849)
- » Leafroller caterpillar
- » Puriri moth larva
- » Weta

» Rongoa

- » Spider webs used as bandage
- » Honey used as *rongoa wharo*, or medicine to aid in clearing the throat of cough (1849)



Nga Ngāngara as environmental indicators



- » Kumara
 - » Abundance of sphinx moth on leaves indicates the size of the kumara to be harvested

- » Puhi (shortfin run) eel
 - » Freshwater shrimp an important source of food
 - » Presence of moths indicates a good time to catch eel

- » Harakeke
 - » Large variety of indicator insects live amongst harakeke
 - » Ironically are insects that SHMAK uses as indicators of poor freshwater health

Anticipated outputs

- » Environmental management decision support
- » Thesis by 2010
- » Resources for iwi, ERMA's networks, other interested parties:
 - » hui, wānanga
 - » scientific papers
 - » web-based articles
 - » databases and lists
 - » model for other research
- » Any questions?
- » Any feedback?



www.hortresearch.co.nz



lmalone@hortresearch.co.nz
ma_joy_baker@hotmail.com
eburgess@hortresearch.co.nz

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