

How do you place a value on native biodiversity?

(MAF BNZ 29 June 2009)



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Outline

- Biosecurity decisions & imbalanced information
- Four case studies
- Applying biodiversity values to biosecurity decisions

Aim

A non-technical explanation
integrating ecology and economics

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Biosecurity decisions

- Management of pest and disease risks
- Balance economic, social/cultural, and environmental aspects
- Imbalance of quantitative information
 - Good info on industry impacts
 - Poor info on environment impacts

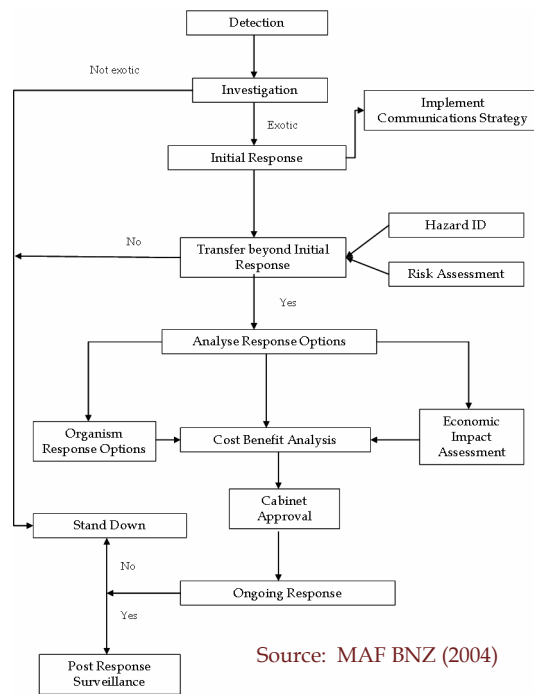
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And so this project was born

Decision Support System

High level response map

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Source: MAF BNZ (2004)

Estimating value

- Cost Benefit Analysis

- Market value

- Discounted cashflows (Price x Quantity)

- Non-Market values

- Revealed Preference

- Travel cost

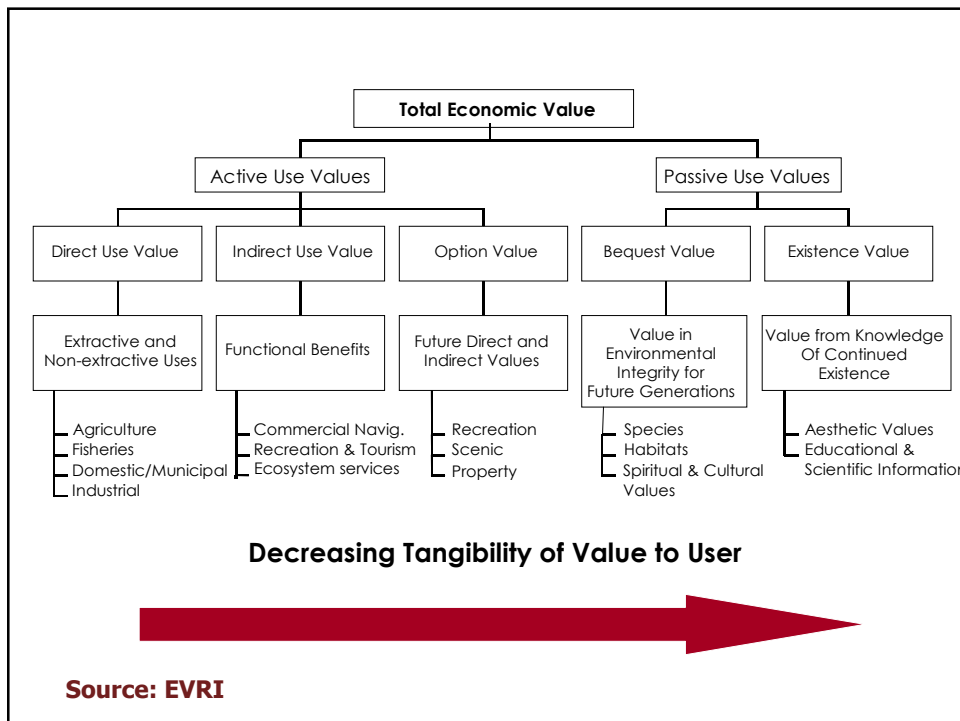
- Hedonistic pricing

- Stated Preference

- Contingent valuation

- Choice Modelling

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Case Studies

Coastal Marine	Freshwater
<ul style="list-style-type: none">■ Shellfish <i>spp</i>■ Kids paddling■ Fishing■ Vegetation	<ul style="list-style-type: none">■ Hydrilla■ Charophytes■ Water quality■ Birds■ Fish/shellfish
S.I high country	Beech forest
<ul style="list-style-type: none">■ Vegetation (<i>Hebes</i>)■ Grass hoppers■ Whitebait (<i>Galaxias</i>)	<ul style="list-style-type: none">■ Insects■ Birds■ Wasp stings

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Choice Modelling

- Estimating changes in welfare (utility) though changes in indigenous biodiversity
- Understanding community values
- Changes in value depend on changes to the environmental attributes
- Provide non-monetary and monetary estimates of benefits

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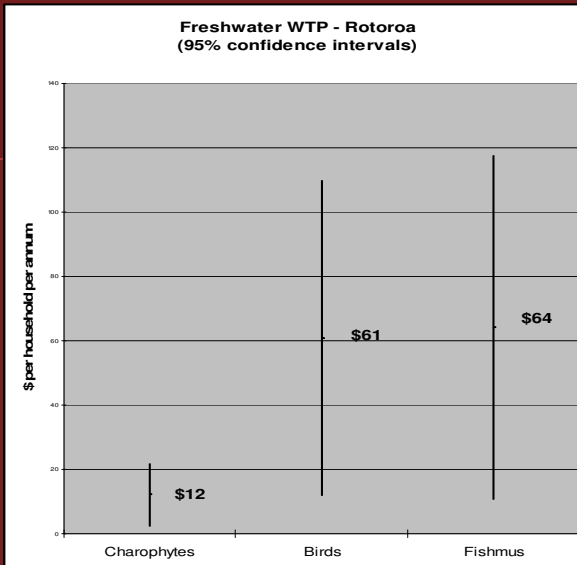
Case study process

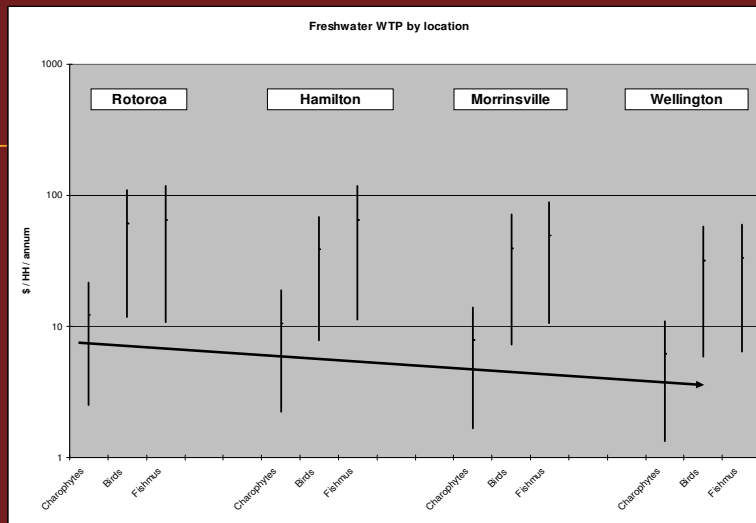
- Representative ecosystems
- Sites selected for wider use
- Involved ecologists
- Focus groups
- Prior sampling for efficient design
- Statistically significant results from small samples
- Data collection
 - face-to-face meetings
 - using community groups



Question 1: Options A, B and C. Please choose the option you prefer. By ticking ONE box.

	Option A	Option B	Option C
Extent of hydrilla	 100% coverage	 30% coverage	No hydrilla
Water quality and clarity	Significant deterioration	OK Same as now	OK Same as now
Coverage of native submerged plants	Eliminated from lake	Eliminated from lake	 Same as now at 21% cover
Number of native bird species	 All 4 shag species do not visit the lake anymore	 3 shag species do not visit the lake anymore	 2 shag species do not visit the lake anymore
Fish and mussels	 2 fish species and mussels disappear from the lake	 Mussels disappear from the lake	 1 species of fish and mussels disappear from the lake
Cost to your household each year for 5 years	\$0	\$160	\$20
I would choose	<input checked="" type="checkbox"/> A	<input type="checkbox"/> B	<input type="checkbox"/> C





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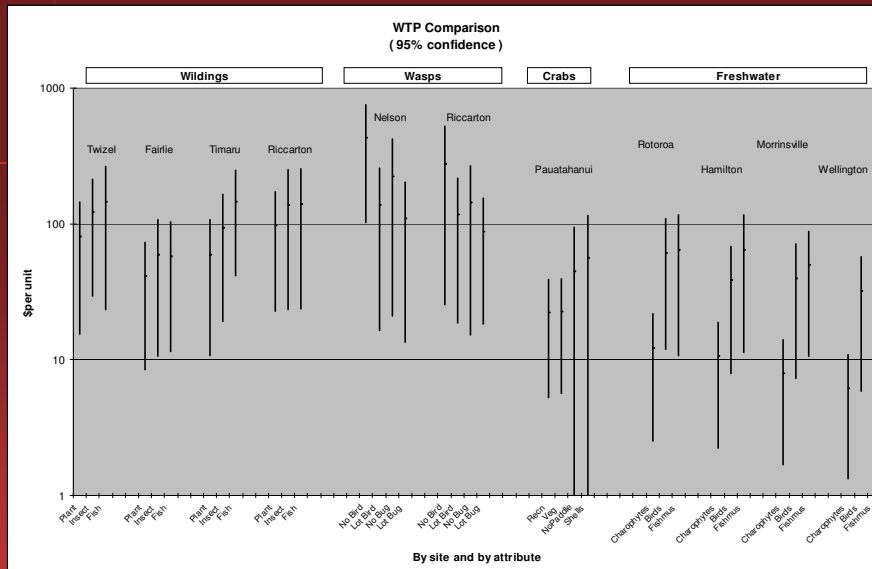
Benefit transfer

- In demand by decision-makers
- Rapidly evolving field
- Recognise uncertainties & limitations
- Orders of magnitude for more informed decisions
- Complex process

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Comparing studies

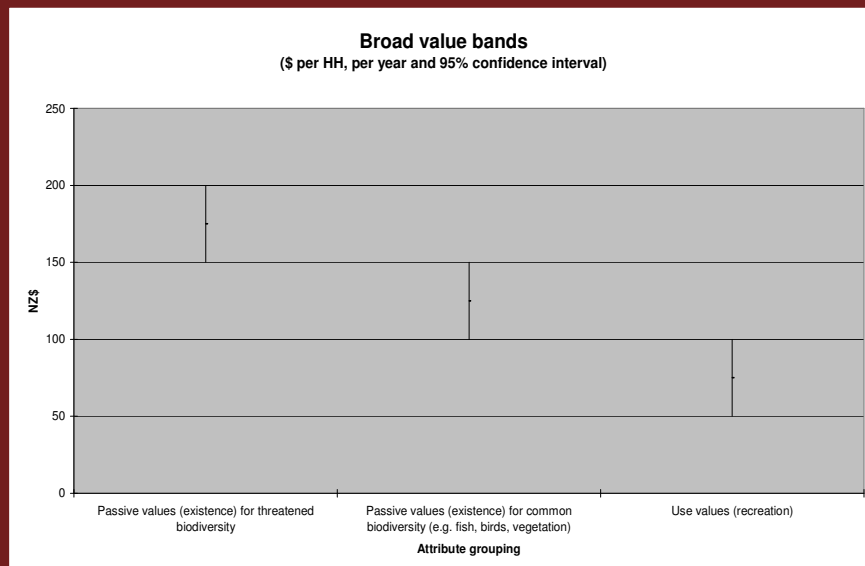
- More similar is better
 - Same process
 - Understand the science and ecology, focus groups, convenience sample, informed respondents, small samples
 - Same Model
 - Efficient design utilising prior information, RPL allowing differing views to be modelled
 - Same timeframe (2007 - 2008)
 - Economic conditions similar



Investigation stage

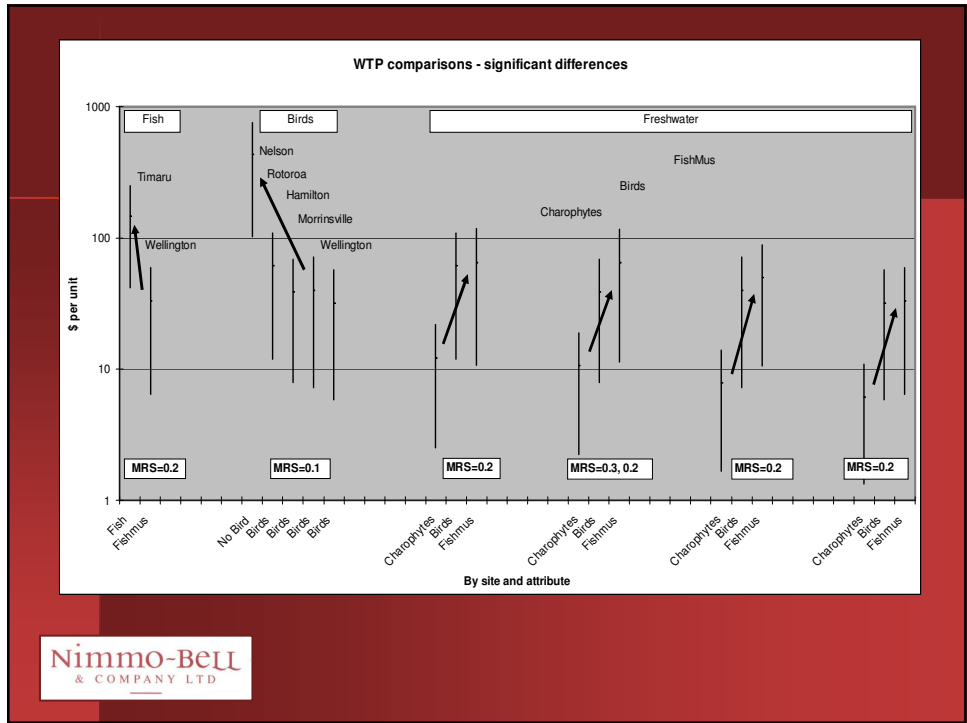
- High level decisions needed
- Trends in attribute types?
- Could we develop broad value bands of grouped environmental attributes for high level decision making?

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Bands further distinguished by scope

e.g. local versus national frame



Stock take on valuing biodiversity

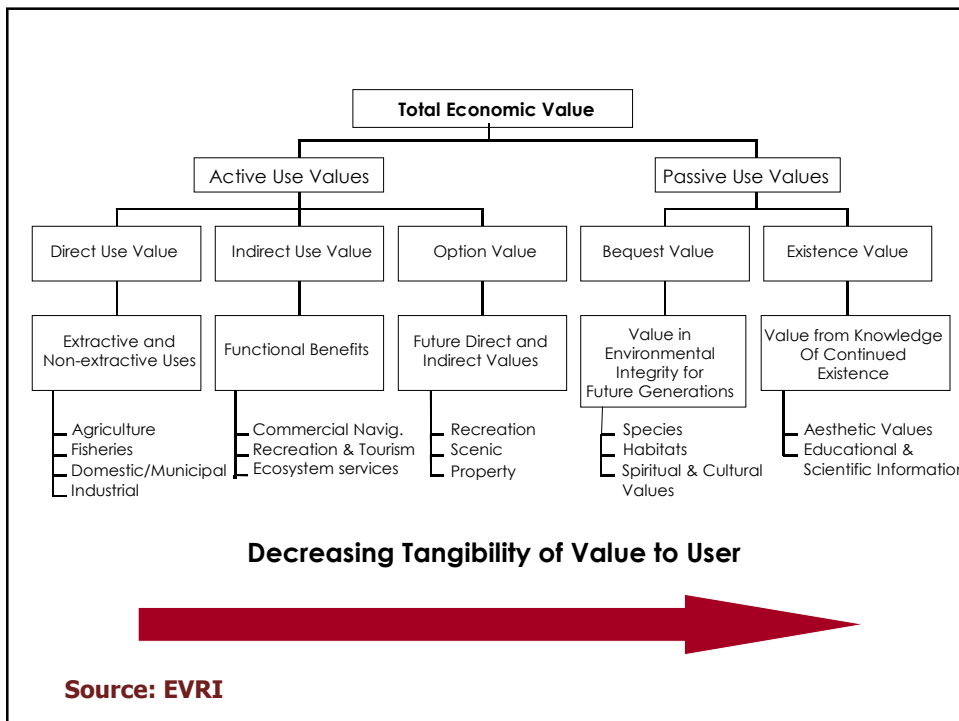
- Choice modelling tool
 - Efficient design
 - Advanced models
 - Captures what people think are important
- Four case studies
 - 36 estimates of env. attributes across 11 different populations across NZ
- Rich information base
- Comparative estimates for database
- Bands of value - early days
- Understanding of the limitations

Limitations

- Framing issues
 - Scale and scope
 - Sample demographics
 - Economic scenario
 - Bias by informing respondents?
- Willingness To Pay
 - Is it a reality?
- Valuing indigenous biodiversity
 - Marginal dollar values, and also
 - Non-monetary values - MRS
- Social and cultural values?

Application to Biosecurity response issues

- Kauri Dieback
 - State of play
 - Cost Benefit Analysis
 - Extractive direct use value of timber
 - Other values?
 - Incorporate risk analysis - QuRA™
 - Benefit transfer values?
 - Primary study?
 - Educating biosecurity managers



Adding value to decision making on Kauri dieback

- Investigation phase
 - High level analysis
- Economic impact assessment
- Cost Benefit Analysis
 - Non-market valuation of passive use values
 - Bequest and existence values
 - Species, habitat, spiritual and cultural, aesthetics

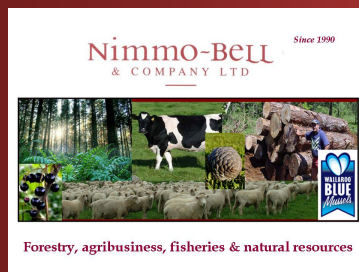
Valuing Kauri

- Understand the biosecurity issue
 - Work with ecologists, scientists and biosecurity specialists
 - Changes at the margin
- Focus groups
 - What values are important to people over what range
- Prior sampling for efficient design
- Data collection
 - face-to-face meetings using community groups or
 - Postal/Drop off/Personal interview/Internet based
- Sophisticated modelling
- Statistically significant results
- Extrapolation

Summing up

- Biodiversity values increasingly important to people
- We have the tools
- Understand the limitations
- Application at:
 - Investigation phase – economics not an afterthought
 - Cost Benefit Analysis
- This is the start

Thank you for coming: questions?



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