

What's at stake?

Understanding the impacts
of non-native species in
New Zealand's changing
ocean





Tools for prioritizing and evaluating marine pest impacts – Deliberative Multi Criteria Decision Analysis

- Where this project fits into ‘What’s at stake’
- Research aim
- Policy setting criteria
- Brief DCE results
- Why use DMCA
- Proposed methodology
- Future opportunities for involvement



Research aim (RA4)

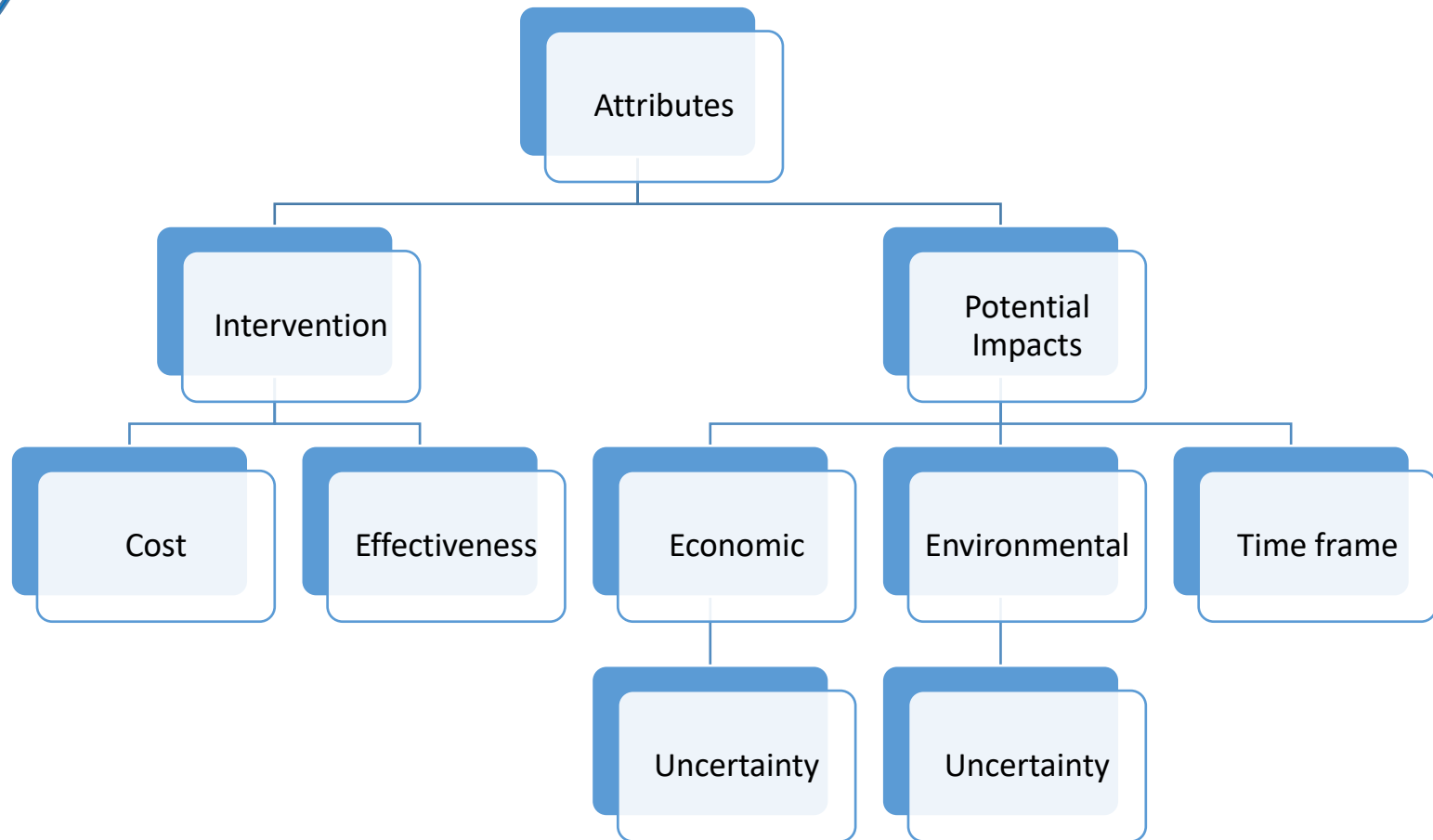
- Defining and evaluating criteria for prioritizing non-indigenous species management in NZ.
- Initially using a discrete choice experiment (DCE).
- Followed up by a deliberative multi-criteria analysis (DMCA).



Research aim - DMCA

- To provide decision makers with a method for prioritizing or selecting options for biosecurity interventions based on performance criteria.
- A practical way to help prioritize response options.
- Including the priority setting criteria derived in the DCE, and those defined through the deliberative process.

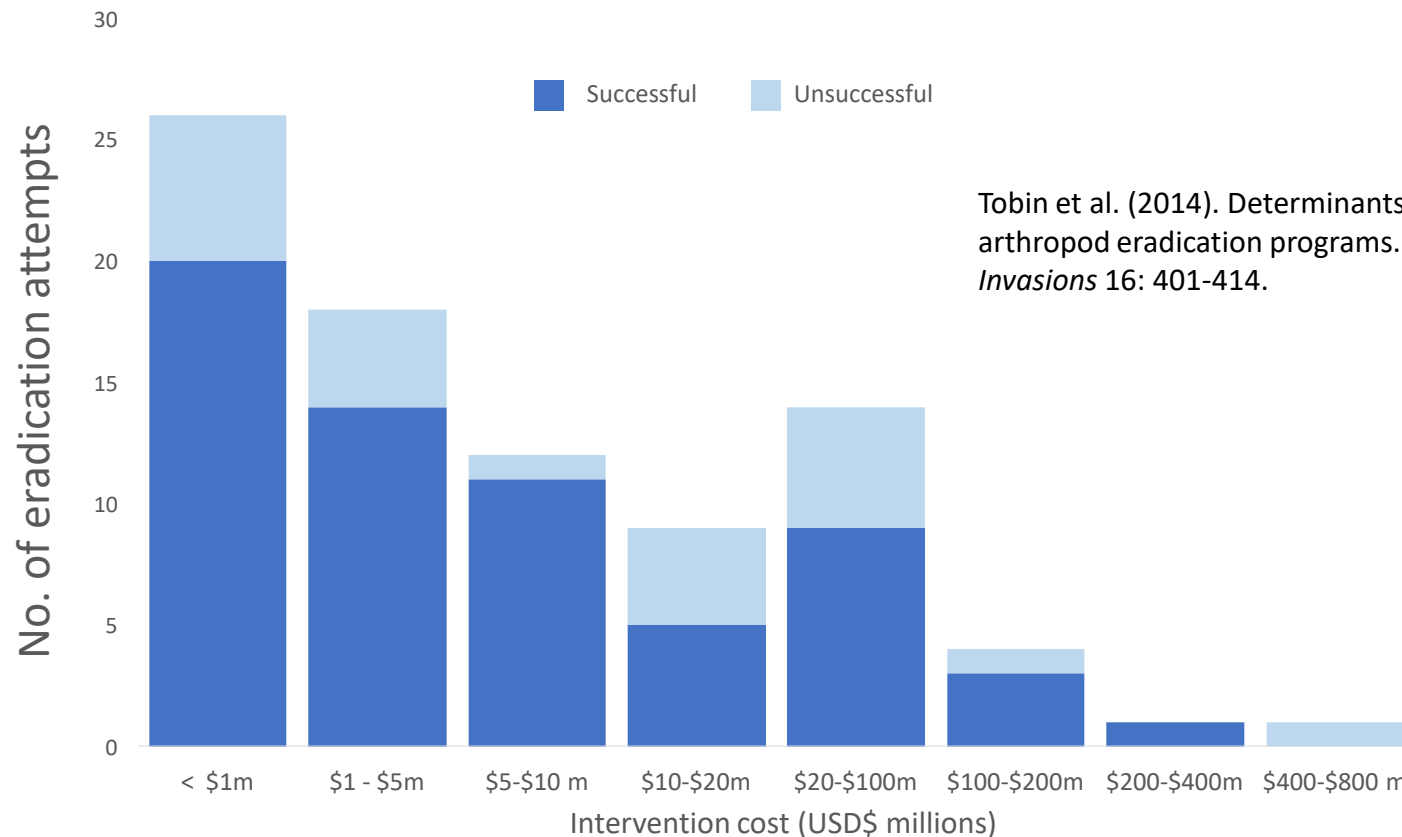
Policy setting criteria (from DCE)



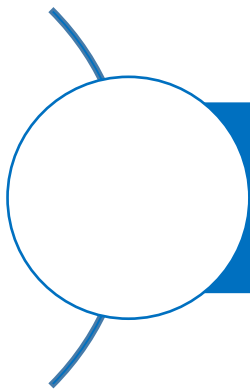
Brief results from DCE

Regression type		Conditional Logit		
Variable		coefficient	St. error	Marginal effect
Cost 1-10 million		0.03	0.83	0.01
Cost > 10 million		-1.65	0.54	-0.34***
Effectiveness	Medium	0.56	0.33	0.14*
	High	1.96	0.60	0.38***
Economic impacts	Medium	1.68	0.50	0.34***
	High	1.73	0.41	0.35***
Environmental impacts	Medium	1.21	0.29	0.27***
	High	1.70	0.87	0.35*
Uncertainty Economic	Medium	-0.23	0.29	-0.06
	High	-0.66	0.21	-0.16***
Uncertainty Environmental	Medium	-1.78	0.99	-0.36*
	High	-1.29	0.63	-0.28**
Time 1-20 years		-0.35	0.42	-0.09
Time >20 years		-0.68	0.24	-0.16***

Arthropod eradications



Tobin et al. (2014). Determinants of successful arthropod eradication programs. *Biological Invasions* 16: 401-414.



DMCA

- Combines deliberative process with the more analytical MCDA to come to agreement on weightings for the decision criteria.
- Overall aim- improve decision making
 - In a incursion, intervention options can be evaluated against a final weighted performance criteria (ideally increasing speed and agreement of decision making).



Proposed methodology

- Performance criteria from DCE
- Deliberative process across stakeholders
- Any additional performance criteria, specifically qualitative attributes
- Rank performance criteria
- Weight performance criteria
- Test on hypothetical (realistic) incursion responses
- Final weighted performance criteria



Challenges/opportunities

- How do we quantify anticipated effects on the economy and environment with minimal information?
 - Both hypothetical scenarios to test performance criteria and in a real biosecurity incursion
- How do we compare qualitative and quantitative measures?
 - Attribute levels help overcome this, for some measures
- Unanimous ranking or by subgroup?



Future opportunities

- Let me, or Graeme Inglis, know if you, or a colleague, would like to be involved further, including:
 - Designing scenarios to test DMCA
 - Ranking performance criteria & evaluating scenarios
 - Other feedback or suggestions

Questions & comments?



Acknowledgements

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