Evaluating the economic benefits of invasive species management in non-timber forests

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Issue: white pine blister rust in high-elevation forests
Problem: Management is required to sustain pine populations and ecosystem function.

Proactive Strategy
- Facilitate adaptation
- Increase prevalence of (natural) resistance to rusts
- Specific types of treatment
  - Select thinning
  - Prescribed burning
  - Plant seedlings (screened for genetic resistance)

Reactive Restoration Strategy
- Data gathering
- Informed Intervention
- Modified Native Ecosystem

Native Ecosystem
- Early Invasion
- Impaired Ecosystem
- Restoration
- Recovering Ecosystems

Functional Ecosystem in the presence of the non-native pathogen
- Late Invasion


Preliminary information—subject to revision. Not for citation or distribution.
Research questions

Policy level
What are the ecosystem services from these forests?
• Recreation?
• Existence?

Overall willingness to pay for management of forests -> contingent valuation (CV)

Local level (management-unit?)
Does public have preferences over management details?
• Proactive strategy?
• Types of treatments?
• Marginal values?

Attributes of programs matter -> choice experiment (CE)

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**Approach**: stated preference survey

- Iterative process with other researchers, general-public focus groups
- Questions on attitudes, experience, etc.
- Two stated preference experiments
- Respondents generally match demographics; use probability weights
Contingent valuation (CV)

“Suppose managers treat quantity% of the high-elevation forests in the Western United States.

As a result, these acres will be healthy in 100 years from now. The remainder of the acreage would not be treated.

Would your household be willing to pay a one-time cost of $bid to fund this program?”

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Contingent valuation (CV)

- Significant benefits overall
- Mostly existence values
- 3 stakeholder groups:
  - High benefits, primarily protection (33%)
  - Higher benefits, protection and recreation (44%)
  - Don’t care for forests (23%)

Choice experiment (CE)

Attributes

• Total cost - $p=0.02$

• Where (acres + infection) + $p=0.08$

• Management type [not sig.]

• LR chance of health + $p<0.01$

Stratified sample

• Order (CV before CE) - $p=0.06$

• Infection level [not sig.]

• Status quo chance (10 or 25%)

Long-run health and cost matter
No preference over “type”
Weak negative effect from CV first

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Order effects

...on CE results

CV first: Status quo more likely
CE first: more precise

...on CV results

Order indicator not significant
CE first: more precise, less fat tail effect
Lessons Learned

• Public benefits from (proactively) managing WPBR?
  • Significant overall
  • Existence values are primary
  • Recreation & tourism are secondary

• Valuing program (instead of outcome)?
  • No preferences over management options
  • Consistent with existence values and “do what works”

• Combining CE and CV in same study?
  • CV -> CE decreased precision (More difficult?)
  • CE -> CV increased precision
    • (Useful information? Or anchoring?)