

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



USDA Forest Service



James Meldrum



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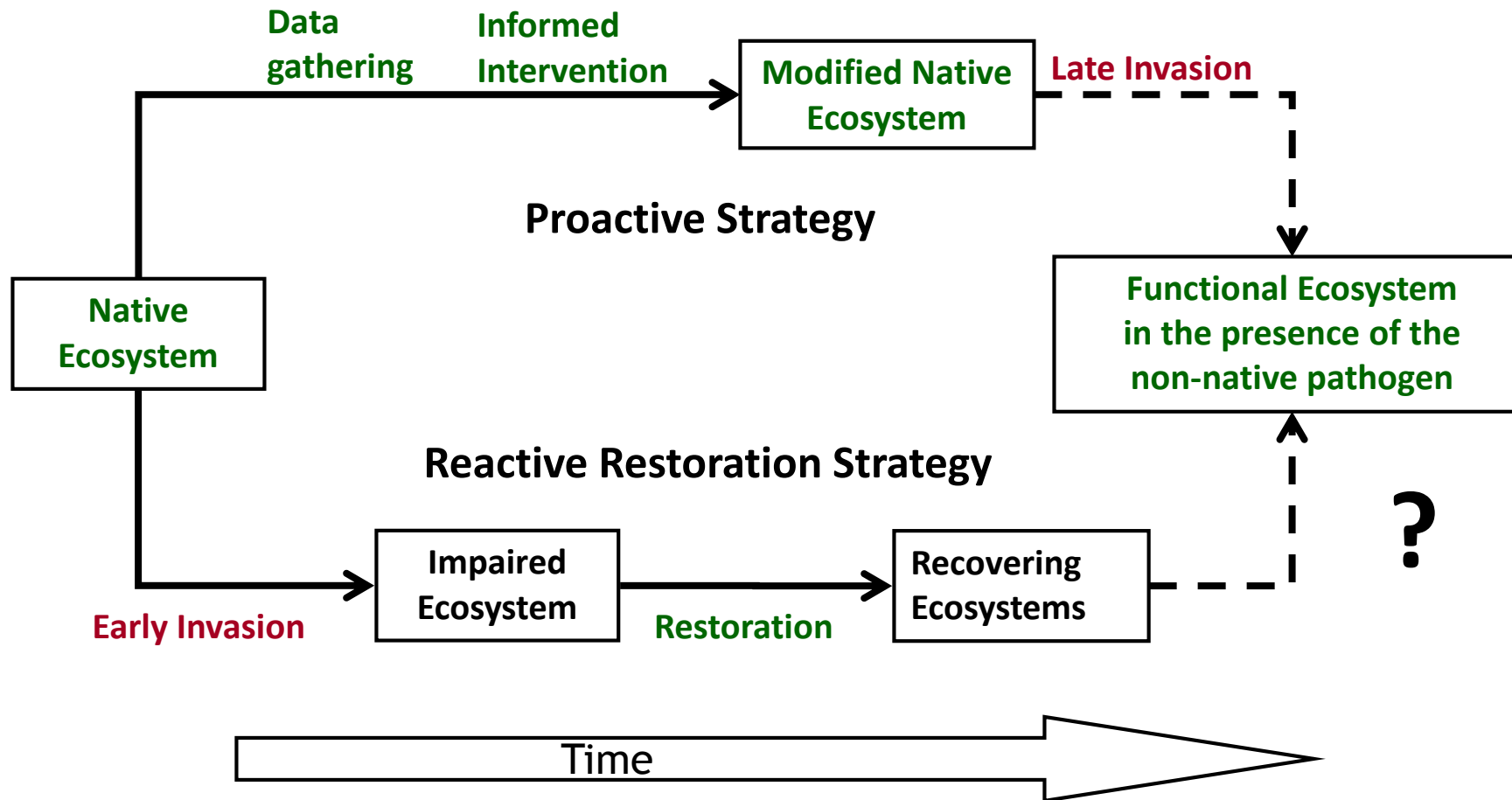


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Problem: Management is required to sustain pine populations and ecosystem function



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)

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?)

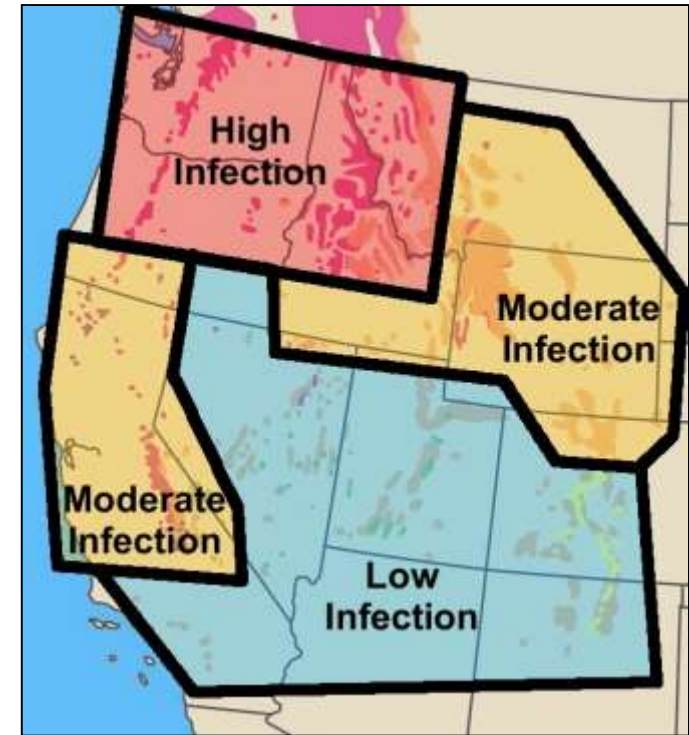
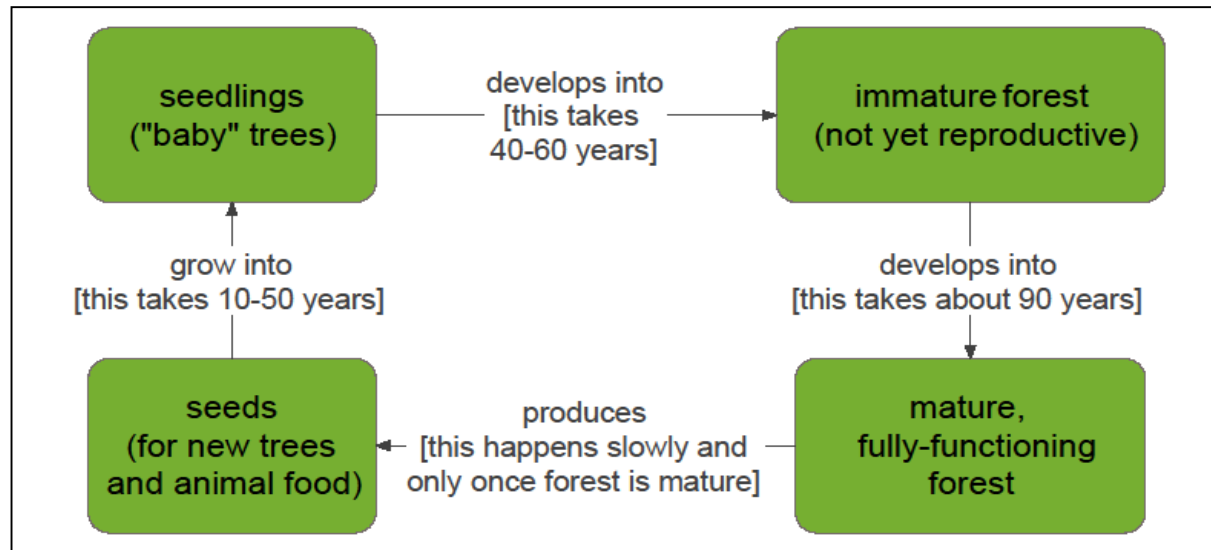
Does public have preferences over management details?

- Proactive strategy?
- Types of treatments?
- Marginal values?

Attributes of programs matter -> choice experiment (CE)

Approach: stated preference survey

- Iterative process with other researchers, general-public focus groups



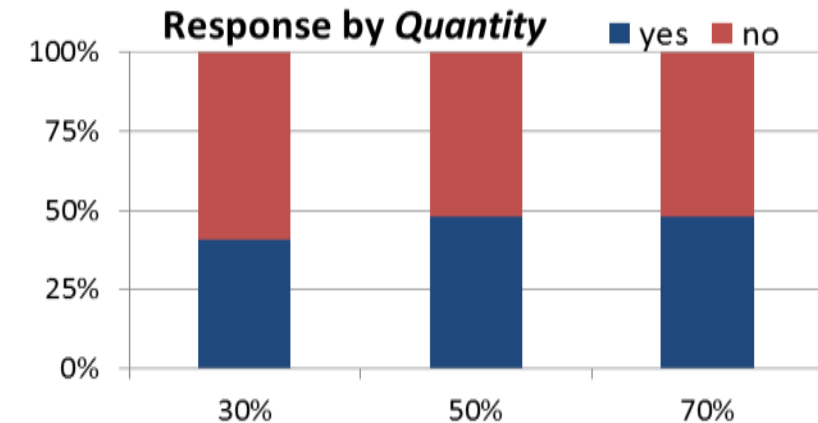
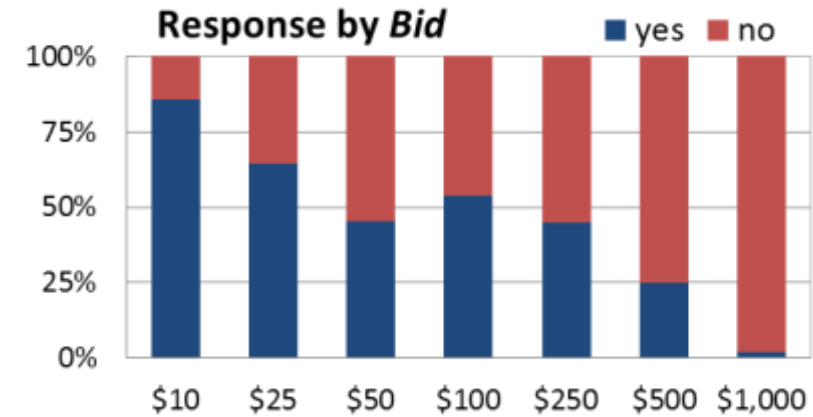
- Questions on attitudes, experience, etc.
- Two stated preference experiments
- Respondents generally match demographics; use probability weights

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?”



Contingent valuation (CV)

y=1 if yes to CV question;
y=0 otherwise

Quantity	-0.11 (0.61)
Bid (\$100)	-0.33*** (0.04)
Constant	0.72* (0.33)

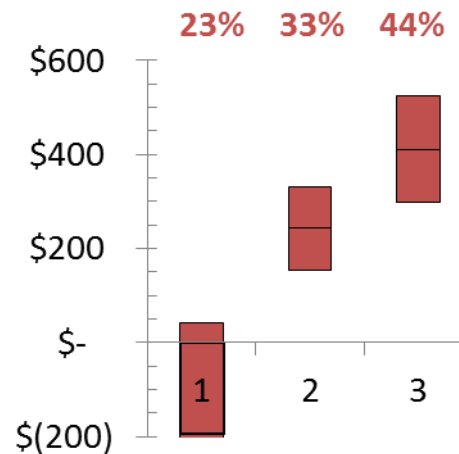
WTP (\$)	\$202.06 (30.11)
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Attitudes (group-level averages)

It is important HEF exist for future generations	4.3
It is important HEF provide recreation	3.5

On scale of 1 [strongly disagree] to 5 [strongly agree]

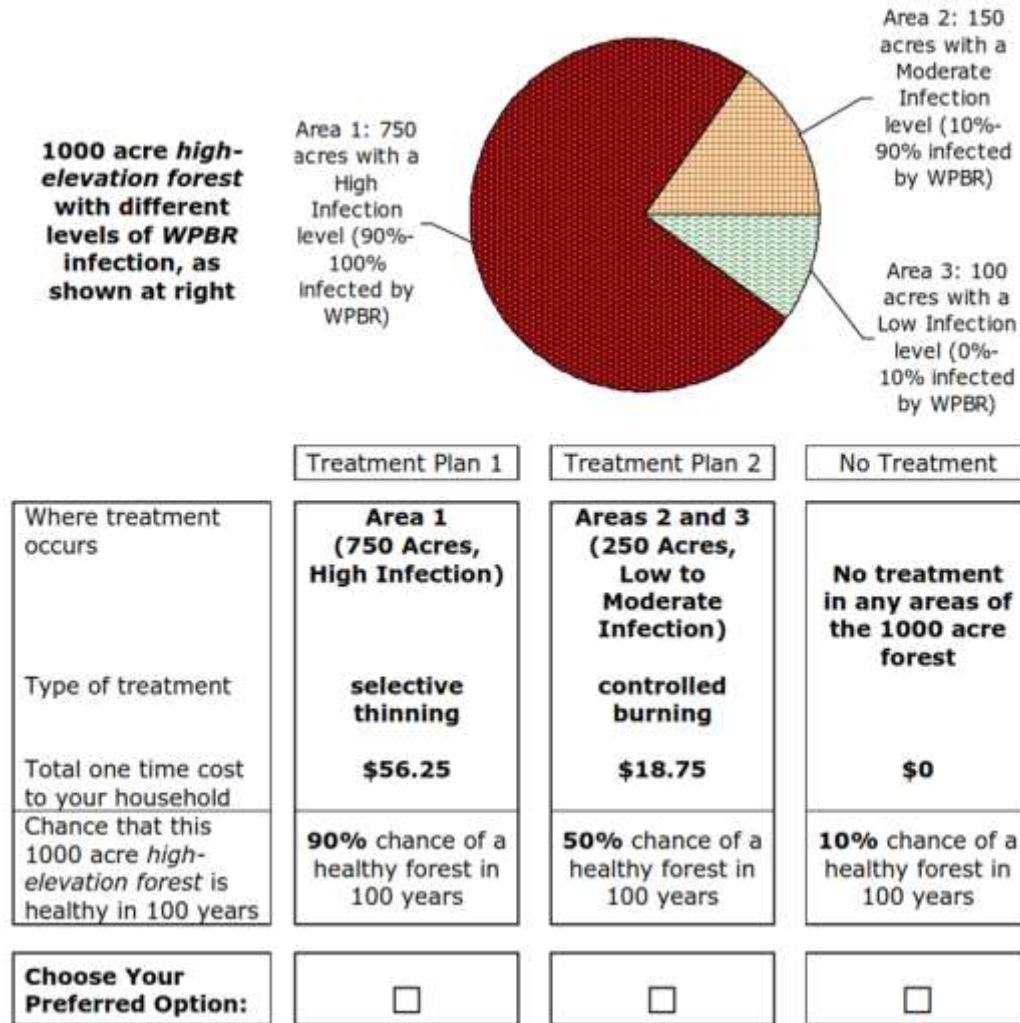
Joint Latent Class Model CV & Specific Attitudes



3.1	4.1	4.9
2.8	3.5	4.0

- 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**

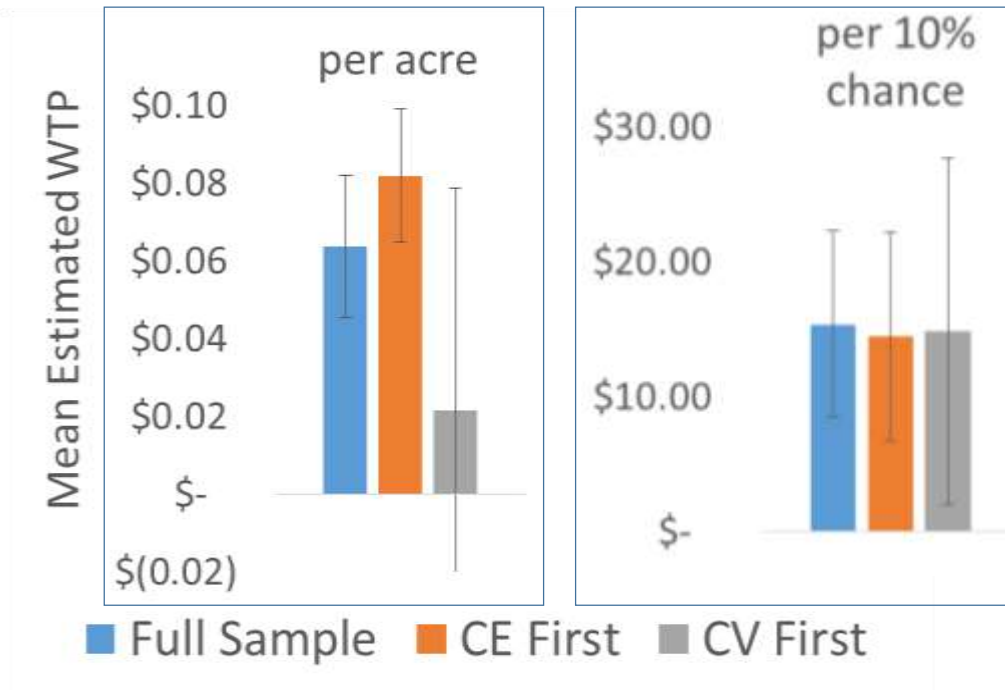
Stratified sample

- 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

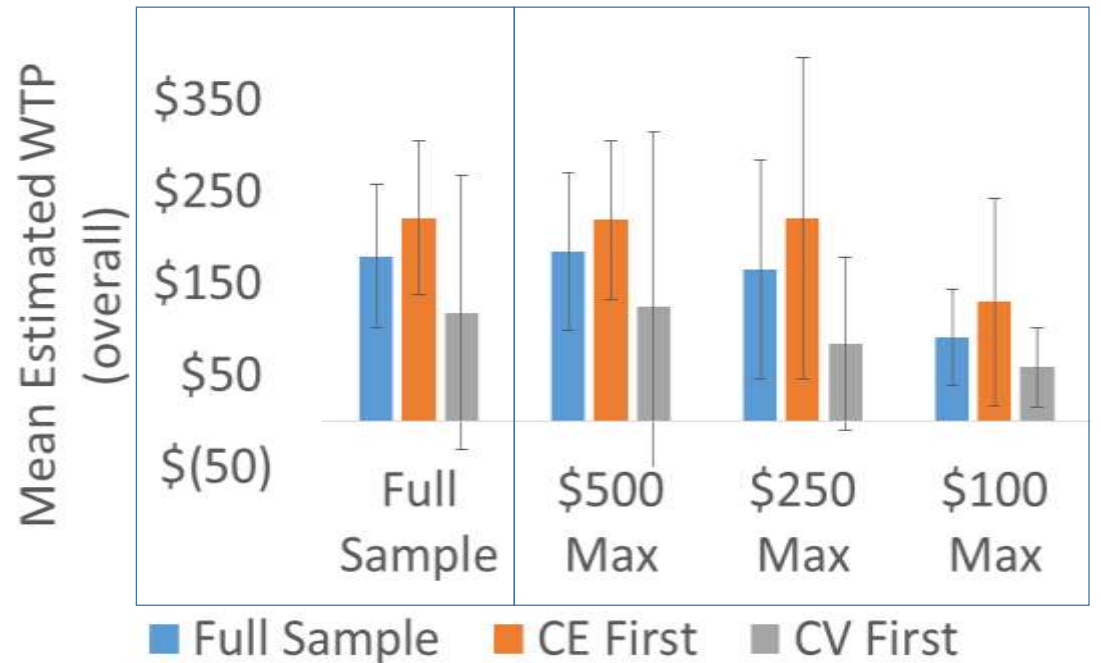
Order effects

...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?)



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