Strategic analysis of restoration priorities and tradeoffs on the national forests in Oregon and Washington

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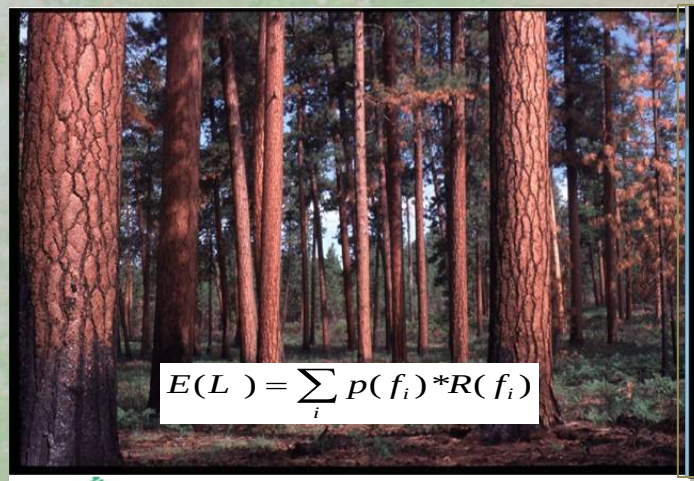
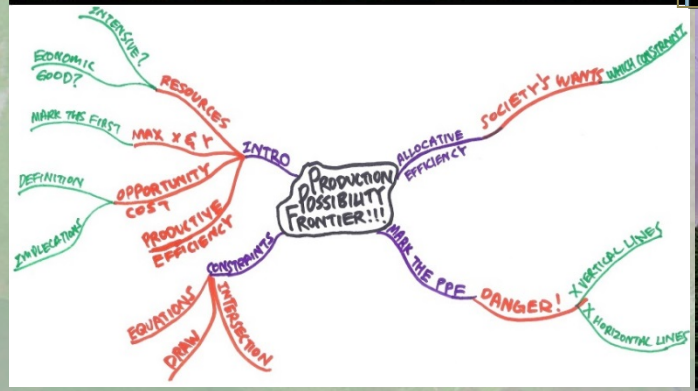
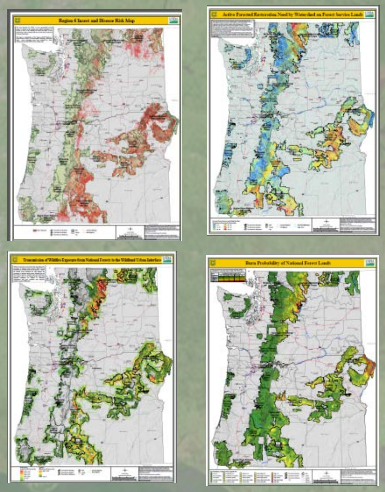
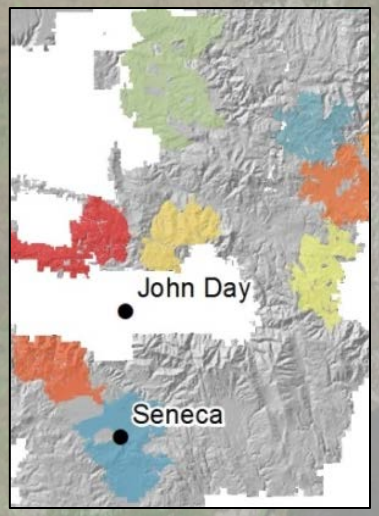




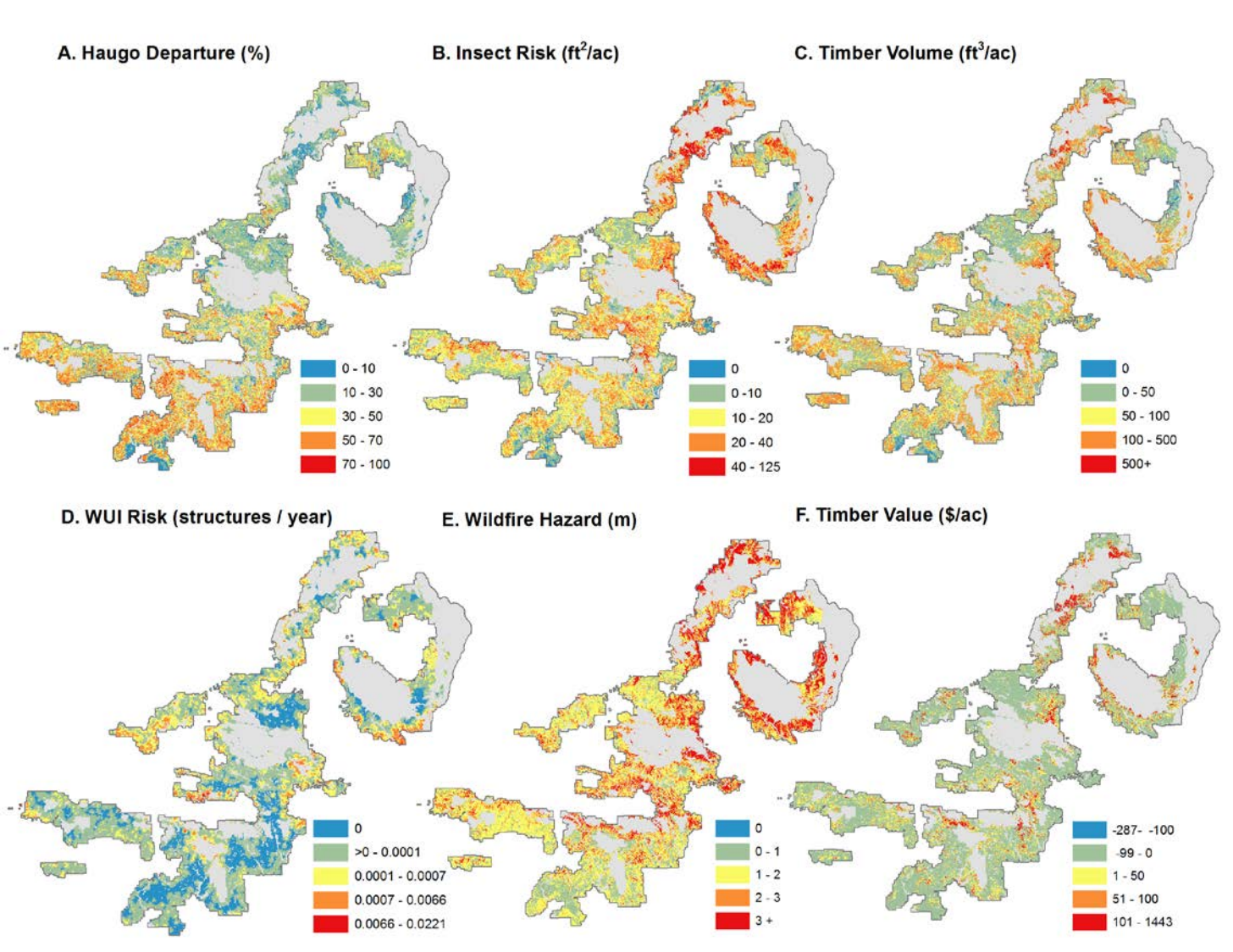
Analytical Gaps

- How do we translate assessments into projects and priorities?
- Optimal mix of restoration goals?
- Management tradeoffs?
- Unique restoration storylines on different landscapes and forests?



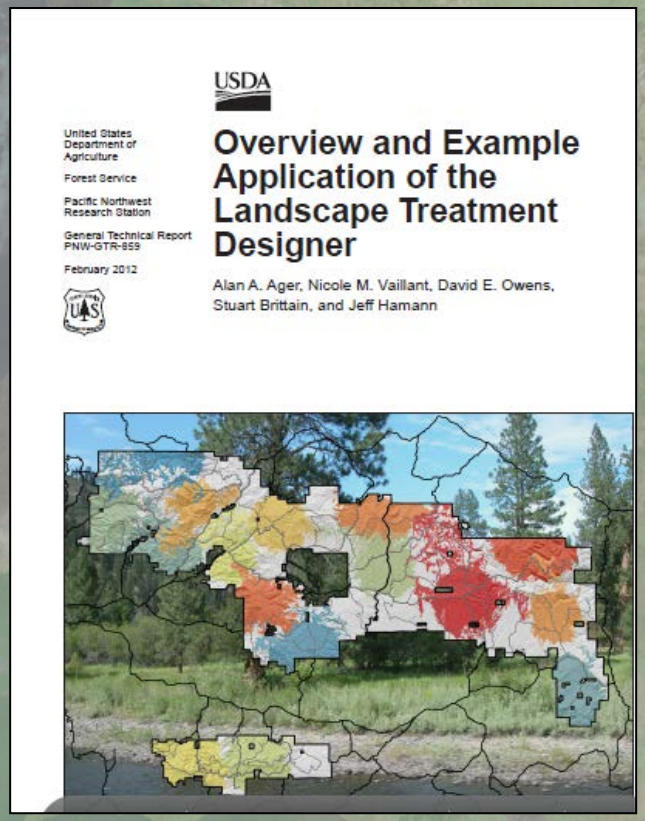


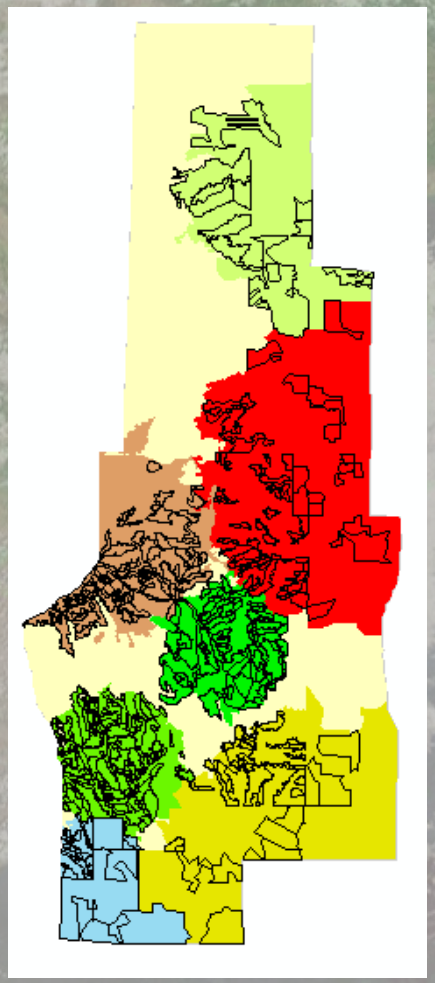
Example restoration objectives



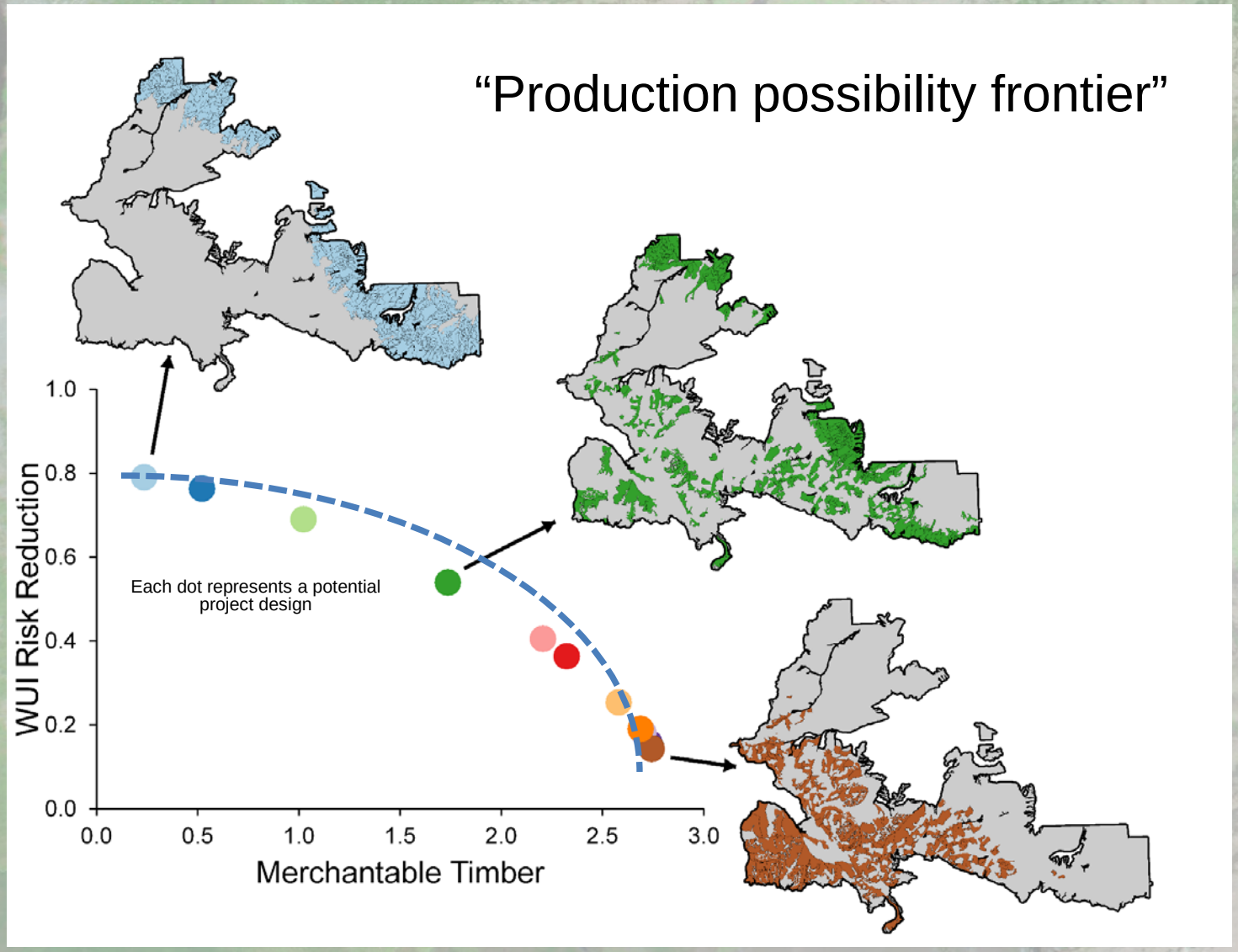
The Landscape Treatment Designer

- Translates restoration goals into optimized project areas



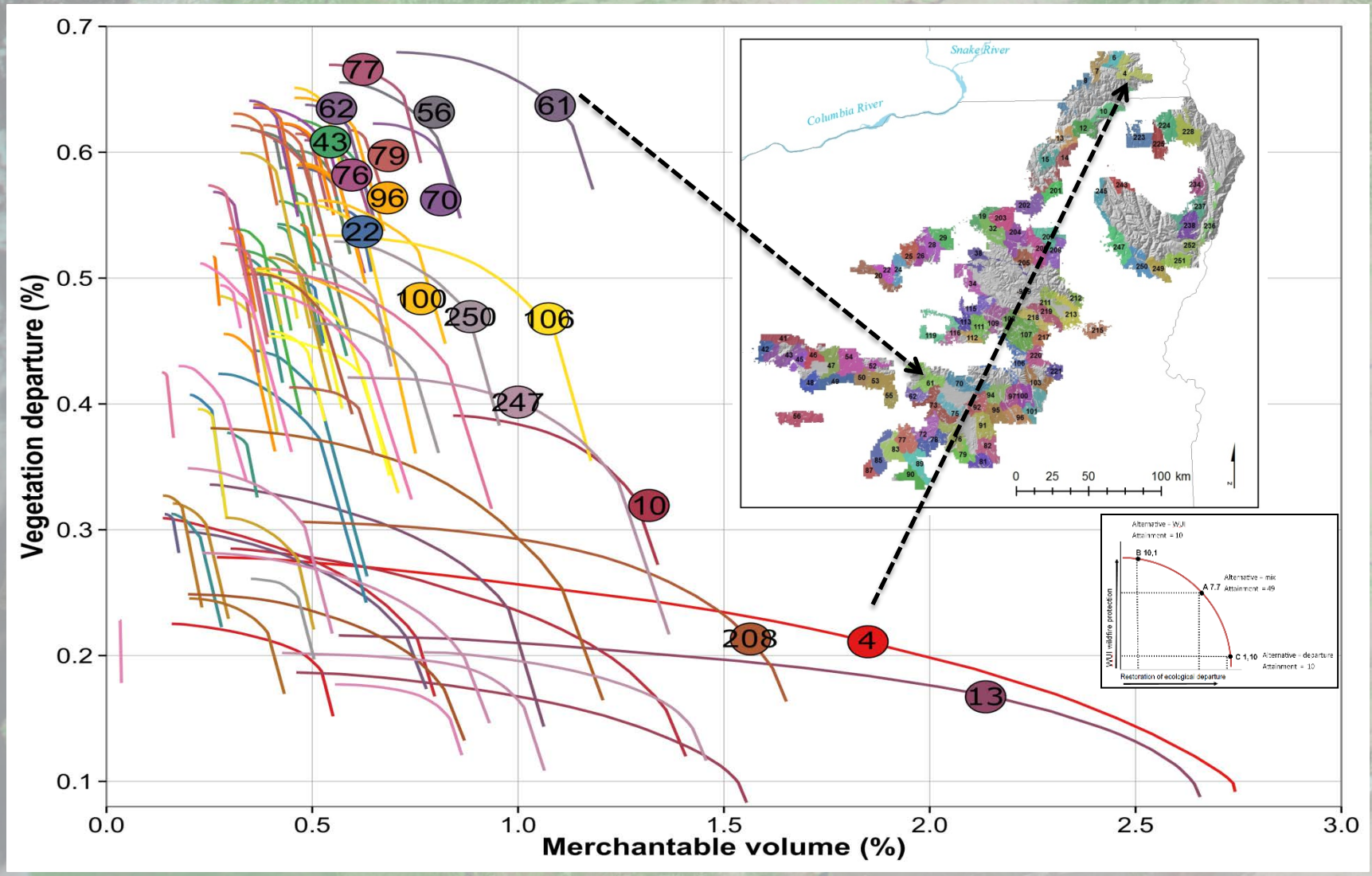


Tradeoffs exist because of the spatial distribution of restoration targets among and within planning areas



Production frontiers by planning area

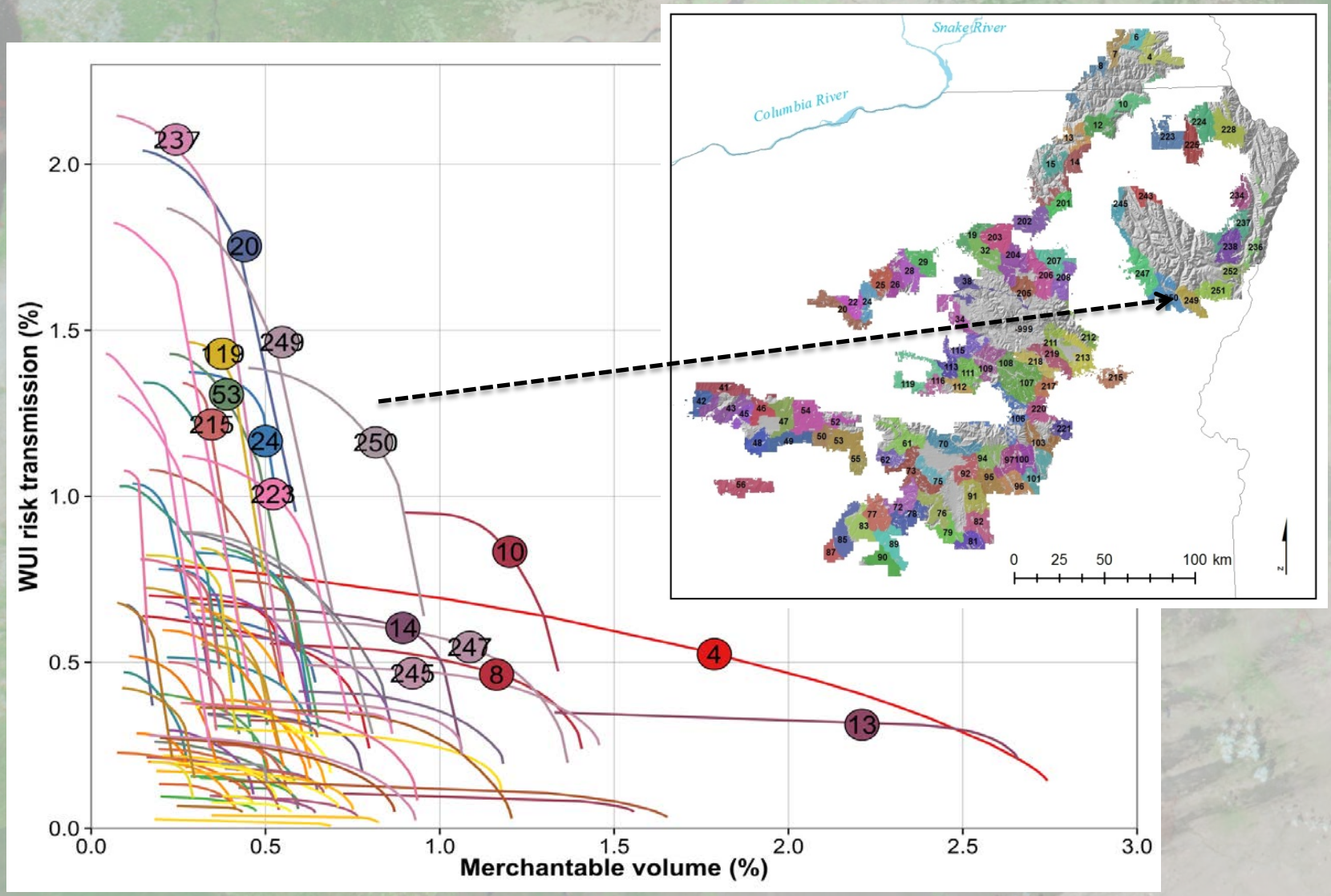
Blue Mountains NE Oregon



Treatments simulated on 12000 acres per planning area

Production frontiers by planning area

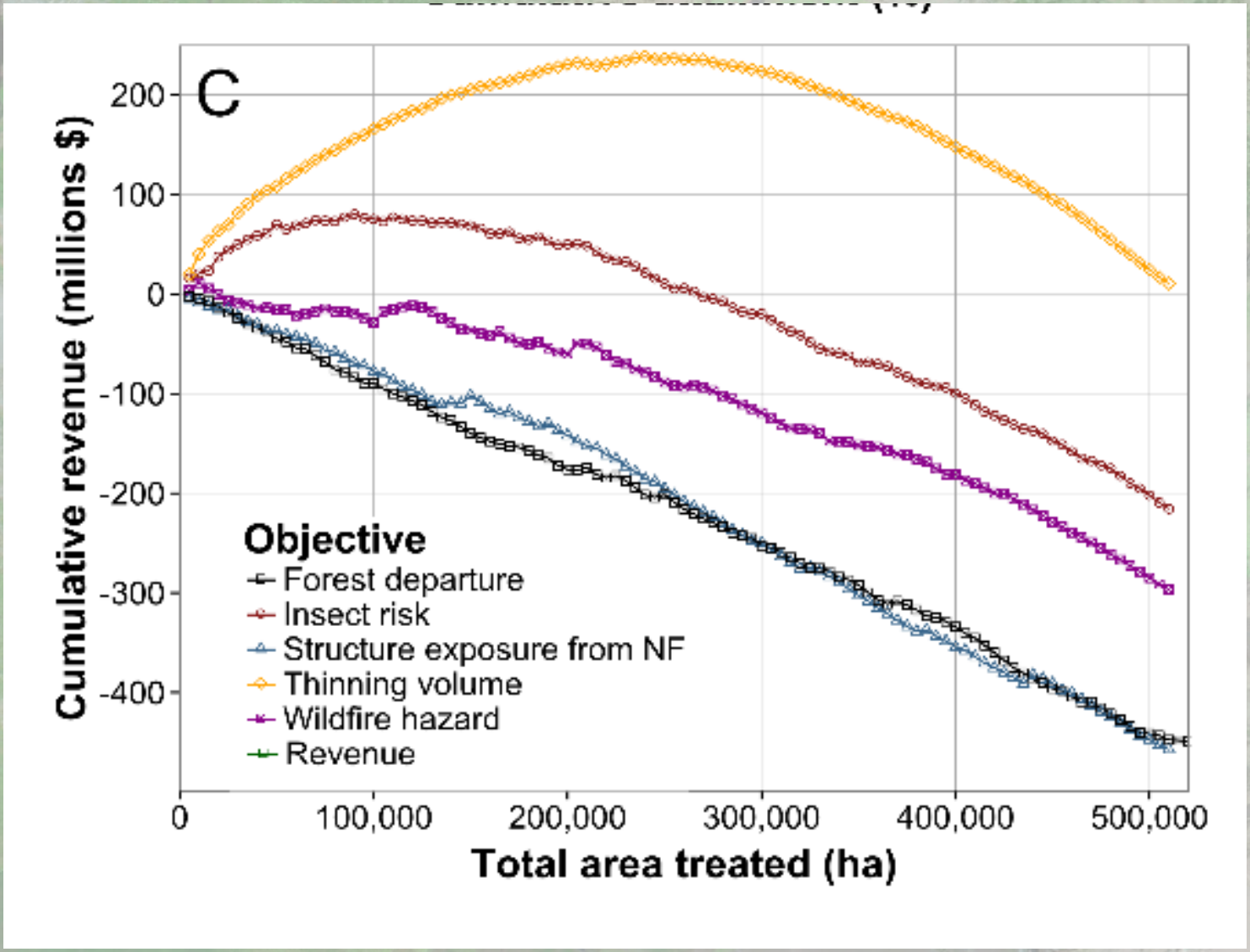
Blue Mountains NE Oregon



Treatments simulated on 12000 acres per planning area

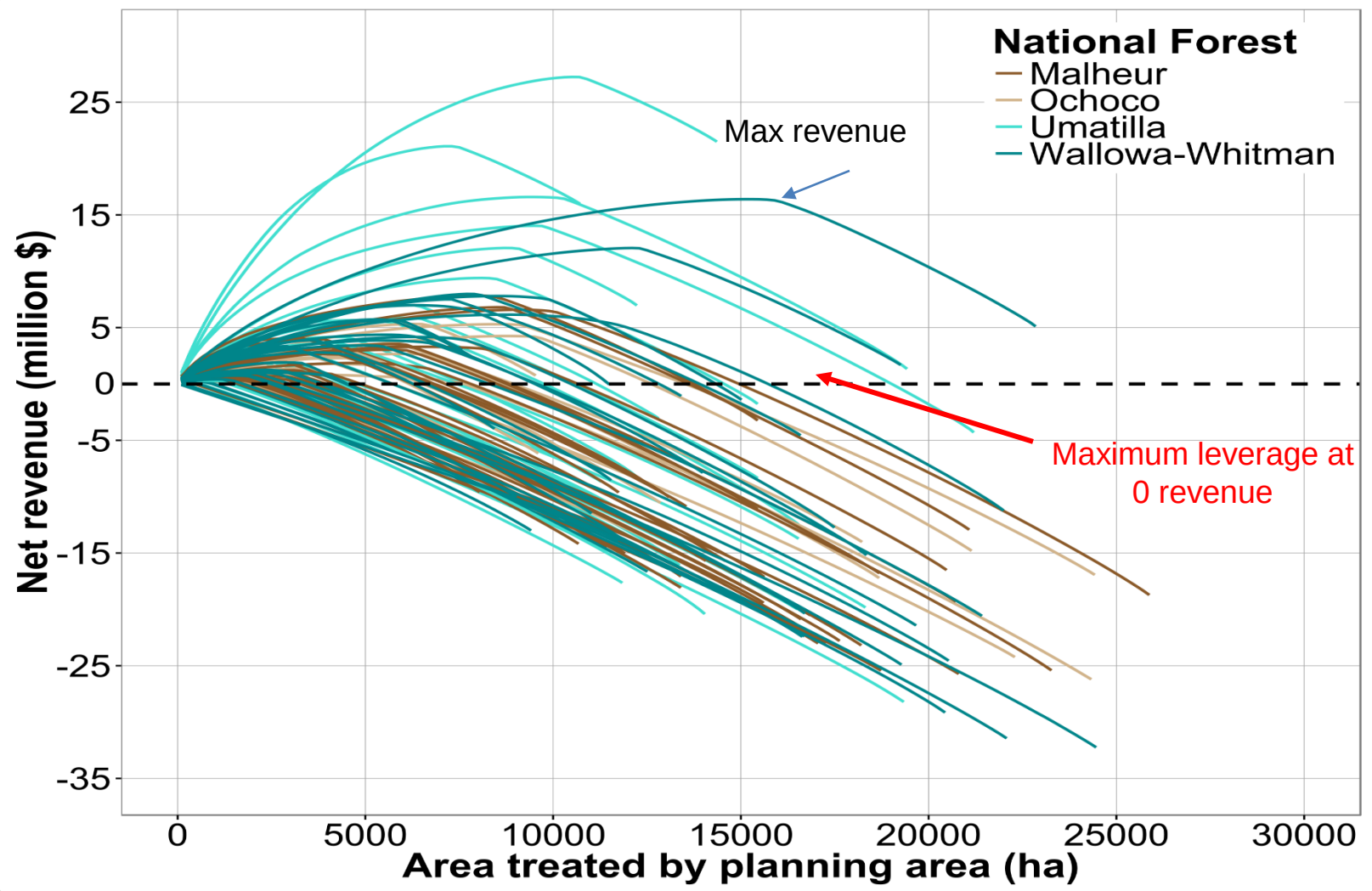
Economic implications of alternative restoration goals

Blue Mountains NE Oregon



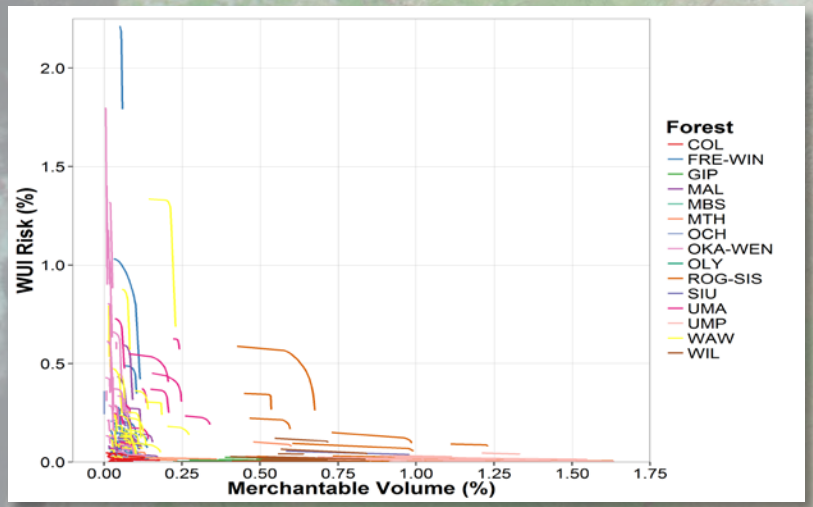
Economic leverage to increase the scale of restoration

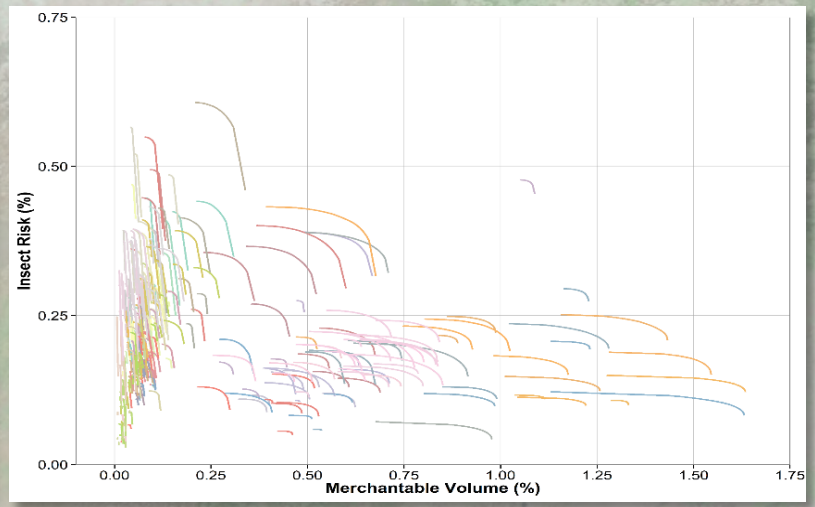
- Planning areas are optimized for revenue under a range of treatment intensities
- As stands are added to the project, revenue peaks then declines

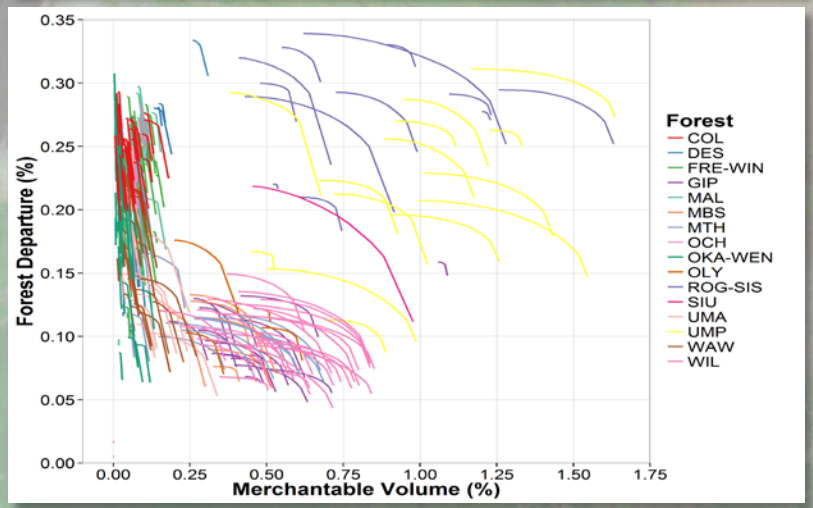


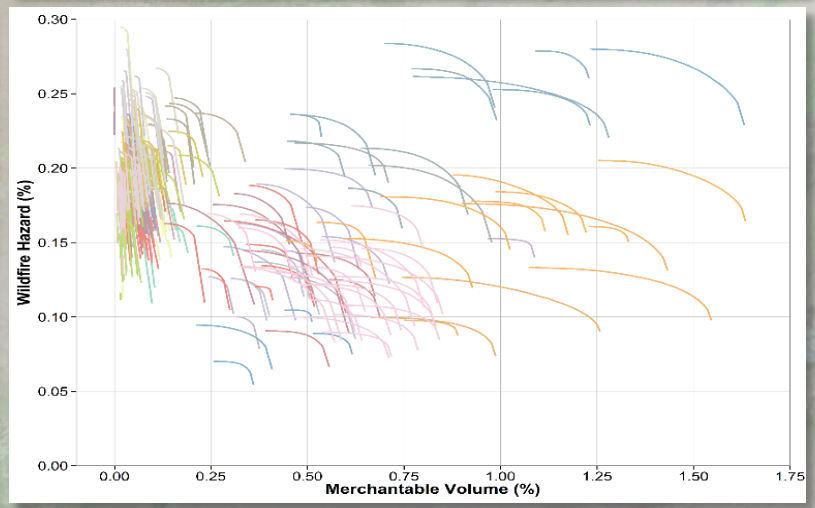
Production frontiers for PNW national forests

- Tradeoffs exist at multiple scales



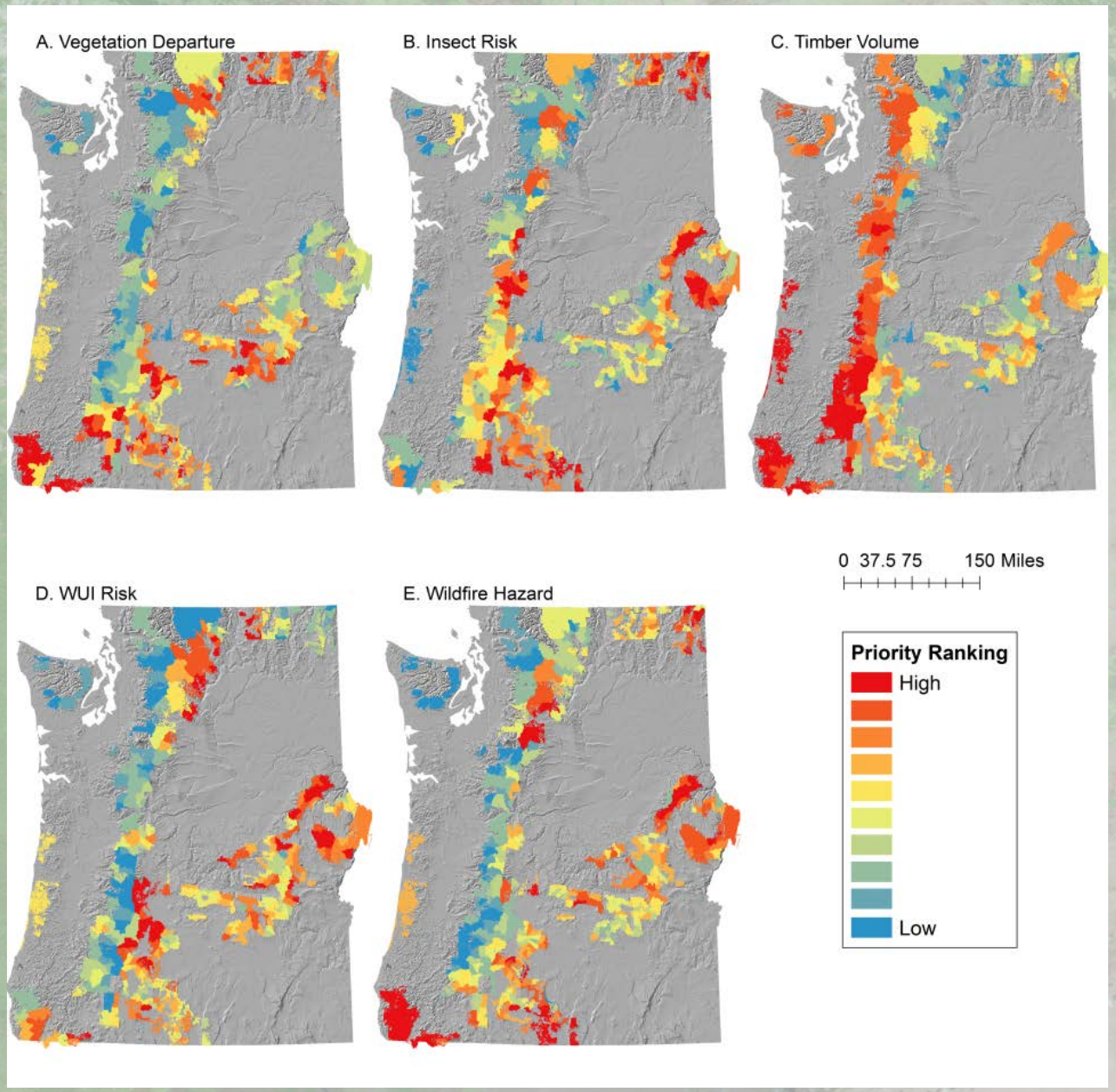






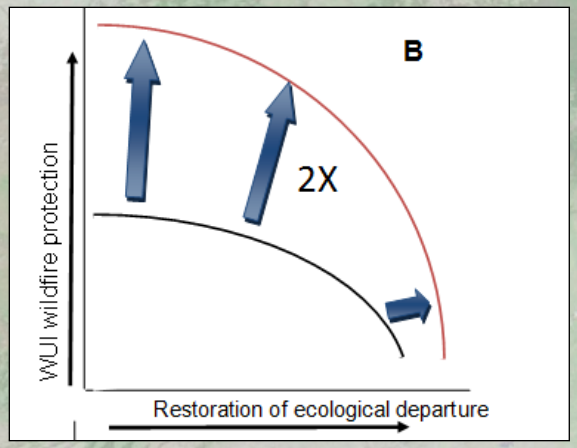
367 planning areas

Map of planning areas prioritized for each restoration metric

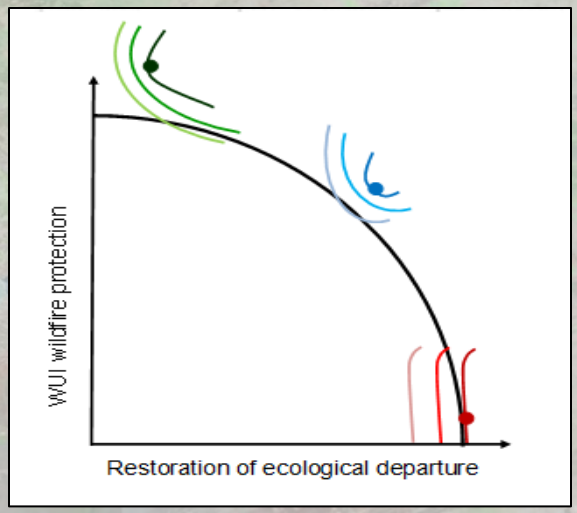


Application and future work

- Strategic planning
  - Prioritization
  - Restoration storylines
  - Pace and scale
  - Economic leverage
- Collaborative planning
  - Facilitate dialog about tradeoffs
  - Compare stakeholder preferences with production frontiers



Shortages change tradeoffs



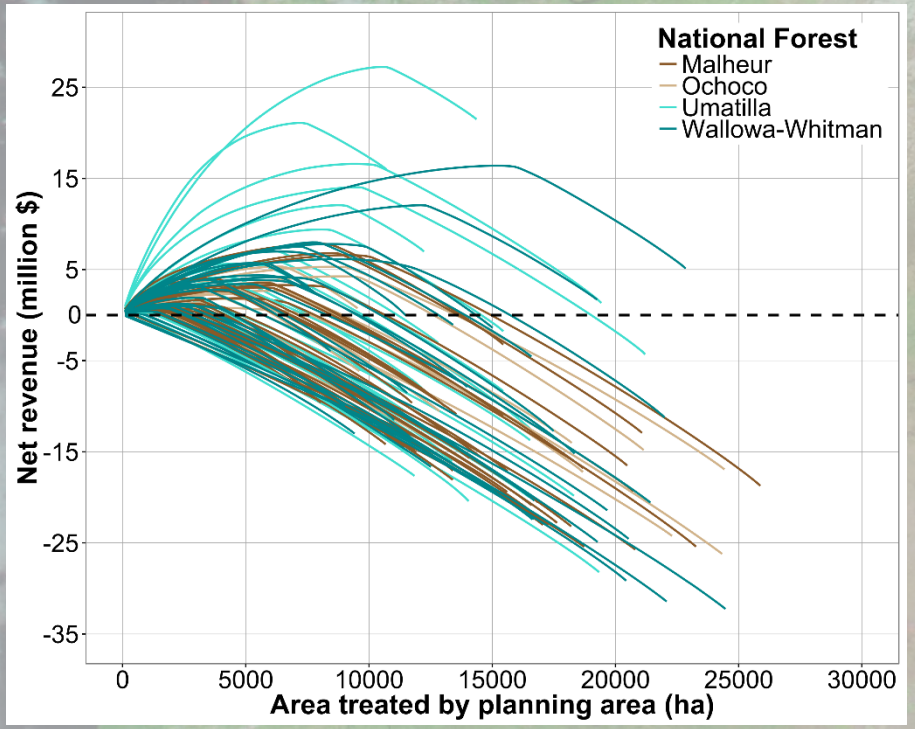
Stakeholder preferences and production frontiers define feasible outcomes

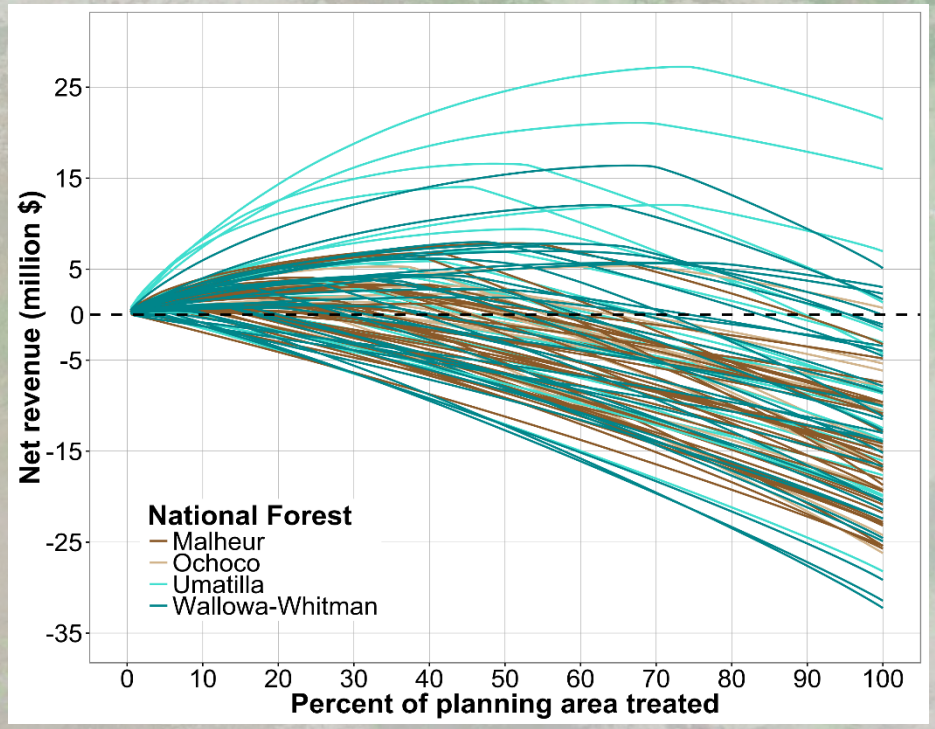
Additional information

- Ager, A.A., Day, M, Vogler, K. 2016. Production possibility frontiers reveal socioecological tradeoffs for restoration of fire adapted temperate forests. Journal of Environmental Management 176 (2016) 157-168
- Vogler, K, Ager, A.A., Day, M. Bailey, J. 2015. Prioritization of forest restoration projects: tradeoffs between wildfire protection, ecological restoration and economic objectives. Forests: 4403-4420
- Ager, A. A., N. M. Vaillant, and A. McMahan. 2013. Restoration of fire in managed forests: a model to prioritize landscapes and analyze tradeoffs. Ecosphere 4:1-19.
- Ager, A. A., N. Vaillant, D. E. Owens, S. Brittain, and J. Hamann. 2012. Overview and example application of the Landscape Treatment Designer. Gen. Tech. Rep. PNW-GTR-859, USDA Forest Service, Pacific Northwest Research Station, Portland, OR.

Photo by Miles Hemstrom

USDA RMRS FireLab MISSOULA, MONTANA


National Forest
Malheur
Ochoco
Umatilla
Wallowa-Whitman
Net revenue (million $)
25
15
5
0
-5
-15
-25
-35
0
5000
10000
15000
20000
25000
30000
Area treated by planning area (ha)


Net revenue (million $)
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5
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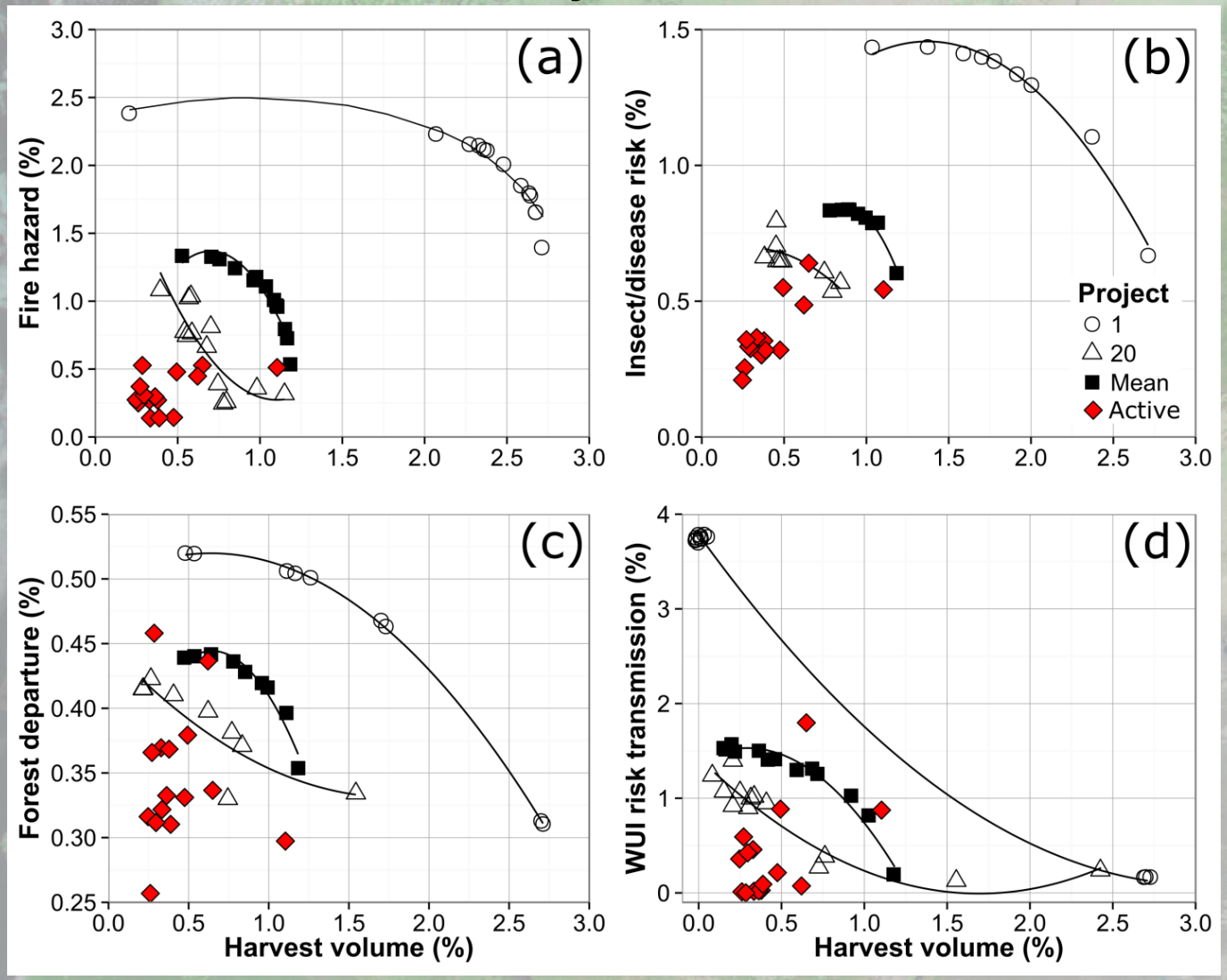
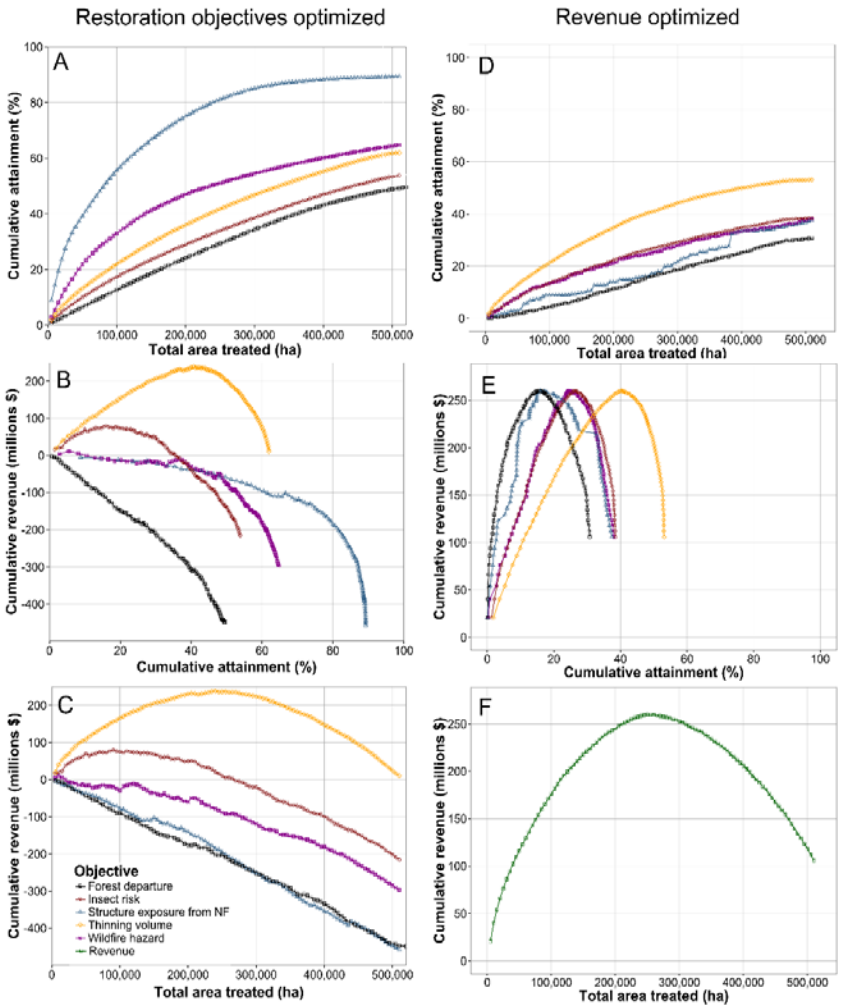
-25
-35
National Forest
Malheur
Ochoco
Umatilla
Wallowa-Whitman
0
10
20
30
40
50
60
70
80
90
100
Percent of planning area treated

Efficiency of current restoration



PPF's for the top and 20th project (and mean of top 20) compared to actual projects.

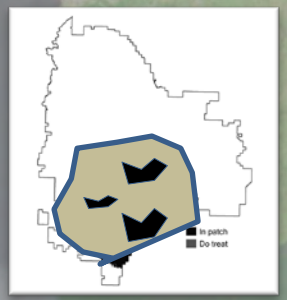

Restoration objectives optimized
Revenue optimized
A
B
C
D
E
F
Cumulative attainment (%)
Cumulative revenue (millions $)
Total area treated (ha)
Objective
Forest departure
Insect risk
Structure exposure from NF
Thinning volume
Wildfire hazard
Revenue

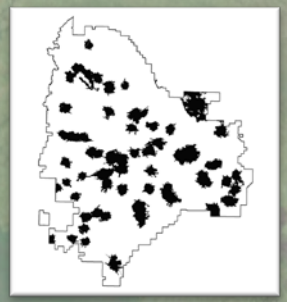
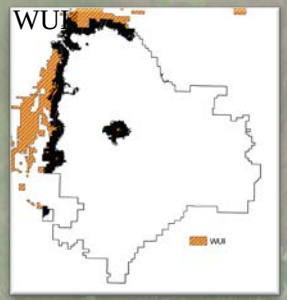
Landscape treatment patterns

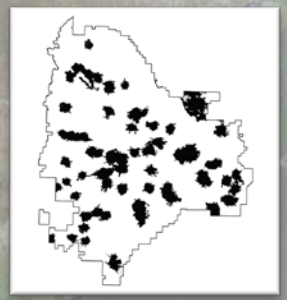
Fire resilient landscapes | Fire adapted communities | Wildfire response

Restoration | **Protection** | **Containment**

Low hazard fire containers	Strategic Restoration of natural fuel breaks	Focused defensible fuel breaks	Dispersed fuel breaks	Treatment optimization model	High hazard fire containers





Black polygons represent treatment units