Large-Scale Integrated Management Experiment in the Olympic Experimental State Forest

- *opportunities for operational research*

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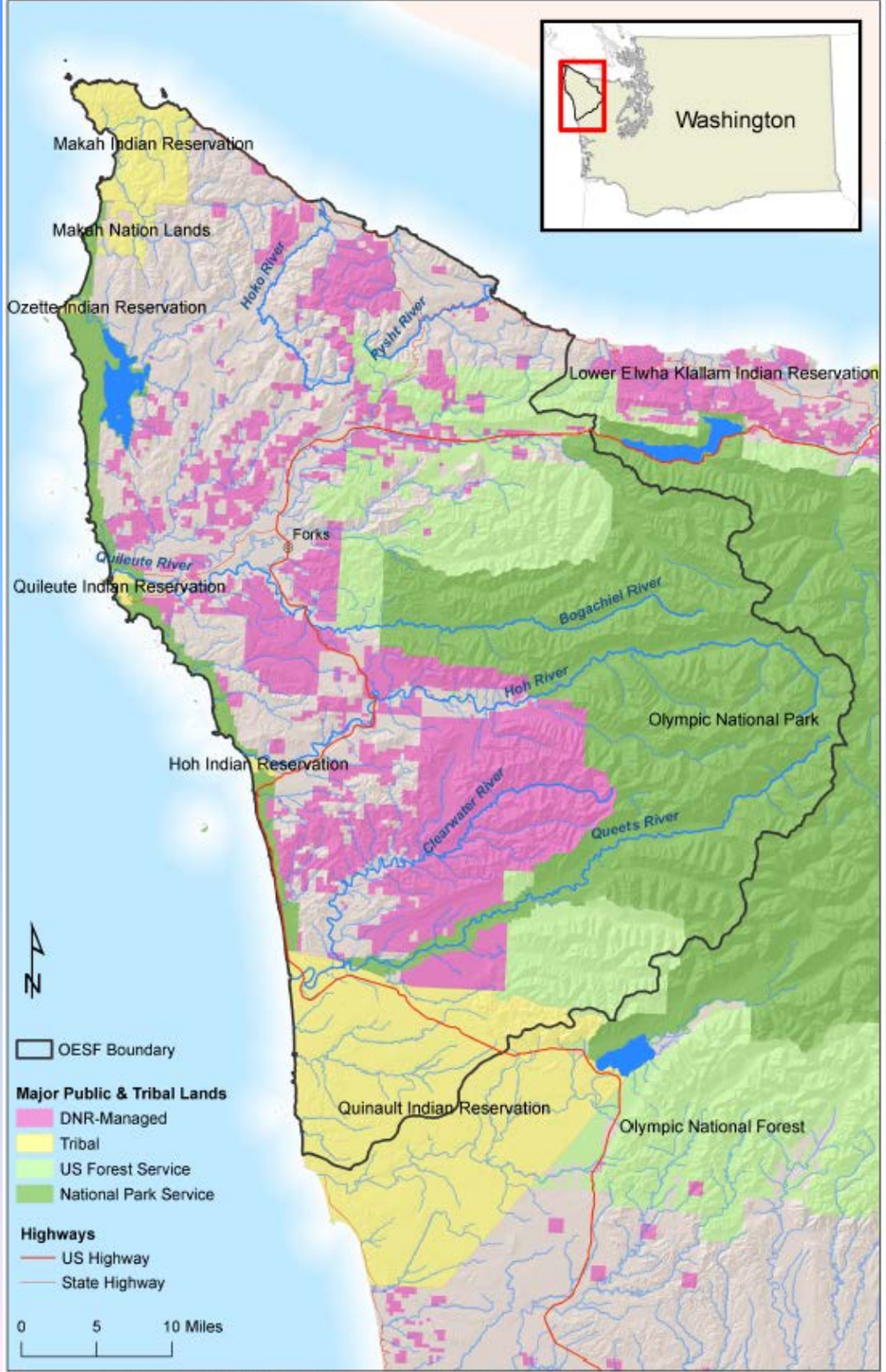
Presentation Outline

- Description of the Olympic Experimental State Forest (OESF)
- Goal and context of the management experiment
- Experimental units, treatments and implementation
- Management uncertainties and ideas for operational research
- Practicalities ($$, operational setting, timelines, etc.)

Olympic Experimental State Forest



Managed by Washington Department of Natural Resources

270,000 ac; non-contiguous

Temperate rain forest (ave. precipitation of 140"/year)

Steep erodible terrain, wind disturbance

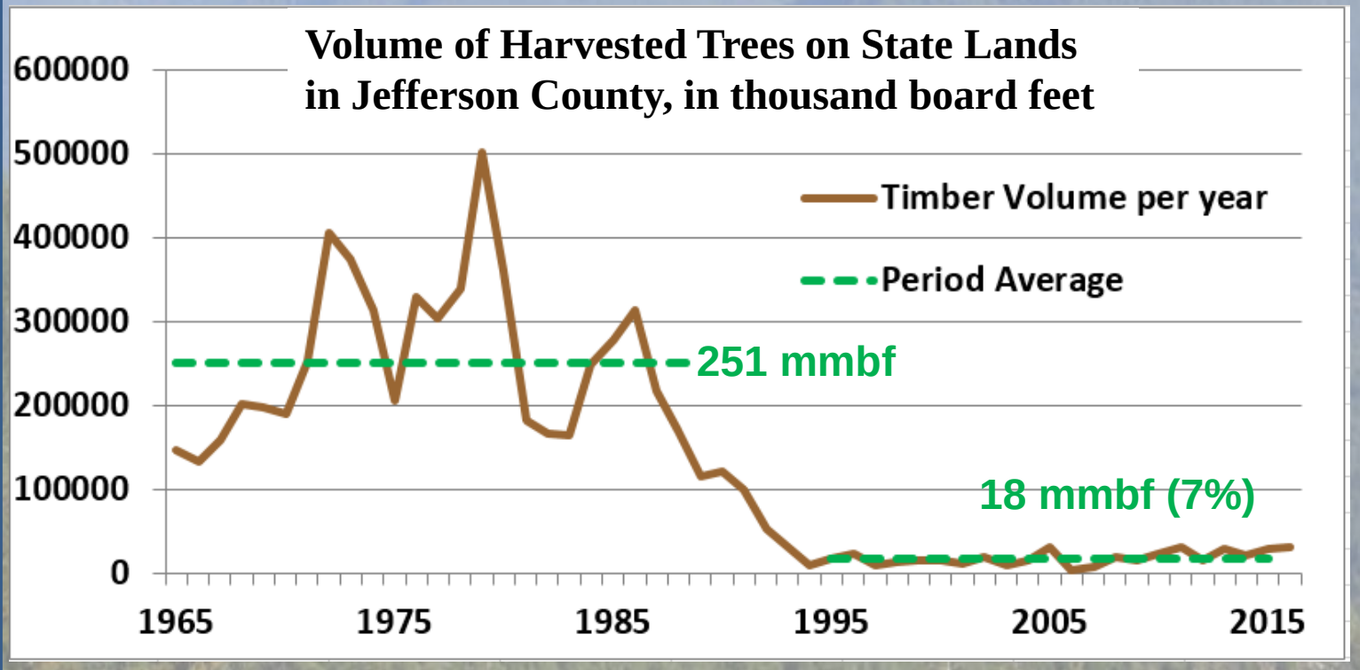
Dense network of streams (>2,500 mi of mapped streams)

Extensive road network (~1,800 miles of active roads)

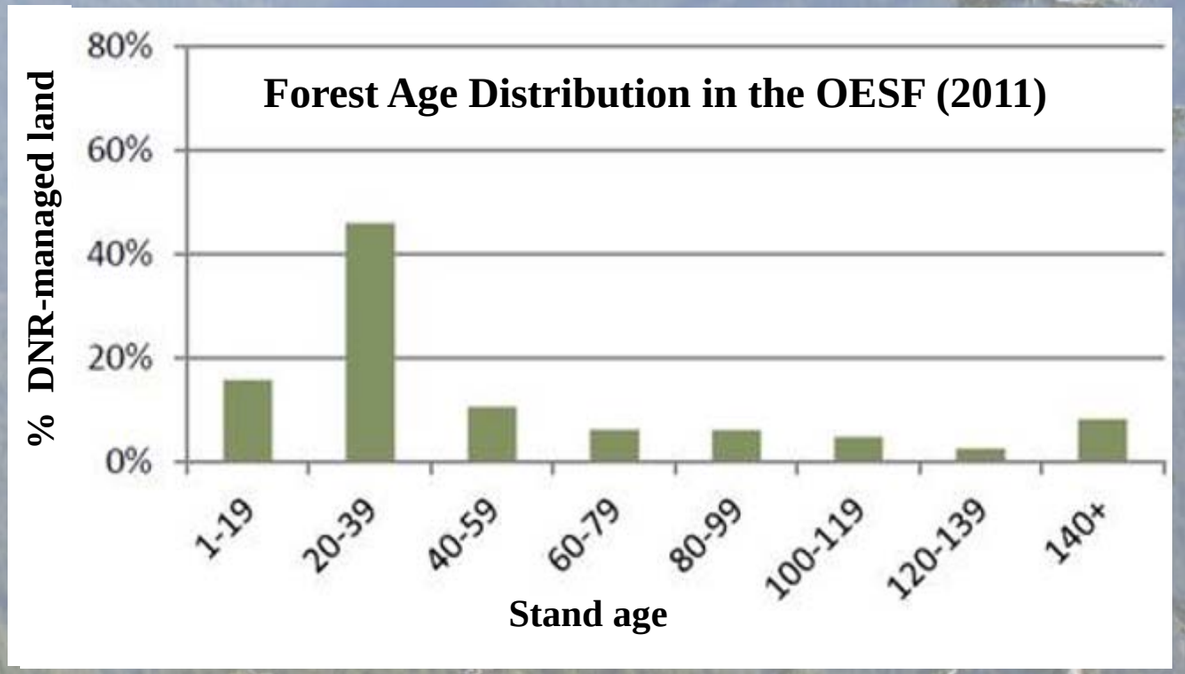
Active timber sale program (ave. 1,500 ac harvested/year)

Management objectives

Historical and Current Management



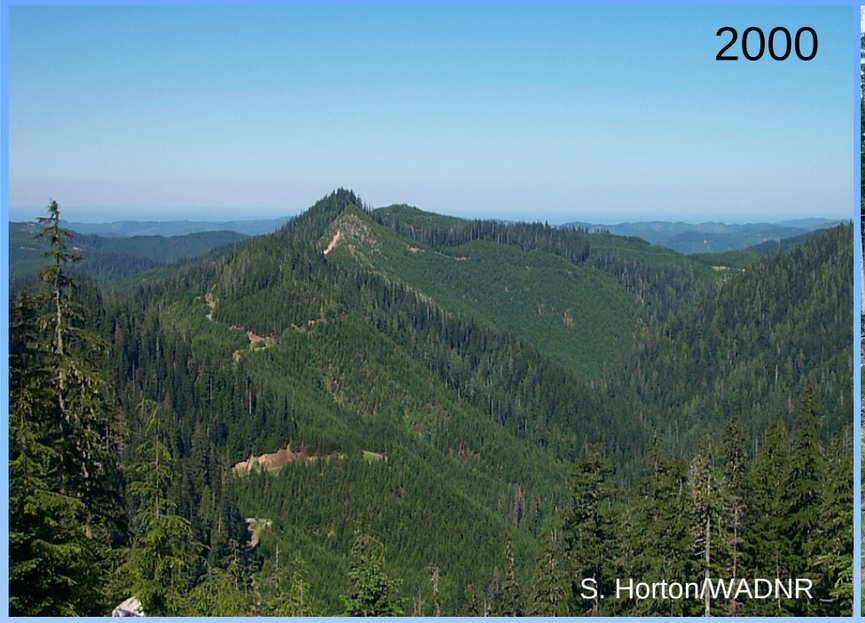
Source: Washington Annual Timber Harvest Reports (WADNR)



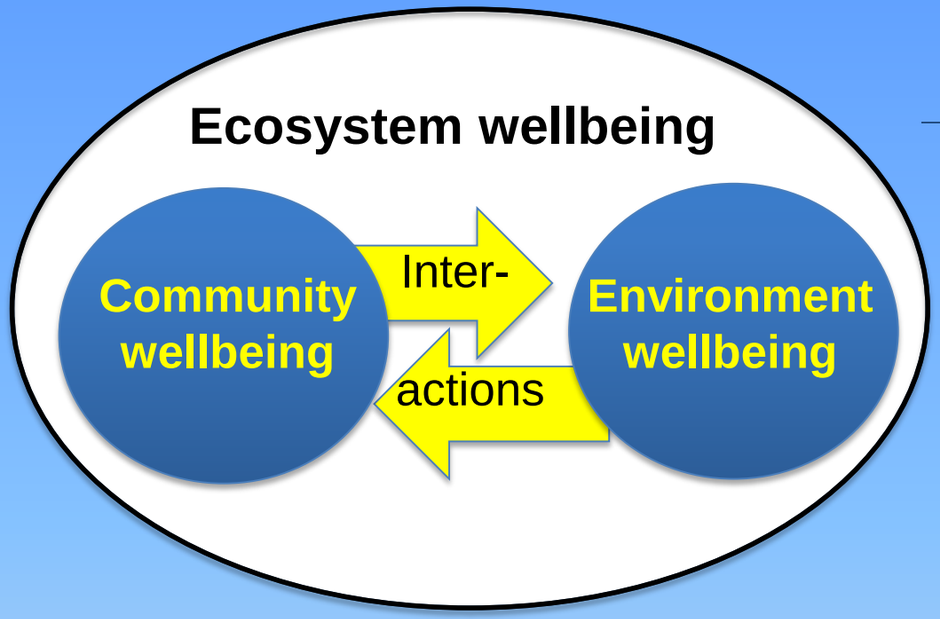
Source: OESF Forest Land Plan (WADNR, 2016)

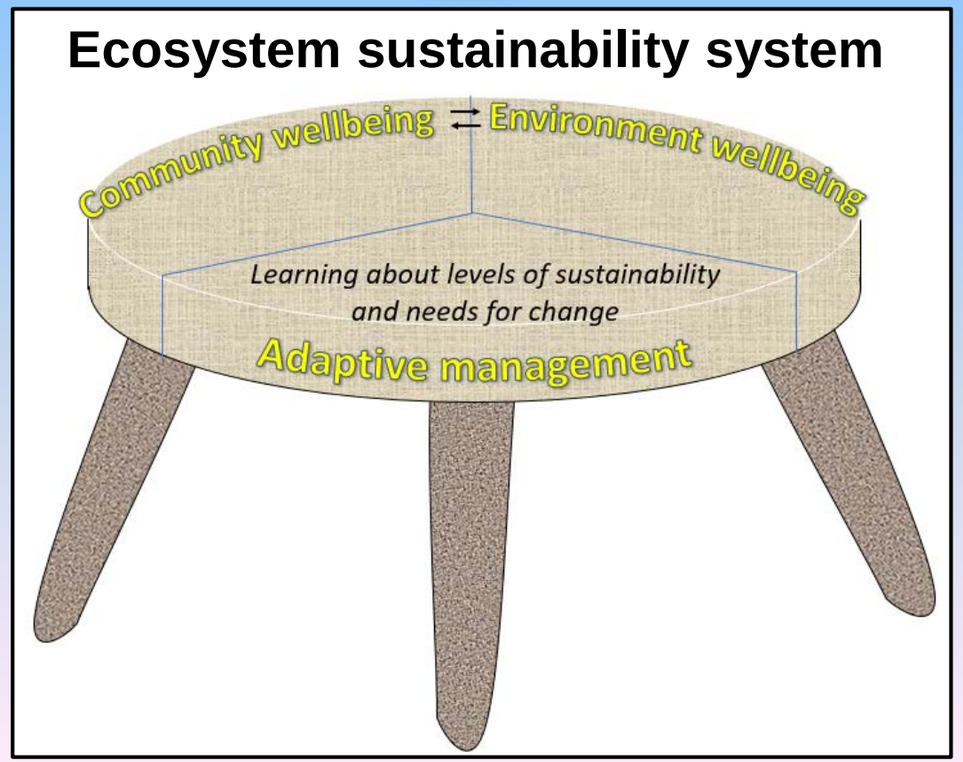
Historical and Current Management

1970's photos by Jeff Cederholm/WADNR



Landscape Management Experiment





Core Question:
Will a higher, sustainable level of rural ecosystem wellbeing emerge from an array of land management strategies implemented and compared experimentally?

16 experimental watersheds (about 1,000 ac each)

Implemented through WADNR timber sale program

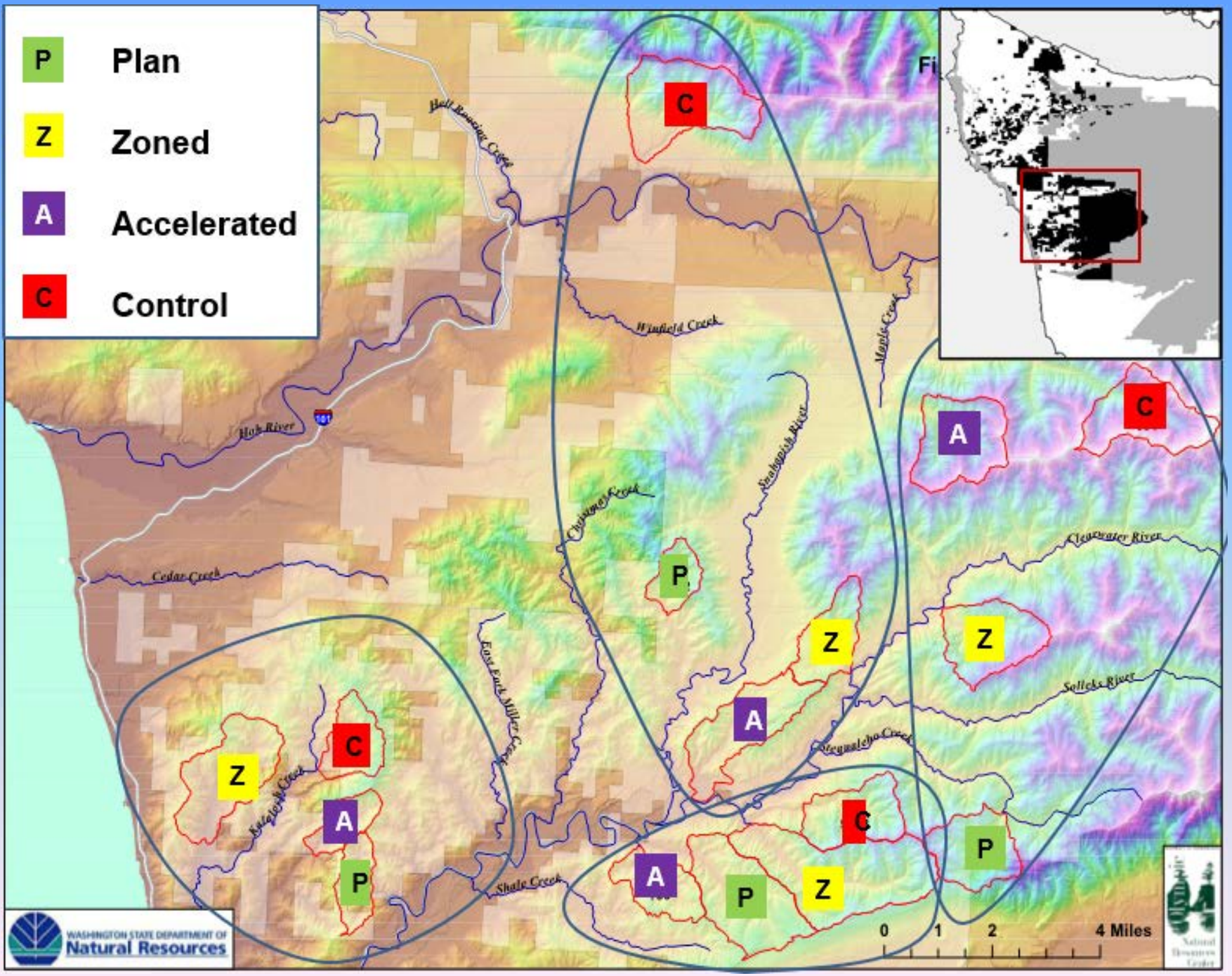
Ecological, economic and operational feasibility response variables

Broad stakeholders support

Management Strategies to be Experimentally Compared

IMPLEMENTATION	Zoned management	OESF Forest Land Plan	Accelerated Integrated Management	No Action Control
Revenue	Less	Planned	More	None
Harvest acres	Less	Planned	More	None
Thinning-VRH ratio	Low	Medium	High	None
Riparian entry	None	Planned	More	None
New operations	?	?	?	None
Old growth entry	None	None	None	None
Old forest entry	None	Later	Some	None
Innovation	Low	Medium	High	None

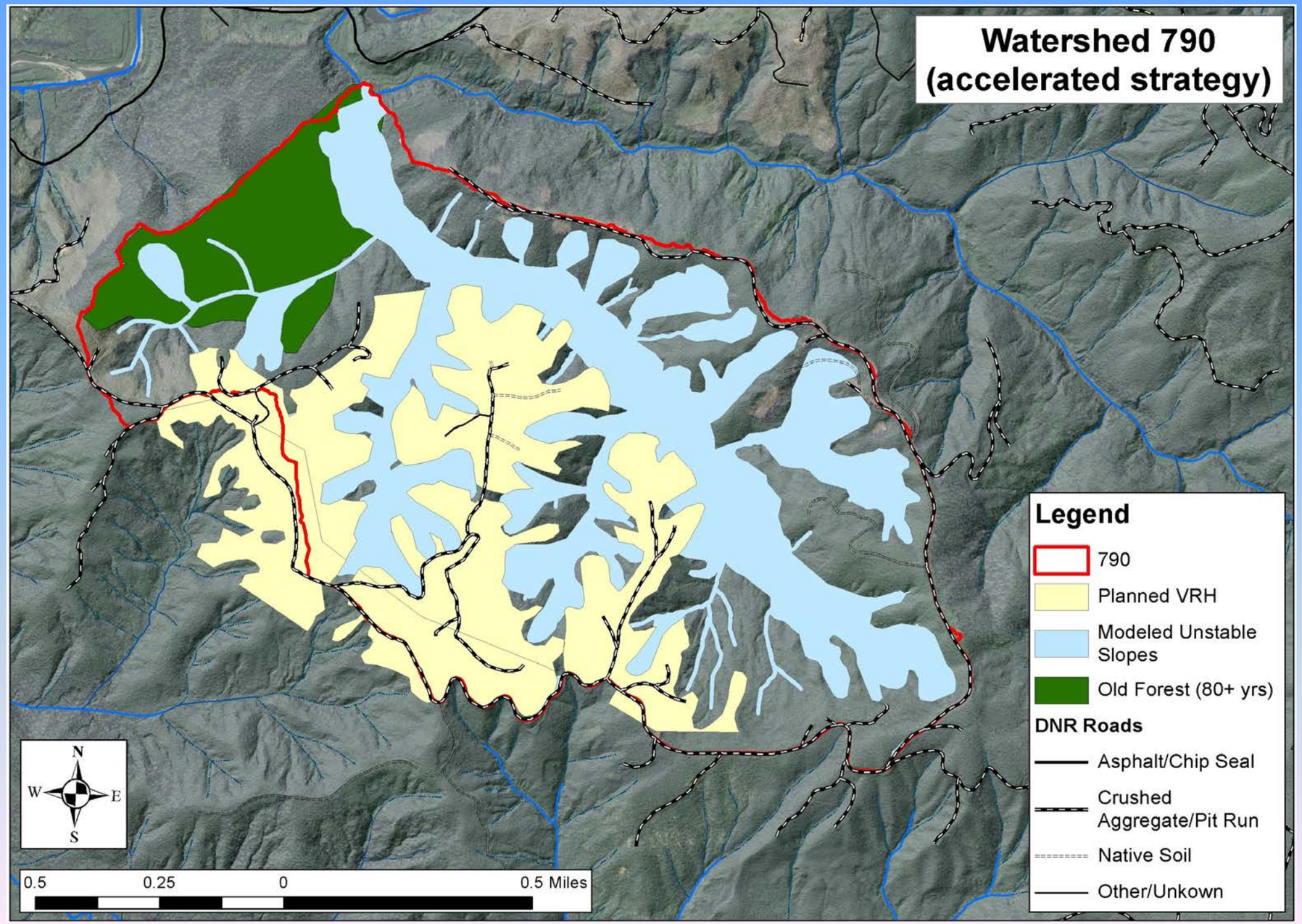
Spatial design



4 blocks of 4 watersheds

Random assignment of management strategies

Watershed Example



WADNR Management Uncertainties

1. Logging and road building on unstable slopes

- Lower environmental impact (landslides and stream sedimentation)
- Reduce cost

2. Operating in scattered small units with a lot of edge

- Cost-efficient logging systems
- Cost-efficient road network (spatially and temporally)

Major constraints: operating in and around habitat, legacy road system, limited distribution of saw mills

Operational research ideas

1. Finding balance between forest roads' performance and cost

   - Aggregate recycling
   - Geosynthetics (geotextiles and geogrids)
   - Alternative road surfaces (wood panels, wood chips, recycled asphalt, etc.)
   - Variable depth of rock depending on expected haul

Operational research ideas

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2. Logging systems
    - Tethered logging – quantifying environmental effects (soil disturbance and sedimentation), logging cost, and safety
    - In-woods processing - feasibility of portable saw mills
    - Use of intermediate support systems

	2016 summer	2016 fall	2017 spring	2017 summer	2017 fall	2018 winter	2018 spring	2018 summer	2018 fall	2019 - 2027
Management strategies selected (study proposal)										
Stakeholder input										
Scientists workshop (project introduction)										
Final selection of experimental watersheds										
Study plan framework rollout (ONRC webpage)										
Silviculture workshop										
Aquatic ecology workshop										
Operations research workshop										
Final study plan workshop										
Complete draft study plan for peer review										
Pre-treatment monitoring										
Experimental treatments										
Post-treatment monitoring										
Analyses, reports, communication										

Practicalities

- Funding
  - No dedicated funds besides WADNR and University of Washington staff time
  - Experimental treatments through WADNR timber sale program
  - Available WADNR data (LiDAR, forest inventory, environmental monitoring, etc.)
  - Actively seeking funding from a broad range of sources: revenue-based endowment, grants, state legislature, industry, and philanthropy

- Decision space
  - OESF is designated for experimentation with alternative management techniques (“HCP research license”)
  - Depending on the level of anticipated environmental impact - consultation with WA Forest Practices, USFWS, NOAA
  - Depending on increased cost and complexity of the manipulations – consultations with WADNR managers

- The challenge of aligning research timelines with timber sales schedules

More Information

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OESF website: https://www.dnr.wa.gov/oesf