

Building Adaptive Capacity through Operational-Scale Forest Management Experiments in Western Washington, USA

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T3 Watershed Experiment

Goal 1: Expand the toolbox of forest management practices

Goal 2: Build capacity to find new solutions

Large-scale management experiment using:

- Adaptive management framework
- Ecosystem-wellbeing framework





Research Partners



Engagement of Stakeholders and Tribes

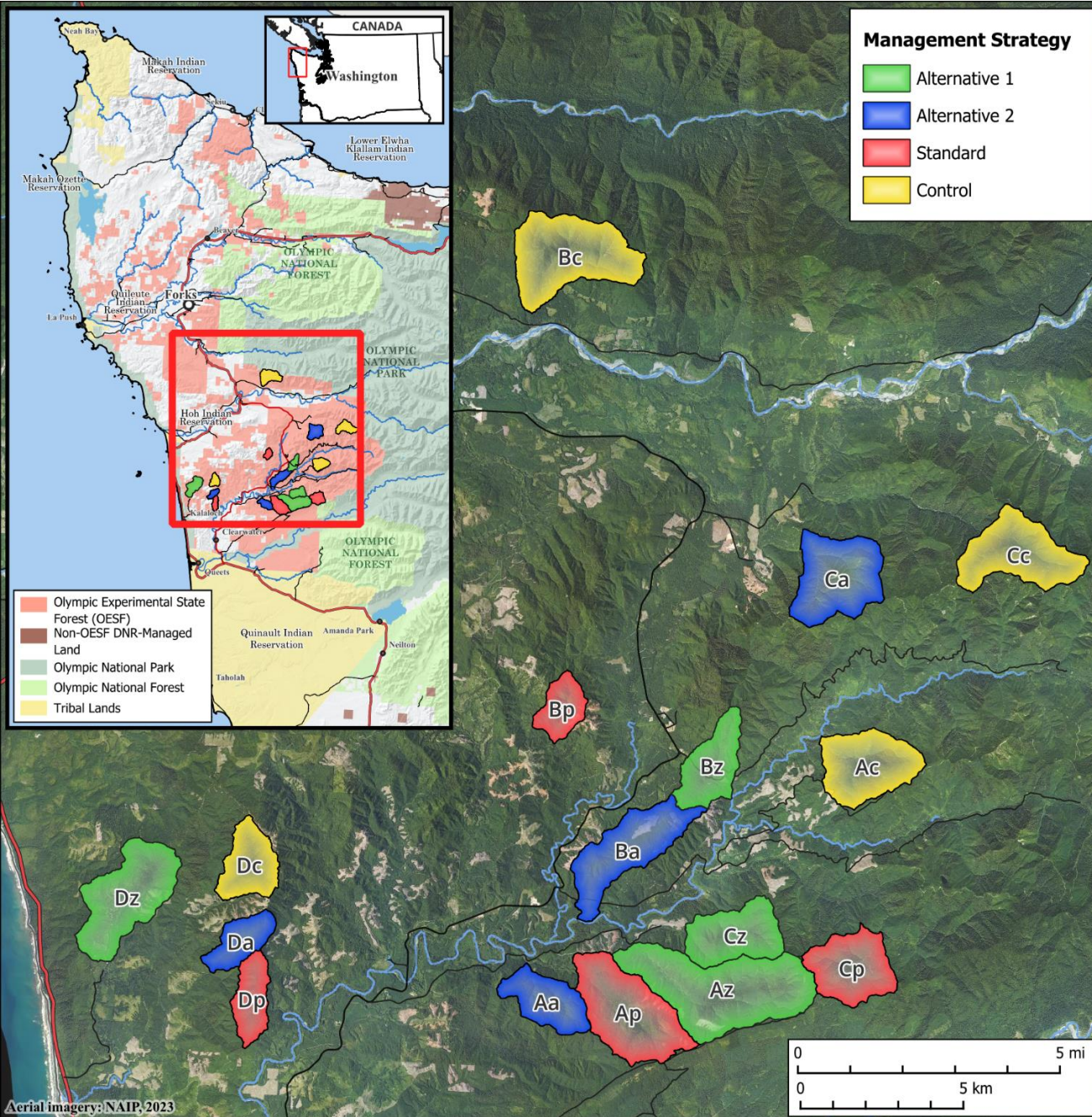
Approach: Learning-based Collaboration

Intent:

- Gather voices and expertise
- Enrich research questions, improve methods
- Built trust and support for innovations
- Share resources for research and monitoring

Implemented through learning groups





Study Area and Design

Olympic Experimental State Forest

20,000 acres in 16 watersheds

4 management strategies x 4 blocks

2,100 acres manipulated

Multiple operational-scale treatments (prescriptions)

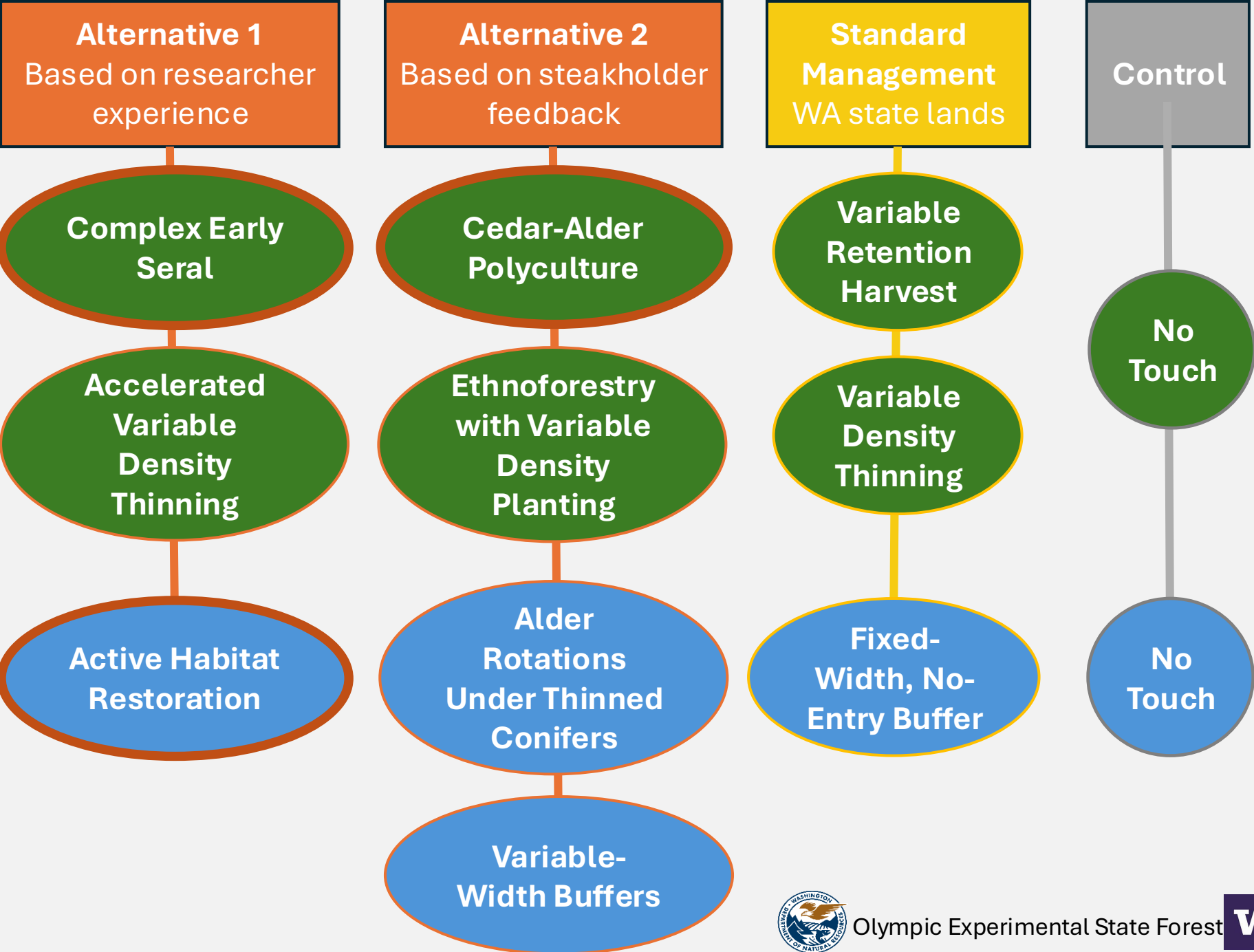


Experimental Prescriptions

Uplands



Riparian





Upland Treatment – Complex Early-Seral



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Complex early-seral:
logs and treetops
left on site

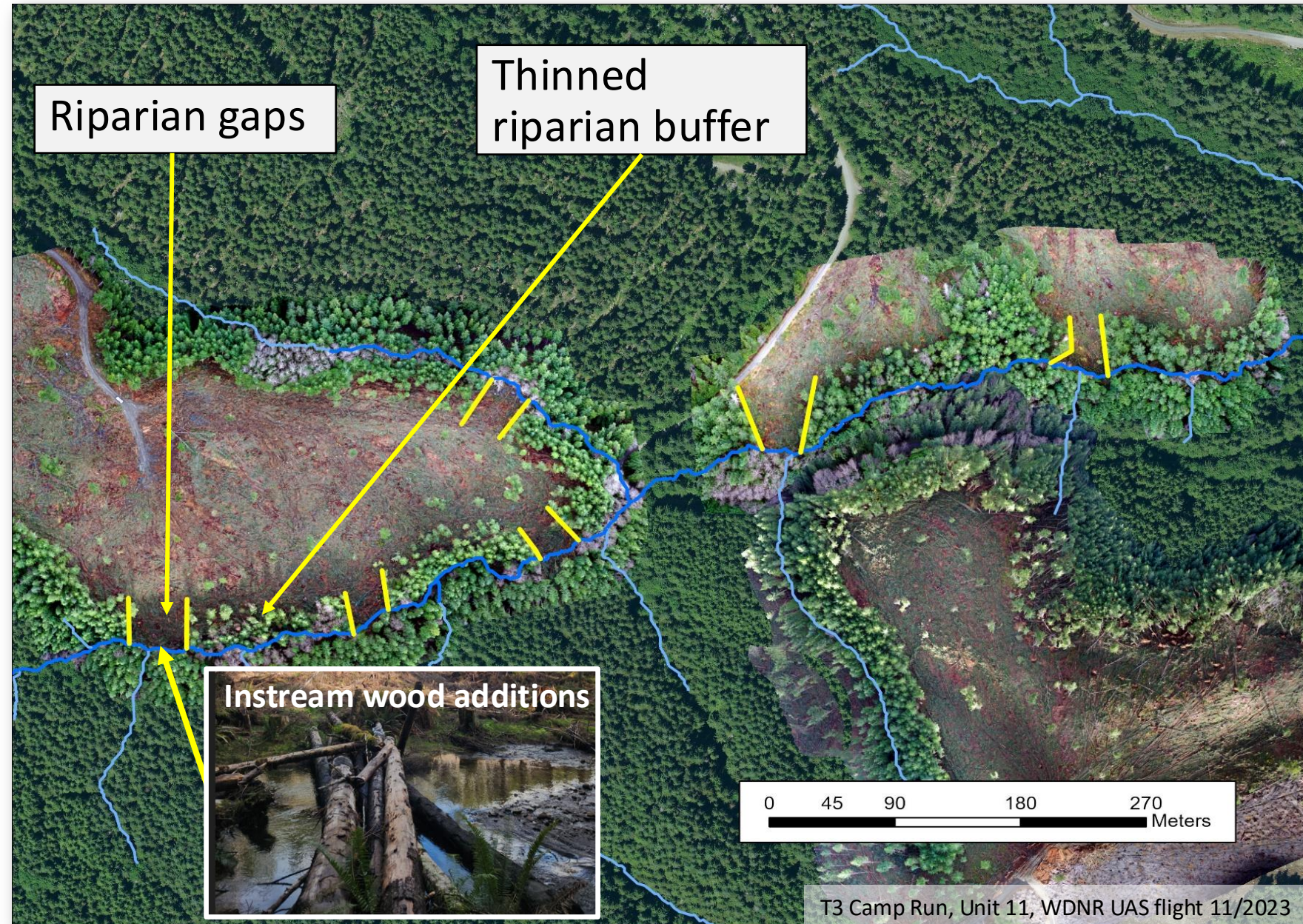
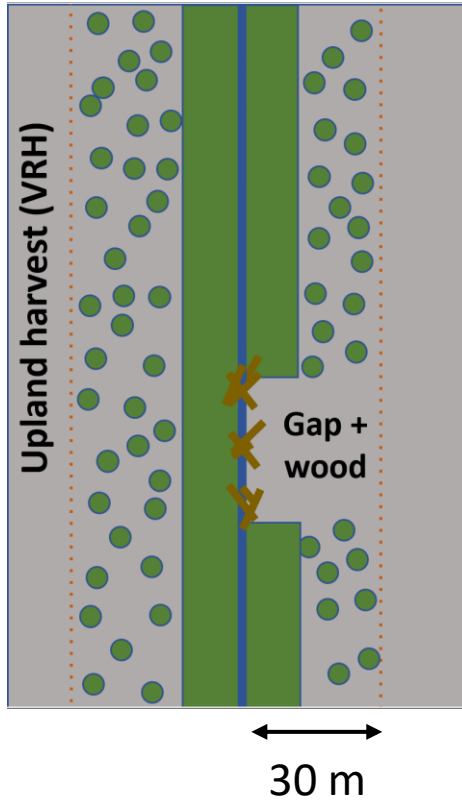
Complex early-seral: 50% more
leave trees (12 tpa) clumped
and dispersed

Standard VRH: 8
leave trees per acre
and slash removal





Riparian Treatment – Active Habitat Restoration

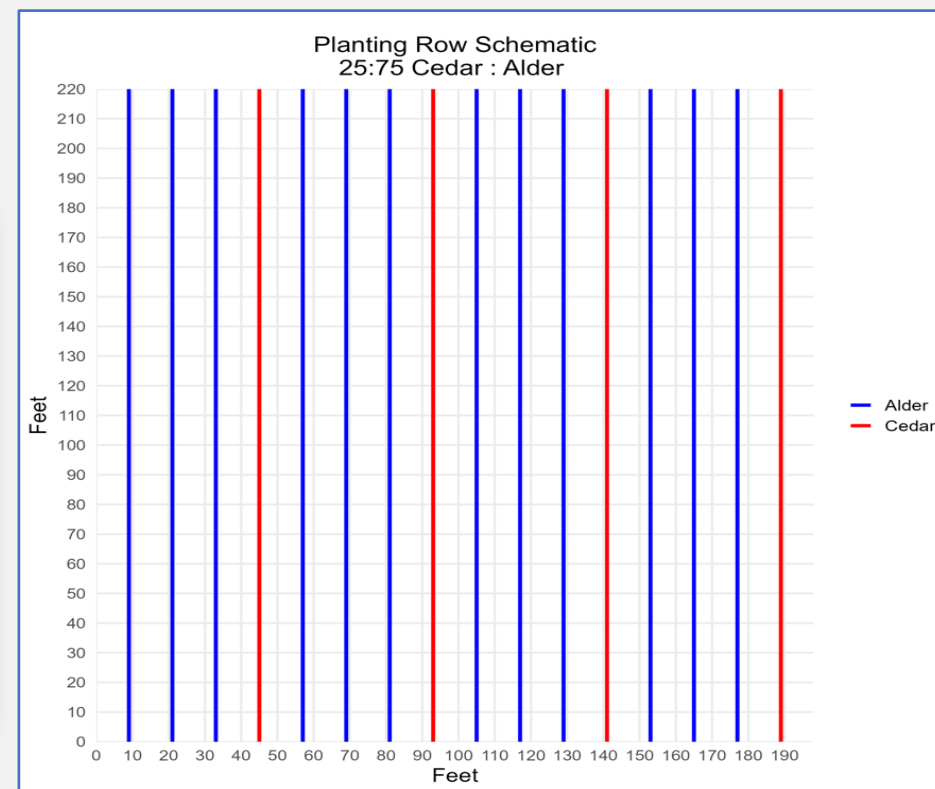
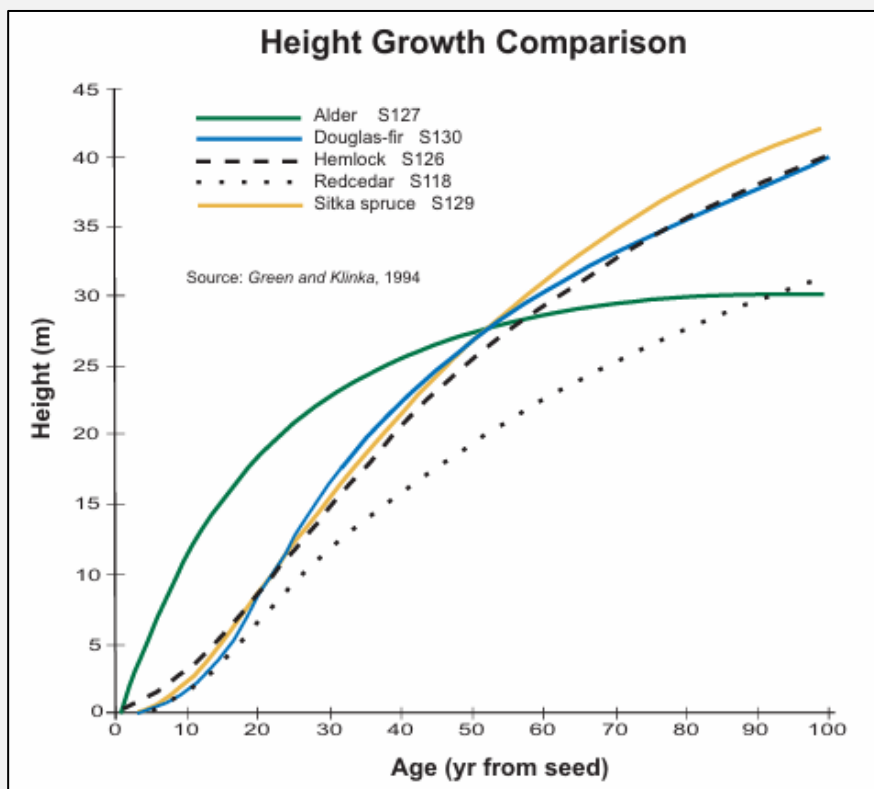




Upland Treatment – Alder-Cedar Polyculture

Five different ratios of planted western redcedar (*Thuja plicata*) and red alder (*Alnus rubra*): 100:0, 25:75, 50:50, 25:75, and 0:100

Two rotations of alder with 1 rotation of redcedar



Environmental and Silvicultural Monitoring

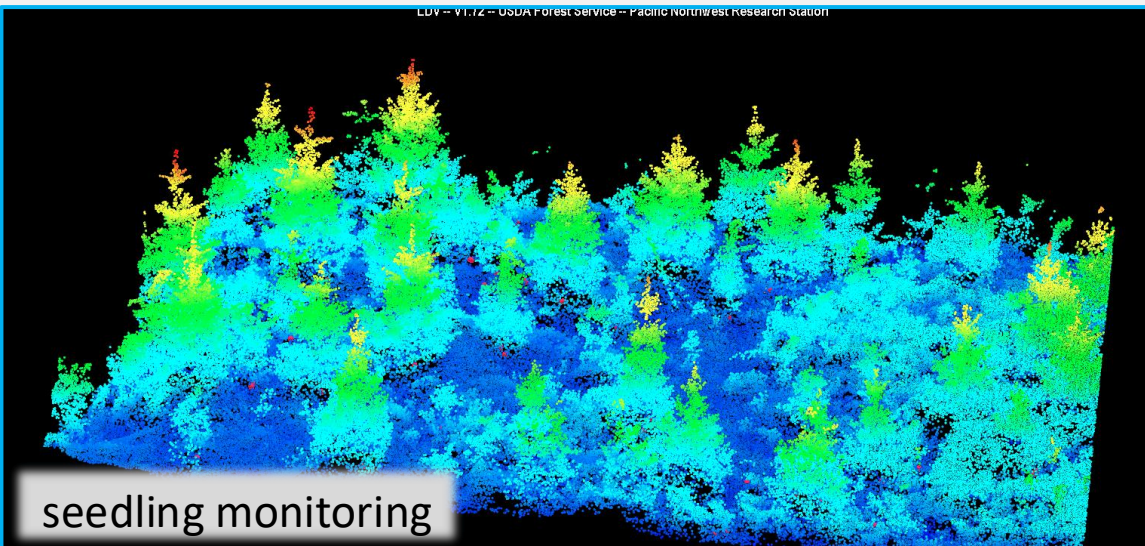
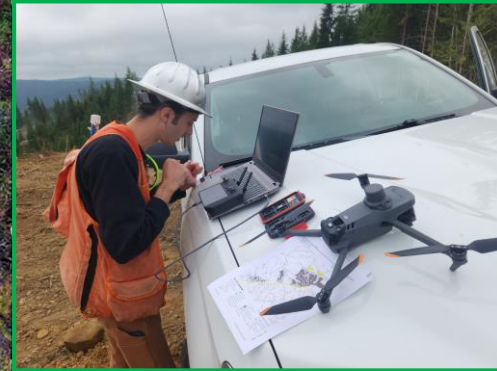


Remote Sensing Monitoring

Drone LiDAR



Drone Imagery



Operational Feasibility – Experimental Logging



0 0.010.03 0.05 0.08 0.1
Miles

T3 C-2800, Units 6 and 7, WDNR UAS flight 08/2024

Operational Feasibility – Experimental Planting





T3 Economic Analysis



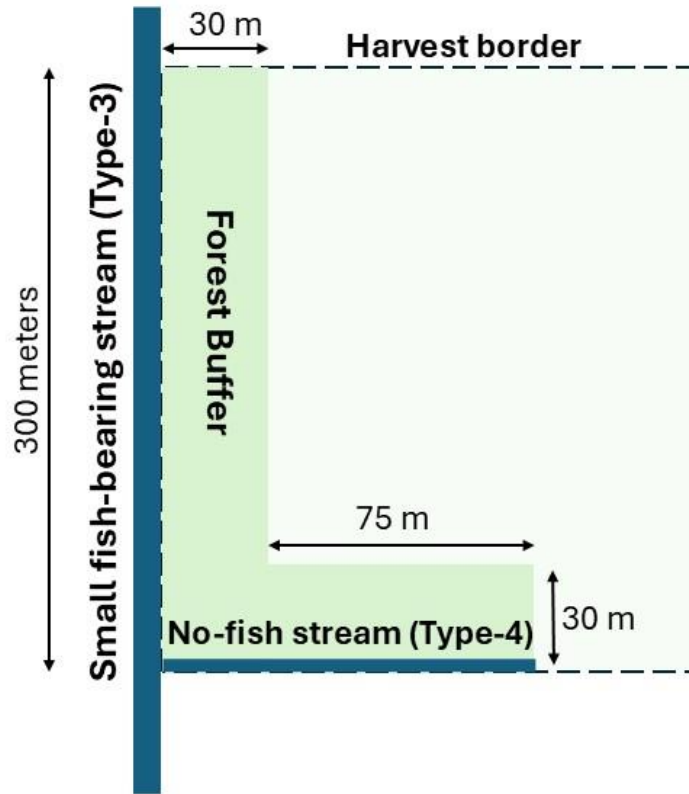
Approach - Evaluate each of the novel prescriptions relative to the standard ones

Components

1. Tracking the implementation costs of T3 timber sales and silviculture
2. Growth and yield (G&Y) projections of the new forest stands
3. Financial projections of the new forest stands
4. Analysis of uncertainties in the G&Y and financial projections
5. Trade-off analyses and management decision support



Active Habitat Restoration – Economics and Operational Feasibility



Assumptions:

- Volume of 25.5 MBF/ac
- Stumpage price of \$223 per MBF
- Acreage based on design, not implementation

Timber harvested in riparian buffers



36% vs. 0% in standard mgmt.

Revenue from buffer harvest



+\$5,687 per 300 m of stream
vs \$0 in standard mgmt.

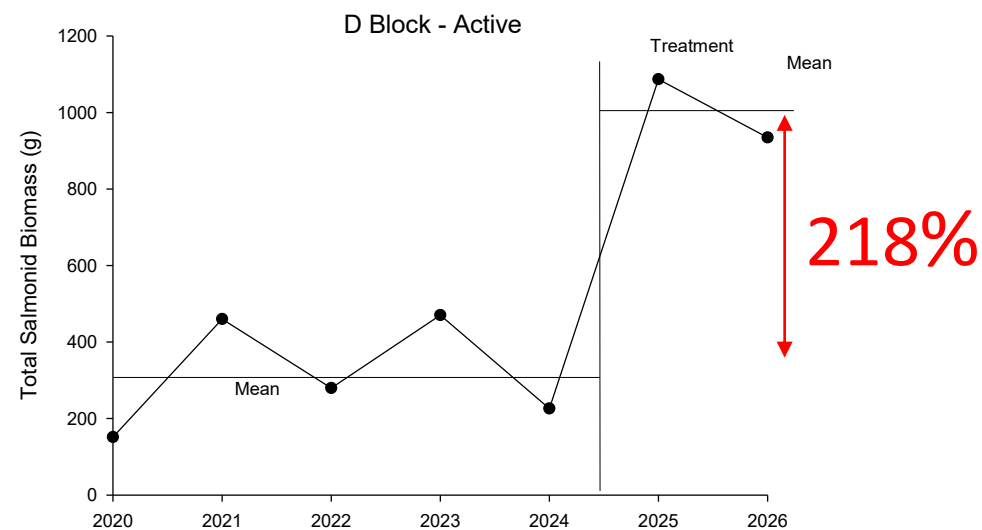
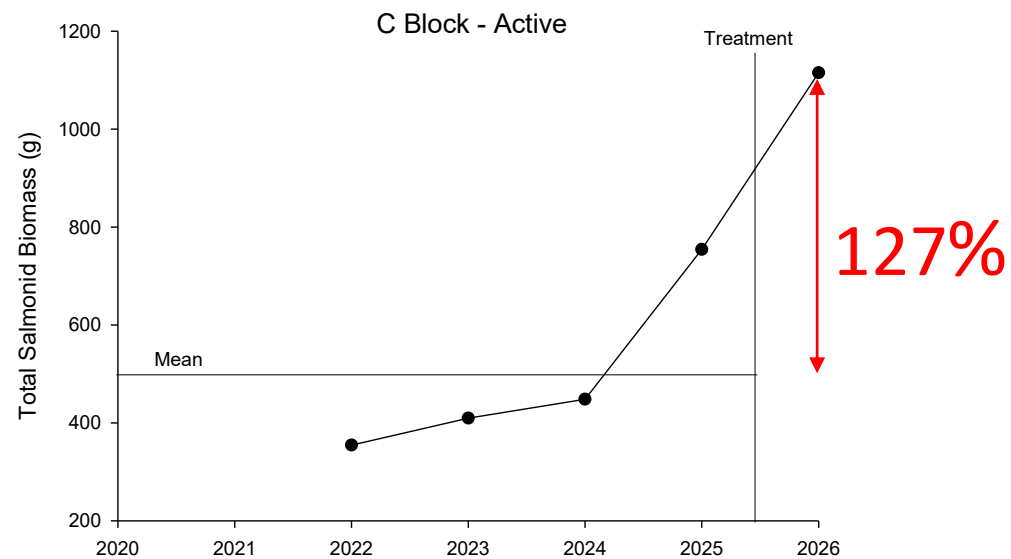
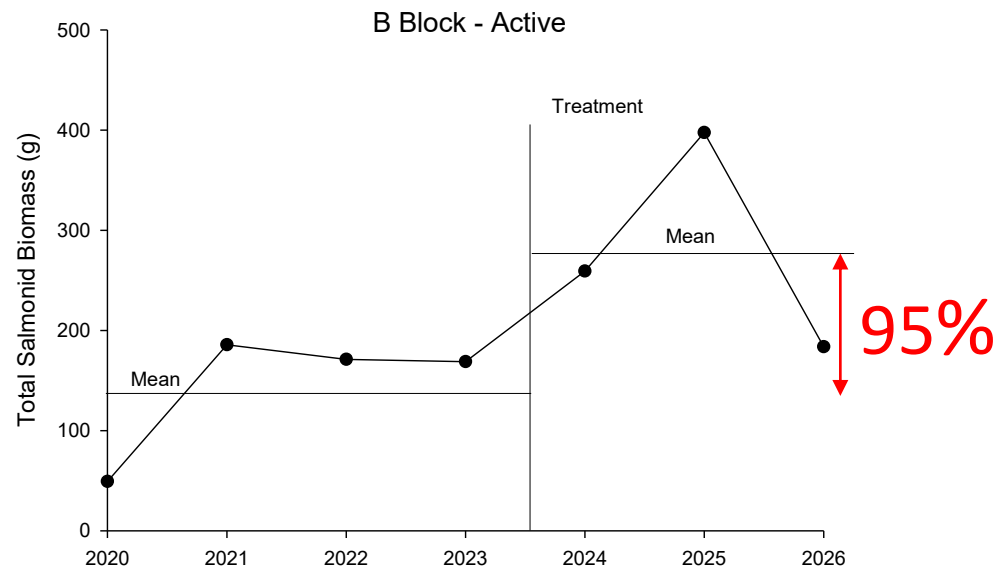
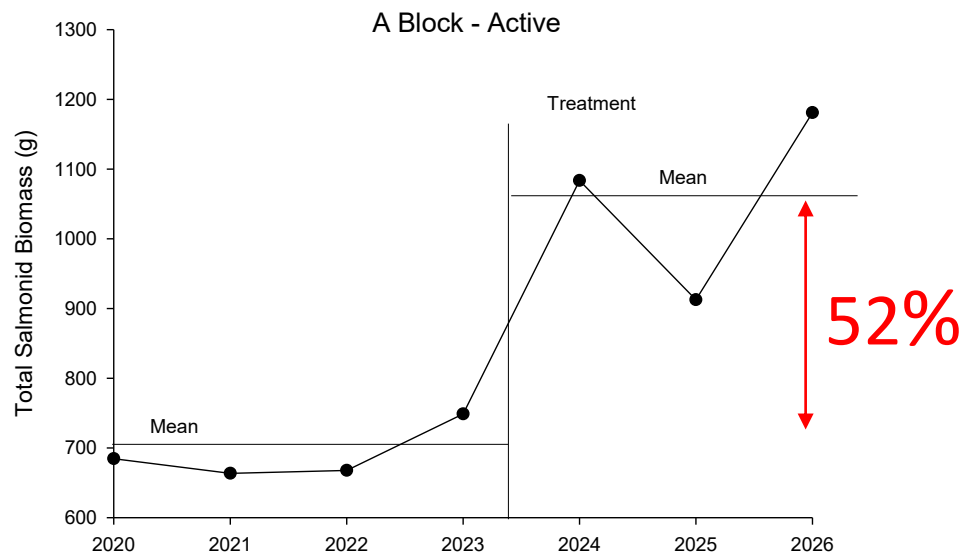
Loggers report on operational difficulty



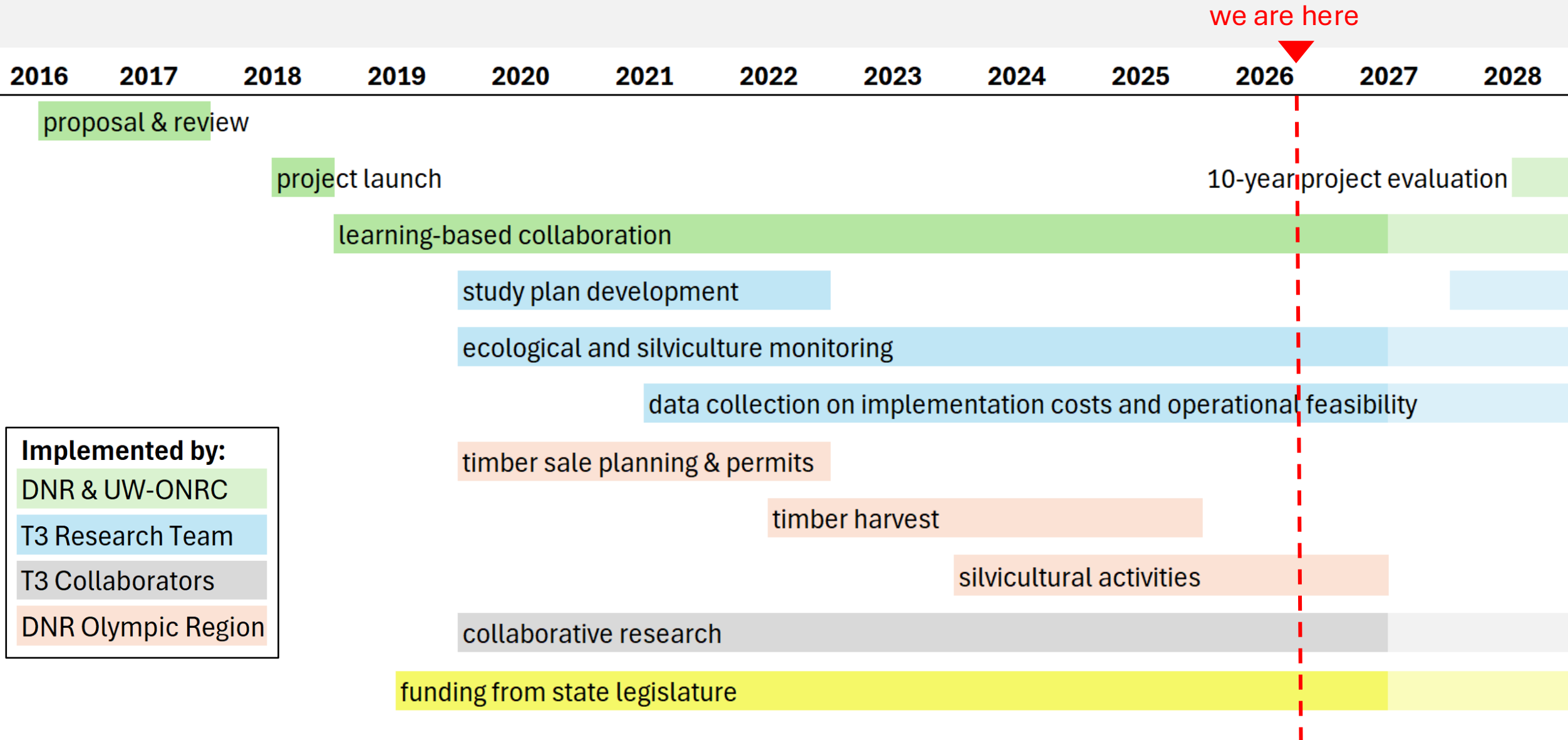
Feasible at the right topography



Active Habitat Restoration – Initial Fish Response



T3 Project Timeline





Next Steps



- Develop economic comparisons of prescriptions' projected revenue and associated uncertainties (2026)
- Analyze the initial response of stream habitat and biota (2027-2029)
- Assess the vegetation and wildlife responses to the complex early seral treatments (2027-2036)
- Monitor the outcome of novel planting prescriptions (2026-2036)
- Develop trade-off analyses and management decision support (TBD)
- Recommend potential management changes or additional experimentation (after 2028)



Key Lessons Learned



1. How to collaborate with local community, tribes, land managers and scientists to develop and implement novel prescriptions
2. Dedicated staff are needed to communicate and coordinate between the research and operations
3. Novel prescriptions were operationally feasible in most locations
4. Riparian active habitat restoration has shown a positive initial response from salmonids
5. Learning-based collaboration is a promising approach to engage stakeholders and tribes
6. *"If you build it, they will come"*

More Information on the T3 Watershed Experiment

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T3 Watershed
Experiment
website

