Red Alder Management on National Forests in the Pacific Northwest: Emerging Opportunities

B.T. Bormann, Olympic Natural Resources Center, University of Washington

Review on why managing alder makes sense

Context for changes in National Forest management

- **Northwest Forest Plan Amendment**
- **Presidential orders; agency directives**
- **Project-level EIS leeway**

Jimmy-Come-Lately Project

- **Student prescriptions**
- **Emerging prescriptions**

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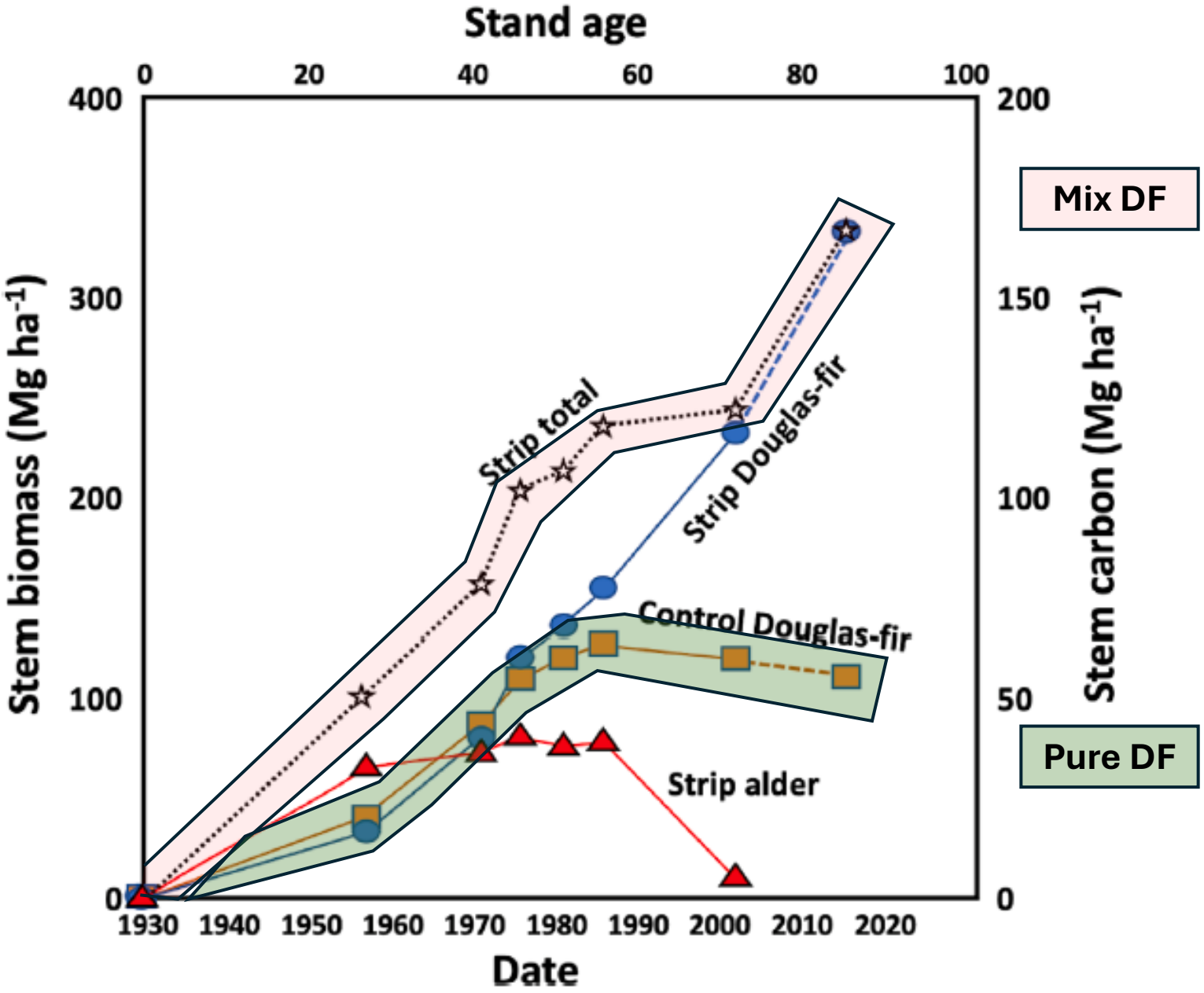
Why alder management?

- Support jobs and maintain hardwood industry infrastructure
- Restore soils badly damaged from historic and modern fires (SOM, N)

Wind River Alder Strip

2.5 – 3.0 times more above-ground biomass and carbon

On top of 1.4 x relative increase in mineral-soil organic matter



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Why alder management?

- Support jobs and maintain hardwood industry infrastructure
- Restore soils badly damaged from historic and modern fires (SOM, N)
- Sequester more C especially in soils to gain C credits?

Effect of considering alder soil C accretion on C sequestration ($GWMP_{100}$)

(UW-OSU report Funded by TNC)

Assume no alder mineral-soil carbon accretion

Species		Douglas-fir								
	Site Index	85	95	105	115	125	135	145	155	165
Red alder	35	0.00%	0.01%	0.12%	0.28%	0.16%	0.01%	0.00%	0.00%	0.00%
	45	0.01%	0.01%	0.06%	0.34%	0.92%	0.88%	0.13%	0.00%	0.00%
	55	0.02%	0.11%	0.24%	0.97%	2.25%	6.39%	3.41%	0.26%	0.00%
	65	**0.01%**	0.10%	0.37%	1.58%	3.96%	12.10%	14.32%	2.67%	0.01%
	75	0.00%	**0.03%**	**0.22%**	0.82%	2.78%	13.00%	13.78%	3.21%	0.06%
	85	0.00%	0.00%	**0.08%**	**0.27%**	**1.10%**	**4.97%**	5.40%	1.14%	0.05%
	95	0.00%	0.00%	0.01%	0.11%	0.49%	0.34%	0.30%	0.10%	0.02%

DF wins 68%

Assume a 0.5 Mg/ha/yr alder mineral-soil carbon accretion

Species		Douglas-fir								
	Site Index	85	95	105	115	125	135	145	155	165
Red alder	35	0.00%	0.01%	0.12%	0.28%	0.16%	0.01%	0.00%	0.00%	0.00%
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Alder wins 67%

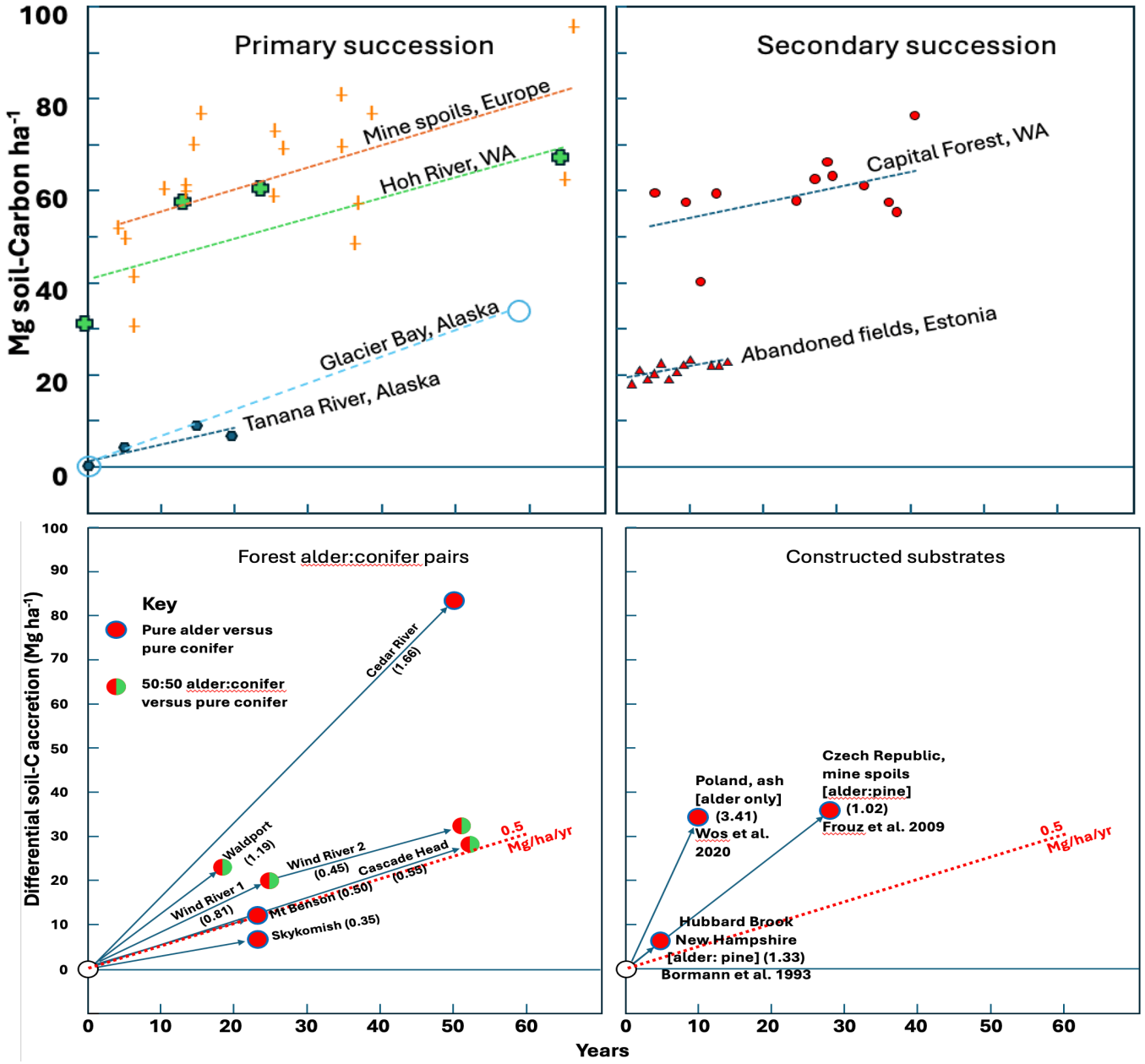
Mineral-soil carbon accretion by alders

Chrono-sequences

0.3 to 0.5 Mg/ha/yr

Alder – conifer pairs

0.3 to 3.4 Mg/ha/yr



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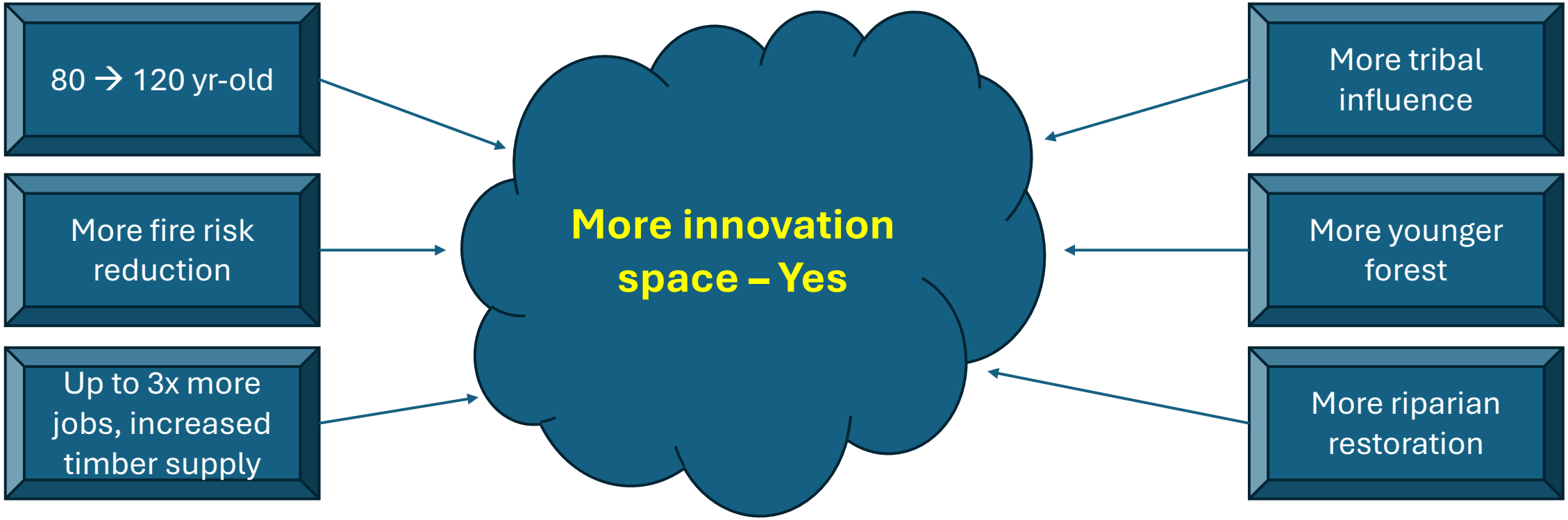
Why alder management?

- Support jobs and maintain hardwood industry infrastructure
- Restore soils badly damaged from historic and modern fires (SOM, N)
- Sequester more C especially in soils to gain C credits?
- Dampen fire movement
- Address major early-seral declines
- Build trust and make active management more widely supported

Context for changes in National Forest management in the Pacific Northwest:

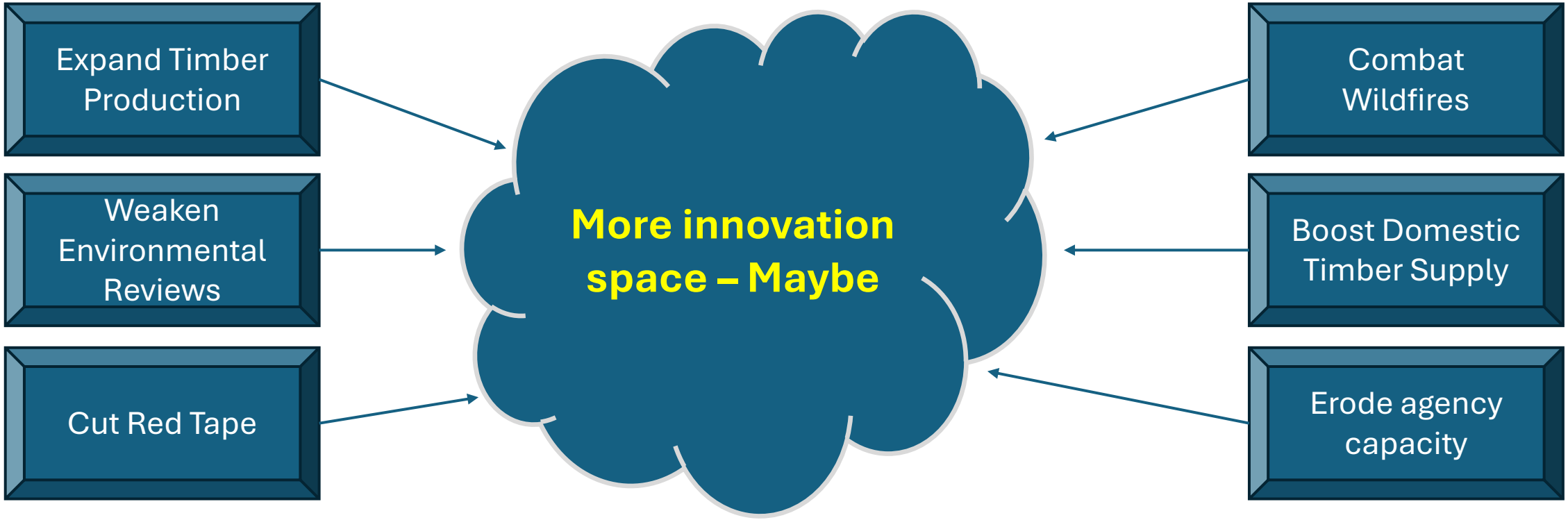
Potential changes in management of PNW National Forests are emerging in the **Northwest Forest Plan Amendment**

Alternatives B, D remain very late-seral centric but give some recognition to new concerns that can affect hardwood use and supply:



Context for changes in National Forest management in the Pacific Northwest:

Recent **Presidential orders and agency directives**



Context for changes in National Forest management in the Pacific Northwest:

Project-level EIS leeway

NEPA: project-level EIS's can deviate from programmatic NEPA when local conditions warrant it.

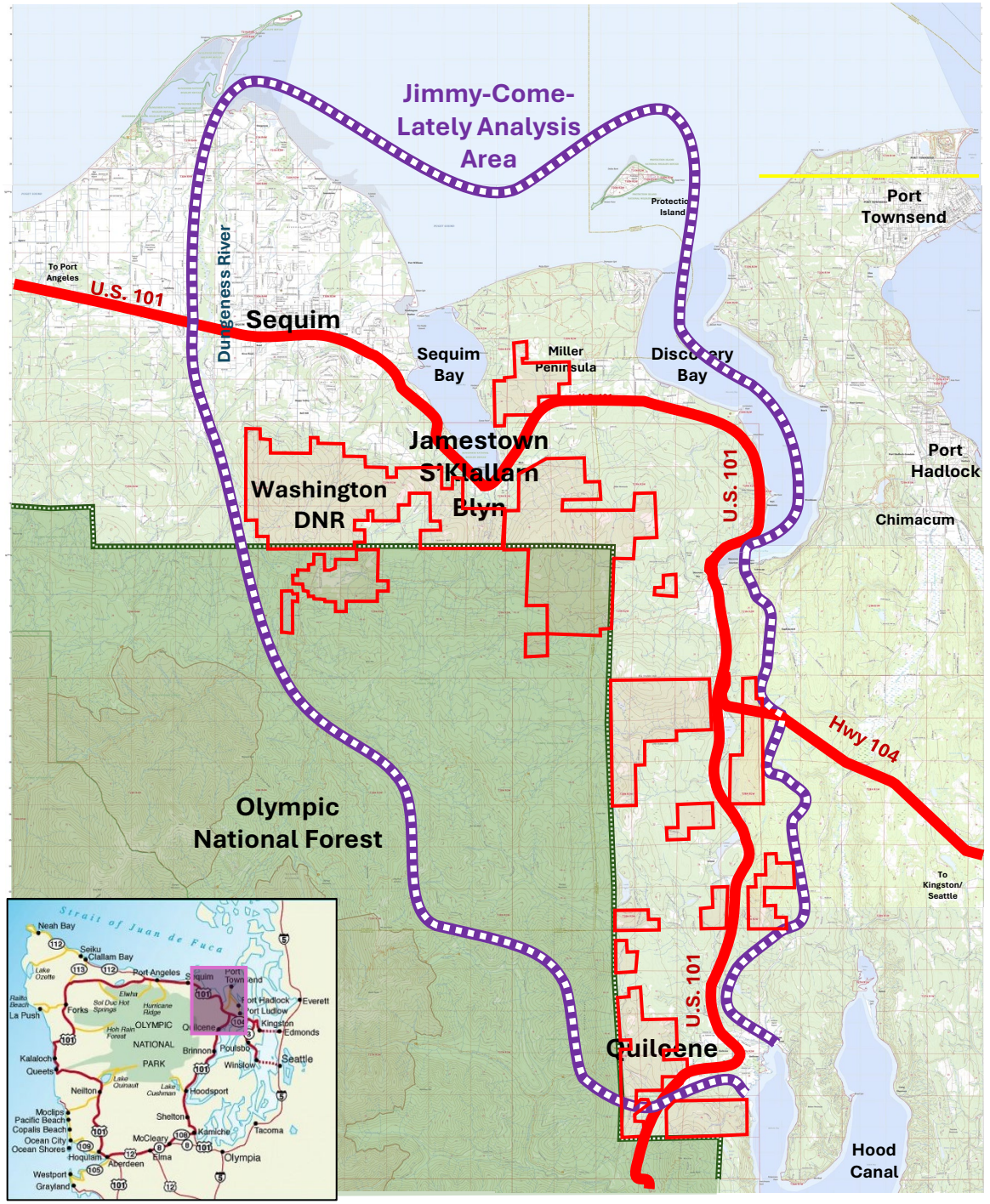
Jimmy-Come-Lately Project

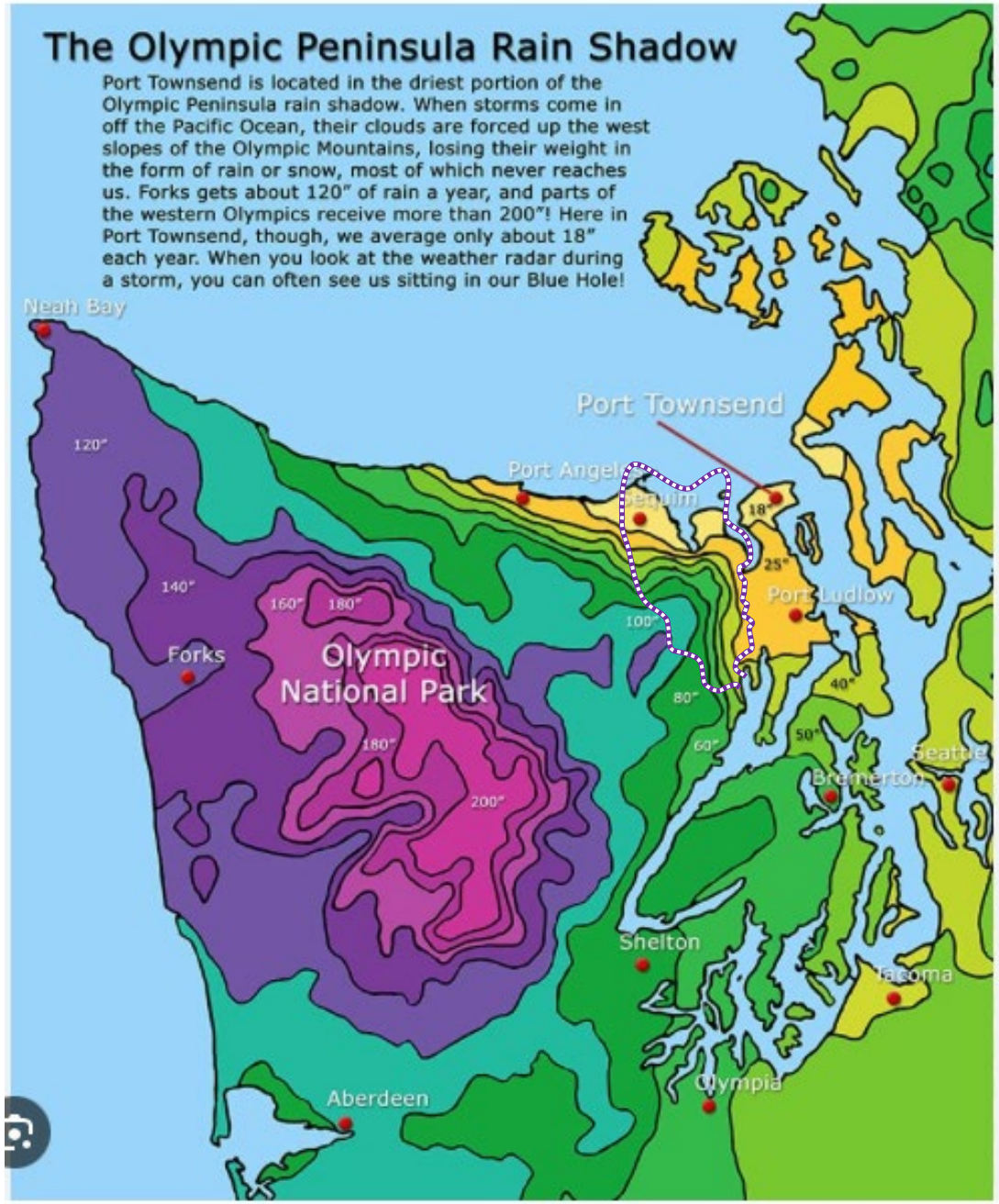
Anticipated deviations:

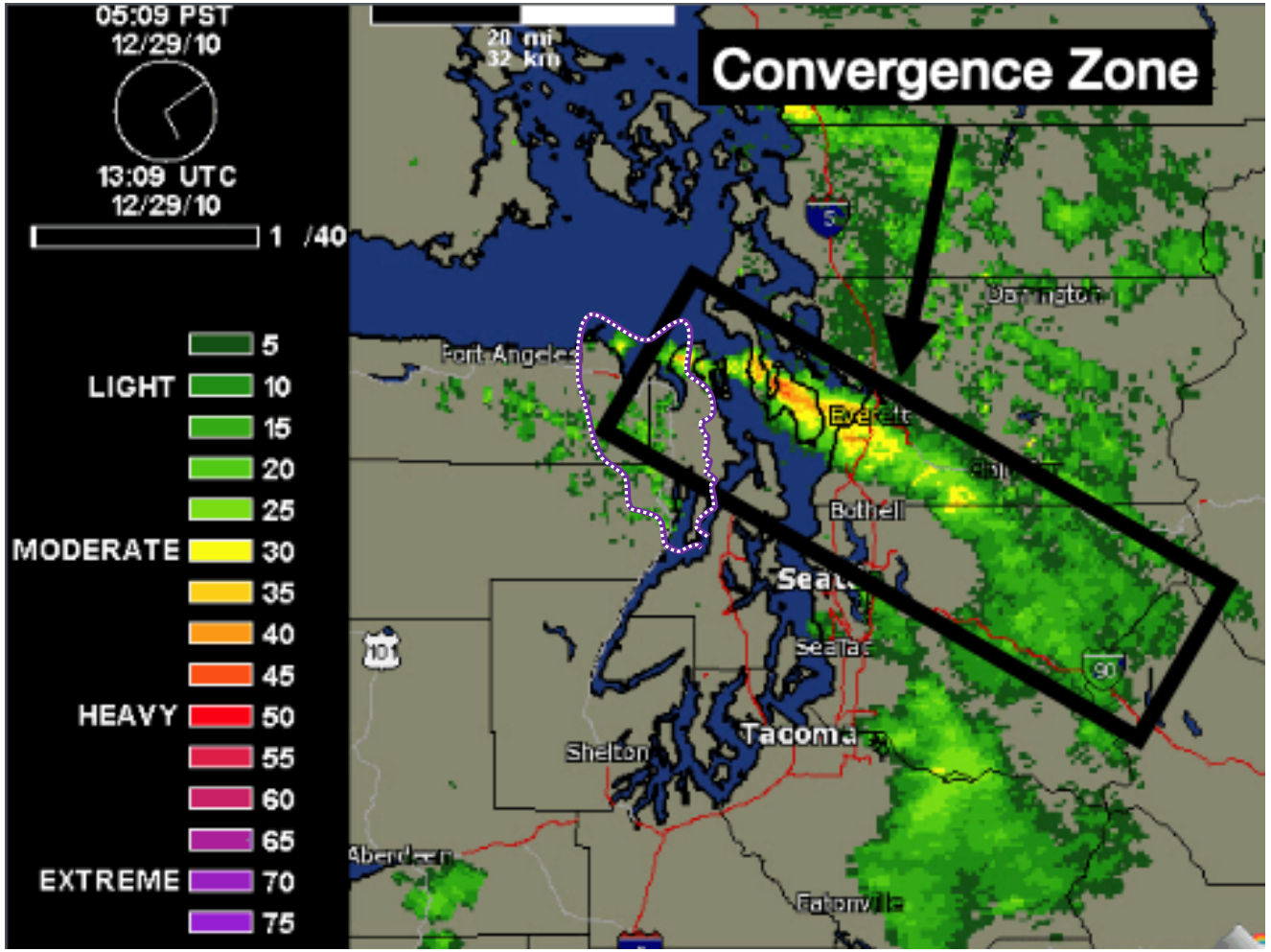
- Learning-based collaboration as basis for the decision process
- A fire-prone "moist" forest (unique fire history, climate)
- Strong tribal/stakeholder interests

Jimmy-Come-Lately Project

This map is for illustrative purposes only and should not be relied on for any purpose other than to ascertain the general area where the PNPTC member Tribes currently authorize fishing activities under the Boldt decision and the Treaty of Point No Point. Authorized areas of fishing can be subject to change and in no way should be considered to limit the treaty rights of the member Tribes.







Rain shadow: yes, but steep gradient with elevation
Some convergence-zone influence

Current conditions on Oly NF portion in 2025:

>20k acres of 60 to 120 yr-old stands harvested before or fire-origin, much of which is slow-growing, “doghair”

Glacial History:

Ice retreats 17k to 8k years ago

Indigenous History:

Low intensity fire for ungulate habitat and beargrass studied south and north of here

Fire History:

Frequent blowdown and mixed severity fire	Burned again	Young conifer	Burned again	Few seedlings	Burned again	Young conifer	Hiatus	Waiting to burn again?
1500 ➡	1858 ➡	1881 ➡	1891 ➡	1900? ➡	1907 ➡	1920? ➡	1935 ➡	Present

Mgmt History:

Early 1900s harvesting

Olympic National Forest

then major entry, then Plan hiatus

1985 ➡ 1991 ➡ Present

DNR

Harvesting mostly 2012 to present

1985 ➡ 2012 ➡ Present

Jimmy-Come-Lately Project

SEFS 526A Advanced Silviculture;
winter quarter 2025

Students exposed to background and ideas from key players, tribes, stakeholders

Asked to develop prescription ideas that that could be incorporated into an Olympic NF EIS that were:

(1) Innovative;

(2) Socially connected;

(3) Practicable; and

(4) Experimental

Red cedar revival
Deirdre Nelis

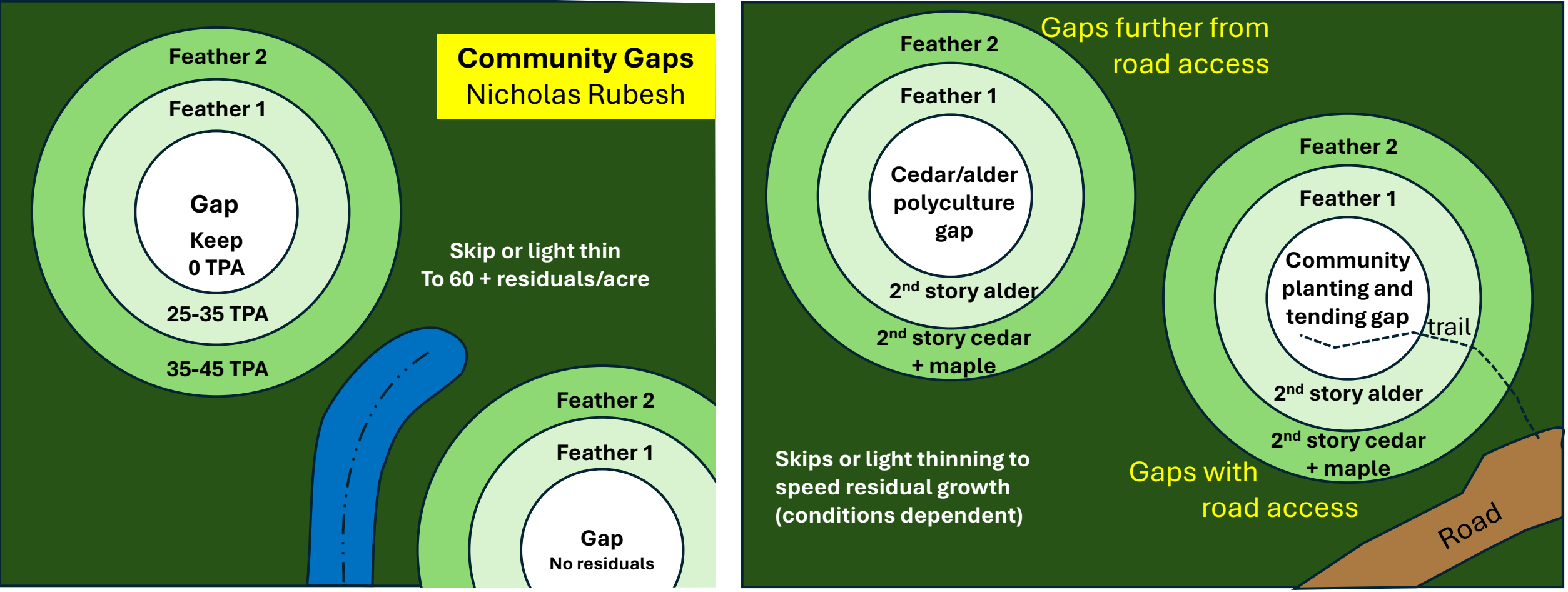
Prescription—Compare and study 4 alternative ways to grow 2nd story with cedar through continuous-cover commercial thinning leaving <40 TPA with the following ratios of cedar: Douglas-fir: maple

- (I): 4:2:1 – full mix
- (II): 2:0:1 – cedar-maple
- (III): 3:1:0 – cedar-fir
- (IV): 1:0:0 –cedar alone

Experimental context

- Place 4 alternatives in a randomized block design across the JCL area;
- Connect to UW stand management coop to monitor over time.

Western Red Cedar



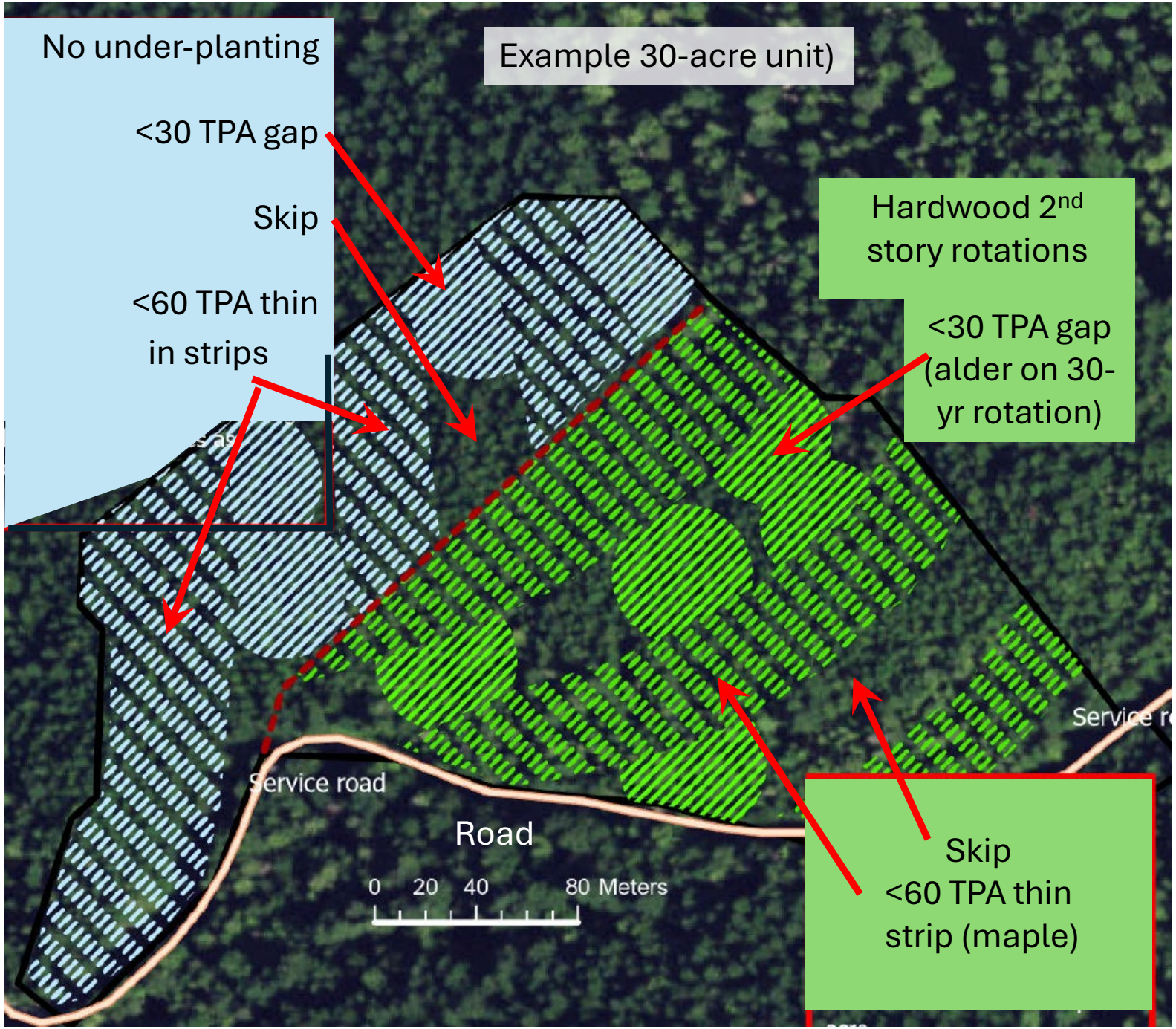
Prescription—concentric circles with feathered residuals within a thin/skip matrix to:

- Minimize excessive windthrow through feathering
- Diversify fuel types and flammability to alter fire movement
- Provide a continuum of stand density for different species to flourish:
  - Cedar-alder polyculture (T3) in gaps for revenue
  - 2nd story alder in F1 for revenue, site productivity, and soil carbon
  - 2nd story cedar and maple in F2 for cultural, revenue, and ecological values)
- Create community gaps near roads (group sponsorships)

Seral Fusion
Ben Johnston

Prescription—Strip shelterwood with retention, group selection with and without 2nd story hardwood rotations

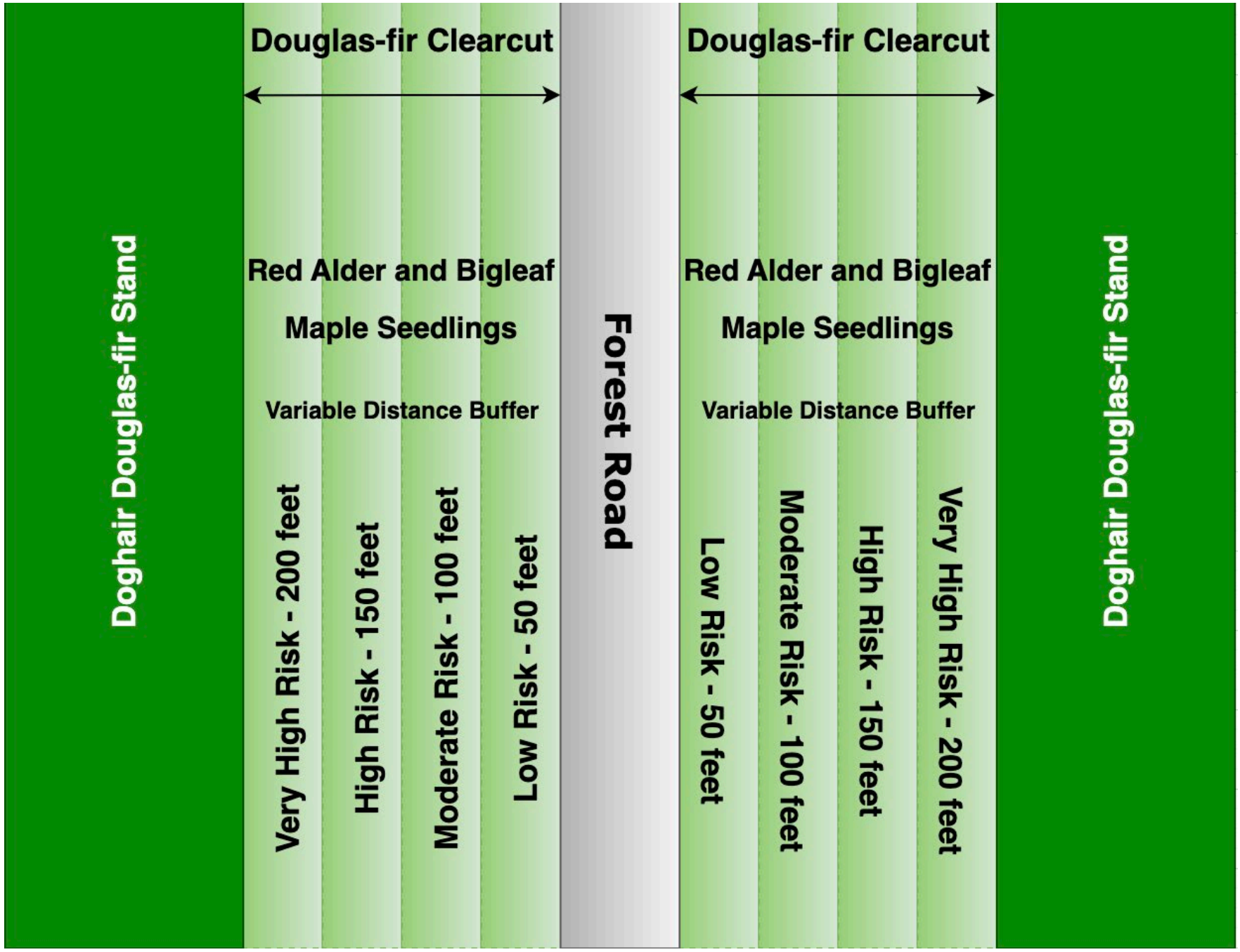
- Whole-tree harvest to reduce fuels;
- Alter fire travel through hardwoods, strips, and increase fuel discontinuity;
- Improve site productivity and soil carbon with hardwoods;
- Explore small-wood/mulch /syrup product and market development; and
- Repeat thin every 30 years.



Disturbance Barriers
Hunter LeGard

Prescription—Reduce landscape movement of fire and laminated root rot by planting hardwood buffers of variable widths along high risks roads to:

- Reduce fuels and rot-affected species (DF WH);
- Facilitate lighting of emergency backfires;
- Grow 3:1 alder:maple mix on 30-year rotations;

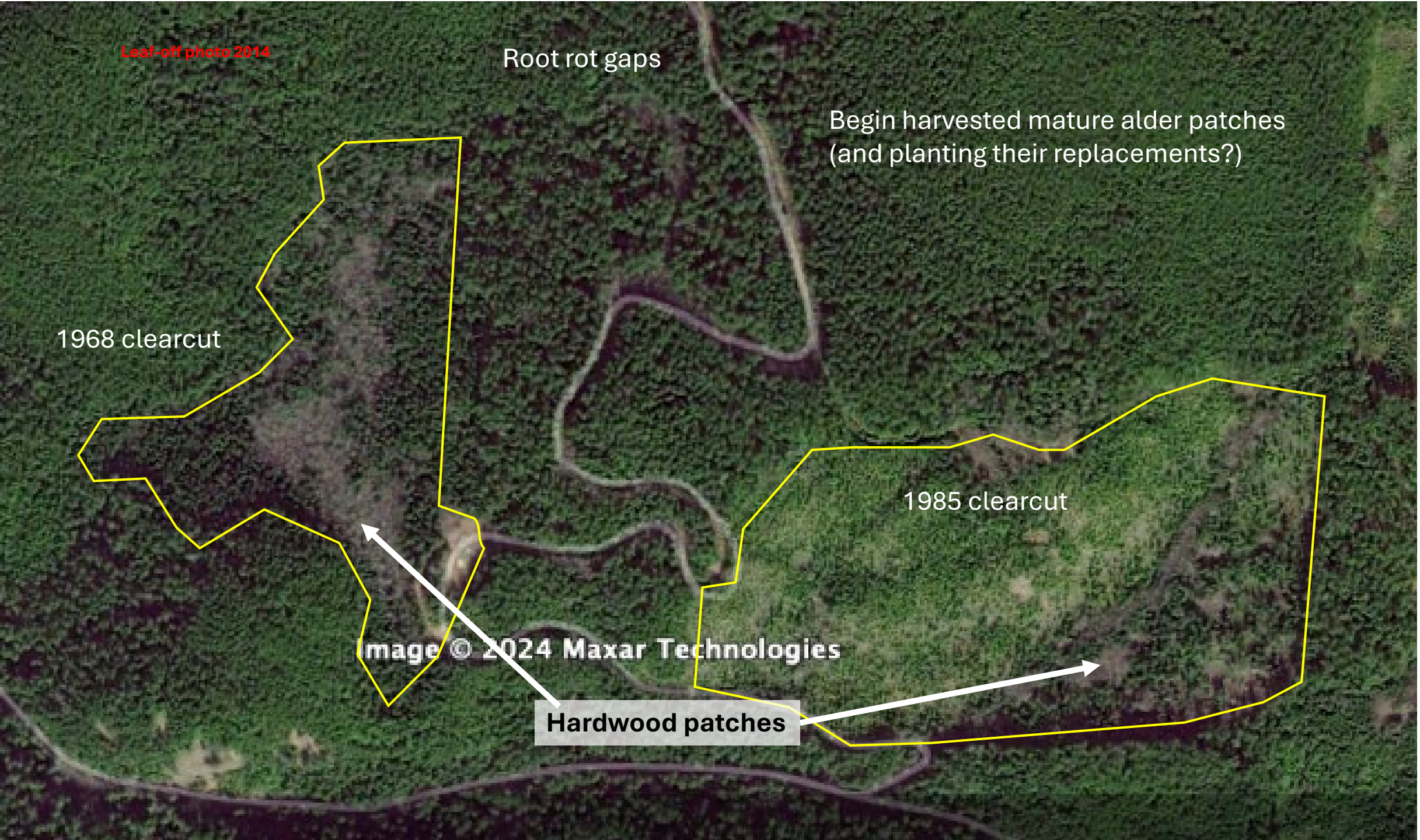


Other ideas under discussion

Broad-scale alder underplanting under widely thinned conifers (<30 tpa residuals) – for fire, C, …

Road daylighting for fire/disease/maintenance savings – for fire, disease, road costs, …

Harvesting mature alder patches


Leaf-off photo 2014
Root rot gaps
Begin harvested mature alder patches
(and planting their replacements?)
1968 clearcut
1985 clearcut
Image © 2024 Maxar Technologies
Hardwood patches

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College of the Environment

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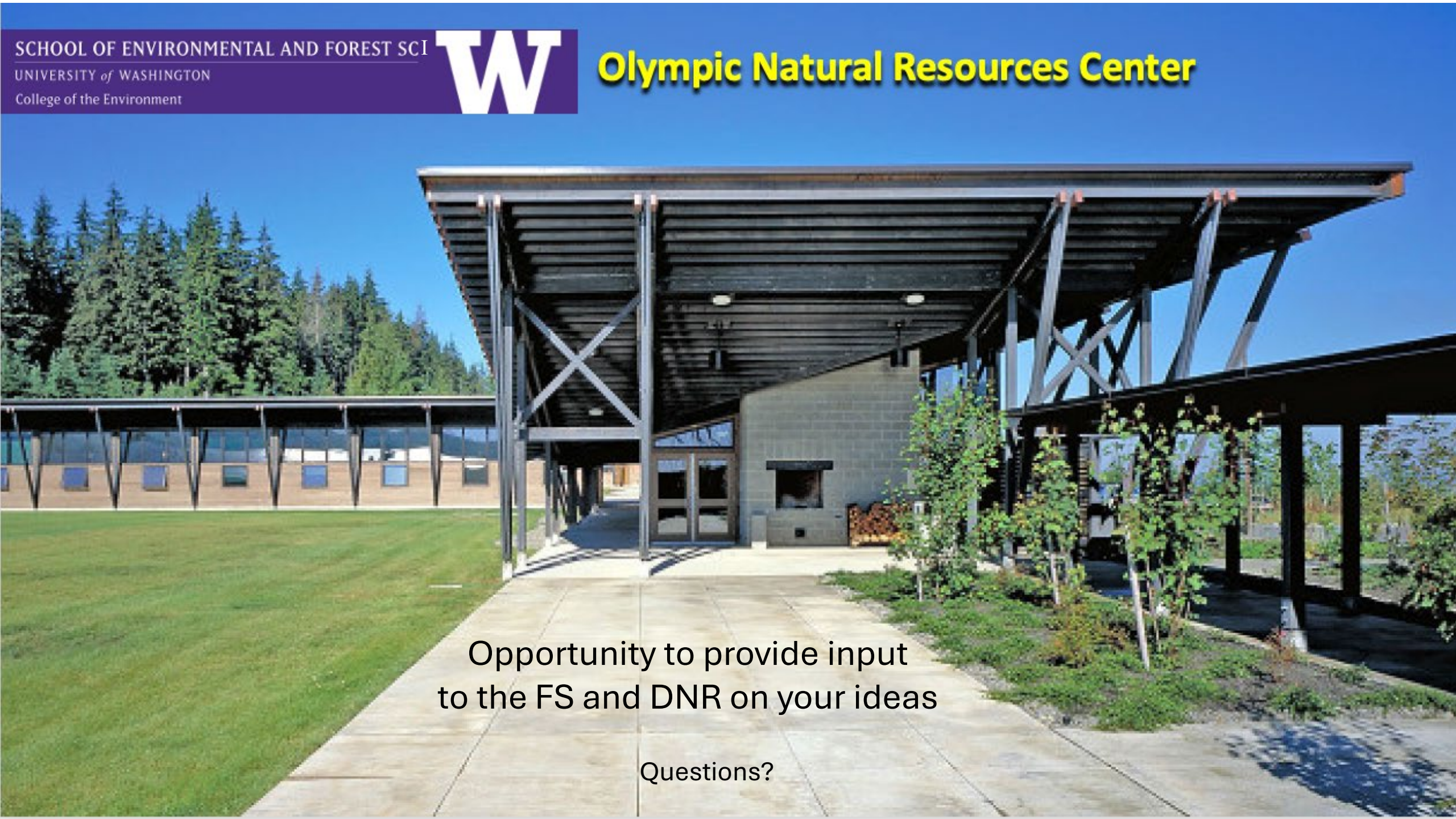
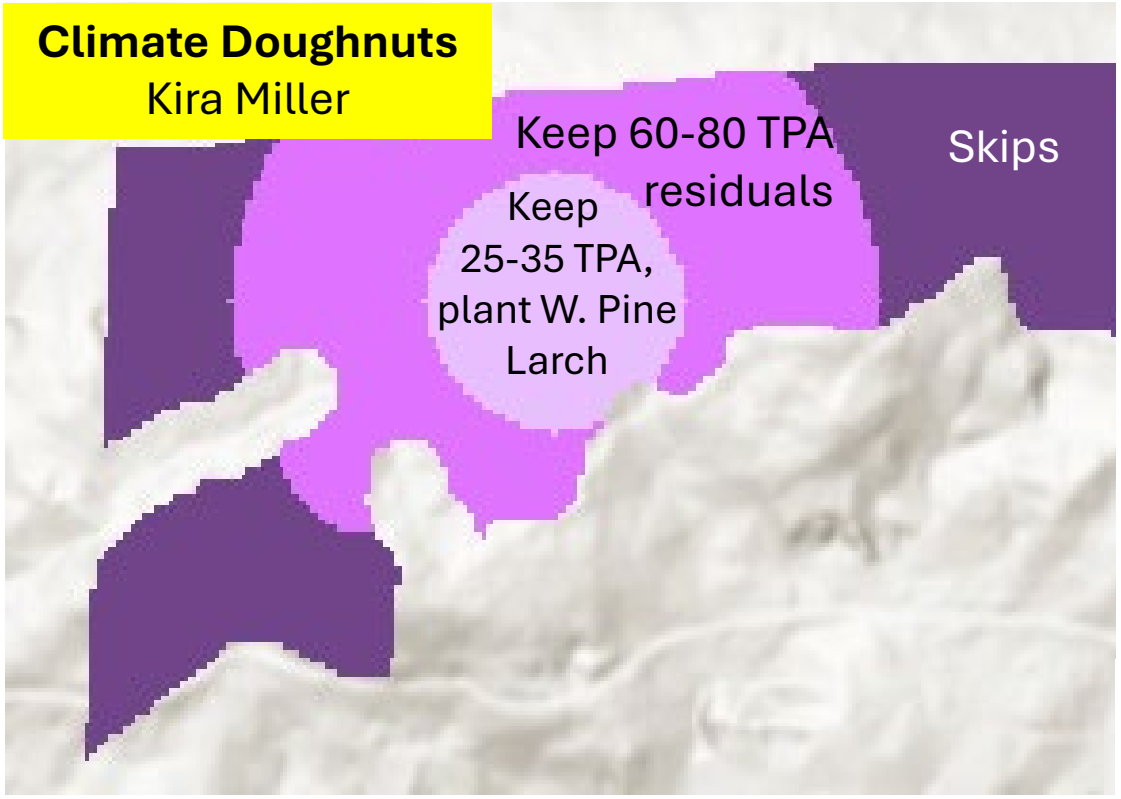
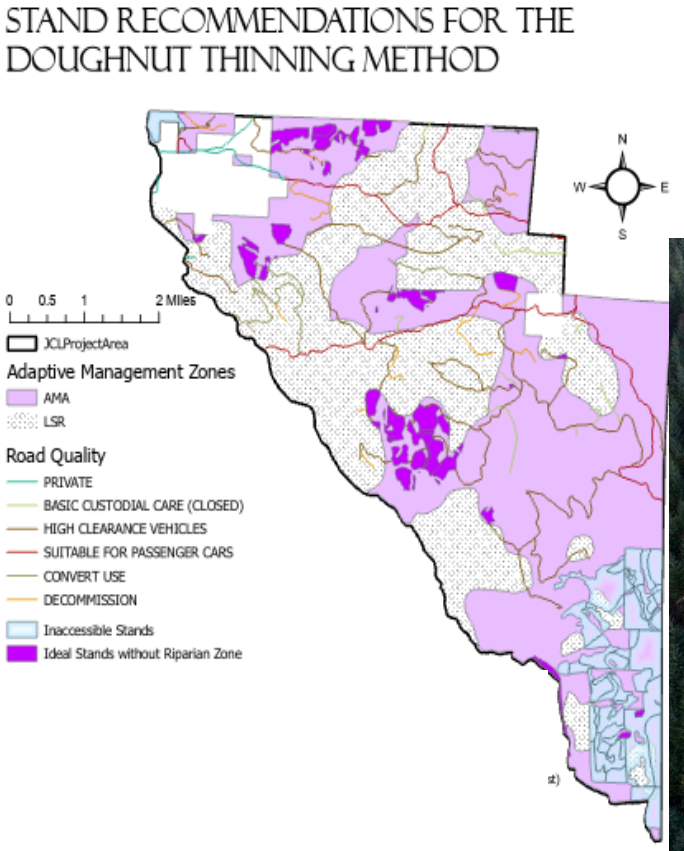


Opportunity to provide input
to the FS and DNR on your ideas

Questions?

Climate Doughnuts
Kira Miller





Prescription—Thin from below to create large-scale pattern in residual stand density to:

- Create open central to denser edges to increase drought tolerance, reduce fire risks, produce timber, and provide habitat (early to late seral);
- Remove smaller and drought susceptible species, retain thick-barked Douglas-fir, and reduce ground fuels; and
- Plant 2nd story in central stand 3:1 western white pine: western larch