Field Tour of the Blue Ridge Unit – Harvest Treatments and Management Considerations

Overview

Boxed lunches, hard hats, and transportation to the field site are provided.
Please follow signs to the buses and be ready to load by 12:15 pm.

Individuals participating in the field tour need to:

- wear sturdy closed-toed shoes
- dress for the weather – this tour will happen rain or shine
- bring enough water and personal snacks for the afternoon
- bring your own hard hat or be prepared to wear a loaner
- bring notepad, pencil, and camera if you wish to take notes

We will depart from Evergreen State College by 12:20 pm and return to campus around 5:00 pm. We will be gone for ~5 hours, including 2 hours of travel and 3 hours in the woods. There will be outhouses available at 2 of the stops. During the tour, participants will travel by foot on primitive trails and roads to view treatment units.

The Blue Ridge Unit in Capitol State Forest managed by Washington State Department of Natural Resources and is part of on-going studies by WA DNR and the U.S. Forest Service. **There is active logging near the site and logging trucks drive along the roads – while WA DNR field staff will be monitoring the area – all participants need to stay aware!**

Blue Ridge Unit sites:

Stop 1 - Treatment Units:
Non-treated control, ~90-year second-growth
Clearcut (~19 yrs) even-aged management
Two-age stand

Stop 2 - Treatment Units:
Group selection (0.1-1.5 acre openings), Uneven-aged management
Patch cut (1.5-5 acre openings), Uneven-aged management

Stop 3 - Treatment Units:
Repeated thinning, Uneven-aged management

Field Tour Speakers:

- Calvin Ohlson-Kiehn, Washington State Department of Natural Resources, State Lands Silviculture Program
- Jeff DeBell, Washington State Department of Natural Resources, Silviculturist & Geneticist
- Timothy Harrington, US Forest Service, PNW Research Station, Research Scientist
- Derek Churchill, Washington State Department of Natural Resources, Forest Health Scientist
- Connie Harrington, US Forest Service, PNW Research Station, Research Forester
- Dylan Fischer, Evergreen State College, Forest Ecology
- Kirk Hanson, Northwest Natural Resource Group

Field Tour of the Blue Ridge Unit – Harvest Treatments and Management Considerations

Schedule	Activity
12:20-1:20 PM	Travel to Capitol State Forest
1:20-1:25 PM	Exit the vans and follow speakers into stop 1
1:25-1:35 PM	Stop 1: Calvin Ohlson-Kiehn will welcome guests to Capitol Forest Jeff DeBell & Tim Harrington give context to research & what we are seeing
1:35-2:35 PM	Stop 1: Jeff & Tim – control 86-year old stand, clear cut stand (now 19 years old), two-aged stand, silvicultural practices about the three sites Derek Churchill - discusses climate resilience & other considerations
2:35-2:40 PM	Biobreak & get into vans
2:40-3:10 PM	Stop 2: Tim & Jeff - groups and patches stands Connie Harrington - seedlot selection in the stands Derek - discusses climate resilience & other considerations
3:10-3:15PM	Get into vans
3:15-4:15 PM	Stop 3: Tim & Jeff - thinning stand that's had two commercial thinnings over 20 yrs Dylan Fischer - discusses carbon analysis Derek - discusses climate resilience & other considerations Let's Discuss - Question & Answer Time
4:15-4:20 PM	Biobreak & get into vans
4:20-5:00 PM	Travel to Evergreen State College *(however long traffic takes)*
5:00 PM-ish	Arrive at Evergreen State College for Reception and Dinner

Silvicultural Options for Managing Young-Growth Production Forests

U.S. Forest Service, PNW Research Station and Washington State DNR

Field Tour of the Blue Ridge Site – June 19, 2018

Timothy B. Harrington

Study objective: To evaluate forestry practices and silvicultural systems that can be used in a landscape management program to reduce the visual impacts of timber harvesting operations while maintaining a high level of production for timber and other values. The options were selected to represent a continuum of forest cover and disturbance intensity and frequency.

Hypotheses: Each of the options evaluated: (a) is biologically and operationally feasible, (b) could be part of a managed, sustainable forest landscape, and (c) would provide a different combination of financial returns, wood production and non-timber values.

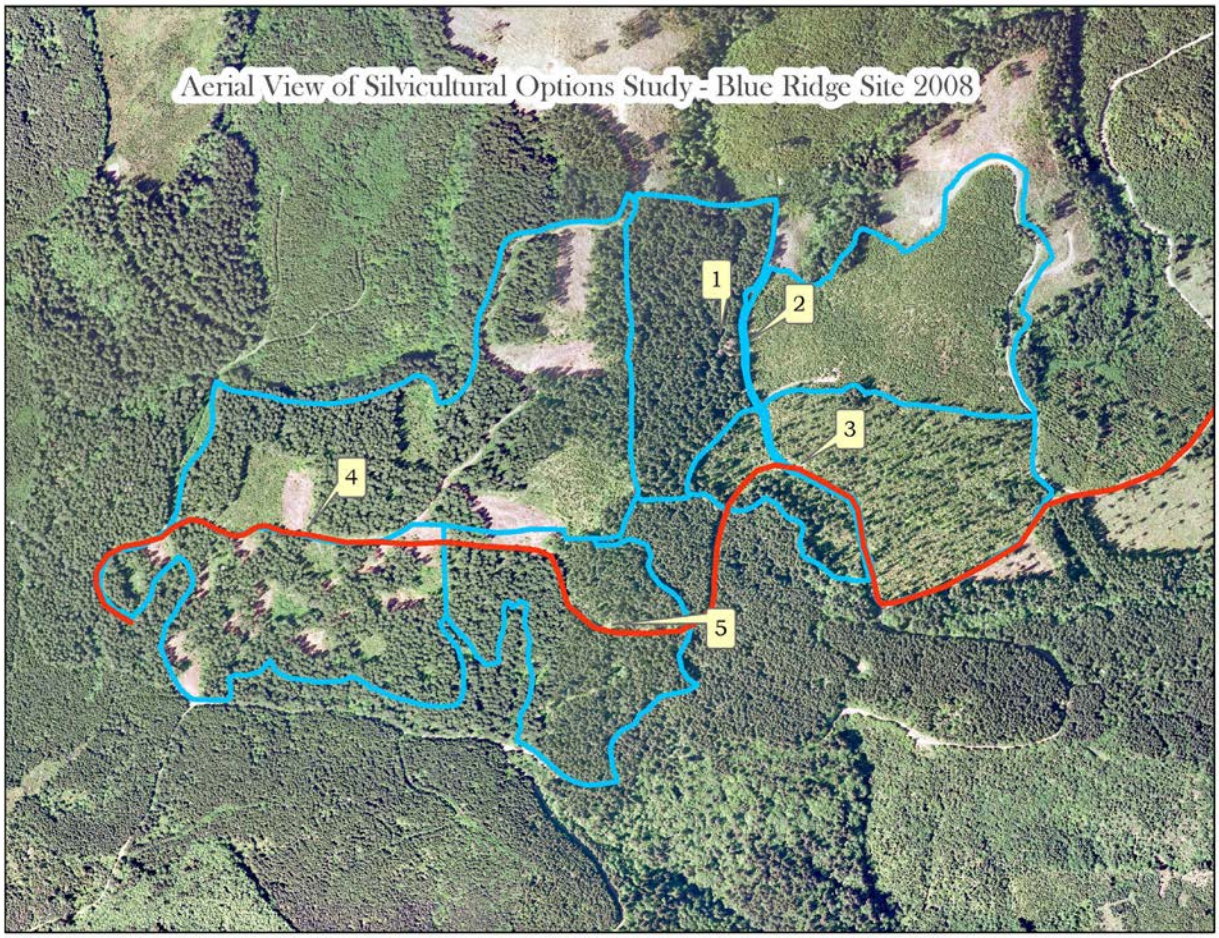
Experimental design: randomized complete block with 3 replications (blocks or sites) of 6 treatments:

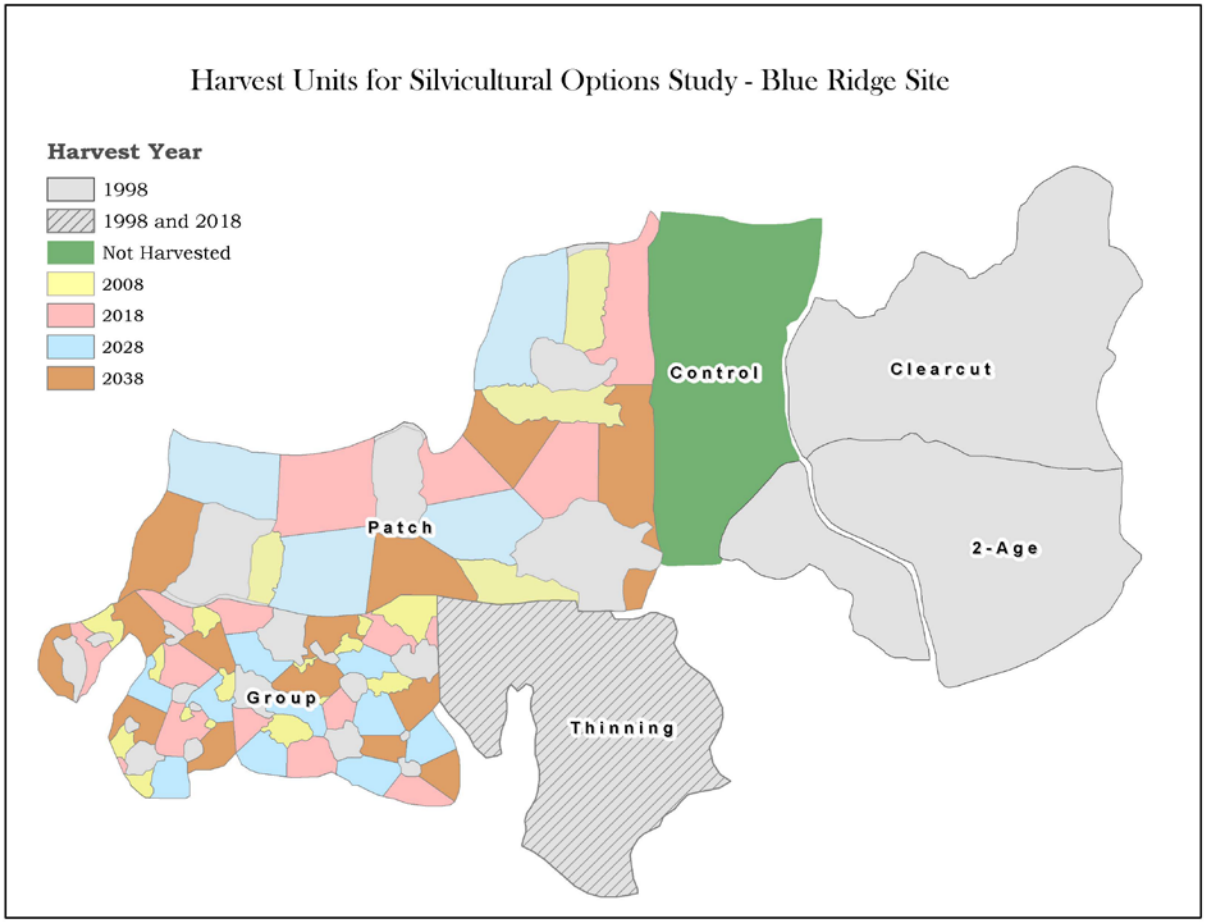
1. Non-treated control
2. Repeated thinning (deferred harvest)
3. Patch cut (1.5-5 acre openings; uneven-aged management)
4. Group selection (0.1-1.5 acre openings; uneven-aged management)
5. Two-age stand (20 overstory trees/acre with planted understory conifers)
6. Clearcut (even-aged management)

Block (site)	Average age at study initiation	Stand origin	Topography; logging method	Year of initial harvest
Blue Ridge	66 years	Natural regeneration	gentle; ground-based	1998
Copper Ridge	69 years	Natural regeneration	steep; cable logging	2002
Rusty Ridge	41 years	Plantation	gentle; ground-based	2004

Treatment implementation:

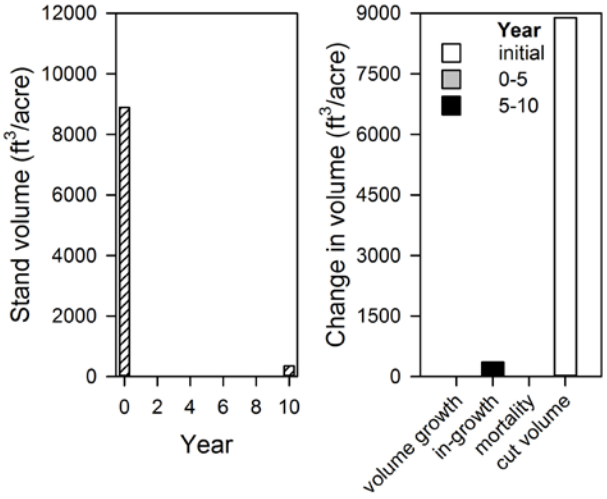
- Ten-year cutting cycle for the patch and group treatments: 20% of the area is cut and replanted each time.
- The thinning treatment is repeated every 20 years. Curtis RD is managed between 40 (immediately after thinning) and 55 (immediately before thinning).
- In the 50th year of the study at Blue Ridge (2048):
  - The clearcut treatment and the oldest cohort in the two-age treatment will be harvested.
  - A new cohort of overstory trees will be recruited in the two-age treatment.
  - The clearcut and two-age treatments will be replanted.


Aerial View of Silvicultural Options Study - Blue Ridge Site 2008
1
2
3
4
5

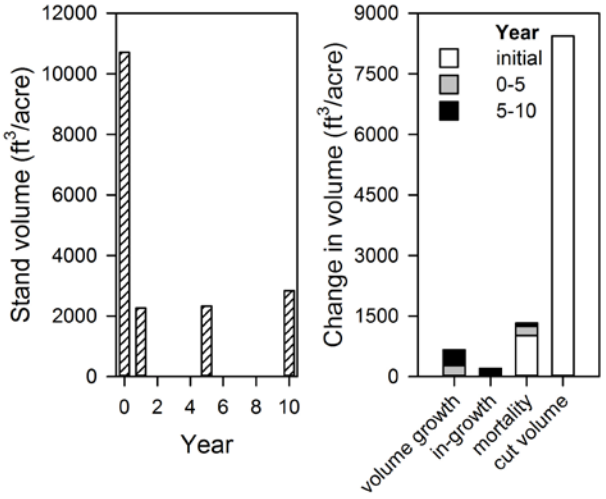

Harvest Units for Silvicultural Options Study - Blue Ridge Site
Harvest Year
1998
1998 and 2018
Not Harvested
2008
2018
2028
2038
Control
Clearcut
Patch
2-Age
Group
Thinning

Silvicultural Options Study -- Stand Volume Responses Years 0-10

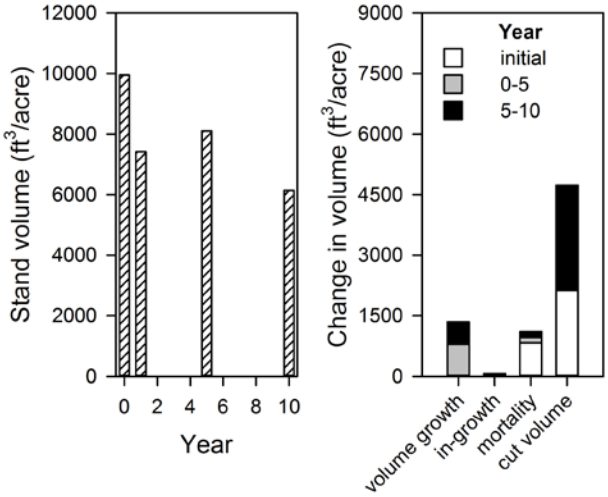
Clearcut



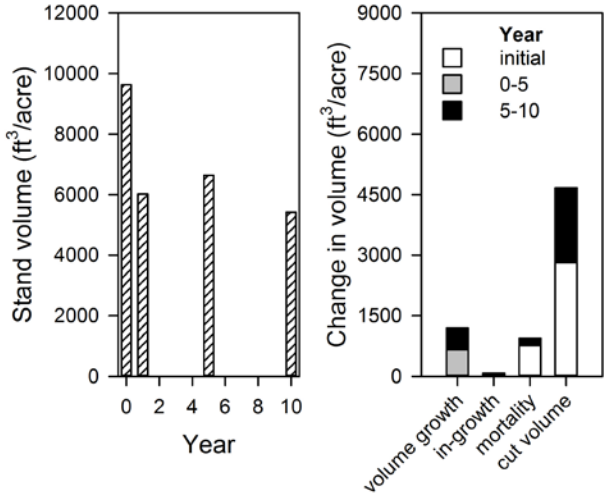
Two-aged



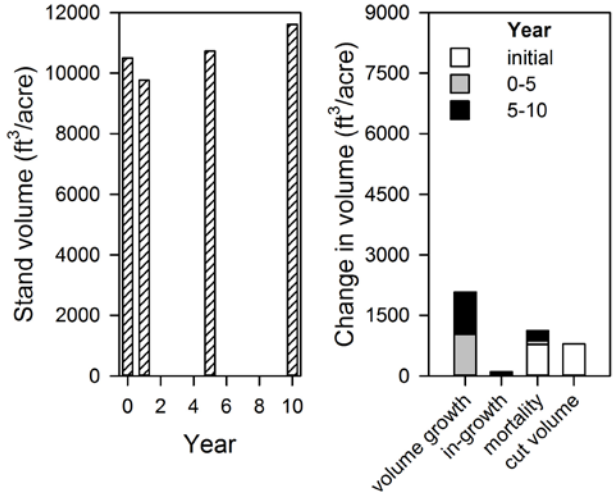
Patches



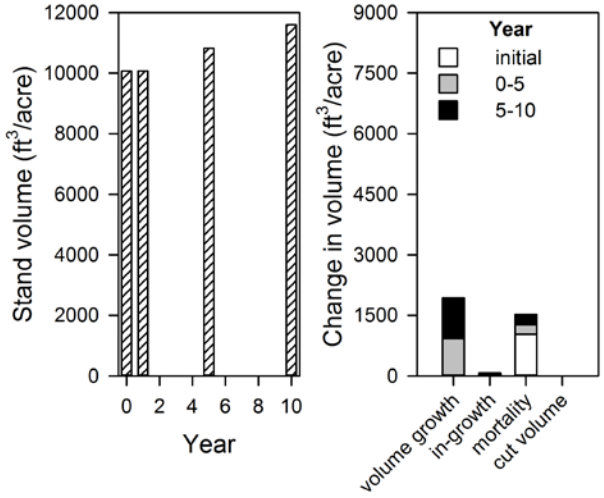
Groups



Thinning

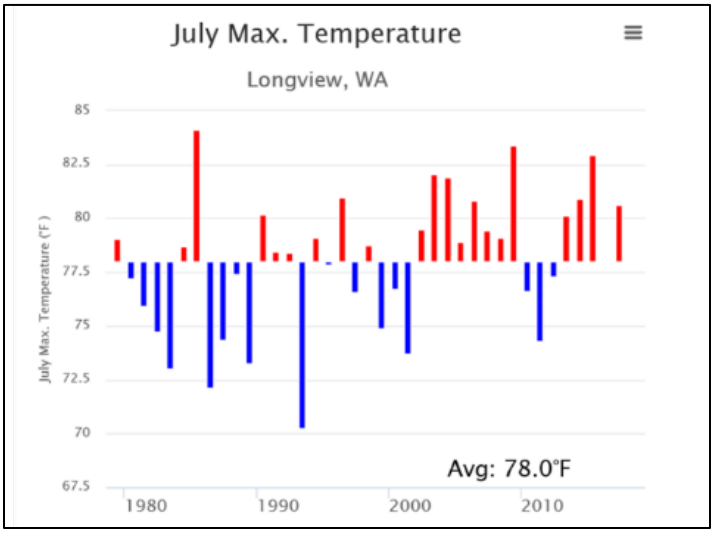


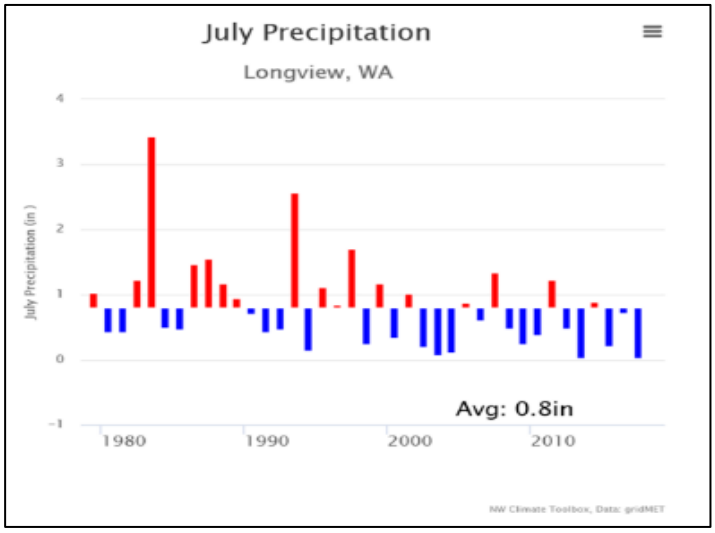
Control



Regeneration Considerations for the Future

Connie Harrington, USFS PNW Research Station





Recent years have been warmer and drier than average and climate scientists indicate the trend will continue.

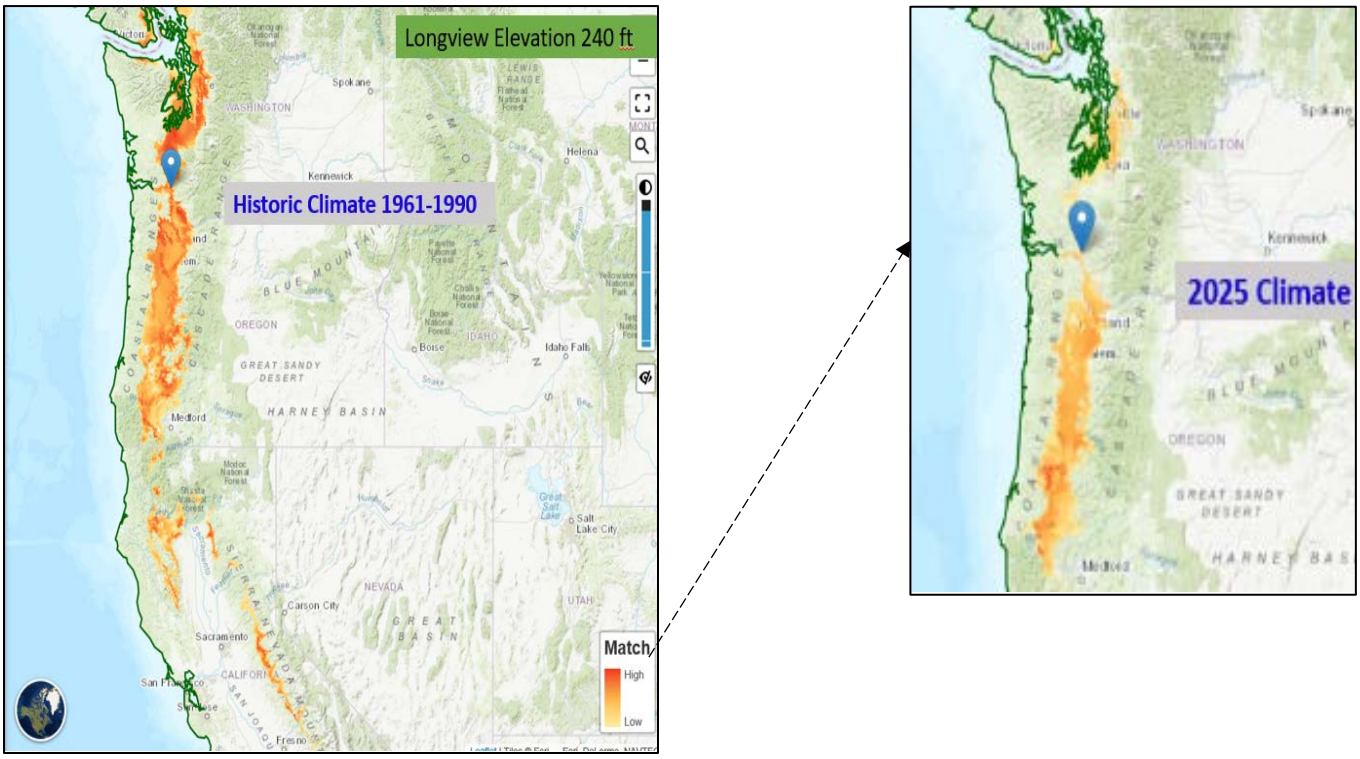
Regeneration: the weakest link in the stand cycle	
Seedlot Selection Tool: planning for future seed needs and selecting seed lots Seedlings need to establish root system quickly, in particular on droughty souls. Best management practices include: • Fall or early spring planting • Reducing competition during first summers • Retaining debris on forest floor • Minimizing disturbance to reduce germination	Successful Fall planting requires: • Nursery willing to provide stock early • Stock grown to have active root tips • Soil moisture & temp at time of planting • Match between stock and site (Seedlot selection tool) Which sites justify the effort? • Droughty soils • Steep SW exposure • Past problems

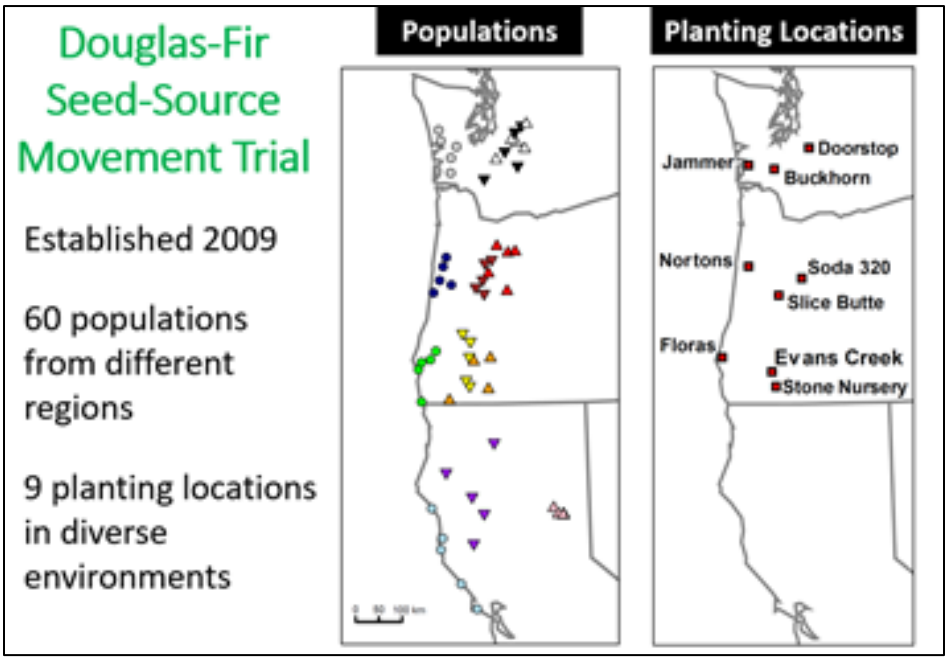
Trying new species and seedlots

- If you mix up your seedlots on a planting site but don't document planting strategy, you hedge your bets but don't learn anything.
- Keep good records, for yourself and those you come after you.
- Better to try in deliberate areas (GPS and record what you did)
    - Use different prescriptions in different or portions of units

Seedlot Selection Tool (what if?)

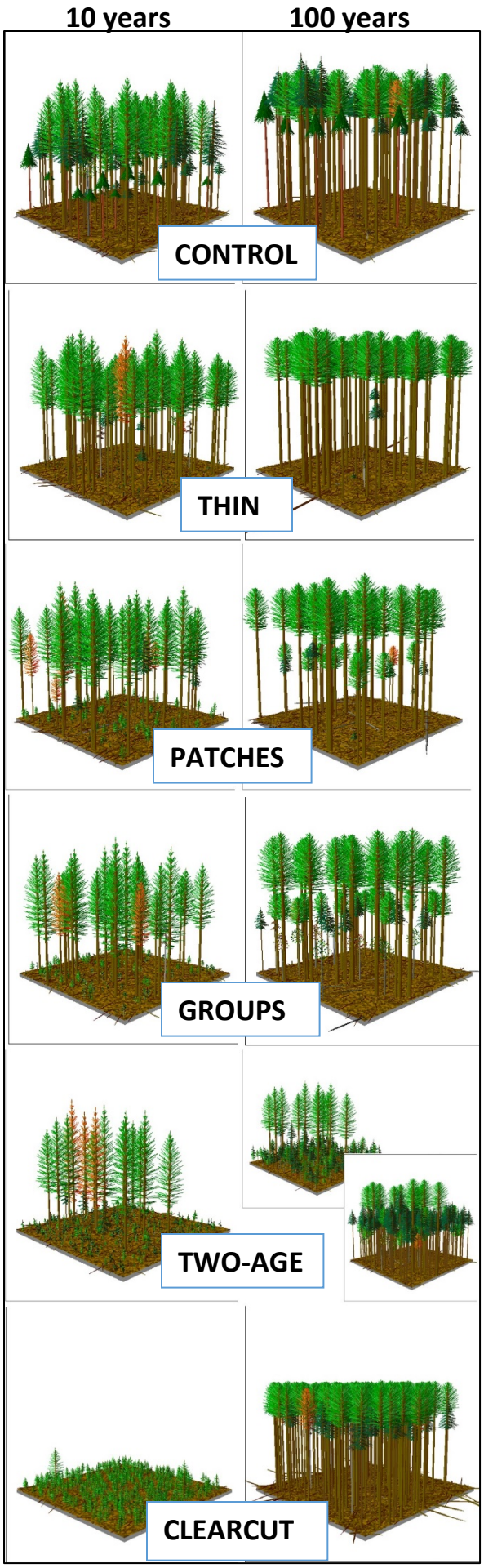
Results of seed suitability study for the area of Longview, WA including recent changes and predicted changes in climate – by 2025. Best climate match for seed sources is anticipated to shift substantially. With Seedlot Selection Tool, you can chose site and which climate variables you think are important.

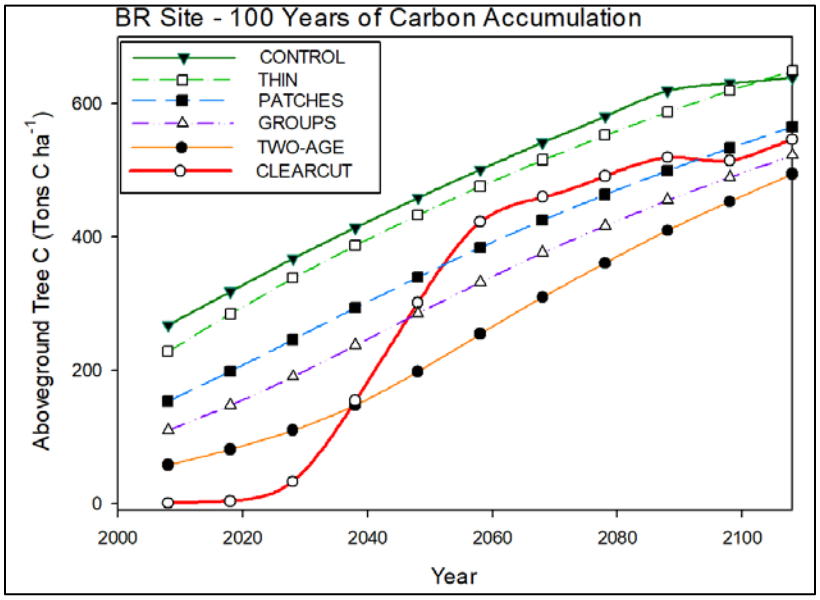


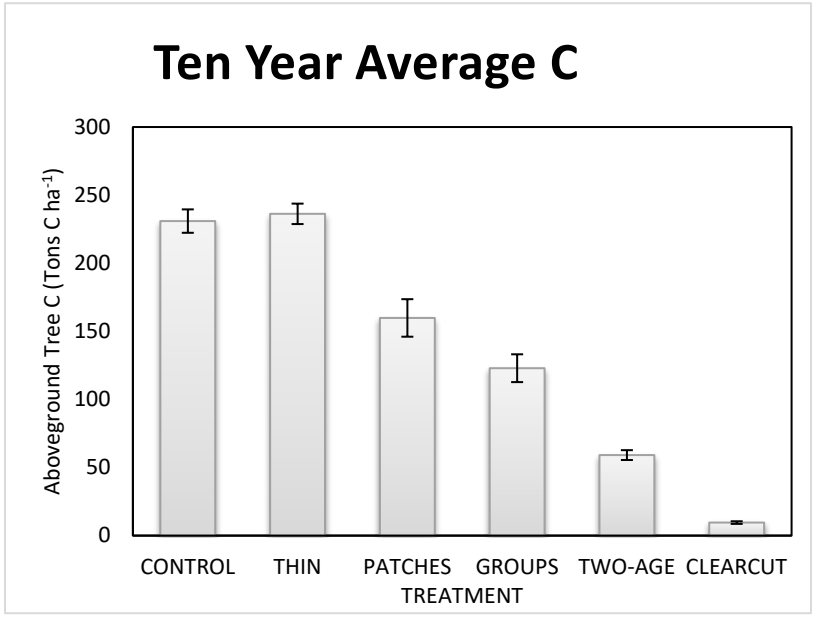


Carbon Modeling for Blueridge Study Site

Dylan Fischer, Evergreen State College







Forest Carbon Content and future projections. These three figures show:

- Visualizations of six stand treatments at 10 years and 100 years at site BR (LEFT);
- Projections of live tree C through 100 years at site BR (TOP RIGHT).
- Average live tree C across all sites ten years following treatments (BOTTOM RIGHT).

All stand projections and projected live tree C were conducted using FVS-Suppose and the FFE Carbon Reports output. Ten-year average C values were calculated from stand inventory data and biomass estimation equations. All biomass and C estimates used the Jenkins et al. 2003 national-scale biomass estimation equations.

Key Considerations for more Climate Resilient Westside Forests

Vulnerabilities

1. Drier spring and summer months, with lower soil moisture, increasing stress on trees and seedling mortality.
2. Increased moisture stress can result in increased incidence of pests and pathogens.
3. Winters may become wetter, or have periods of more intense rainfall, changing soil and watershed hydrology.
4. Increased severity of natural disturbance events (e.g. fire, wind, rain, etc.), interactions between disturbances may magnify overall effects.
5. Tree species ranges are likely to shift.
6. Riparian forests become more susceptible to changing hydrologic regimes.

Adaptation Strategies

1. Design forest management prescriptions for site specific conditions (e.g. forest type, soils, local climate) vs. broad-brush.
2. Plan for response to natural disturbances before they happen.
3. Manage for species diversity, including hardwoods. Replant sites with diverse conifers and hardwoods.
4. Shift species composition to more drought tolerant species. On drier sites, emphasize Douglas fir, big leaf maple, and western red cedar. Western hemlock may not do well at the drier end of it current range in the future.
5. Consider sourcing a portion of seedlings that will be planted on site from other seed zones that reflect the anticipated future condition of the site.
6. Reduce fire risk to homes by though firewise strategies, including creating defensible space close to structure.
7. Thin dense stands and maintain them at moderate densities to maintain tree vigor and reduce soil moisture composition. Consider planting at wider spacings.
8. Be aware that heavy thinning to reduce crown fire spread can result in increased understory tree and shrub growth, which can cause higher flame lengths in the event of a forest fire.

Resources

Stand volume/growth response

Curtis, R.O., D.D. Marshall, and D.S. DeBell. 2004. Silvicultural Options for Young-Growth Douglas-Fir Forests: The Capitol Forest Study—Establishment and First Results. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-598.

de Montigny, L.E. and N. J. Smith. 2017. The effects of gap size in a group selection silvicultural system on the growth response of young, planted Douglas-fir: a sector plot analysis. Forestry 90: 426–435.

Hartley, D.S. and H. Han. 2007. Effects of alternative silvicultural treatments on cable harvesting productivity and cost in western Washington. West. J. Appl. For. 22(3): 204-212

Peterson, C.E. and D.A. Maguire (eds.). 2005. Balancing ecosystem values: Innovative experiments for sustainable forestry. USDA Forest Service, Pacific Northwest Research Station, General Technical Report PNW-GTR-635.

Seedling considerations & seedlot selection

Northwest Climate Toolbox (Climate Tracker) - https://climatetoolbox.org/tool/Climate-Tracker

Seedlot Selection Tool - https://seedlotselectiontool.org/sst