



NORTHWEST CERTIFIED FORESTRYTM

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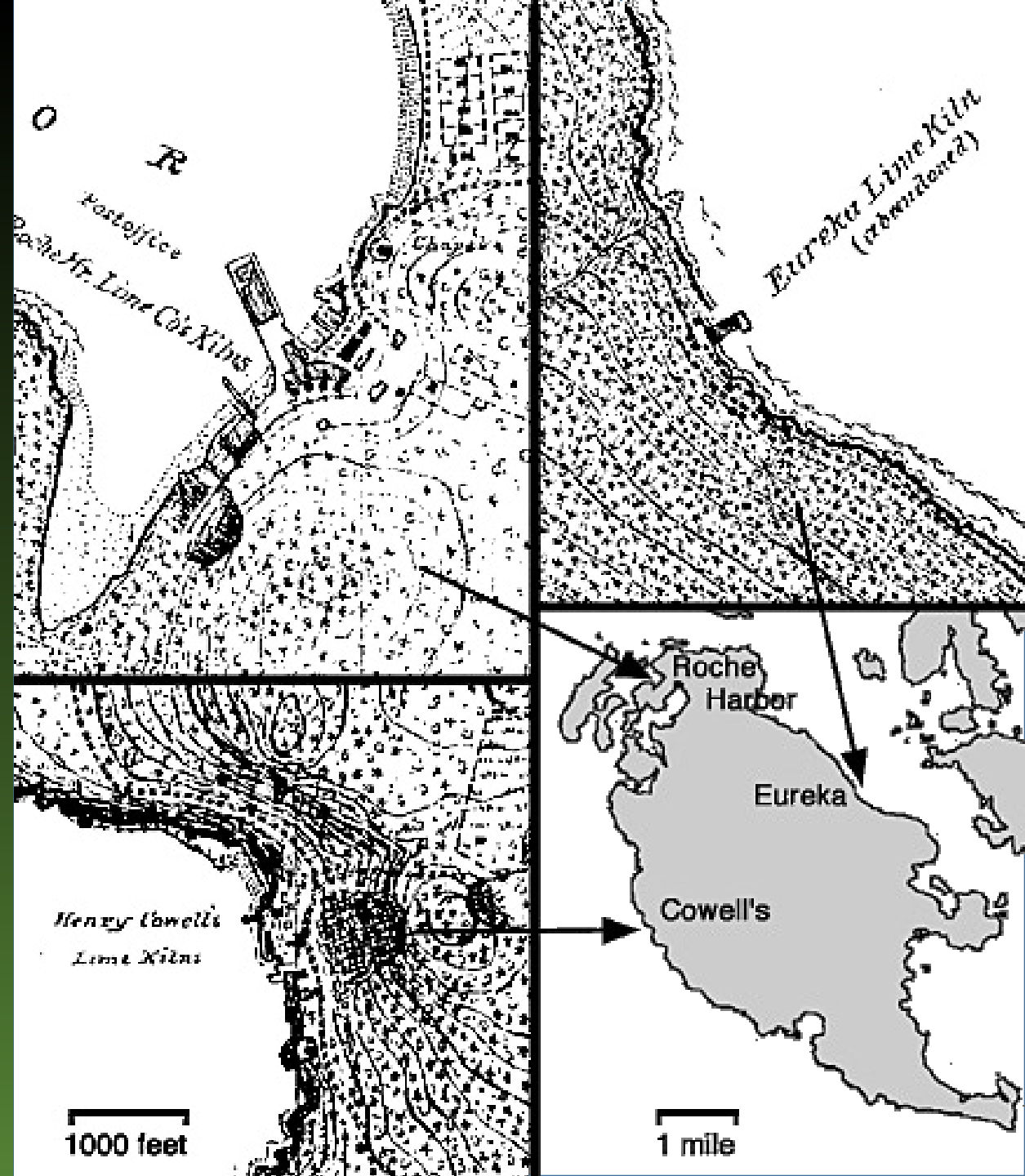
Why are many forests in the islands so crowded?

Complex story of:

- Climate: Low rainfall
- Soil types
- Cultural Factors...
 - Logging history
 - Fire suppression
 - Little active management



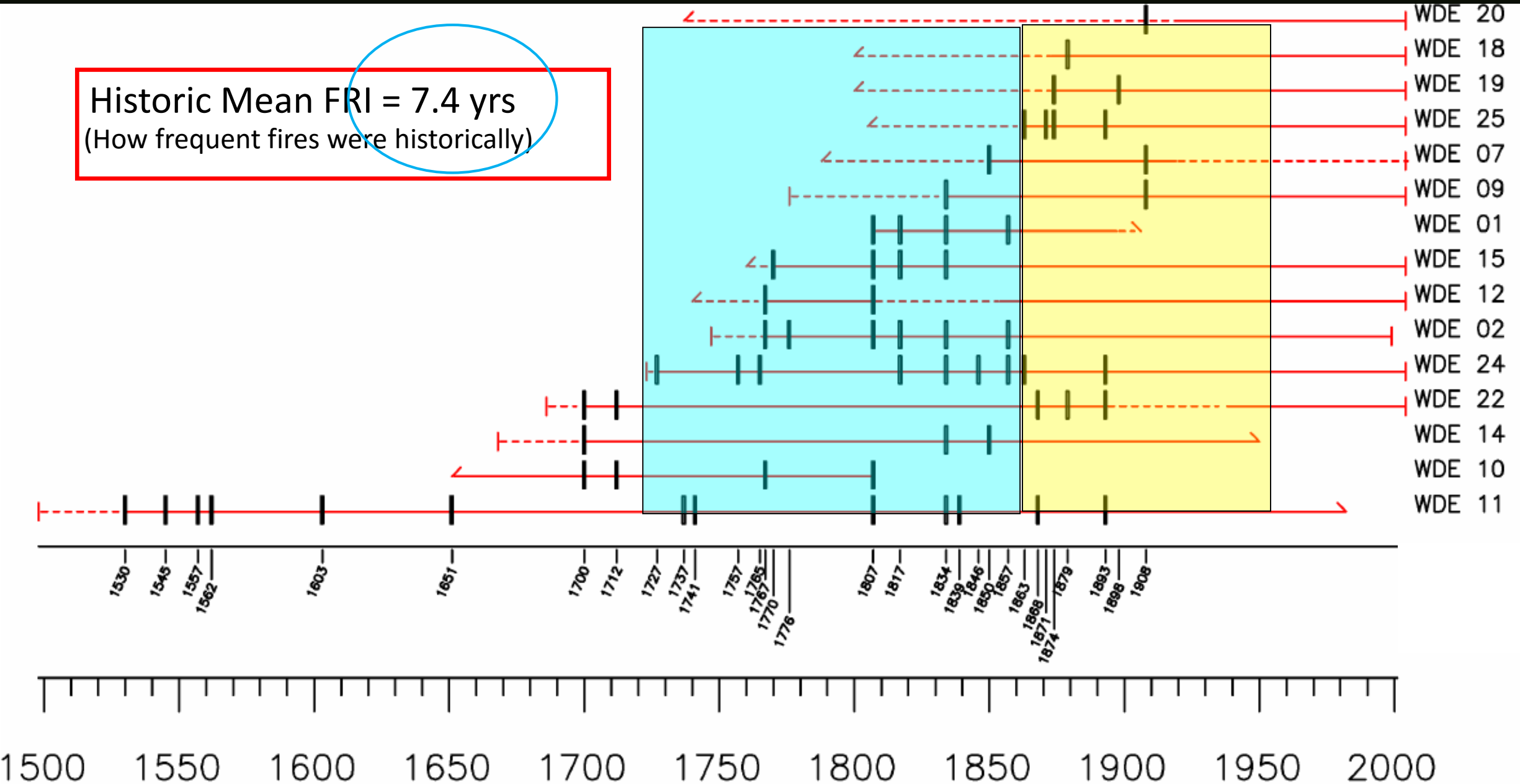
A black and white photograph showing the interior of a large lumber mill. The space is filled with heavy wooden beams and logs. Several men are visible, engaged in different tasks. In the foreground, a man stands near a large log. To his right, another man is working with a piece of machinery. In the background, more workers are visible, some handling logs. A large, spoked wheel is mounted on the wall on the right side of the image. The floor is covered with sawdust and wood shavings.



Fire History

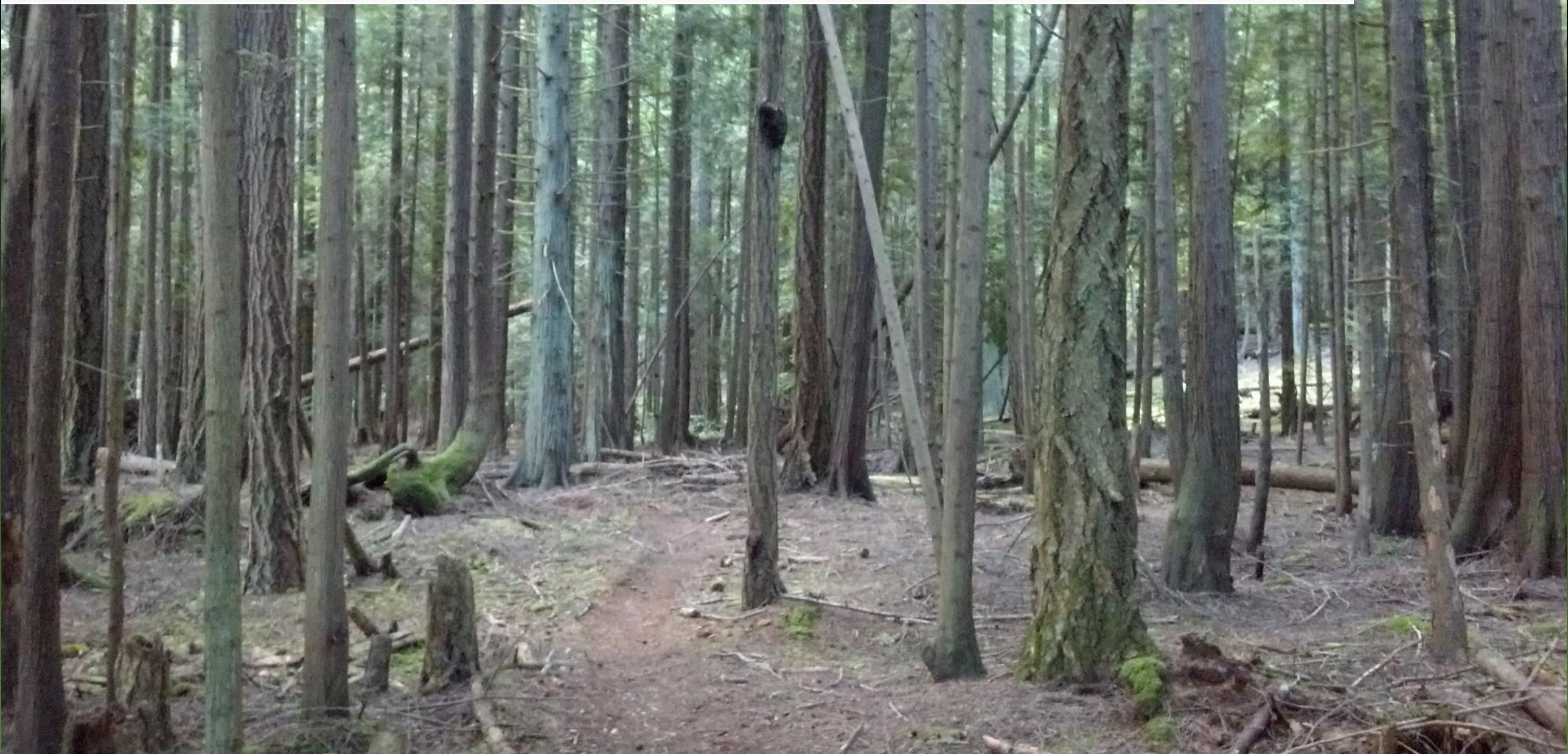
Courtesy: Carson Sprenger, Rainshadow Consulting

Historic Mean FRI = 7.4 yrs
(How frequent fires were historically)



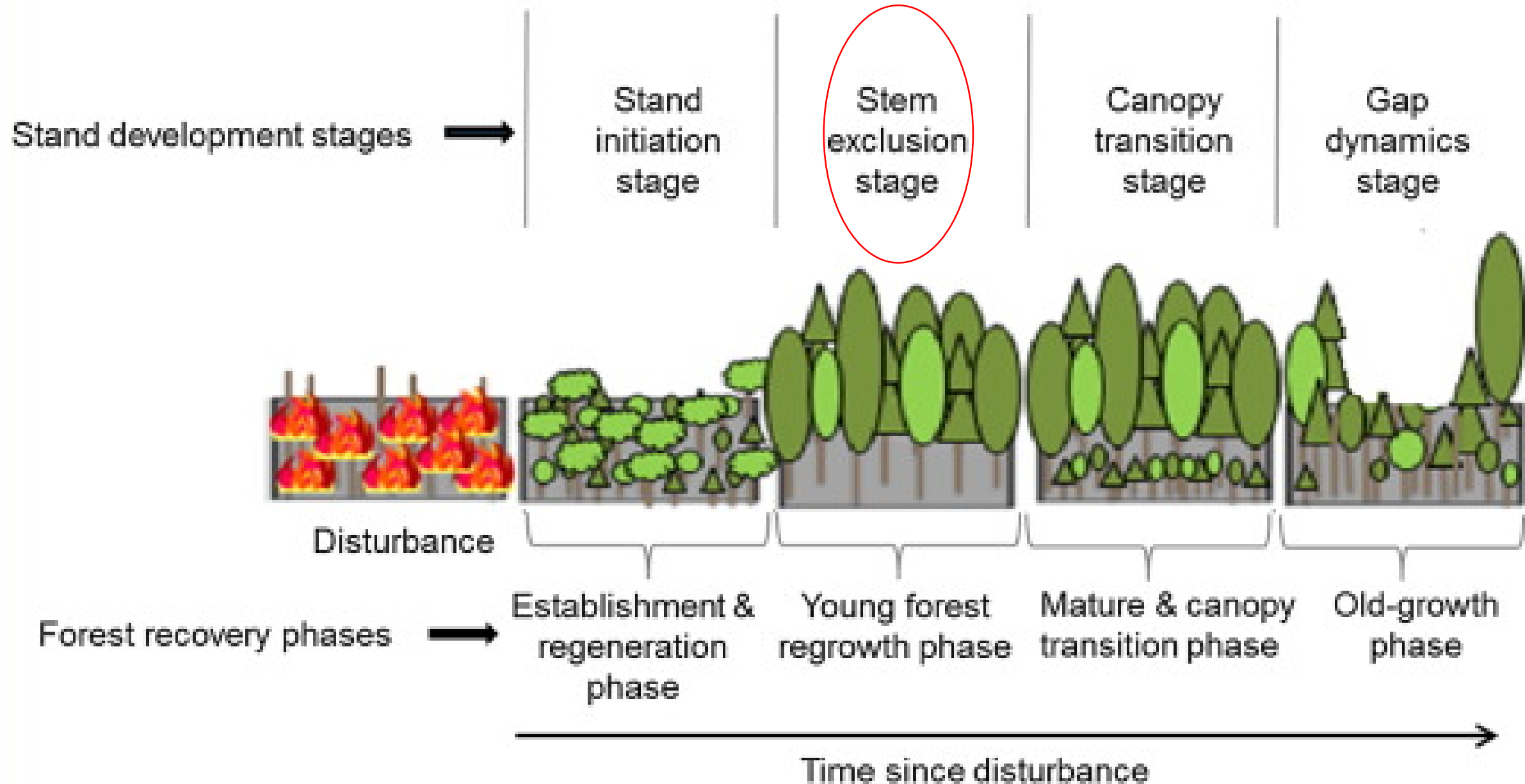


What is “overstocking” or “overcrowding”?



Stand Development Stages

Adapted from Oliver and Franklin (1996)



Stem Exclusion Phase



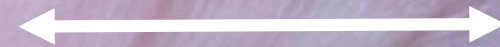
Signs

- Reduced live crown
- Dense, uniform canopy
- Dead lower branches
- Mortality (self-thinning)
- Lack of understory

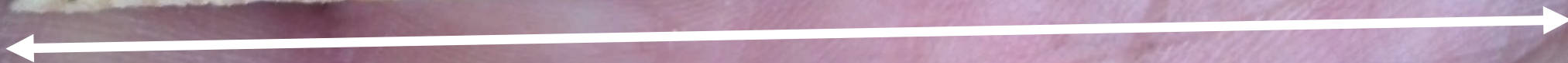
Effects

- Reduced vigor & disease resistance
- Increased windthrow
- Low diversity
- Reduced growth

1" – 30 years



4" – 70 years



What is pre-commercial thinning?



**The selective removal of trees— primarily for improving growth or health of the remaining trees.
(No initial financial return)**

- Increase long-term value/profits
- Accelerate old-growth characteristics
- Increase resilience (e.g. insects, disease, wind)
- Reduce fire risk
- Increase biodiversity



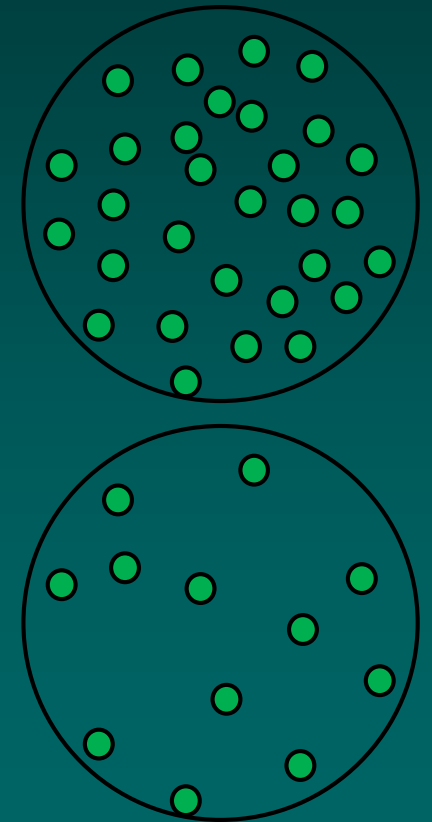


Pre-Commercial Thinning Strategies

Thinning “from below”

Remove:

1. Smallest diameter
2. Most suppressed
3. Trees with least live crown (<30%)
4. Defective trees (broken tops, wane, forked, etc.)
5. Non-preferred species
6. Spacing
7. “Release” understory trees







Courtesy: Carson Sprenger, Rainshadow Consulting



Pre-Commercial Thinning Strategies

When to thin?

- Before overcrowding
- Before trees lose more than 2/3 of their live crown
- *Usually* at 20-25 years
- More often & less intensively = Resistance to windthrow

Risk of Doing Nothing

- Increased risk of fire
- Decrease in productivity
- Slower pace in regaining old-growth characteristics/ large trees
- More susceptible to disease, insects, and drought



Risk of Doing Something

- Increase in light can lead to an increase in undesirable plant species
- Overthinning can increase windthrow potential
- Leaving woody biomass in forest can increase fire risk

Food for Thought

- Historically, forests were much more open
- Thinning can increase
 - Productivity/ growth of trees
 - Structural diversity
 - Health of forest
- Every site is different, understand what you have!

Commercial logging costs for pulp

10 acres

Conventional Off-Island Market			
<u>Activity</u>	<u>Units</u>	<u>\$\$\$ / Unit</u>	<u>Total Cost/Revenue</u>
Pre-commercial thin	40 MBF (280 tons)	\$37/ton	\$10,400
Hauling	40 MBF (10 trucks)	\$700/truck	-\$7,000
Logging costs	10 acres	\$1,000/acre	-\$10,000
Consulting	10 acres	\$150/acre	-\$1,500
		Cost	-\$8,100

Pre-commercial Thinning Costs

- Cut and slash - \$600/acre
- Cut, pile & burn - \$800 - \$1,000/acre
- Cut & chip - \$1,100 - \$1,700/acre
- Mechanical - \$1,300/acre
- Work party – beer & brats!



Environmental Quality
Incentives Program (EQIP)
Program Guide



Practices	Payment Rates
Forest management plan	\$1,065 - \$1,280 (<20 acres)
Pre-commercial thinning	\$344/acre
Forest slash treatment	\$279/acre
Downed large wood	\$119/each
Wildlife habitat pile	\$163/each
Pruning	\$256/acre
Fence	\$3.49/ft.
Site prep for planting, light veg.	\$209/acre
Stream crossing, culvert <3' dia.	\$333/ft
Tree planting with cages	\$545/acre
Bird/bat nest boxes	\$32/each





Biomass wood pellet machine



SAWDUST

Sawdust
demand:

Size: <6mm
Moisture: 15-20%



Pellet size: $\Phi 6\text{mm}$; $\Phi 8\text{mm}$



Model: XGJ560

- Power: 90kw
- Capacity: 1-1.5t/h
- Weight: 6.1T
- Dimension: 2.6x1.3x2.3m



Next Steps

1. Coalition of the willing
2. Feasibility study grant
3. Current biochar grant
 - NNRG, UW, ARC, SJC Farmers
 - Free site visits
 - One more event



Thank You!

