



Resilient Landscapes Are the Product:
Forest Products are the Byproduct



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Context. Long before the era of fire suppression...

- ▶ For 10,000 yrs, lightning + Indigenous ignitions burned forests creating meadows, woodlands, & open canopy forests
 - Fires were frequent, every 2-15 yrs, dense forests minimized food & resource production
 - Food, medicines, basketry materials grew in open forests
 - Absent fires, forests grew denser & nonforests are forested
- ▶ These fires also burned in moist & cold forests
 - They were hotter fires and less frequent, on average, 35-50% of a large landscape area was recovering after fires
 - Today, there is a very large fire deficit, 45-85 MM ac annually burned historically in the CONUS
- ▶ Because of these fires, many western pine & mixed-conifer forests were fuel limited



Credit: Frederick Remington (public domain)



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Frequent fire
(2-15 yrs)
Dry forests



1934

NARA Seattle



2010

John Marshall



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An important local stabilizing feedback

Frequent low- or moderate-severity fire...

...leads to more of the same forest condition and future fire severity



Bob Van Pelt
drawing



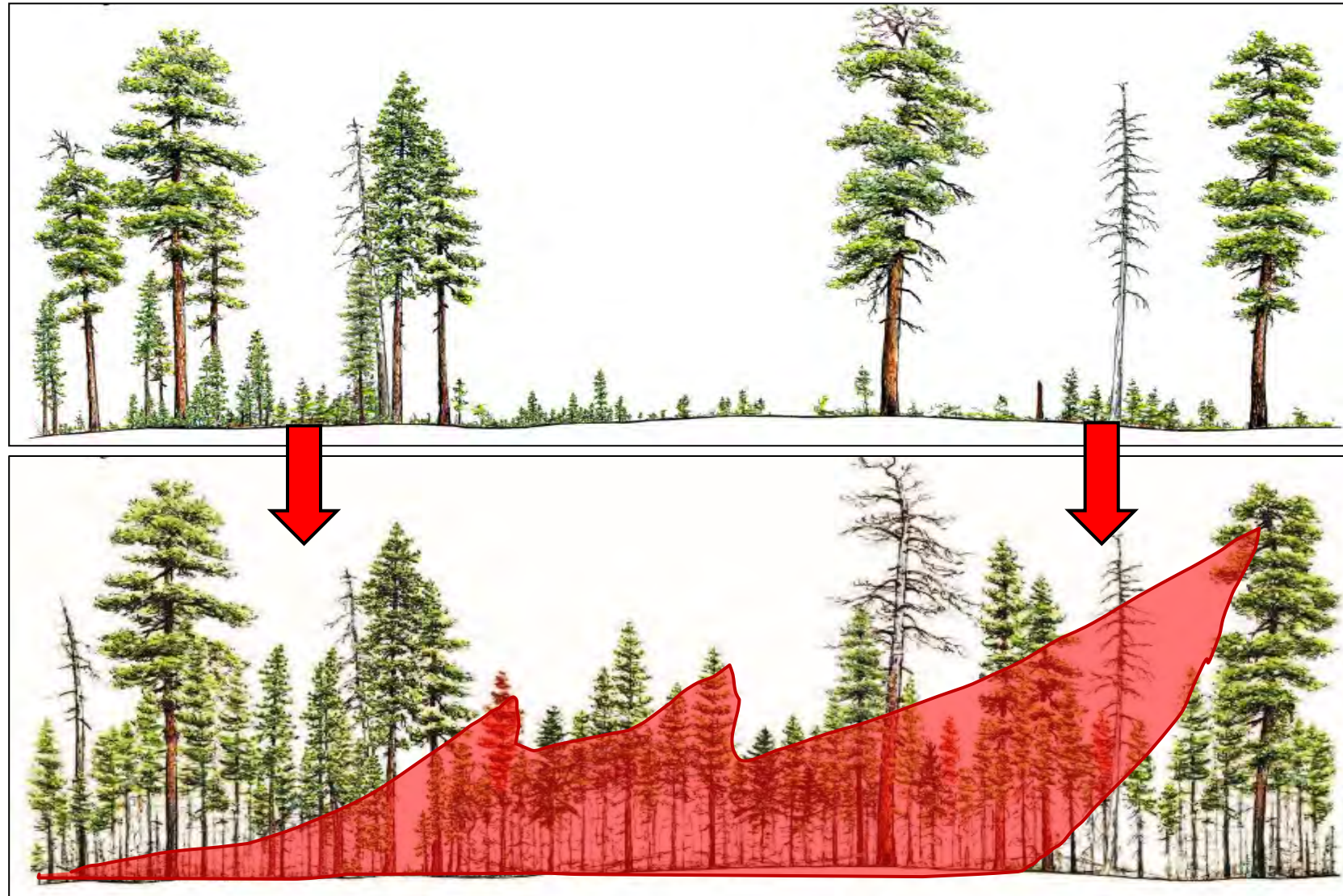
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Lacking these high frequency fires

Trees quickly accumulate

Flames can now *“climb”* the layered subcanopy

Resulting in crown fires



Bob Van Pelt drawing



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Moderate frequency fire
(15-50 yrs)
Moist forests





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Fuel provides the energy for burn severity

Infrequent fire
(30-150 yrs)
Cold forests



High connectivity of dense forest provides the means for large, severe fires



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Nonforest conditions & resilient landscapes

- ✓ **Widespread historical nonforest, 25-75% of area**
 - Burned bare ground, early seral conditions, woodlands, meadows, shrublands, wetlands
 - Hardwood / mixedwood patches also abundant
- ✓ **These features limited future fire size/severity**
 - Tug-o-war btw factors growing/burning forests
 - Nonforests & hardwood forest, emergent property
- ✓ **With CC, this intensifies, & we can aid transitions**



Andrew Larson photo



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The Challenge: Forest Reburning is **THE large landscape stabilizer**

- Mimic this effect over large areas, focus on leaving behind fire and climate adapted conditions
- Fires of varied size and severity created ever-shifting mosaics of non-forest & forest conditions
- Fires overlapped each other over space & time; this enabled the landscape to store more forest
- Second & later fires consumed dead wood from prior fires, decoupling surface from canopy fuels
- Resilient forest landscapes were MUCH less forested than we think





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Nonforest conditions & resilient landscapes

- ✓ **Much nonforest historically, 25-75% of area**
 - Burned bare ground, early seral conditions
 - Nonforests: sparsely treed woodlands, meadows, prairies, shrublands, wetlands
 - Hardwood patches also abundant
- ✓ **These features limited future fire size/severity**
 - Tug-o-war btw factors growing/burning forests
 - Nonforests & hardwood forest were the emergent property
- ✓ **With CC, this intensifies, & we can aid transitions**
- ✓ **How did we get here?**



Andrew Larson photo



Strategies to Reduce Future Severe Wildfires: Big Picture

- ✓ Current interior wUS forests are unsustainable
 - Re-establish open and closed canopy mosaics
- ✓ Stabilize the tug-of-war
 - More nonforest, hardwoods, wetlands
- ✓ Restore positive ecological role of fire
 - Incorporate Indigenous knowledge & mgt
 - Primary tools, cultural burning, Rx burning, managed wildfires, thinning + Rx burning
- ✓ Incorporate low & variable density thinning w/ Rx burning to achieve fire/climate adaptation goals
- ✓ With CC, nonforests & open canopy forests are more important to maintaining stability
- ✓ How did we get here?



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Change Agents

Pre-1850

2023

Fire exclusion – Reduced Indigenous burning, livestock grazing, land development, ditching/draining wetlands, agriculture, roads + rails, fire suppression

Timber harvest – Logging of large-old fire-tolerant trees, fire-sensitive trees filled in

Climate change – Hotter, drier, windier climate, more lightning, longer fire seasons, reduce snowpack, warmer winters, faster snow attenuation

Smoke management – Strict regulations positive feedback to large fire size & severity via less intentional burning --> more smoke, poorer air quality & human health, more structures destroyed



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OR Bootleg Fire of 2021, 414,000 ac, 3rd largest since 1900.

Fire rapidly transitions from crownfire in untreated forest...

...to surface fire in thinned & burned forest



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OR Bootleg Fire of 2021



Thinning + Rx Fire

Thinning only

The thinned only treatment does not protect the forest



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Thank you!

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