

Fire Regimes and Forest History in Oregon's Dry Forests

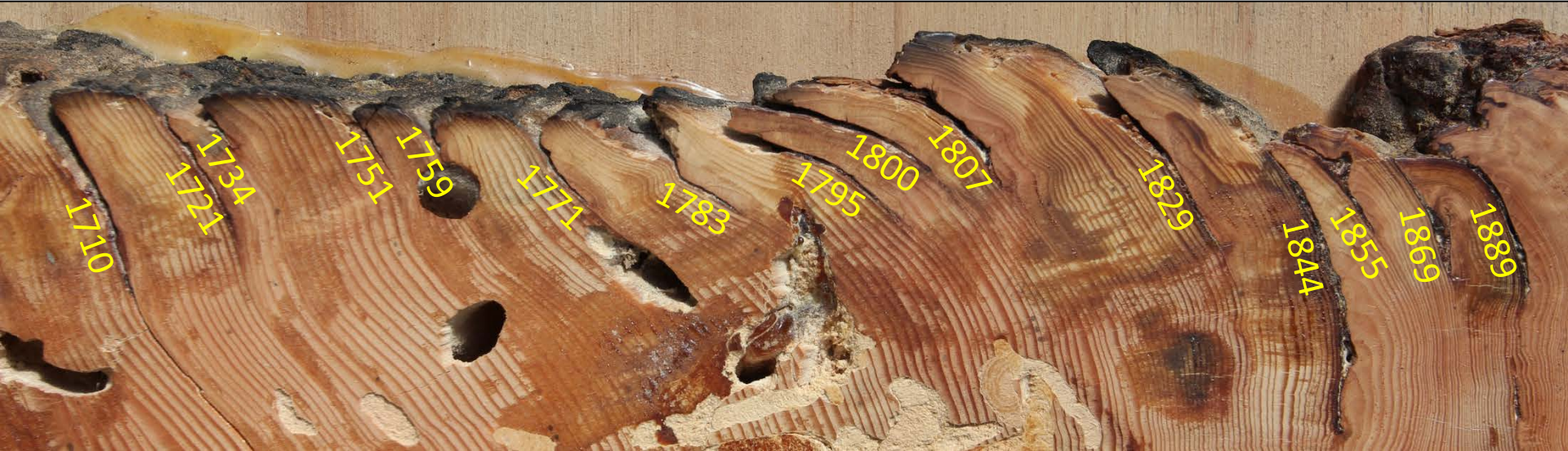


Climate
Fire
Insects and Disease



Andrew Merschel, Oregon State University

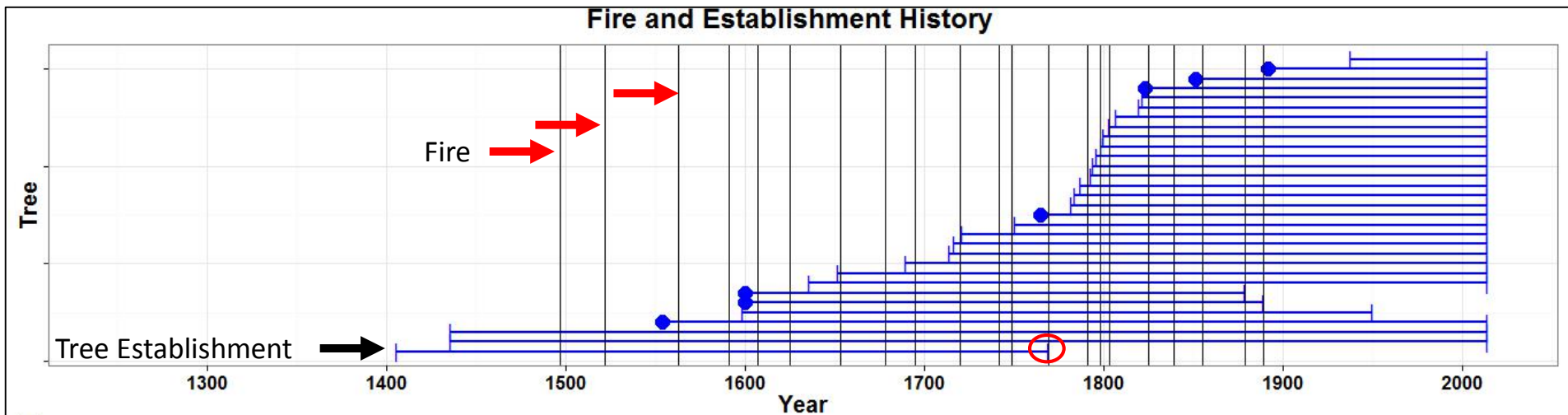
Reconstructing Historical Fire Regimes



Reconstructing Forest History



Fire and Establishment History



Land Use Changes in Mixed-Conifer Forests (Early 1900s)



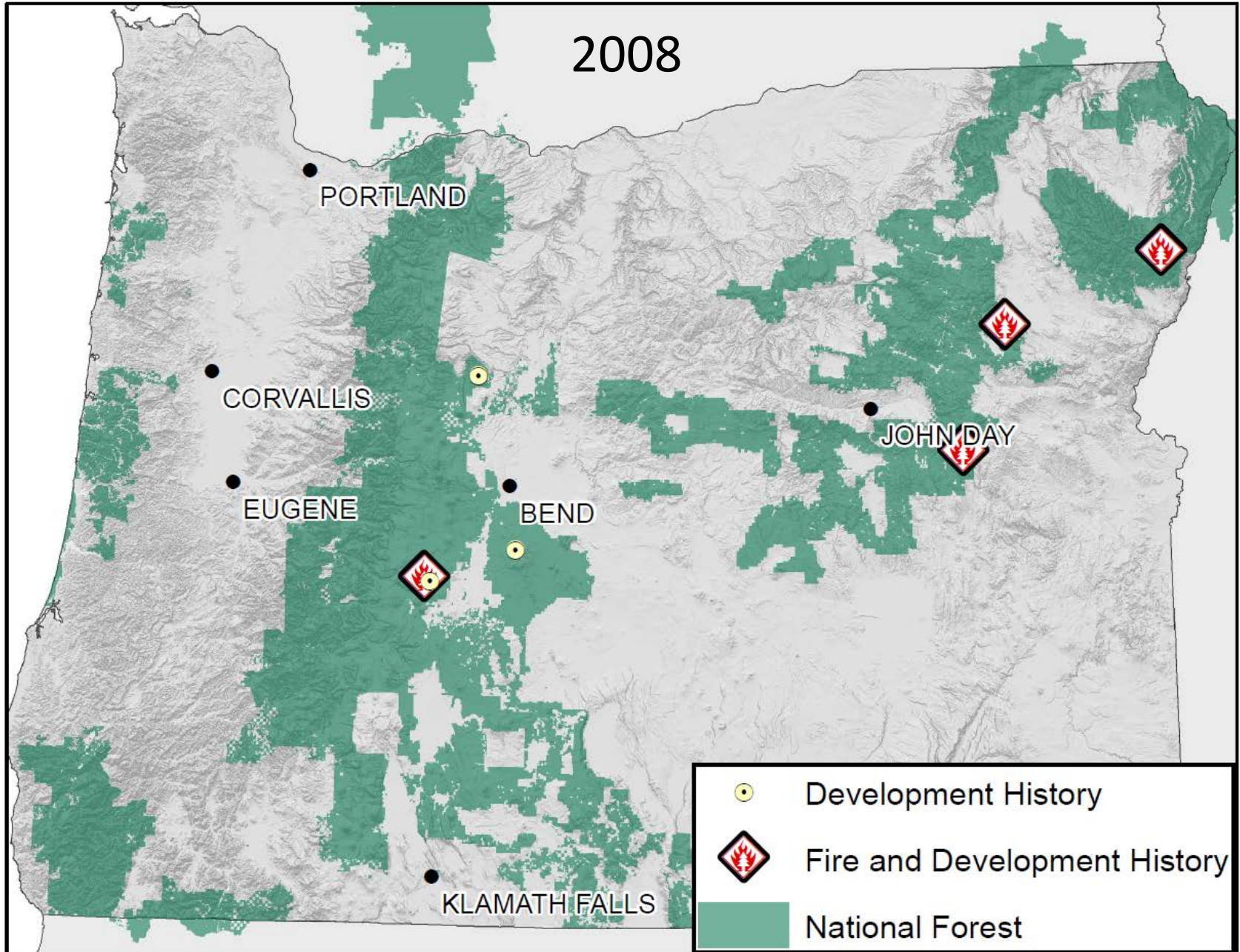
Selective Logging of Large Fire-Resistant
Trees

Heavy Grazing

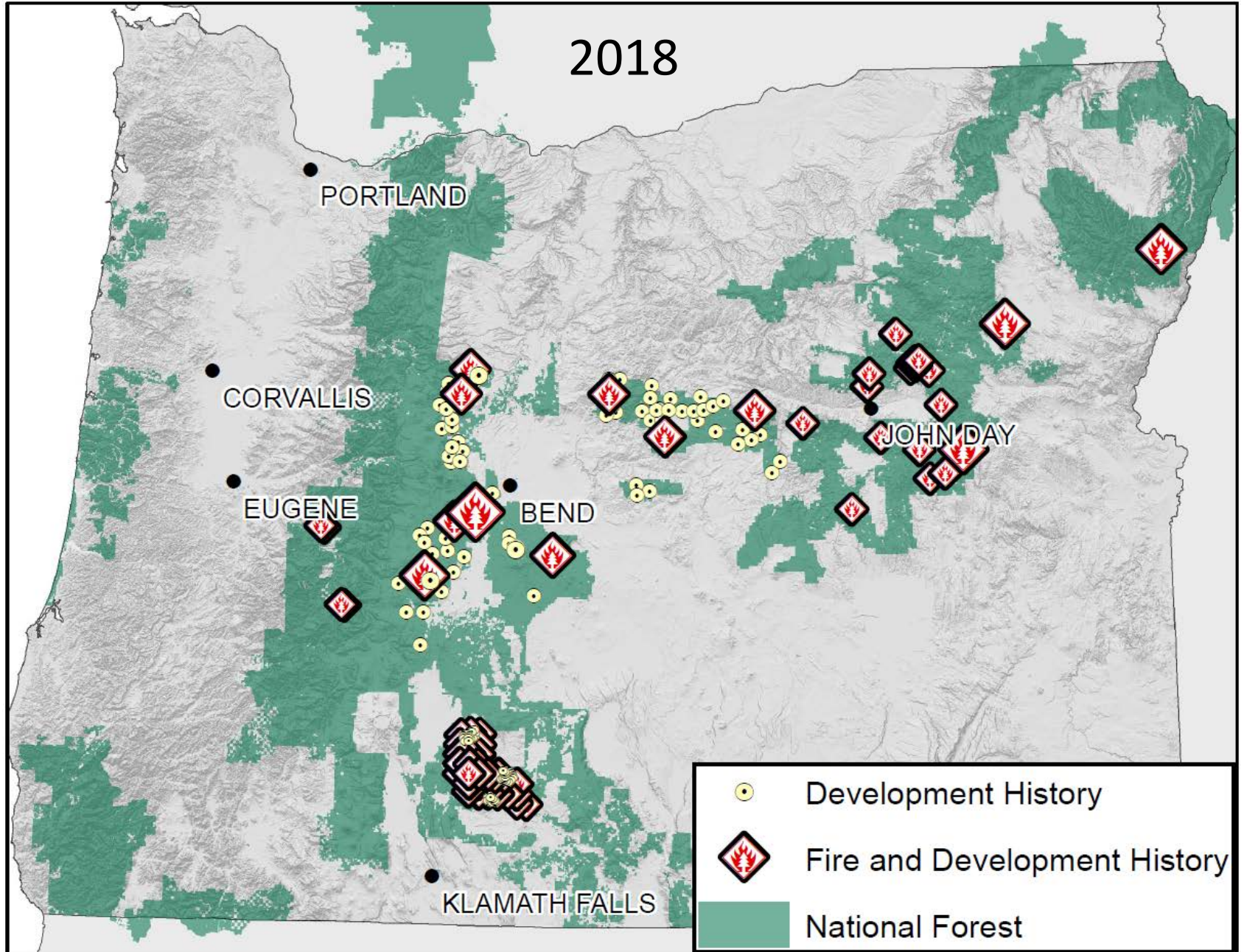
Fire Exclusion and Suppression



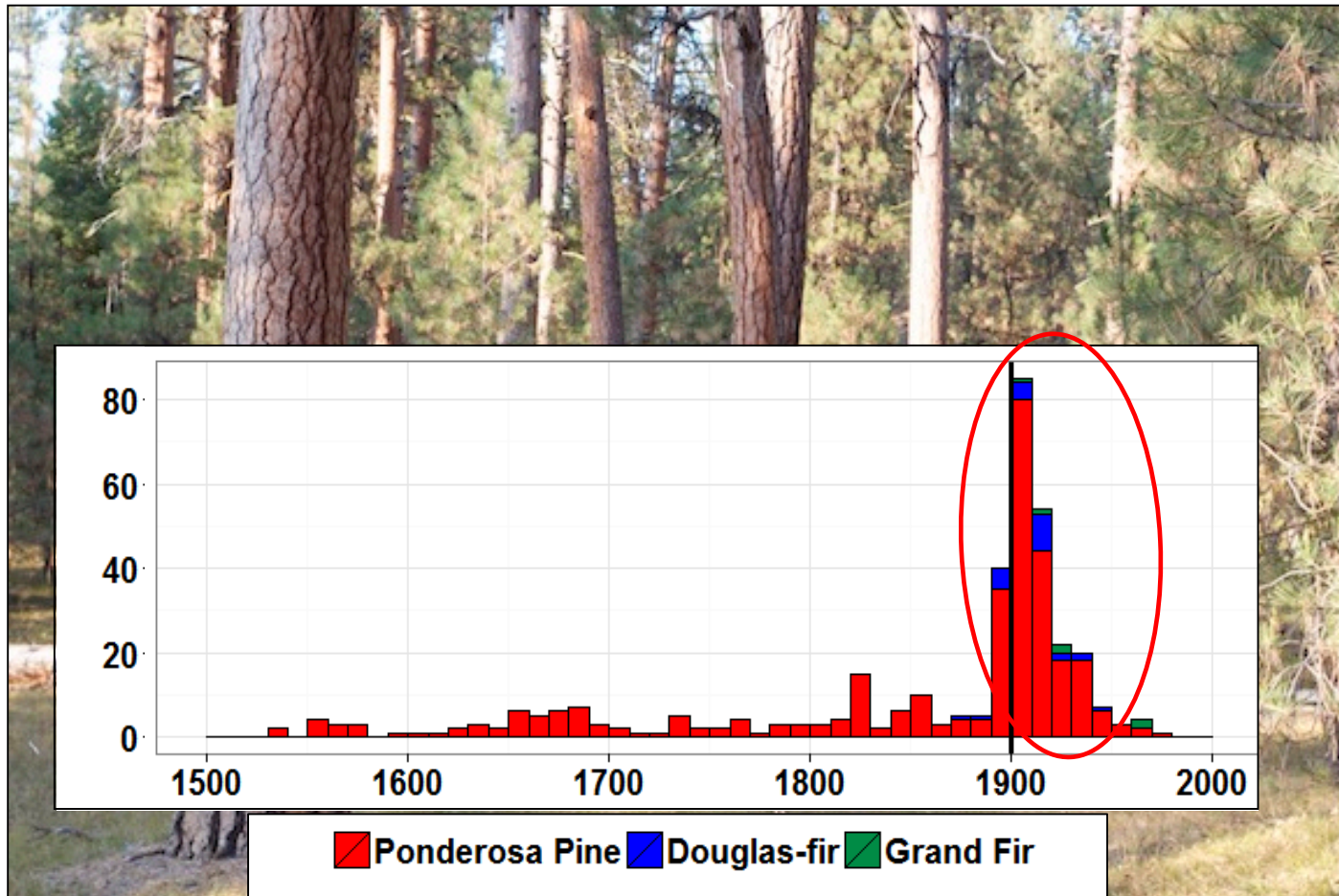
Dry Forest Tree Ring Fire and Forest Histories



Dry Forest Tree Ring Fire and Forest Histories

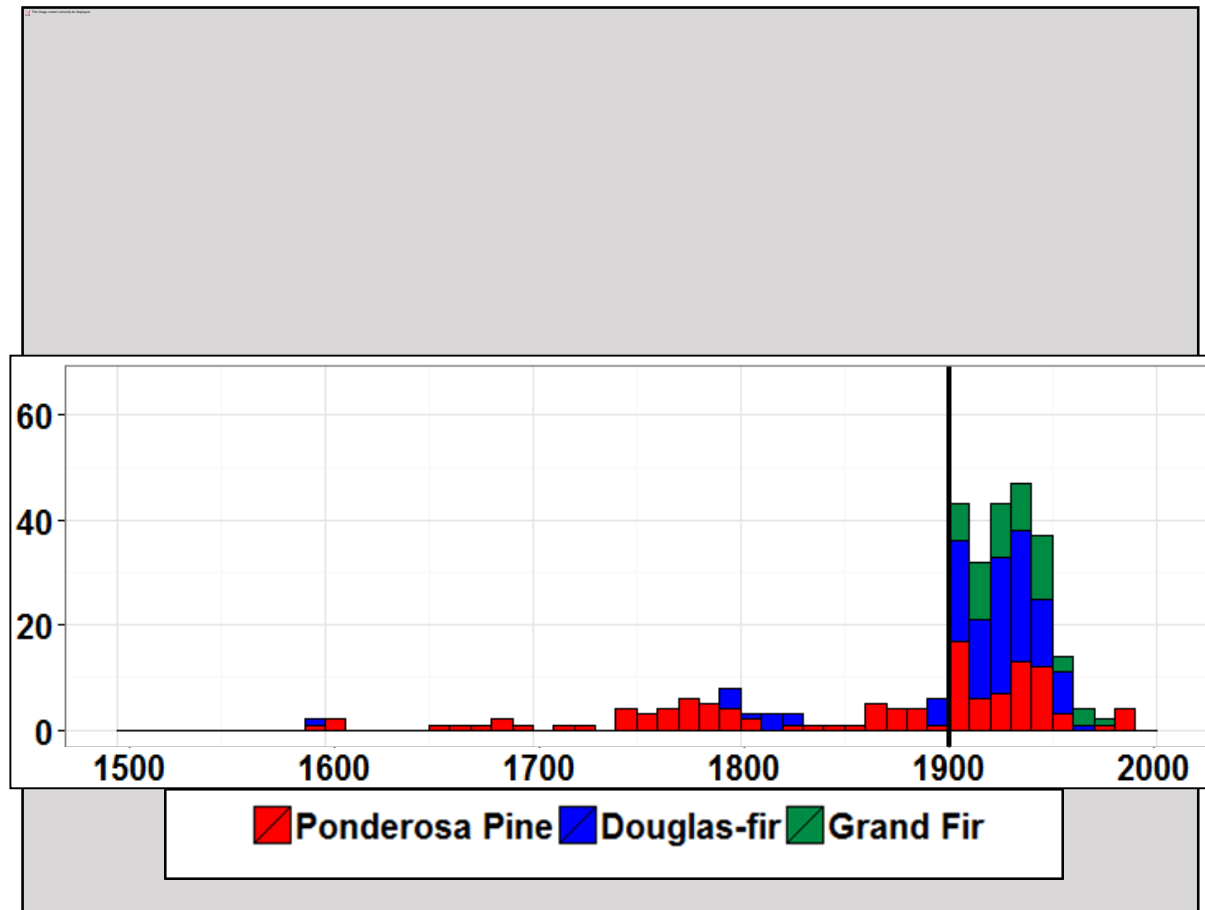


What was the historical structure, composition, and development history of Oregon's Dry Forests?



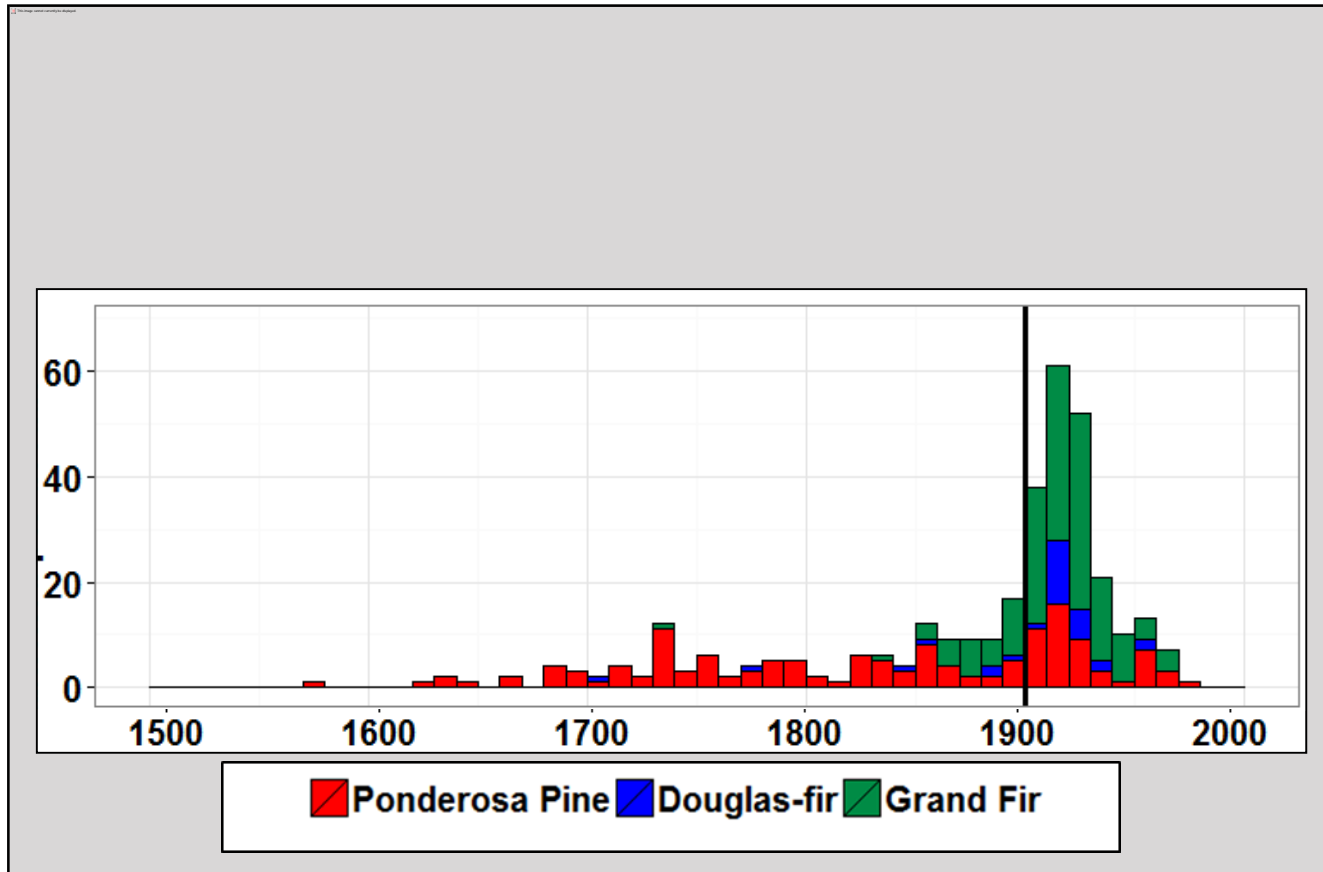
Persistent Ponderosa Pine

What was the historical structure, composition, and development history of Oregon's Dry Forests?



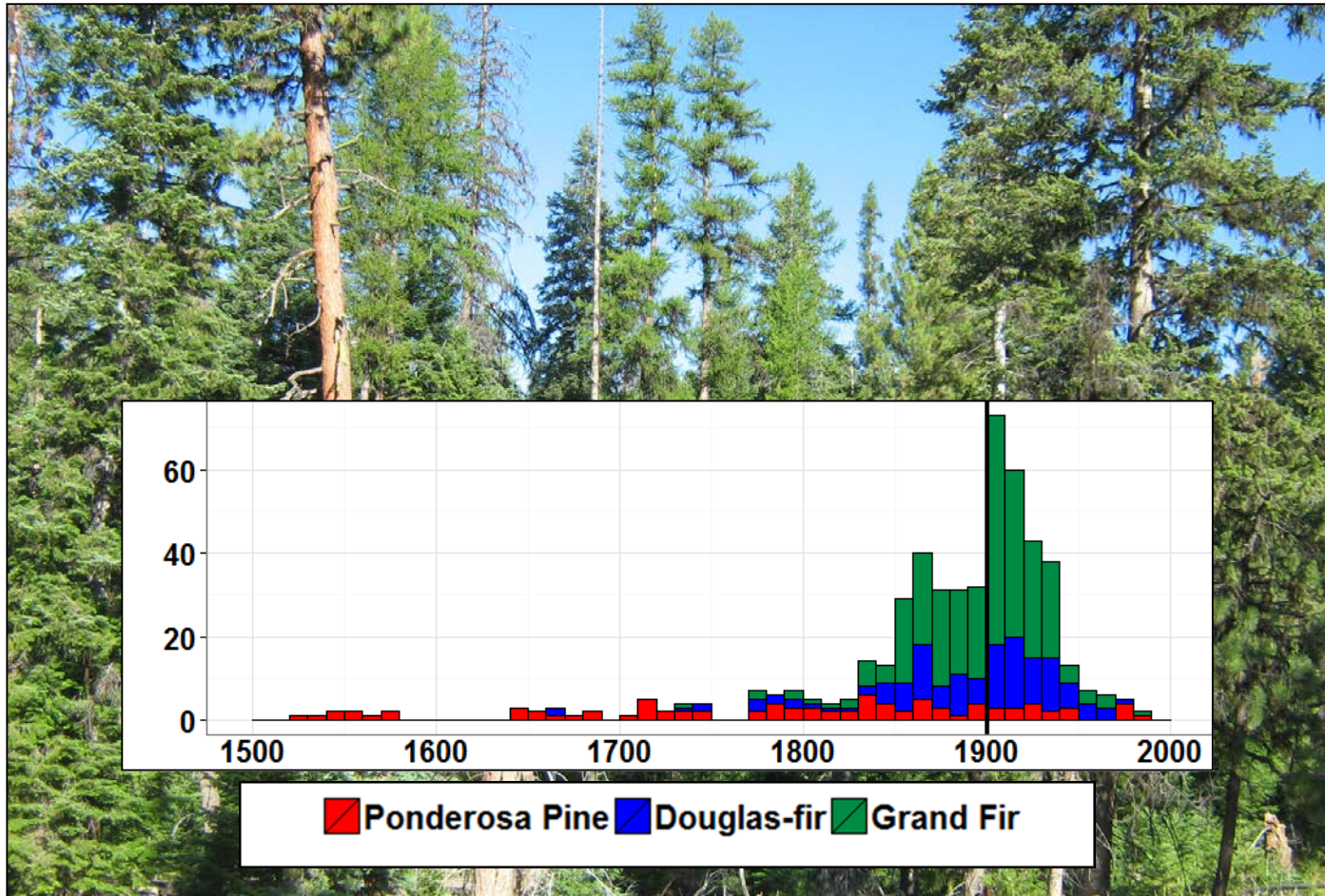
Recent Douglas-fir

What was the historical structure, composition, and development history of Oregon's Dry Forests?



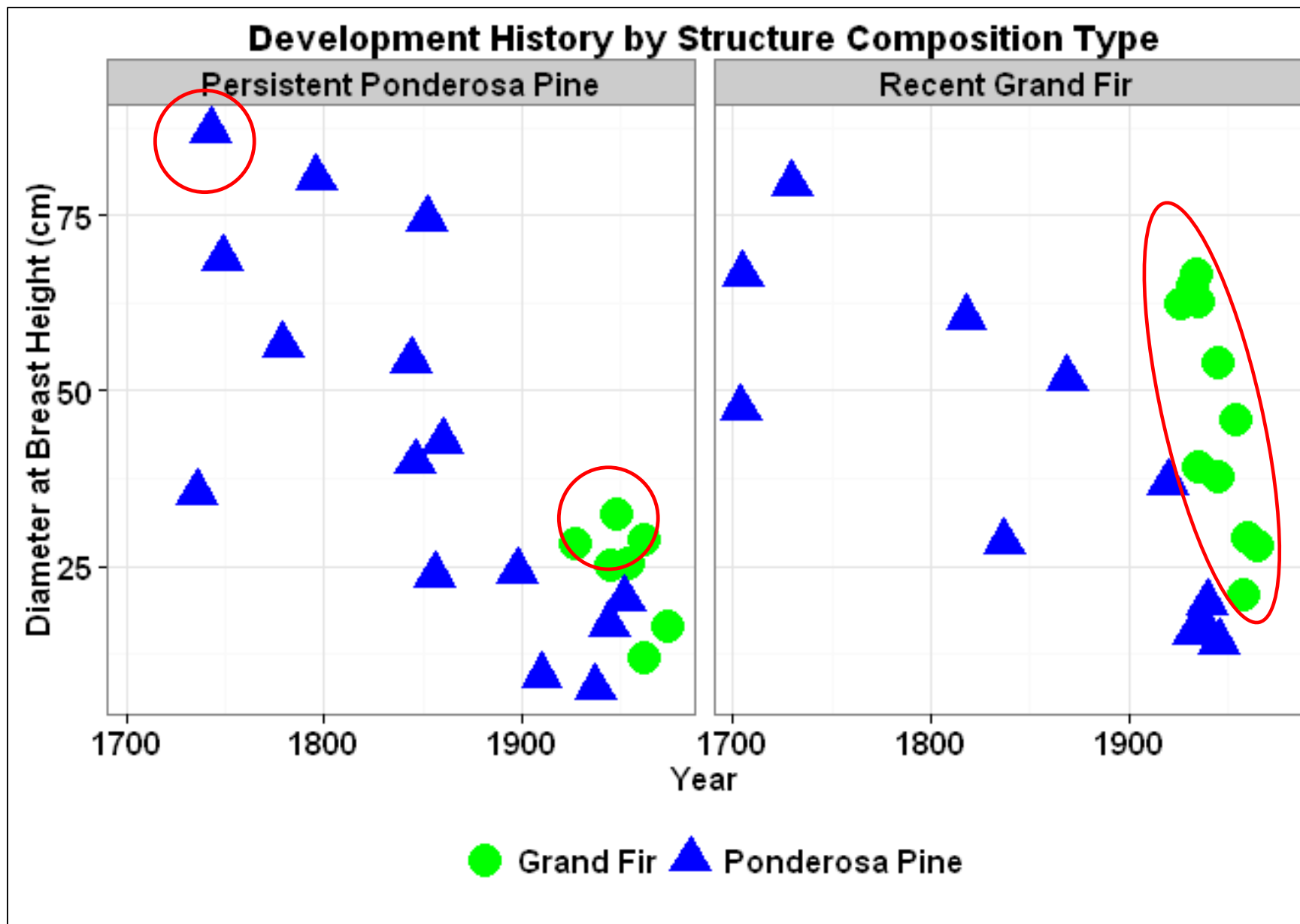
Recent Grand Fir

What was the historical structure, composition, and development history of Oregon's Dry Forests?



Persistent Shade Tolerant

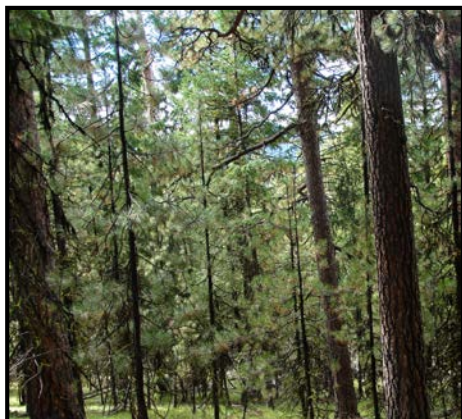
Variable Response to Land Use Change



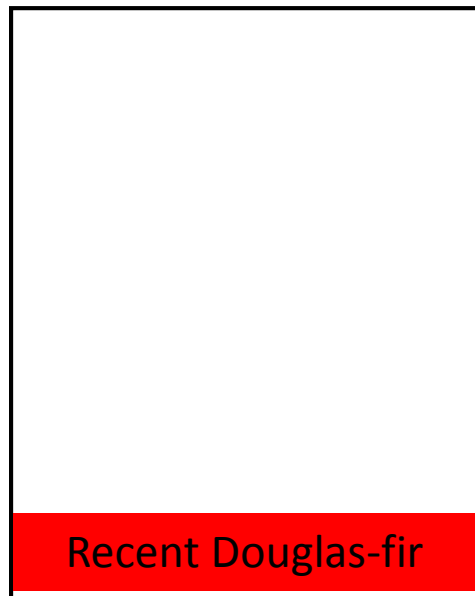
Response to Land Use Change Varies *with Environment*

S
o
l
a
r

R
a
d
i
a
t
i
o
n



Persistent Ponderosa Pine



Recent Douglas-fir



Recent Grand Fir

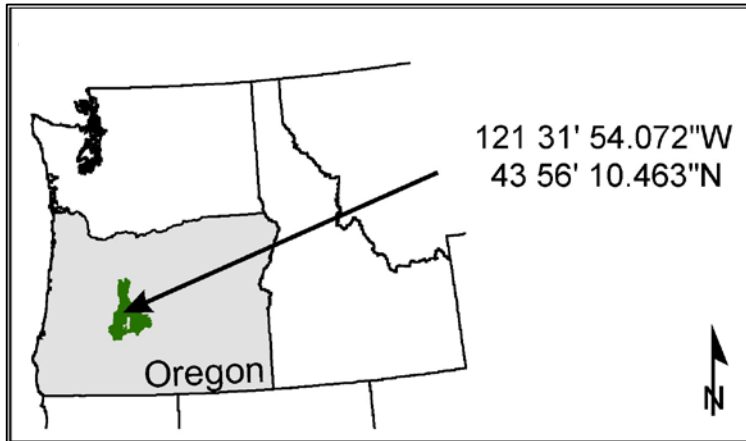


Persistent Shade Tolerant

Precipitation and Elevation

Average Maximum Temperature

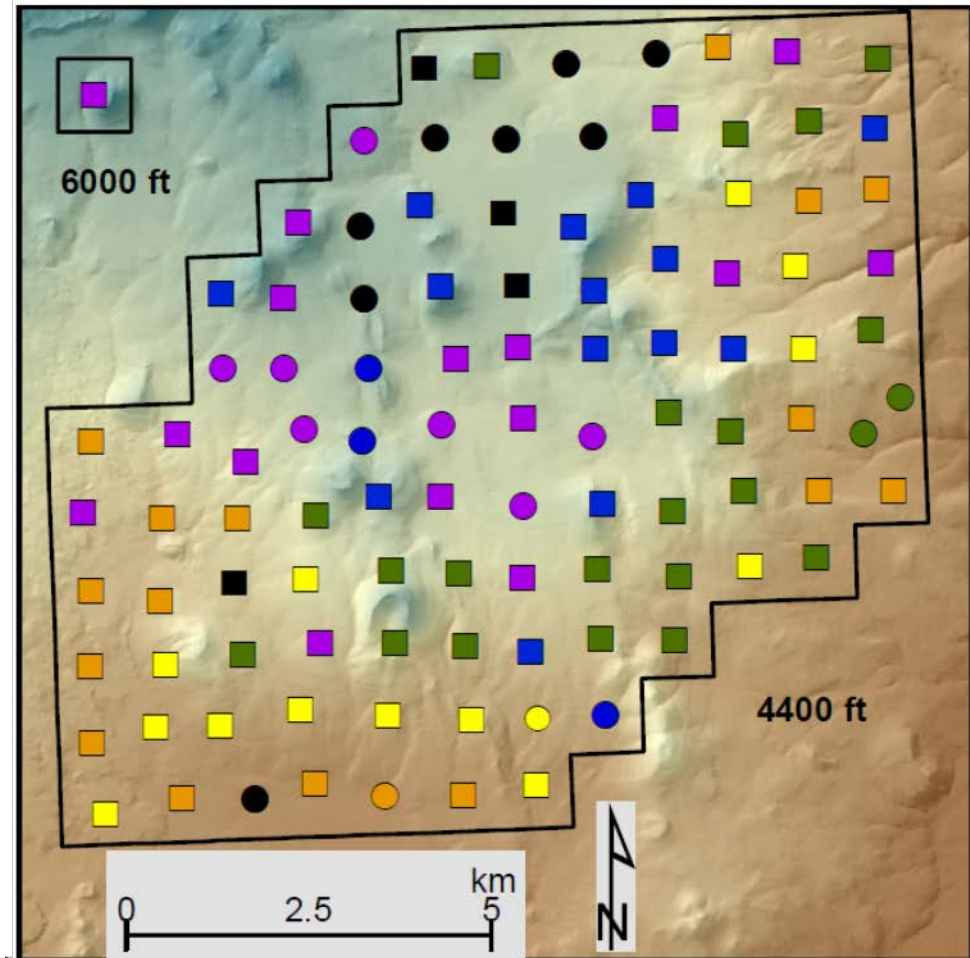
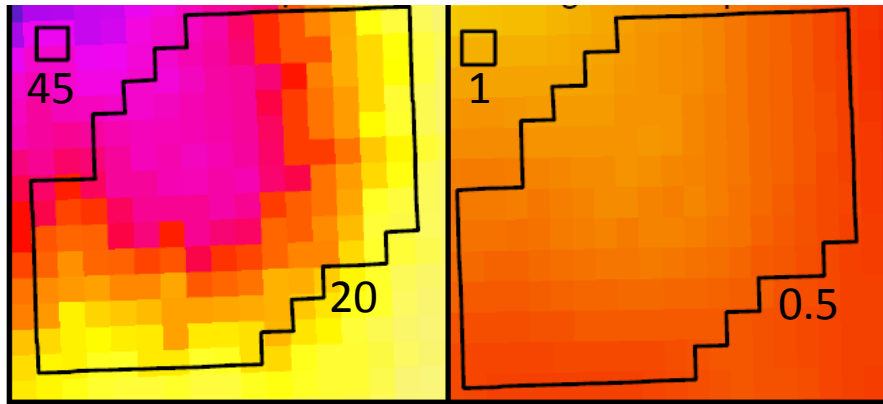
Landscape Fire Reconstruction Across Forest Types



Precipitation (in)

Annual

August



Forest type

- Lodgepole
- Persistent Shade Tolerant
- Persistent Shade Tolerant with Lodgepole
- Recent Grand Fir
- Persistent Ponderosa Pine with Lodgepole
- Persistent Ponderosa Pine

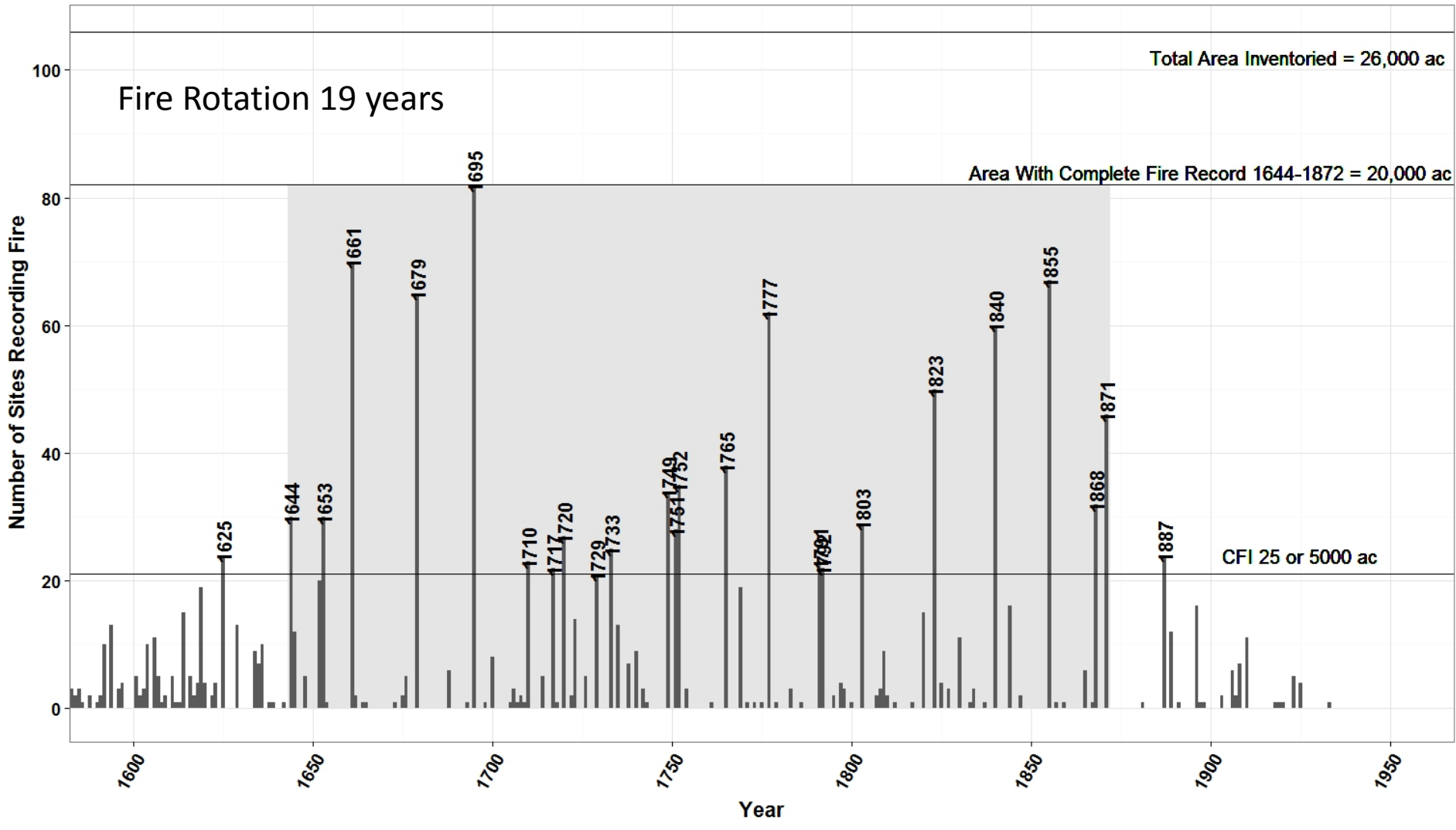
Evidence sampled

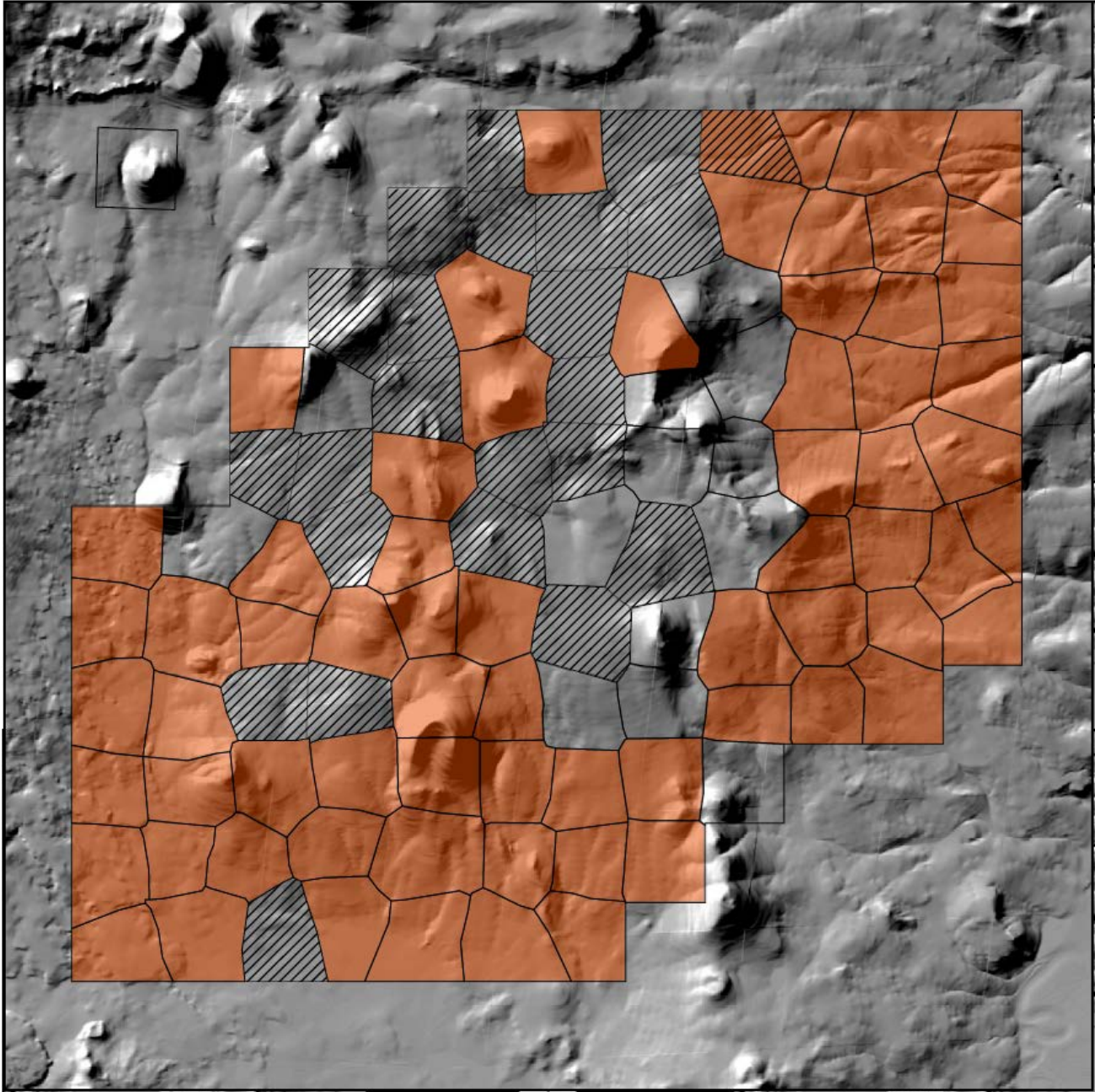
- Fire scars & establishment dates
- Fire scars only

■ Pumice basins

Historical Fire Size and Frequency

Fire Event Area by Year



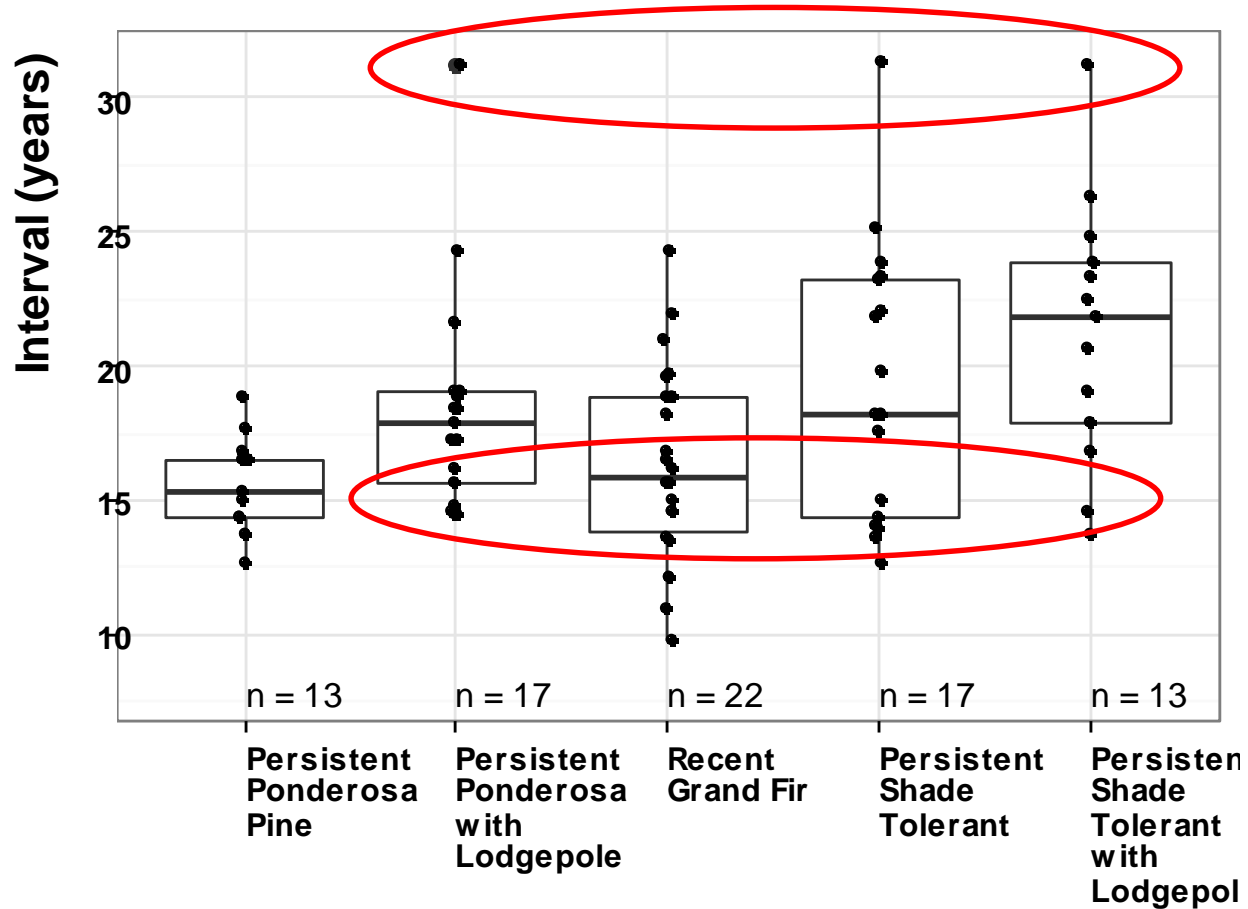


Unburned



Burned

Variation in Frequency Among Forest Types



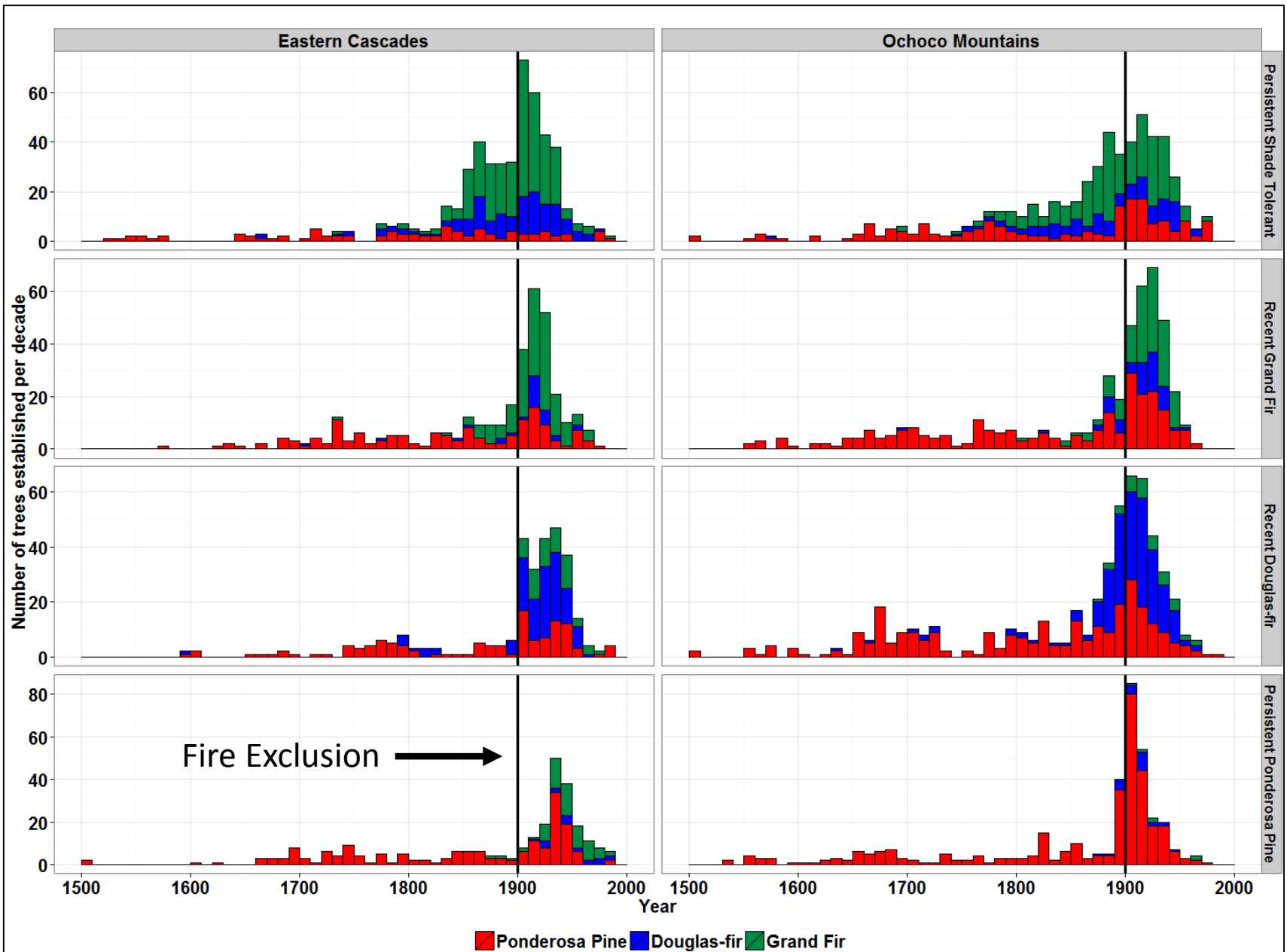
Take Home Messages

Historical fire kept density low across a broad range of forest types. In the absence of fire, there has been far greater change in moister and more productive settings.

Historically, fire occurred far more frequently and fire perimeters were much larger.

Low severity surface fire was the dominant fire effect in very different forest types from ponderosa pine to mixed-conifer. Infrequent, high severity fire occurred, but it was quite limited in spatial extent.

Variable Response to Land Use Change



The Study of Tree Rings (Dendrochronology)



Climate
Fire
Insects and Disease





Ponderosa Pine



Recent Douglas-fir



Recent Grand Fir



Persistent Shade Tolerant

Response to Land Use Change Varies *with Environment*

