

# General Condition of Western Forests

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# Objectives

- I. Review need for fuels treatments to reduce wildfire risk
- II. Present a west-wide estimate of potential biomass available from fuels treatment activities
- III. Discuss implications of Mountain Pine Beetle (and other) insect outbreaks on biomass supply

# I. Need for fuels treatment

- Depends upon the forest type
- Some tree species are adapted to **Frequent Low Intensity, Surface fire regimes** - need to restore forest structure
- Other tree species are adapted to **Infrequent High Intensity, Stand Replacement Fire Regimes** – need to restore landscape structure

Frequent Low  
Intensity, Surface  
fire regime

Fire-scarred  
Ponderosa Pine





• 1898

• 1889

• 1879

• 1872

• 1865

• 1858

• 1851

• 1844

• 1837

• 1847

• 1843

• 1841

• 1837

• 1830

• 1827

• 1823

• 1819

• 1814

• 1810

• 1808

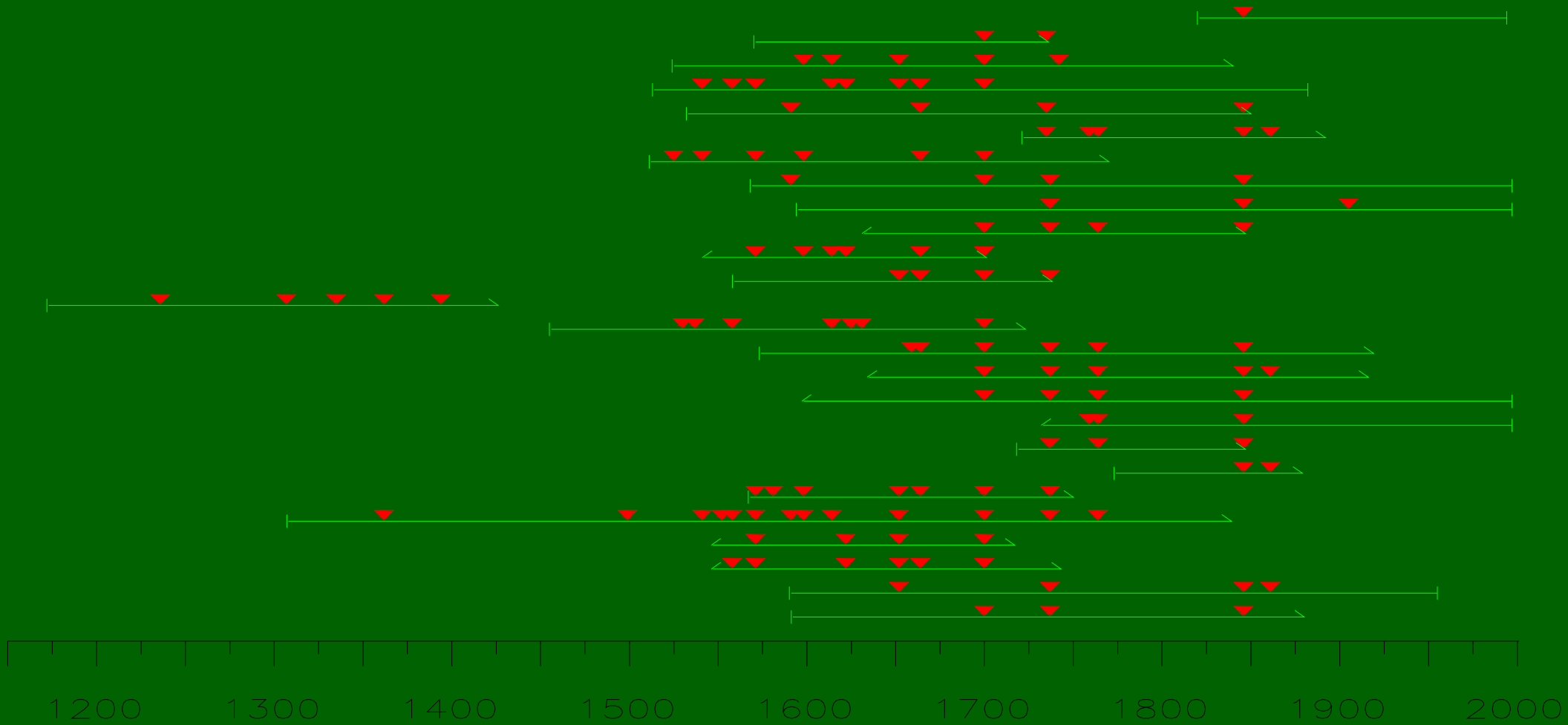
• 1805

• 1803

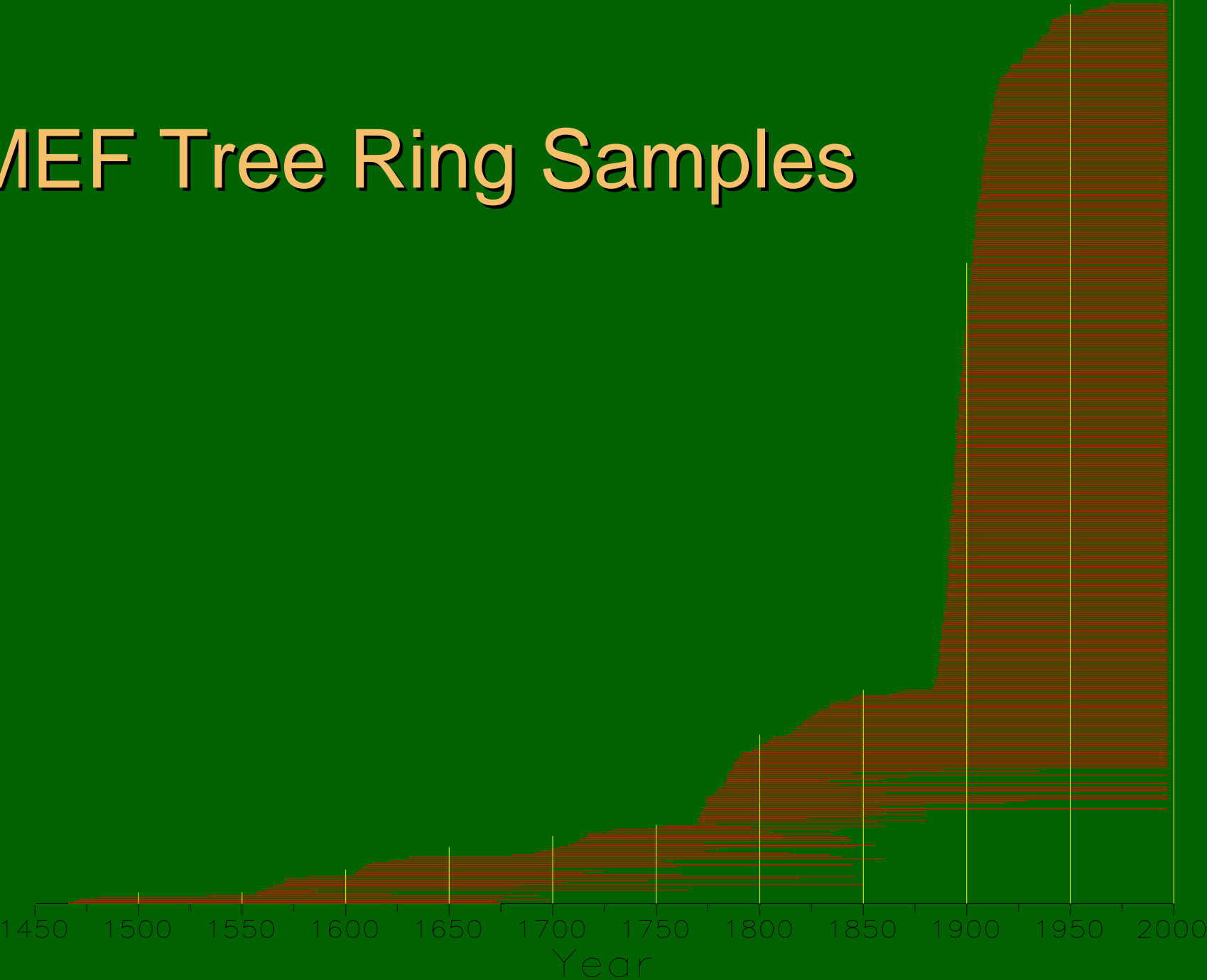
• 1800

• 1793

# MEF Fire Chronology



# MEF Tree Ring Samples













# I. Need for fuels treatment

- **Infrequent High Intensity Stand Replacement Fire Regimes** – need to restore landscape structure

# Subalpine Forests



# Fuels treatments in stand replacement fire regime forests

- Break up continuity of fuels at the landscape scale
- Introduce new age classes into landscapes
- Revert to earlier successional stages (aspen, shrubs, and lodgepole pine)

## II. Potential Biomass Available

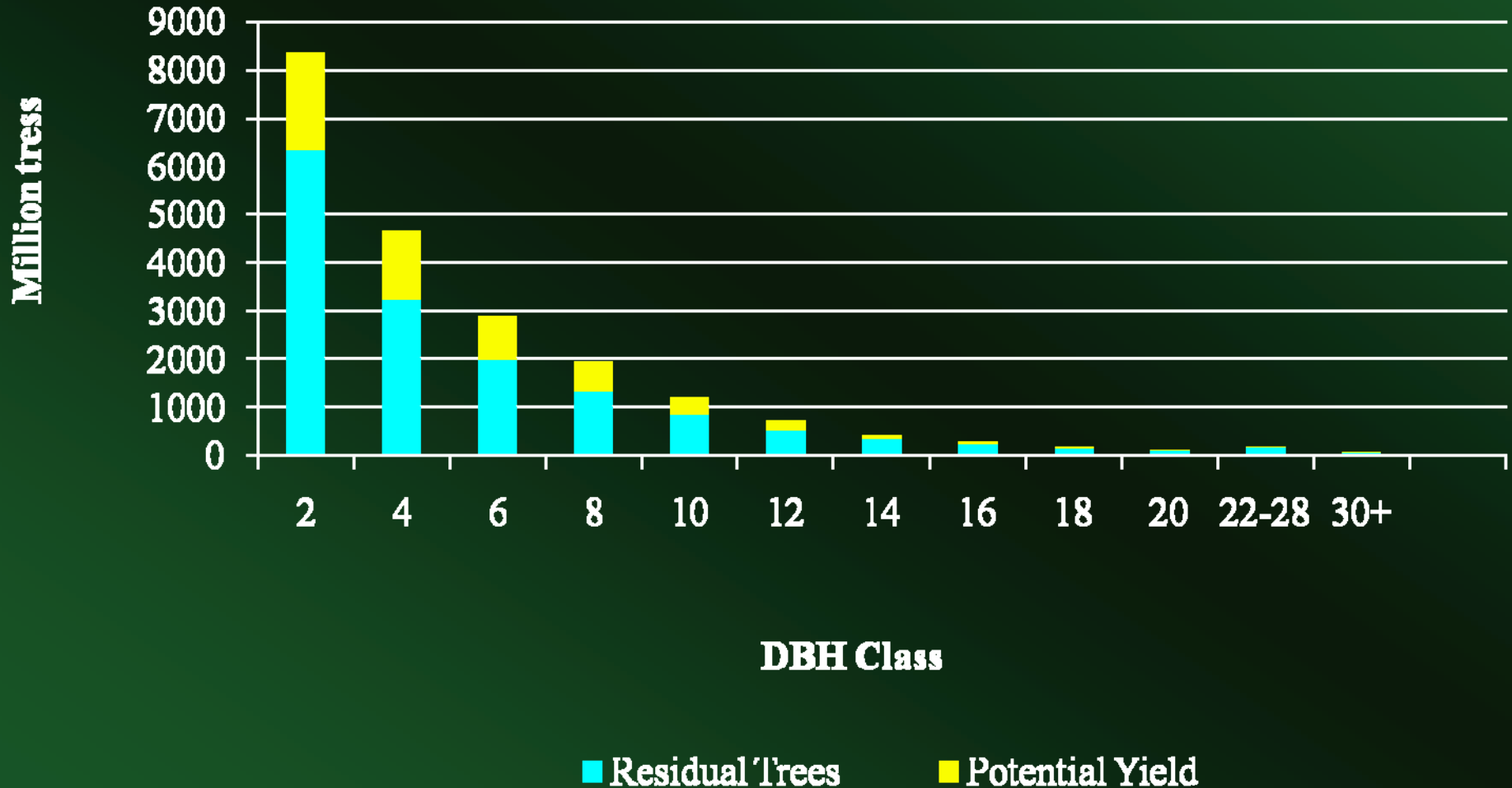
- Miles, Patrick D.; Skog, Kenneth E.; Shepperd, Wayne D.; Reinhardt, Elizabeth D.; Fight, Roger D. 2006. Broad-scale assessment of fuel treatment opportunities. Proceedings of the sixth annual forest inventory and analysis symposium; Denver, Colo., September 21-24. 2004. Gen. Tech. Report WO 70. Washington, D.C.: U.S. Dept. of Agriculture, Forest Service; p. 29-34.  
(<http://www.treearch.fs.fed.us/pubs/14241>)
- Used FIA data and selected WUI lands in 15 western states
- Used Fuel Treatment Evaluator program to thin forests to CI = 20 mph, or 30% relative density (SDI)

# FTE Results

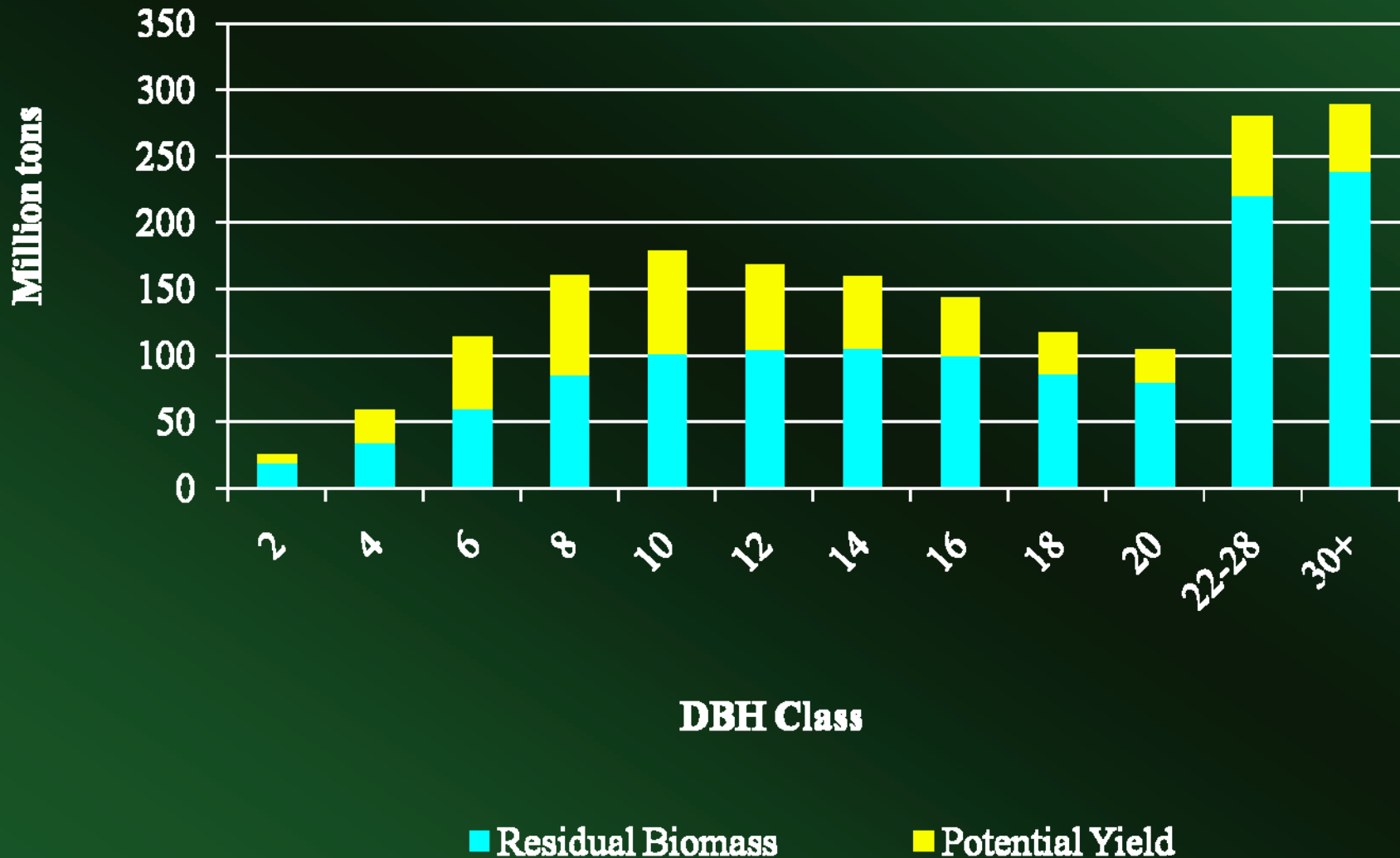
State	Total treatable acres	Potential yield (dry tons)
Montana	2,648,318	70,929,635
Colorado	2,549,387	65,551,237
California	2,132,695	97,676,889
Idaho	1,892,542	60,361,378
Washington	1,621,094	68,053,090
Oregon	1,371,935	63,667,586
Utah	870,716	23,073,807
Wyoming	847,337	23,797,380
Kansas	751,545	17,186,238
New Mexico	638,171	16,646,198
Nebraska	470,594	10,750,054
North Dakota	193,428	4,528,753
Arizona	181,743	6,922,558
South Dakota	145,438	2,698,311
Nevada	40,904	883,991
Total	16,355,846	532,727,105



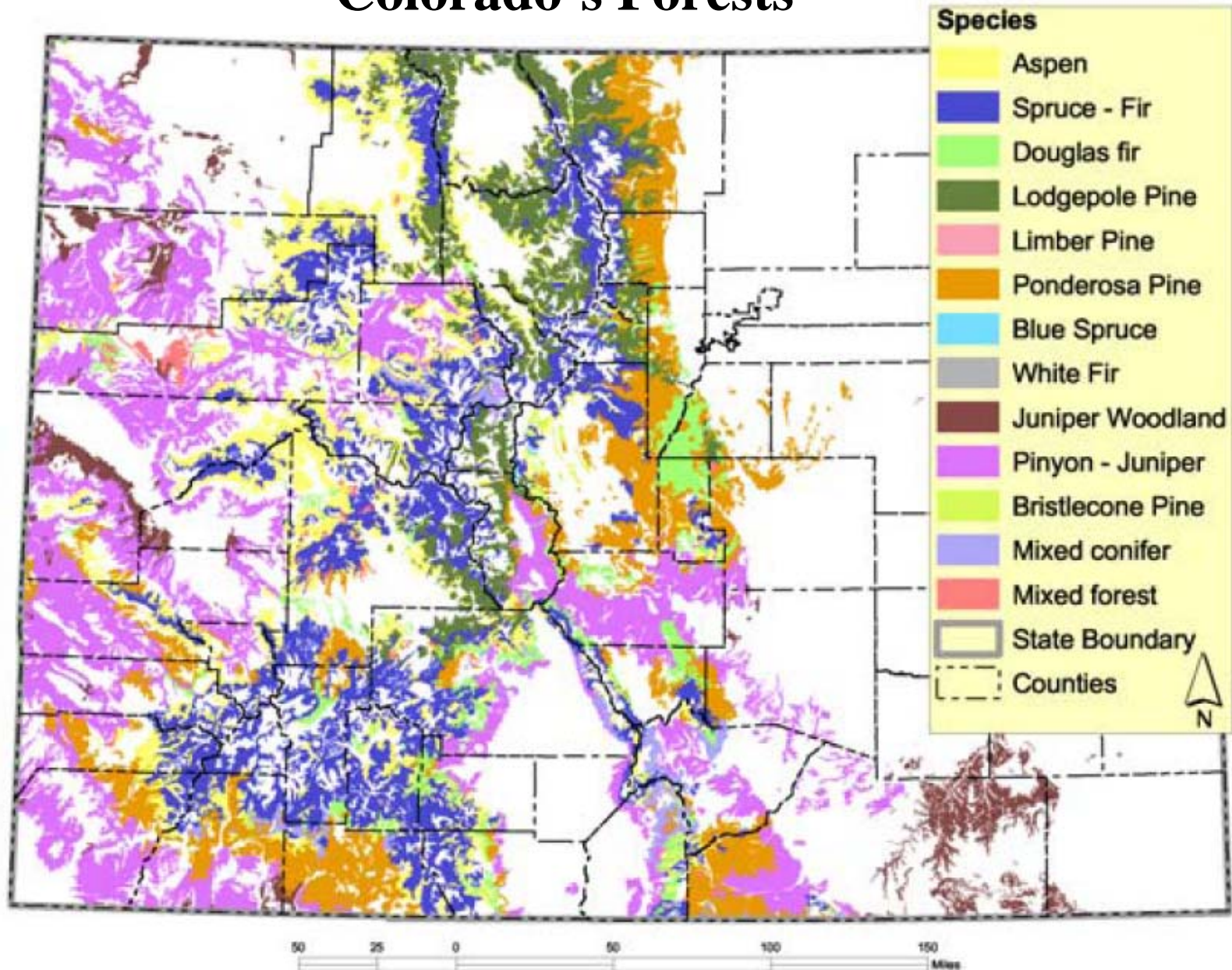
# Number of trees by size class



# Biomass by size class



# Colorado's Forests



# Colorado's Forest Resources

<b>Forest Type</b>	<b>Acres</b>
Ponderosa pine	1,542,000
Douglas-fir	863,200
Spruce-fir	652,100
Lodgepole pine	454,700
Aspen	1,009,200
Other Hardwood	105,700
<b>Total</b>	<b>4,626,900</b>

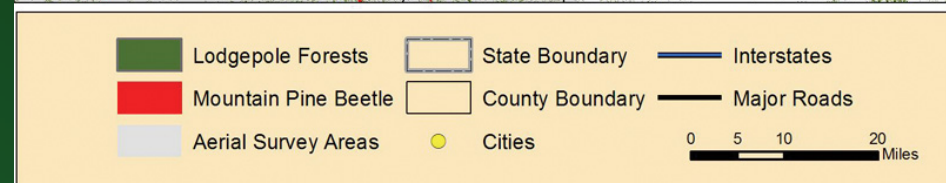
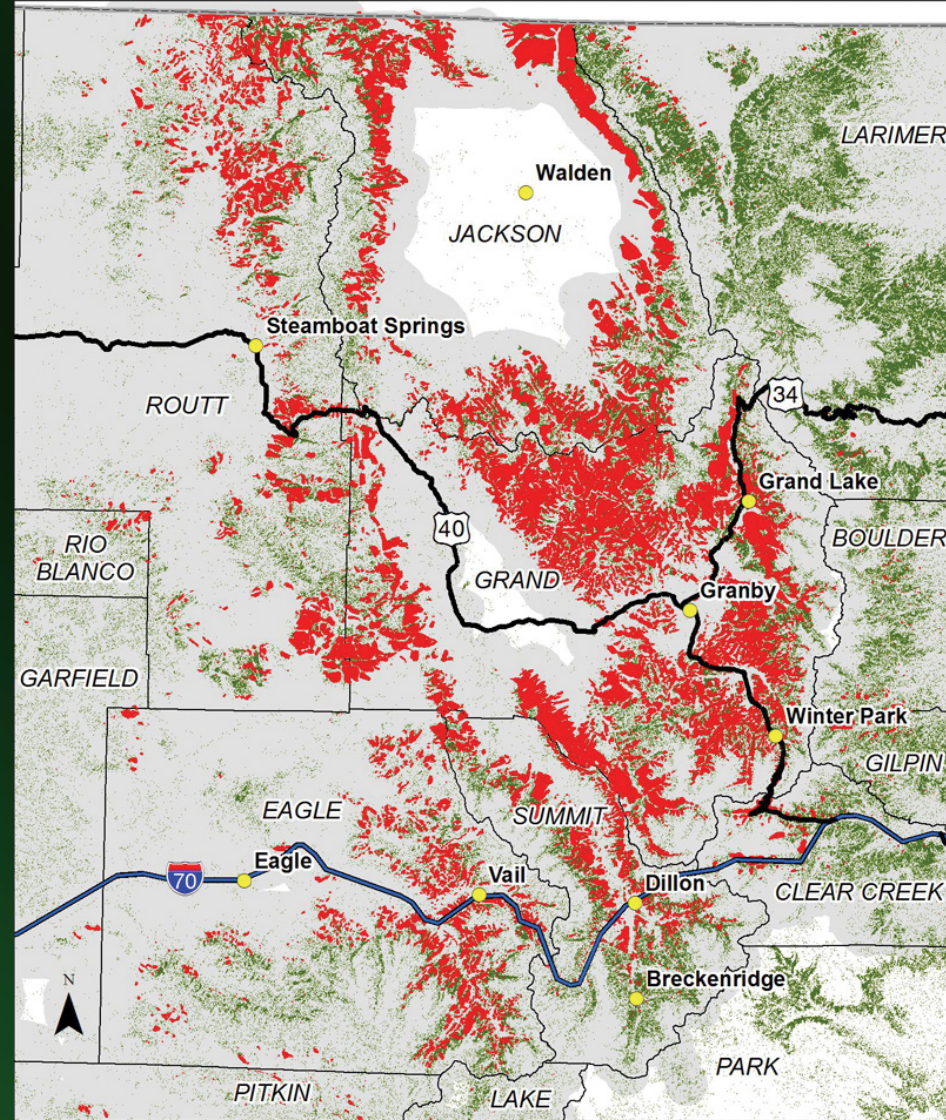
Source: 2001 State-wide Forest Legacy Assessment Need

### III. Implications of insect outbreaks on biomass supply

# Mountain Pine Beetle



# Mountain Pine Beetle - Northern Colorado Infestation in Lodgepole Pine 2006



# The “Hand of Death”





# Ecologic effects of MPB

- Most mature lodgepole pine forests in central and NW Colorado are affected
- Trees over 6 inches are dead or dying
- All biomass in mature pure stands is dead or dying
- Mature Lodgepole component of mixed stands is dead
- **Westwide, MPB isn't the only bug in the woods!**

# MBP effects on Biomass Supply

- Initially, more dead wood than can be utilized
- Potential for utilization will diminish with time
- Biomass supply will remain low until pure forests re-grow
- Increased growth in mixed-species forests will partially offset loss of supply from pure
- **Active management will be needed to insure a future economically sustainable biomass supply!**

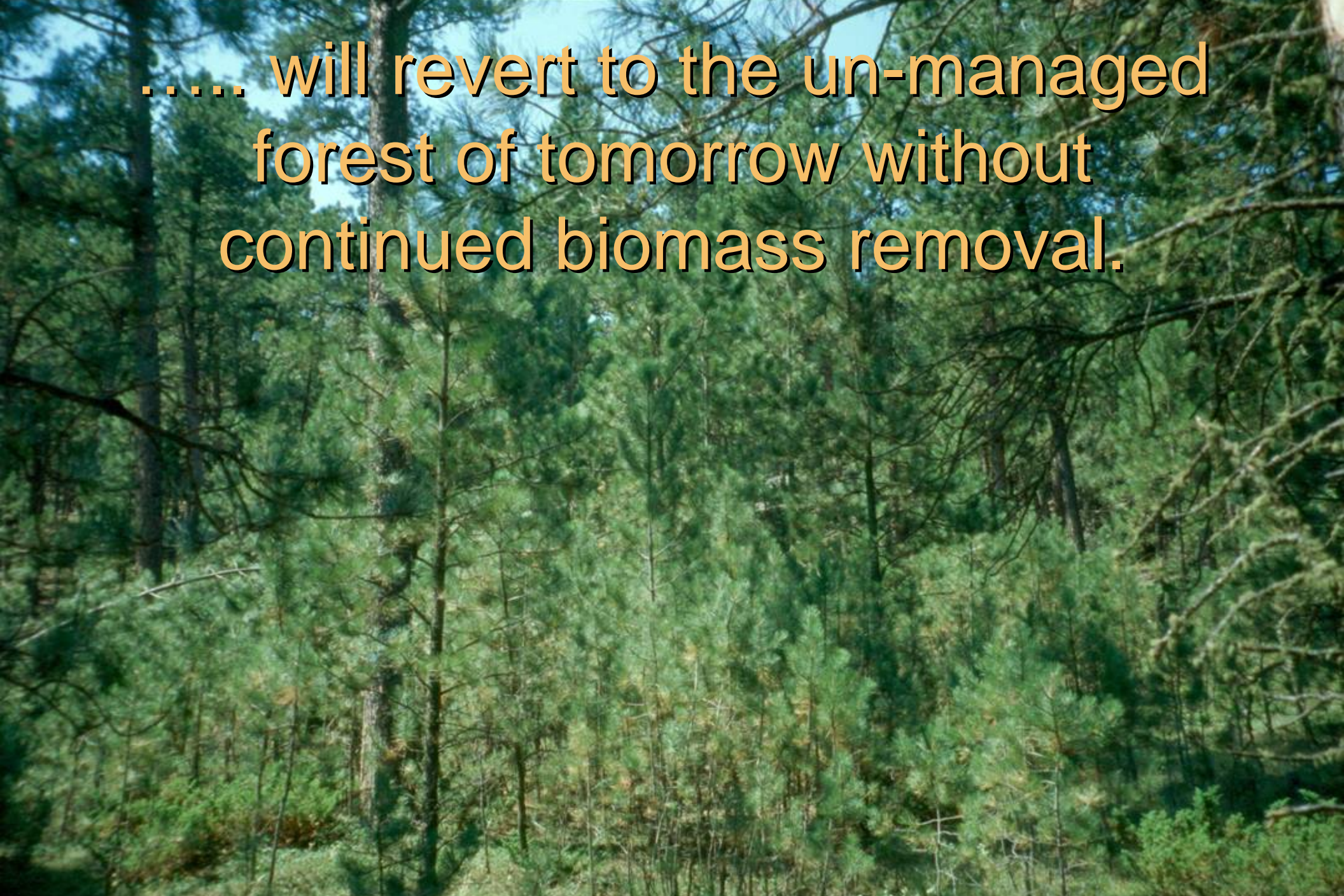
# Need for Active Management

- Establish and maximize growth of new forests in areas where Insects killed all trees
- Maintain healthy and productive mixed-species forests where insects only killed one species
- Manage fuel treatment areas to maintain healthy forests and reduced wildfire risk

Remember, the managed forest of today.....



..... will revert to the un-managed forest of tomorrow without continued biomass removal.



The End