Lodgepole Pine Ecology In the Wild…

Mike Ryan
USDA Forest Service, RMRS

With help from

Bill Romme
Colorado State University

Dan Kashian
Wayne State University

The Strife of Lodgepole Pine:

"In spite of its length, this trail is not strenuous, but is not recommended for visitors hoping for scenic vistas or heart-warming old-growth forests . . . rather than a grand finale, the trail's final 4.3 miles is mired in monotonous, unexciting lodgepole pine forest."

--- Trail Guide for Arapaho-Roosevelt National Forest

The Strife of Lodgepole Pine:

"Thank goodness for these fires – we'll be far better off in the long run with more meadows and less lodgepole pine."

--- District Ranger, Yellowstone National Park, 1988

Lodgepole Pine Ecology

- Life cycle of lodgepole pine forests
- Compare with Ponderosa pine
- Lodgepole pine forests and mountain pine beetle

Lifecycle

Trees and forests go through a lifecycle, just like humans. We often don't realize this because they usually live much longer than we do.

Lifecycle – Rebirth

Serotinous cones open after fire and produce many seedlings. Early cone production (< 15 years) helps fill in any gaps

Lifecycle – Old Age > 230 years old

Many stands have been attacked by beetles

Forest thins as large trees are replaced by new regeneration

500 stems/ac

Beetle killed

Lifecycle – Death

Lodgepole forests usually end with a stand replacing fire every 200-350 years

Compare Lodgepole to Ponderosa Pine

Historically open woodlands

Burned by light surface fires every
10 to 30 years

Compare Lodgepole to Ponderosa Pine

Cones and seeds destroyed in crown fire = poor or no regeneration

Fire management may reduce risk of crown fire and restore historical forest structure

Lodgepole versus Ponderosa pine

Usually has dense stands.

Crown fire regime at 200 - 350 years.

Fire regime and age structure may be out of balance – but less so than for Ponderosa pine

Lodgepole Pine and the Mountain Pine Beetle: MPB is a native species and outbreaks were common in the past

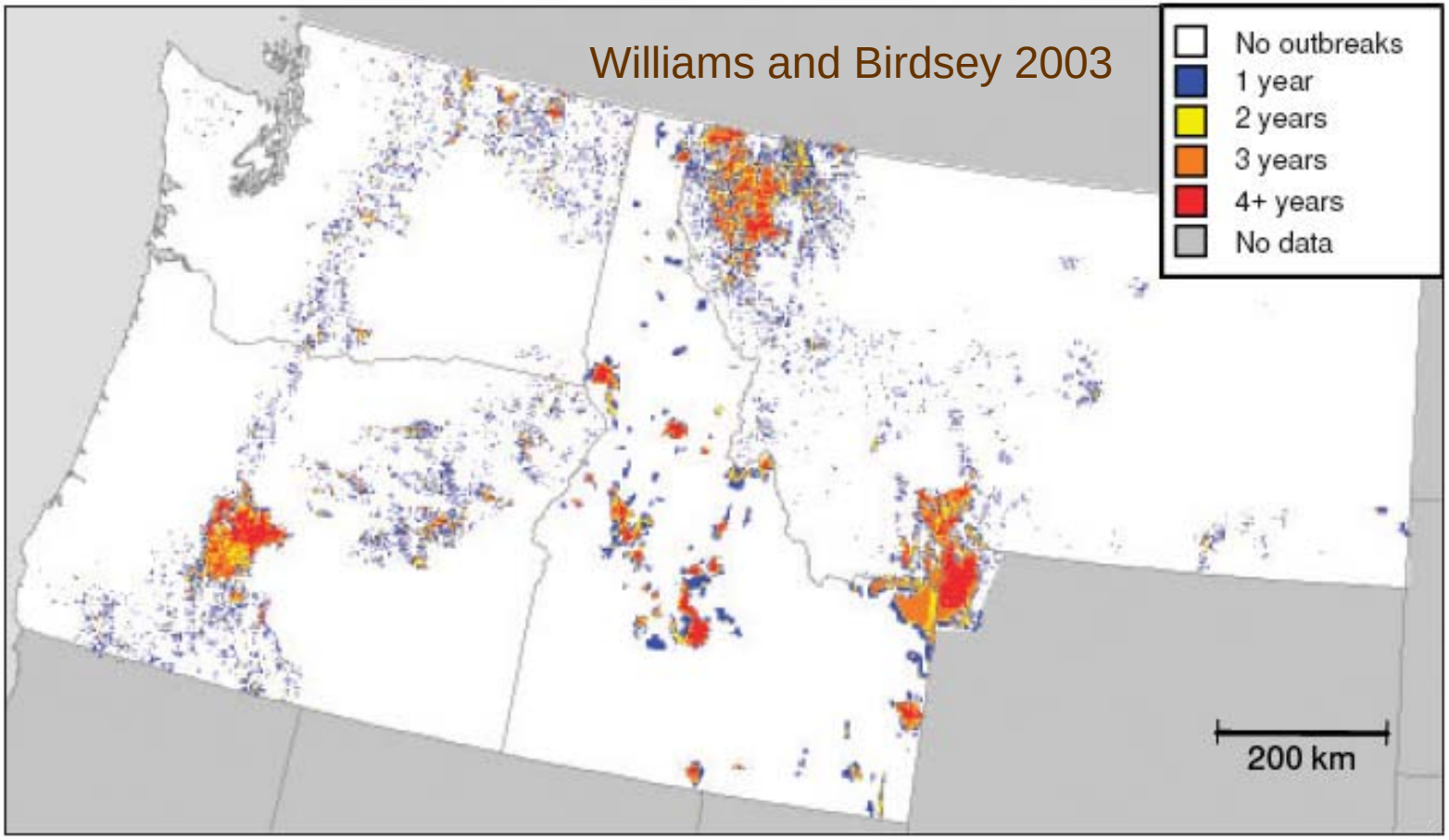
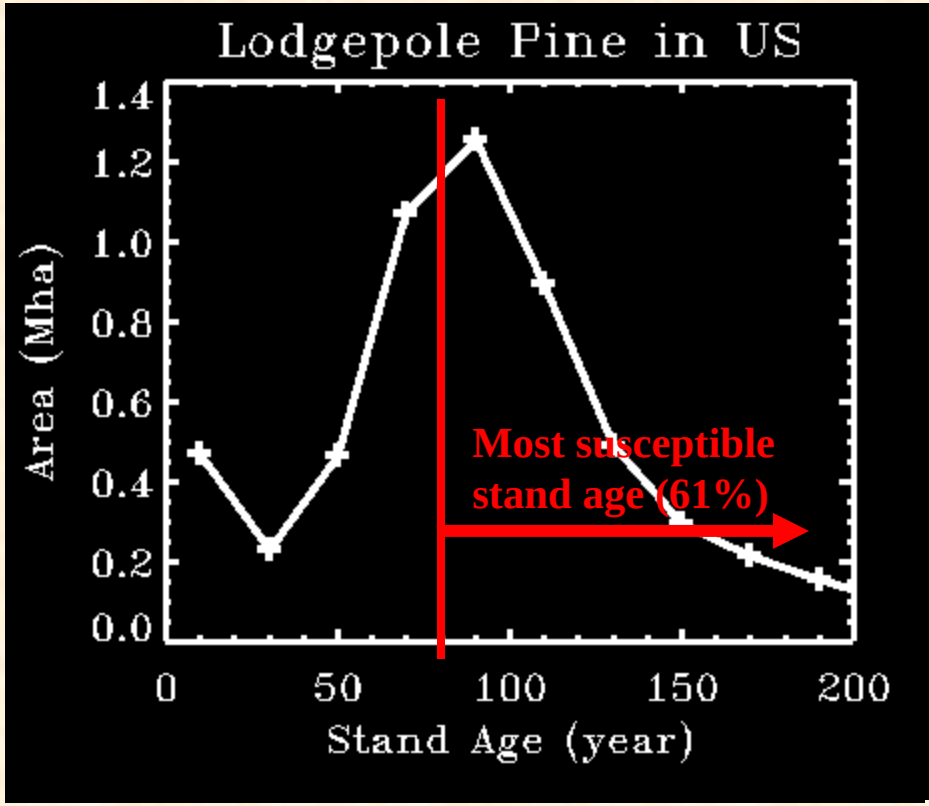
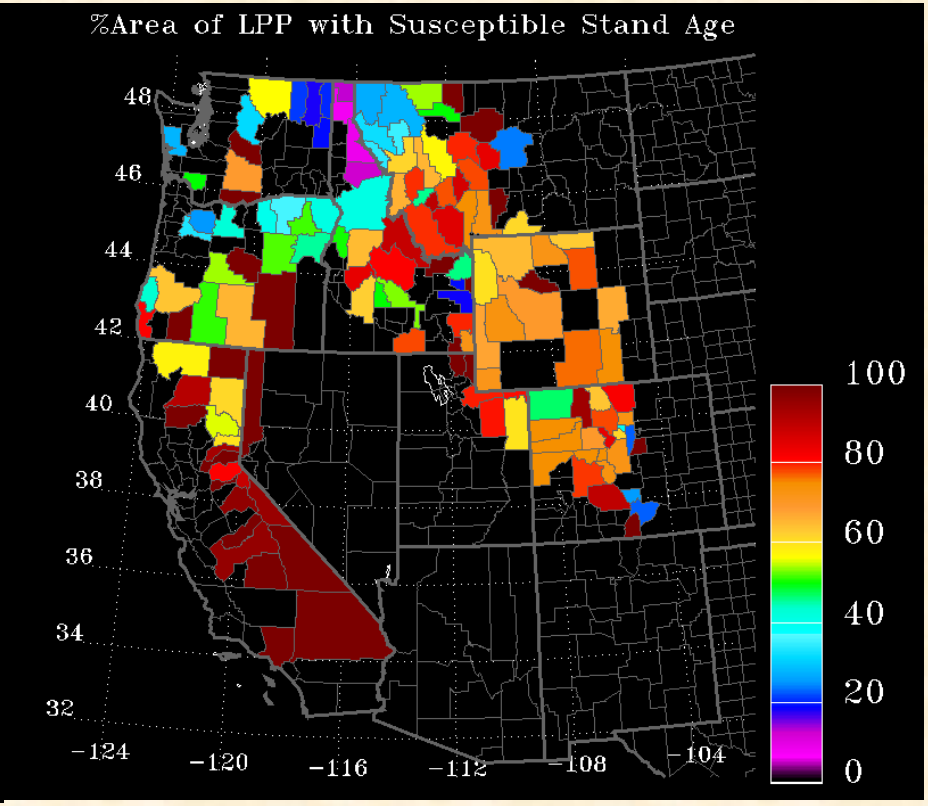


Figure 2q.—Frequency of outbreaks by mountain pine beetle from 1980 to 1995.

Currently, a large amount of lodgepole pine is susceptible to MPB infestation

Couple with lack of cold winters lead to larger outbreaks

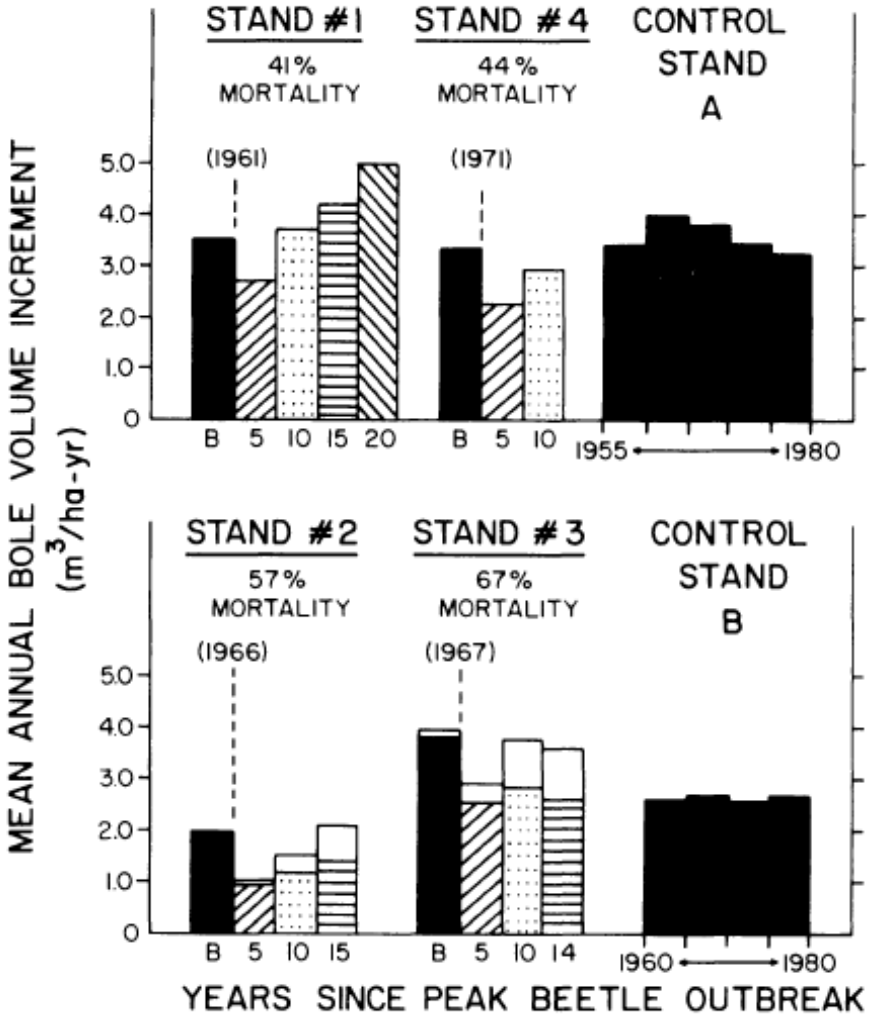




Hicke et al., *in preparation*

Forest productivity is reduced temporarily after a bark beetle outbreak … but quickly recovers

The beetle-caused mortality accelerates succession by killing the dominant canopy pines and releasing the spruce & fir in the understory



Grand Teton NP
30 yr after outbreak

Take Home Points

- Lodgepole pine's lifecycle usually starts and ends with a crown fire.
- Lodgepole pine is *not* Ponderosa pine. Stands aren't unnaturally dense and frequent fires not part of their ecology.
- MPB are a natural part of the ecosystem, help lower risk of crown fire and help reset the system.
- Effects of MPB don't last forever.
- Lots we don't know.