

Forest Health: Forest Ecology, Tree Vigor, and Landowner Objectives

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WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

Forest Entomology and Pathology

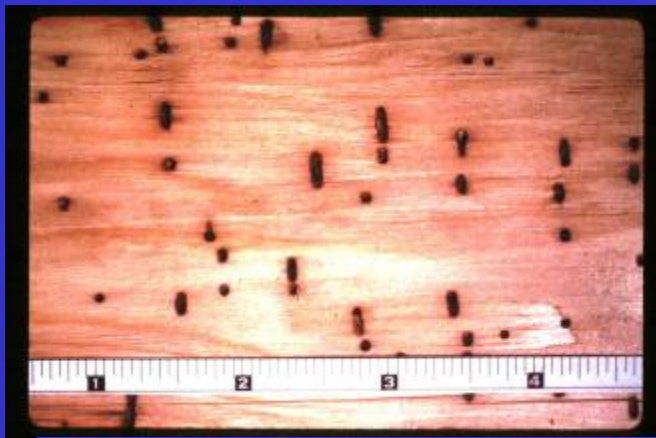
Organisms or events that:

- Kill trees
- Slow tree growth
- Damage wood products



Ips bark beetle

Weevil killed top



Ambrosia beetle damage

Forest Health

Greater attention to:

- Forest ecosystem processes
- Forests resilient and resistant to pests
- Landowner objectives



Fir engraver beetle
(*Scolytus ventralis*) gallery
in grand fir

Ecosystem Processes

Insects and diseases
cause structural
and functional
changes



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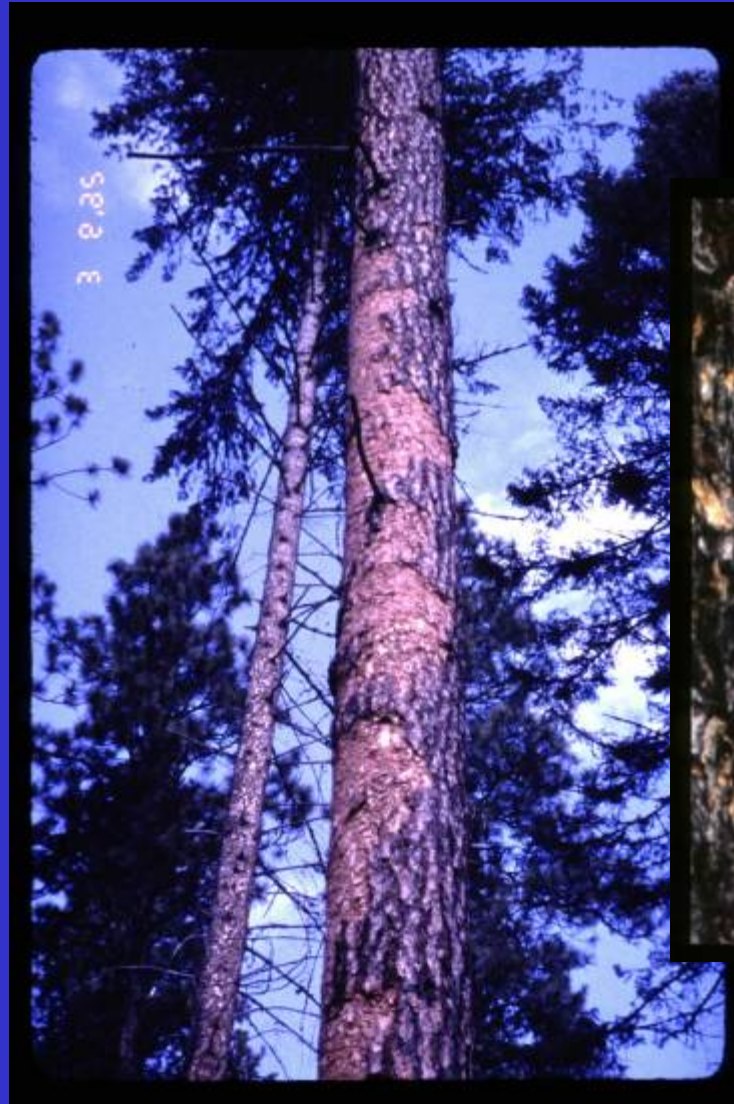
Lodgepole pine killed by
mountain pine beetle
Dendroctonus ponderosae

“Pocket” of laminated root rot *Phellinus weirii*

Ecosystem Processes

**Mortality and
decadence
produce
important
habitats**

**Western pine beetle
Dendroctonus brevicomis
killed ponderosa pine**



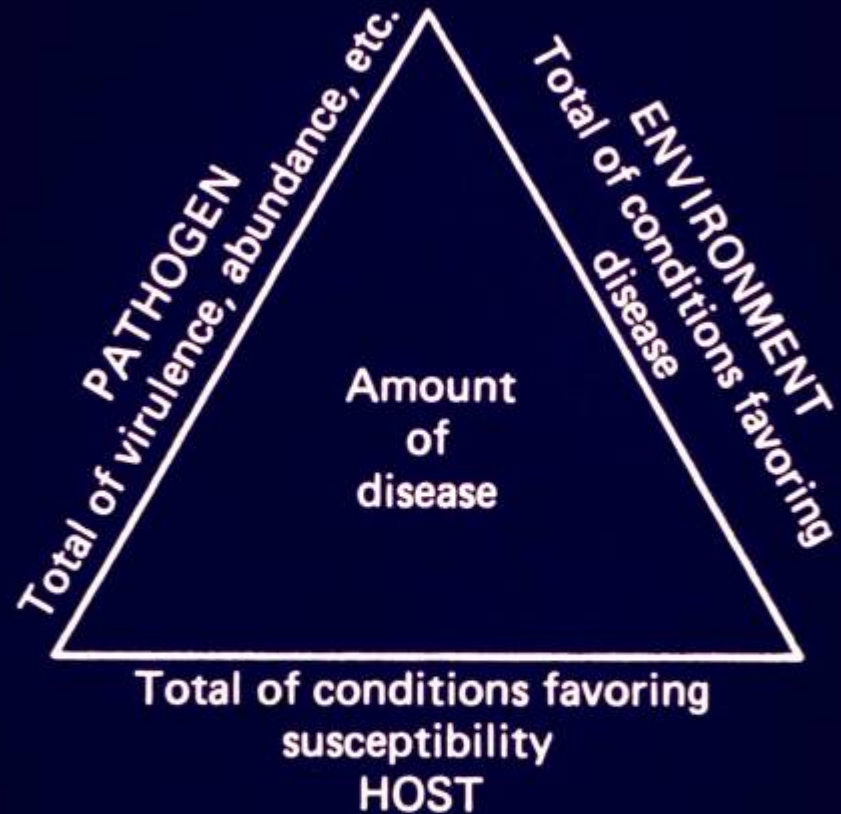
Ecosystem Processes

Some structures are highly vulnerable to change:

- Older stands
- Overstocked stands
- Stands with multiple layers



Forests resistant and resilient to insects and pathogens



Priorities for tree growth:



1. Living tissue
2. Fine root and leaf production
3. Flower and seed production
4. Height, branch, root growth. Scar tissue.
5. Diameter growth and resistance to insects and diseases
6. Storage

Vigorous trees can resist insects and pathogens

Pitch tubes



Caterpillar feet



Vigorous trees can recover from damage or disease



Adventitious root growth



Fire scorched ponderosa pine

Exotic Pests are BAD



Balsam woolly adelgid

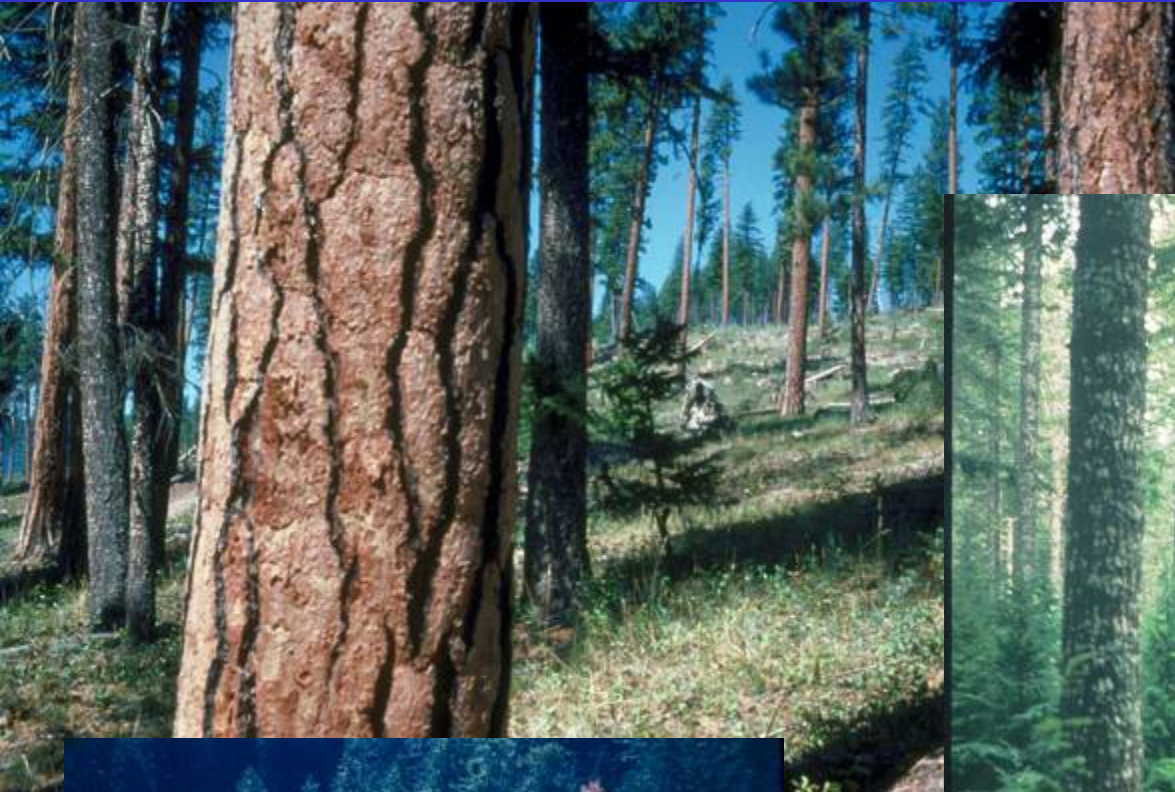
Asian Long-horned Beetle



Gypsy moth



Landowner Objectives



Landowner Objectives:

Successful Regeneration

- Seedlings are vulnerable to pests and the environment
- Failure is expensive
- Seed zone
- “Go down one step in the series”



Landowner Objectives: Prevent Losses

- Improved stands represent more investment
- Critical habitats
- New tools are available



Landowner Objectives: Intensive Management

- Critical needs
- Responsible profits
- New pests



Monitor damage level and insect populations in order to make appropriate management choices



**Douglas-fir tussock moth
early warning trap**



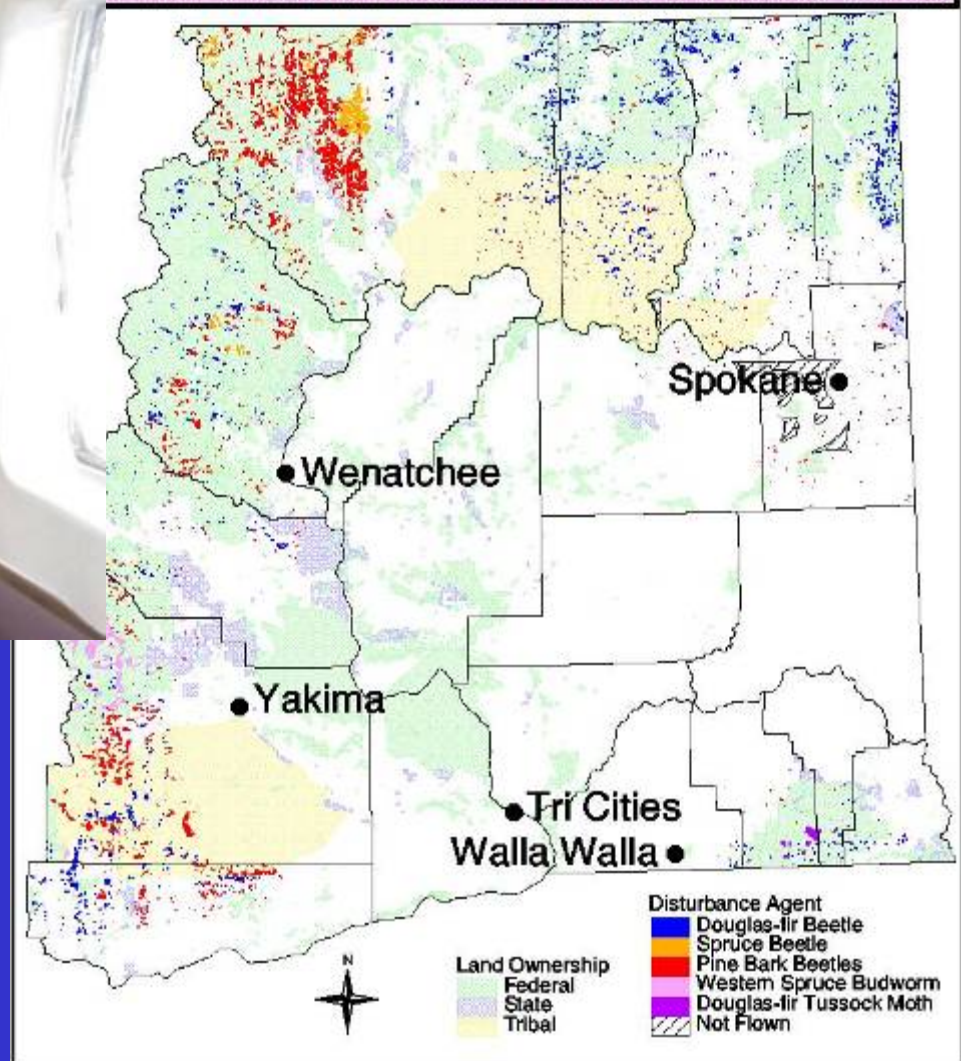
**Douglas-fir tussock moth
egg masses and female moths**

Monitor damage level and insect populations

Eastern Washington Forest Pest Conditions 2002



Aerial observer: Jeff Moore

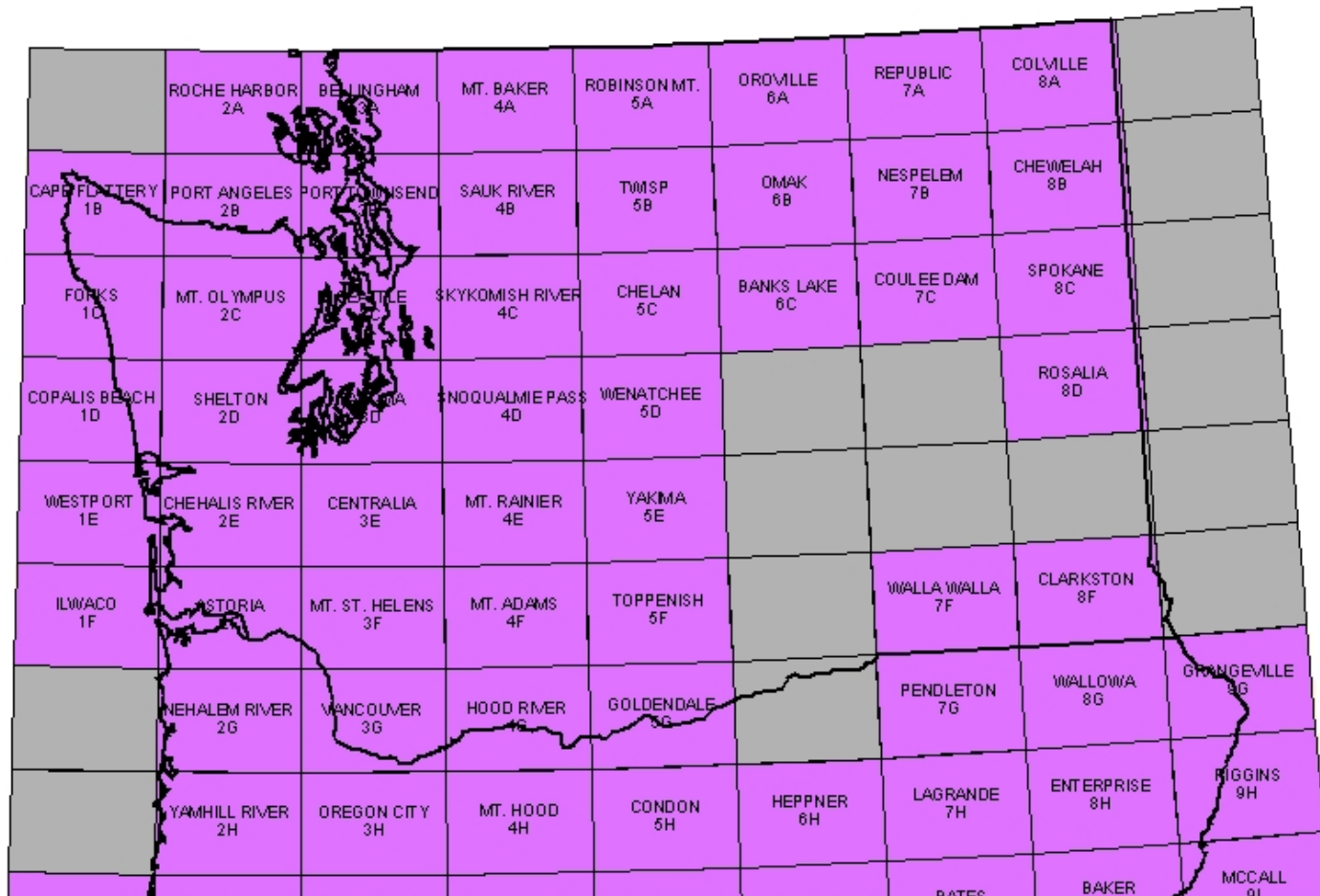


Summary Map

See your own land:

<http://www.fs.fed.us/r6/nr/fid/as/quad/>

2003 Final Aerial Survey Data Maps Available



Conclusions:

- **Vigorous trees are GOOD**
- **Exotic Pests are BAD**



Recognize important insects and diseases

- Signs and symptoms
- Potential impact to landowner objectives



Recognize:

- High risk habitats
- Management techniques



More information:

www.fs.fed.us/r6/nr/fid

**Annual reports, pamphlets and
aerial survey data**

DNR's Forest Health Program

(360) 902-1300

**Common Tree Diseases of
British Columbia**

(250) 363-0600