State of the State: 2017 Insect Trends

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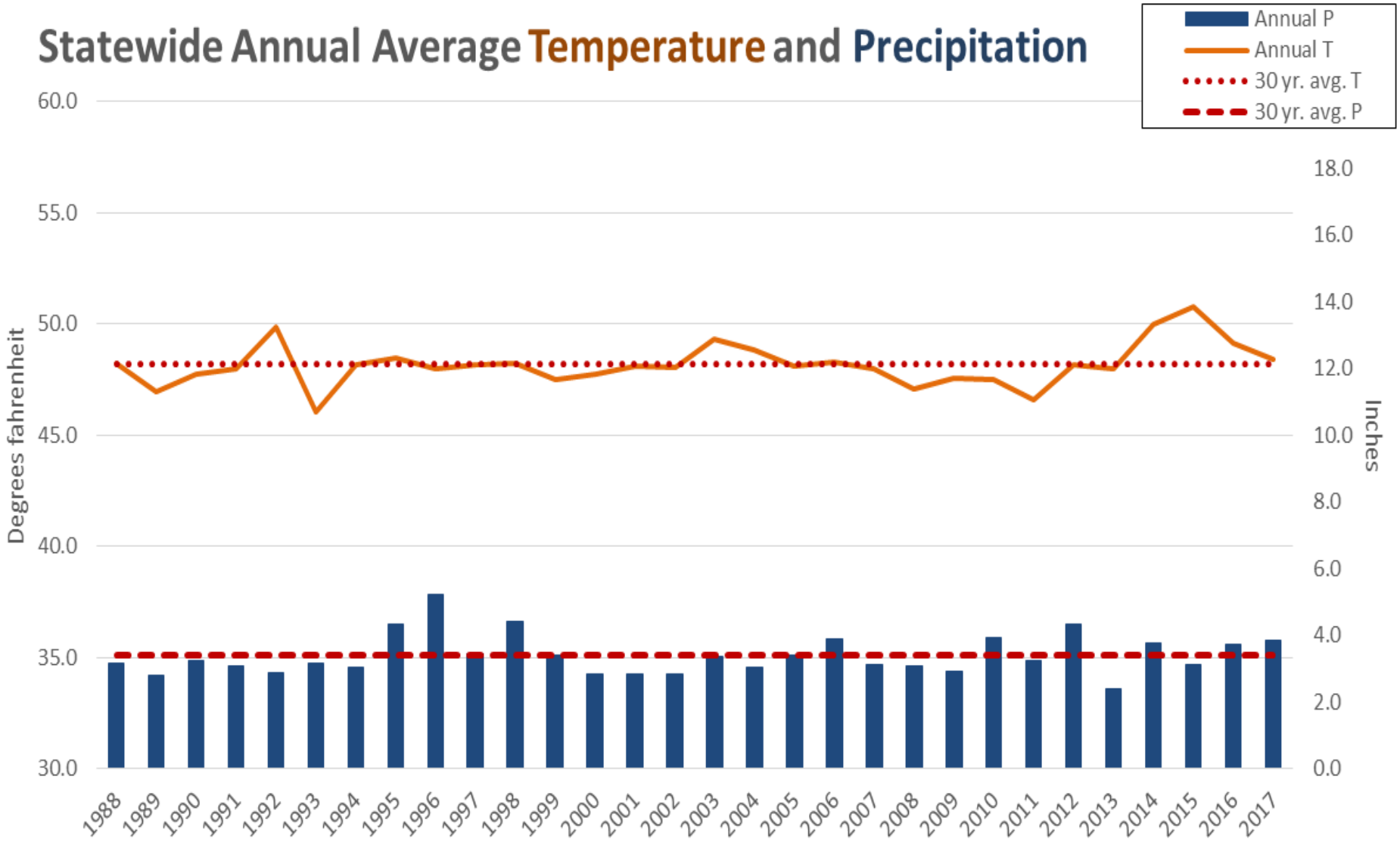
ODF Entomologist

Precursors to insect damage

- Poor or inappropriate location for tree species/cultivar
- Poor or inappropriate site quality
- Drought, waterlogging
- Competition
- Mechanical or chemical injury
- Fire, ice, wind and other environmental damage
- Prior vertebrate, insect, pathogen damage
- Old age/low vigor

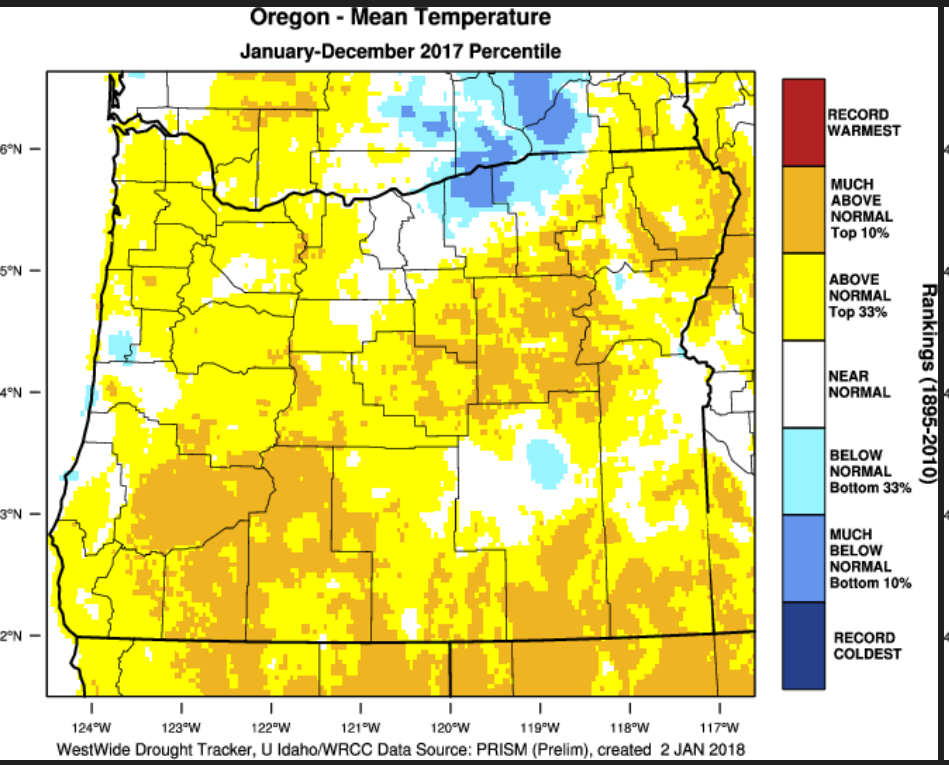
STRESSED TREES = SUSCEPTIBLE TREES

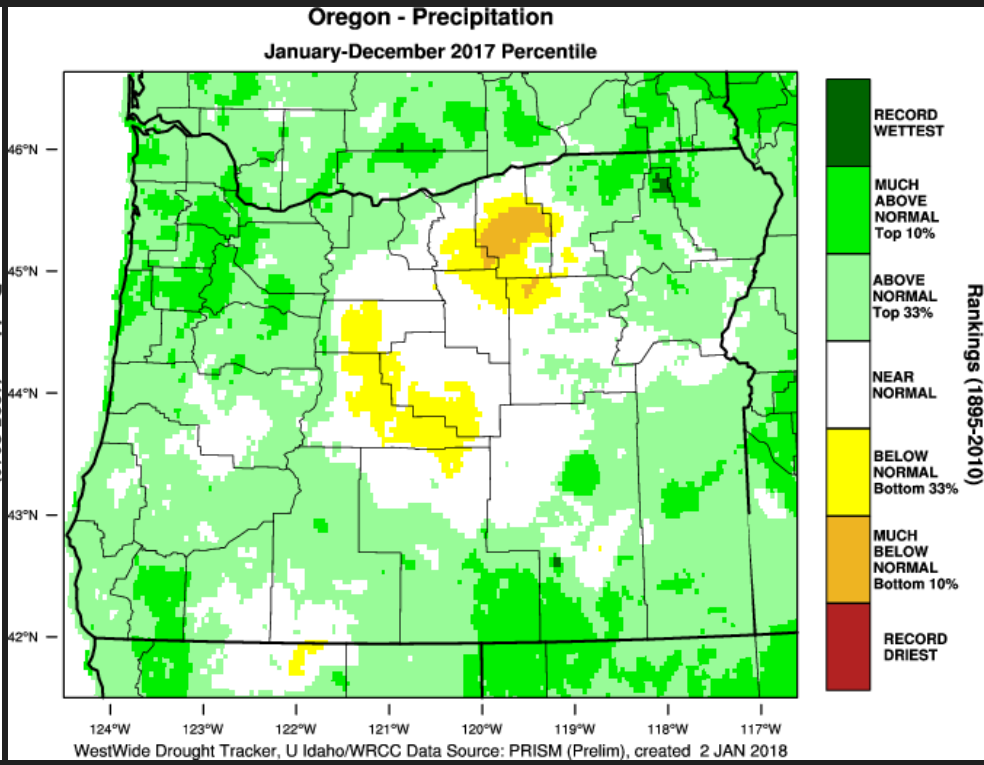
Drought and climate change



Drought and climate change

Drought = extended warm and/or dry days
lack of consistent precipitation (+snowpack)





Data: Western Regional Climate Center

Drought impacts on trees

Long-term impacts to trees:

- Collapsed vascular system
- Atrophied roots
- Less resources for growth & defense

Susceptibility

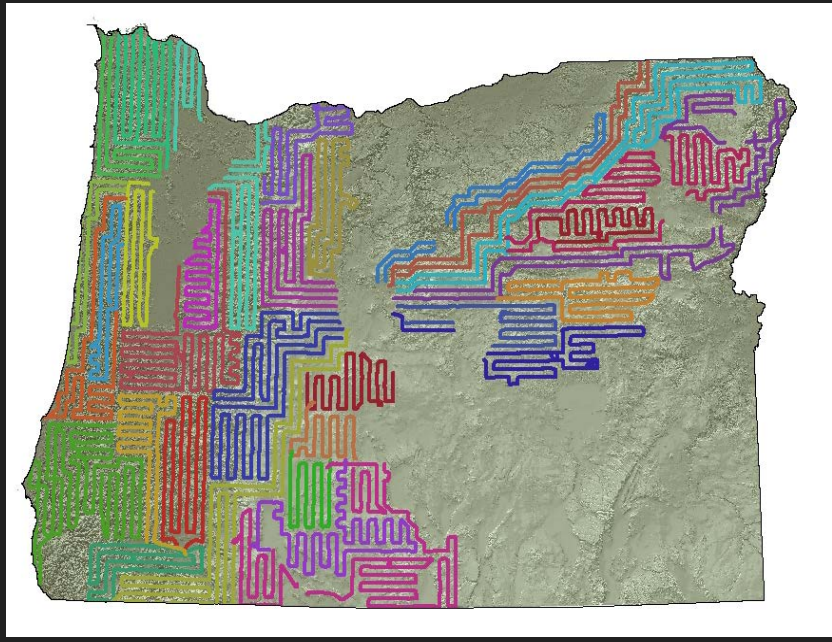
Douglas-fir
Western red cedar
Grand and noble fir
Ponderosa pine
Red alder

Aerial survey

How is this data collected?

- ~120 mph and 2,000 feet

Flight path

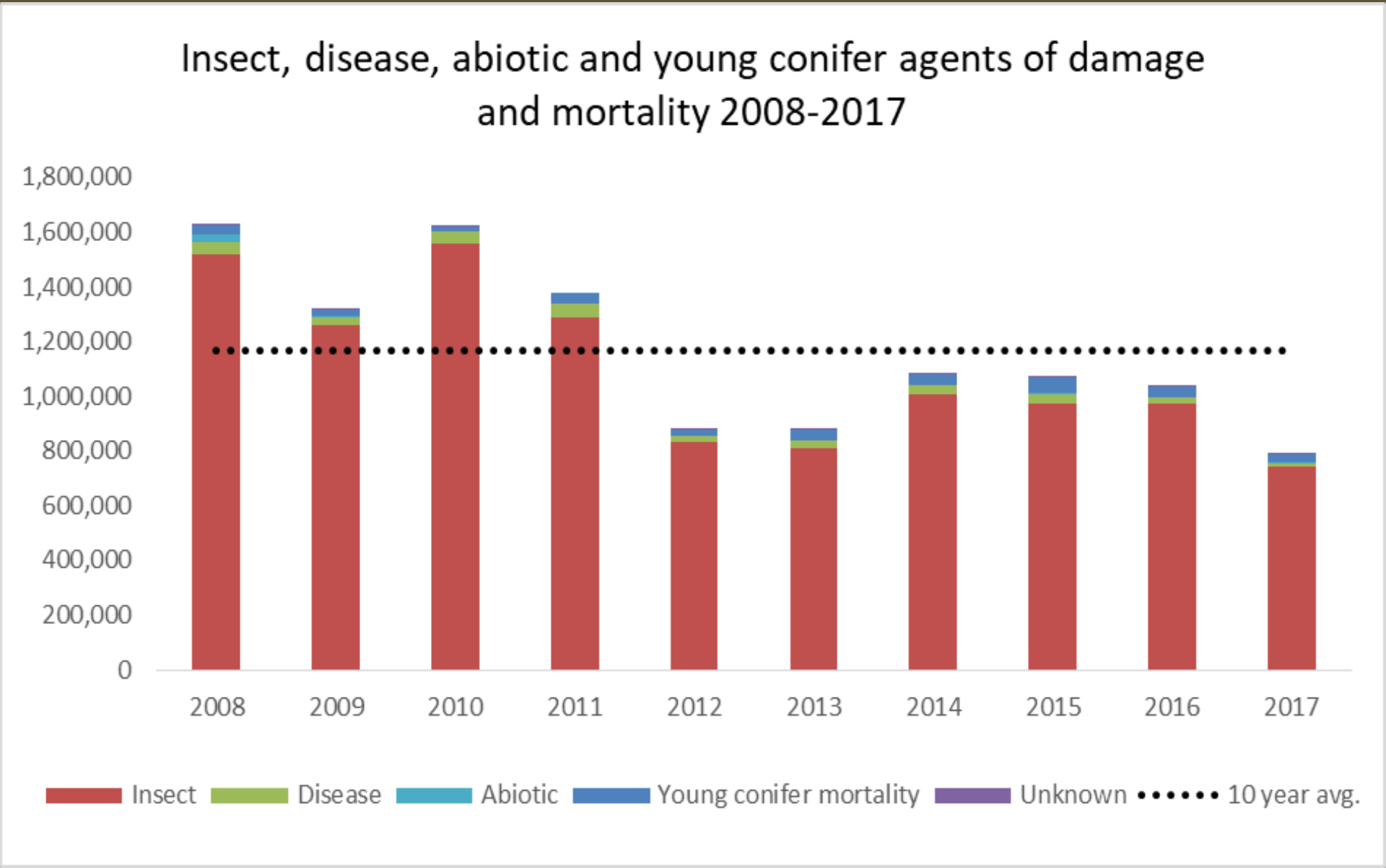


How should this data be used?

- Snapshot in time and space
- Some agents not identifiable
- Acres <u>with</u> not *of* damage
- Location and agents are estimated
- Does not account for complexes and may single out incorrect agent as primary stressor

Aerial survey

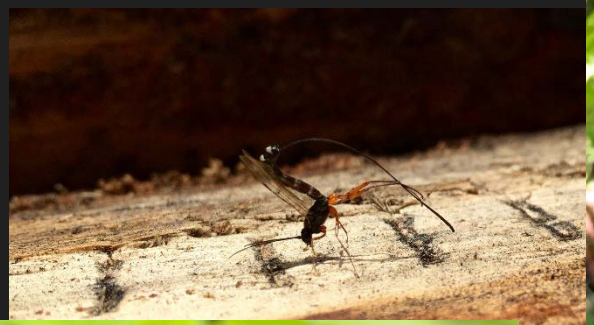
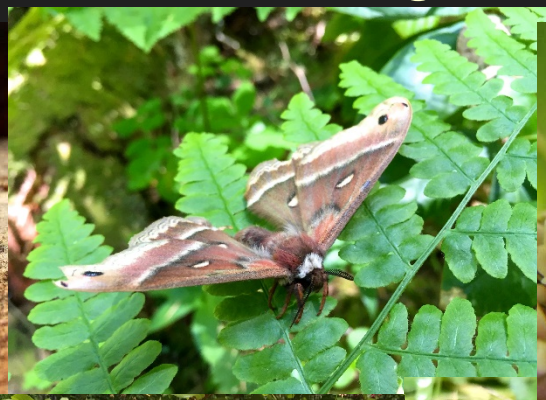
Damage totals



Insects: necessary for healthy forests

Ecosystem services:

- Natural enemies (predators and parasites)
- Prey for wildlife
- Decomposition and nutrient cycling
- Selective removal of less vigorous trees




…and some of us find them aesthetically pleasing!

When insects present a problem…

Fire damage perimeters

When insects present a problem…

Contiguous stands of dense trees

When insects present a problem…

Lack of natural controls

Major forest insects in Oregon

Bark Beetles

- Doug-fir beetle (*Lg. DF*)
- Fir engraver (*true fir*)
- *Ips*, mountain, western pine beetles (*pine*)

Woodboring insects

- Flatheaded fir borer (*DF*)

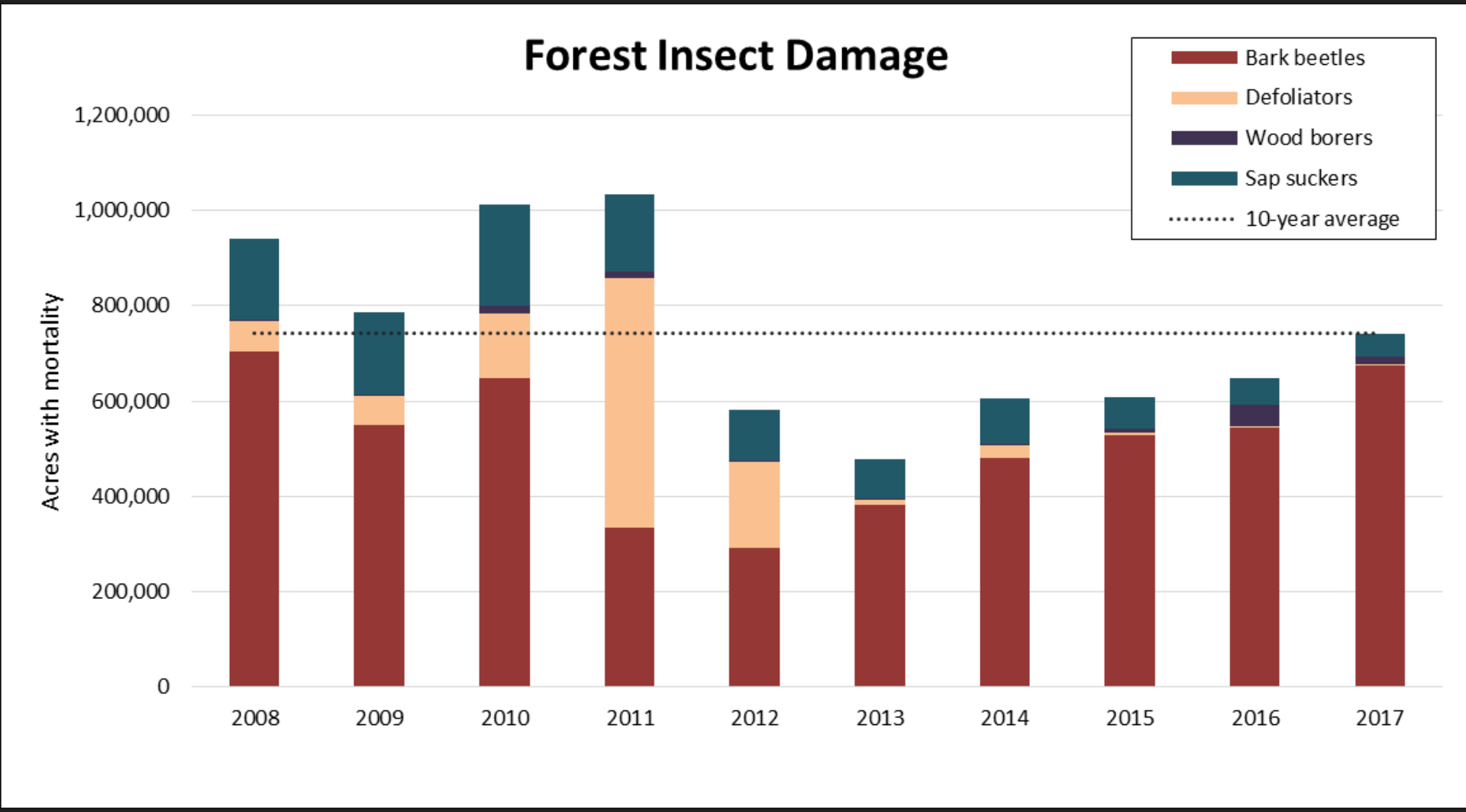
Defoliators

- Western spruce budworm (*DF, fir, etc. east of Cascades)*
- Douglas-fir tussock moth (*DF, fir, etc. east of Cascades)*
- Pine butterfly (*pine east of Cascades*)
- Oak looper, western tent caterpillar, bagworm, etc. (*Hardwoods*)

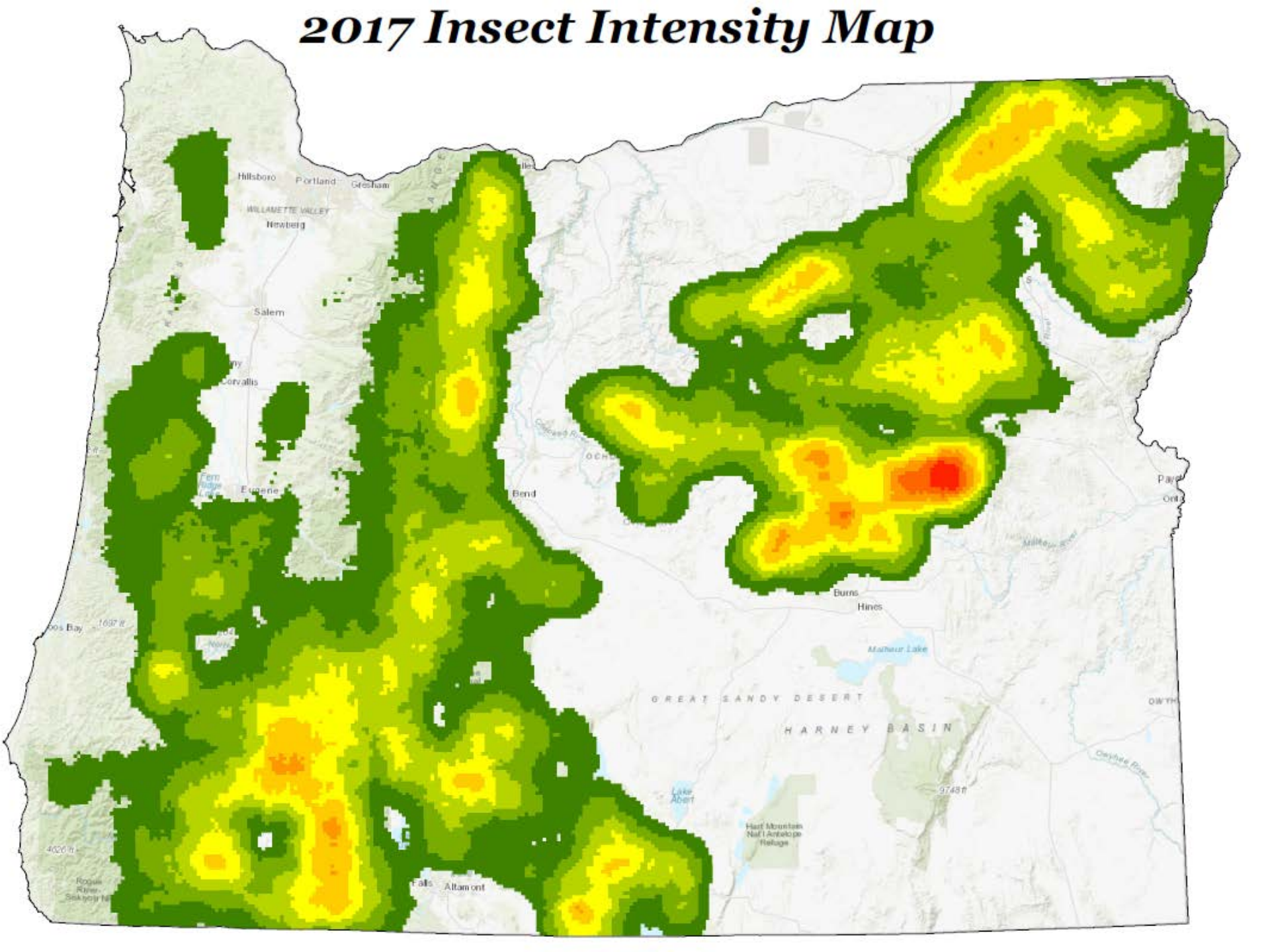
Sap-sucking insects

- Balsam woolly adelgid (*fir*)
- Black pineleaf scale (*pine, DF*)

Total insect damage trends

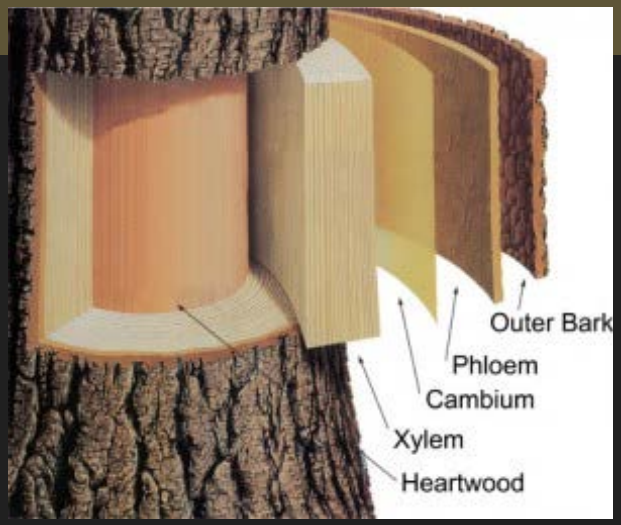


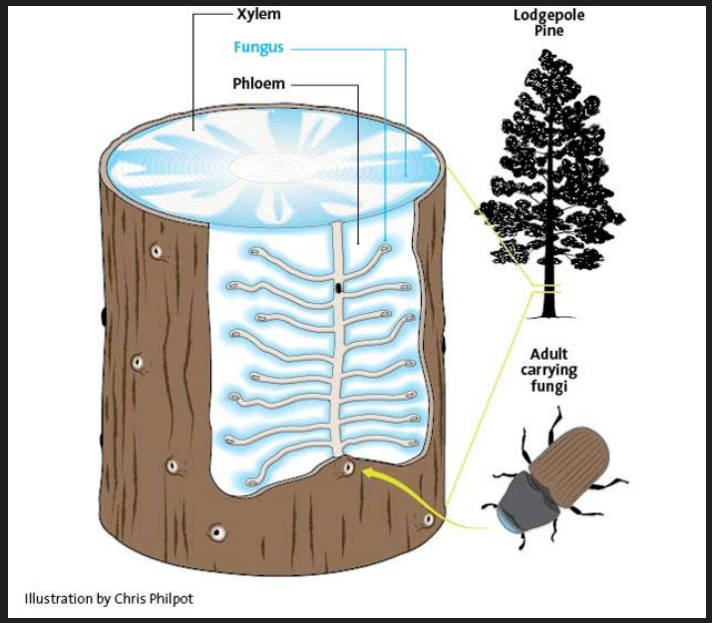
2017 Insect Intensity Map



Bark beetles

- Opportunistic, some eruptive
- Chemical signaling
- Feed on inner bark
- Introduce fungi
- Affect water and nutrient uptake





But they can also make some really cool guitars!

Douglas-fir beetle

Biology

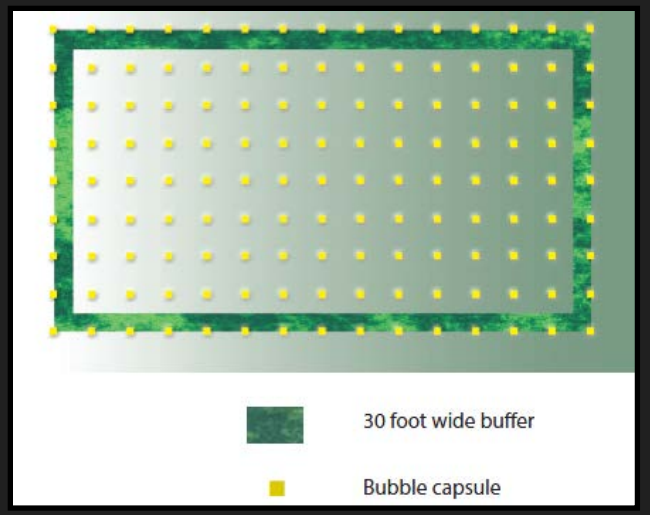
- Attacks >10” dbh Doug-fir
- Prefers blowdown (<5 down per acre ok in healthy stands)

Management

- Remove struggling trees
- Thin dense stands
- Remove downed trees or apply MCH before 1st or 2nd April after storm

Douglas-fir beetle: MCH repellant

- Repels Doug-fir beetle
- Apply before April
- 1 blister pack per tree in a grid (~30/acre)
- $80-100/acre
- Also in flake form for aerial application
- More efficacious when paired with silvicultural management



Fir engraver

Biology

- Attacks all diameter true fir
- Often secondary in root rot or dry sites (<25”/yr)

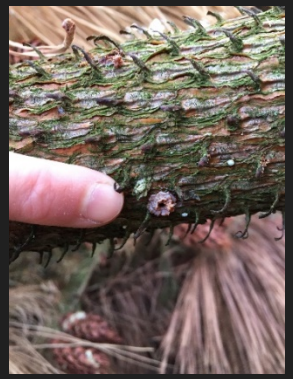
Management

- Avoid planting fir in dry or sun-exposed sites
- Manage root rot

Ips beetles

Biology

- Attacks 3-8” pine (small trees, or tops & branches)
- Prefers fresh slash

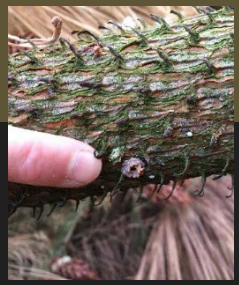


Management

- Timely and sufficient PCT
- Avoid overstocking pine on dry or scabby sites
- Timely management of slash

Slash-*Ips* cycle

1) Slash from operations or storms



2) *Ips* attacks **April-October,** develops in as little as 2 months

3) *Ips* move to standing trees

Oct-Dec. = scatter on ground

<u>or</u>

Chip or burn before April or within 1mo.

Mountain pine beetle

Biology

- Attacks >6” pine
- Prefers old (>60yr.), slow groing, overstocked (BA>100ft^2) lodgepole

Management

- *Preventative* thinning
- Verbenone repellant only in lodgepole, during outbreaks

Western pine beetle

Biology

- Attacks large ponderosa
- Prefers less vigorous or overly mature trees

Management

- Removal of damaged trees or trees that are struggling
- Manage for *Ips*

Are bark beetles still present?

Not likely

Are bark beetles still present?

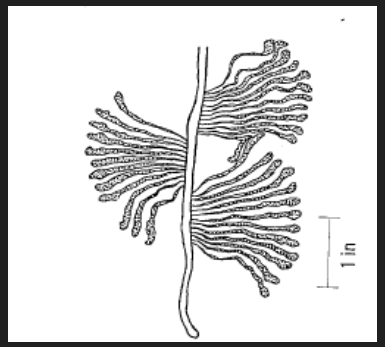
Maybe
some left

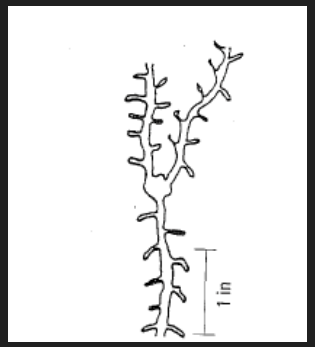
No, deeper holes indicate secondary borers have moved in

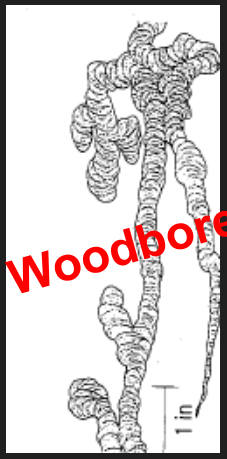
Are bark beetles still present?

Take a closer look (peek under bark…)

Are bark beetles still present?







Look for galleries

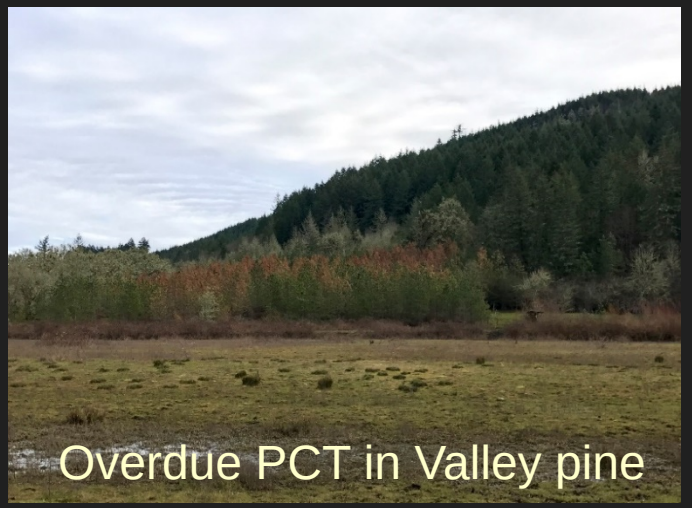
Are bark beetles still present?

Nope!

Situations that will get you into trouble…

Situations that will get you into trouble…


Overstocked lodgepole/fire suppression


Overdue PCT in Valley pine


Over-mature ponderosa/fire damage/poor site


Unsuitable site for Doug-fir or true fir

Flatheaded fir borer

Biology

- Attacks Doug-fir
- Prefers trees on dry, thin-soil or fire damaged sites

Management

- Avoid planting DF in oak/pine habitat
- Plant DF in locations with more moist microclimate
- Remove damaged or struggling DF

Balsam woolly adelgid

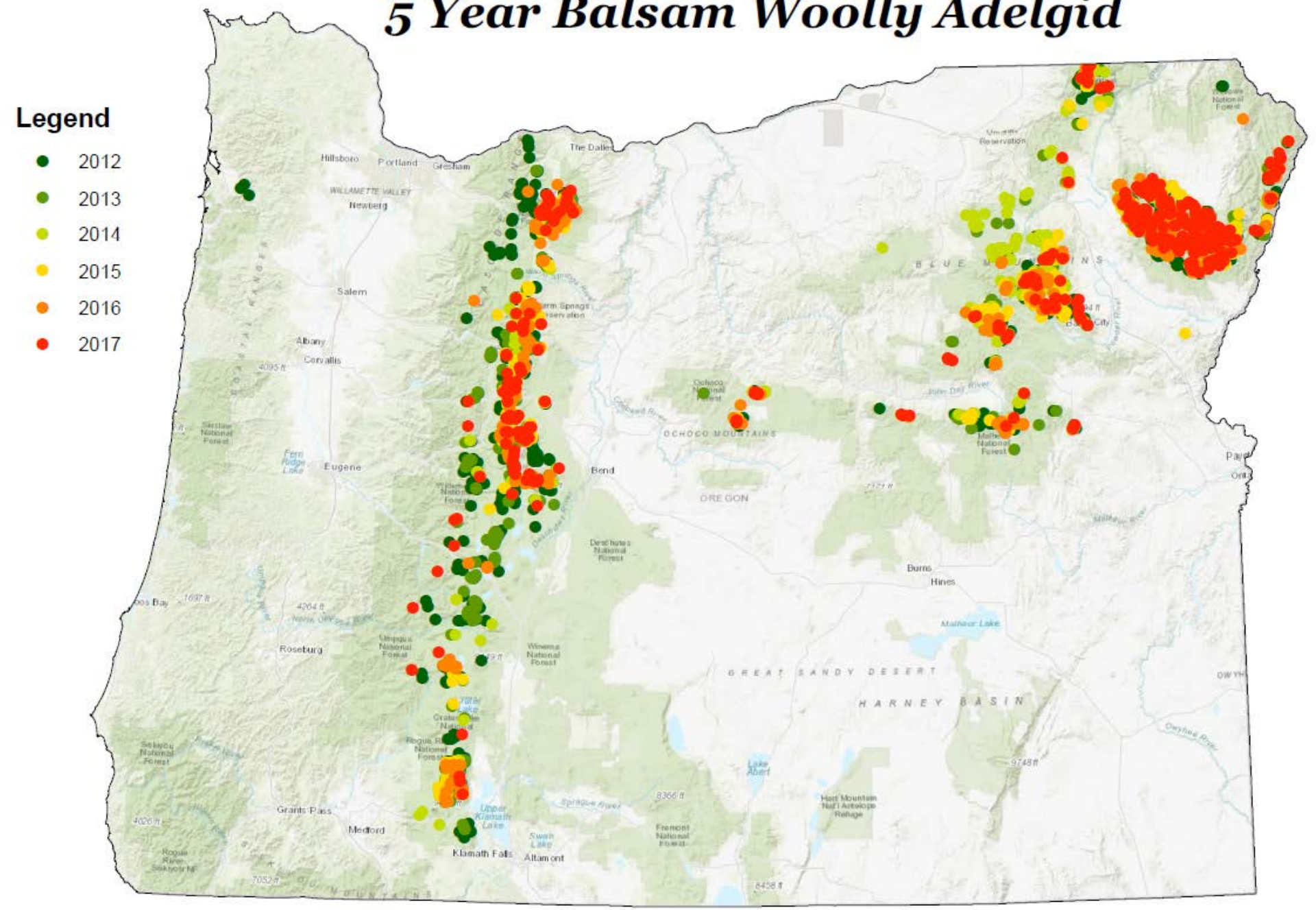
Biology

- Attacks true fir

Management

- Some chemical treatments for ornamental true firs

5 Year Balsam Woolly Adelgid



Black pineleaf scale

Biology

- Attacks pine (some DF)
- Thrives near agriculture sprays

Management

- Avoid planting pine on poor sites or along agriculture edges
- Allow natural enemies to rebound

Defoliators

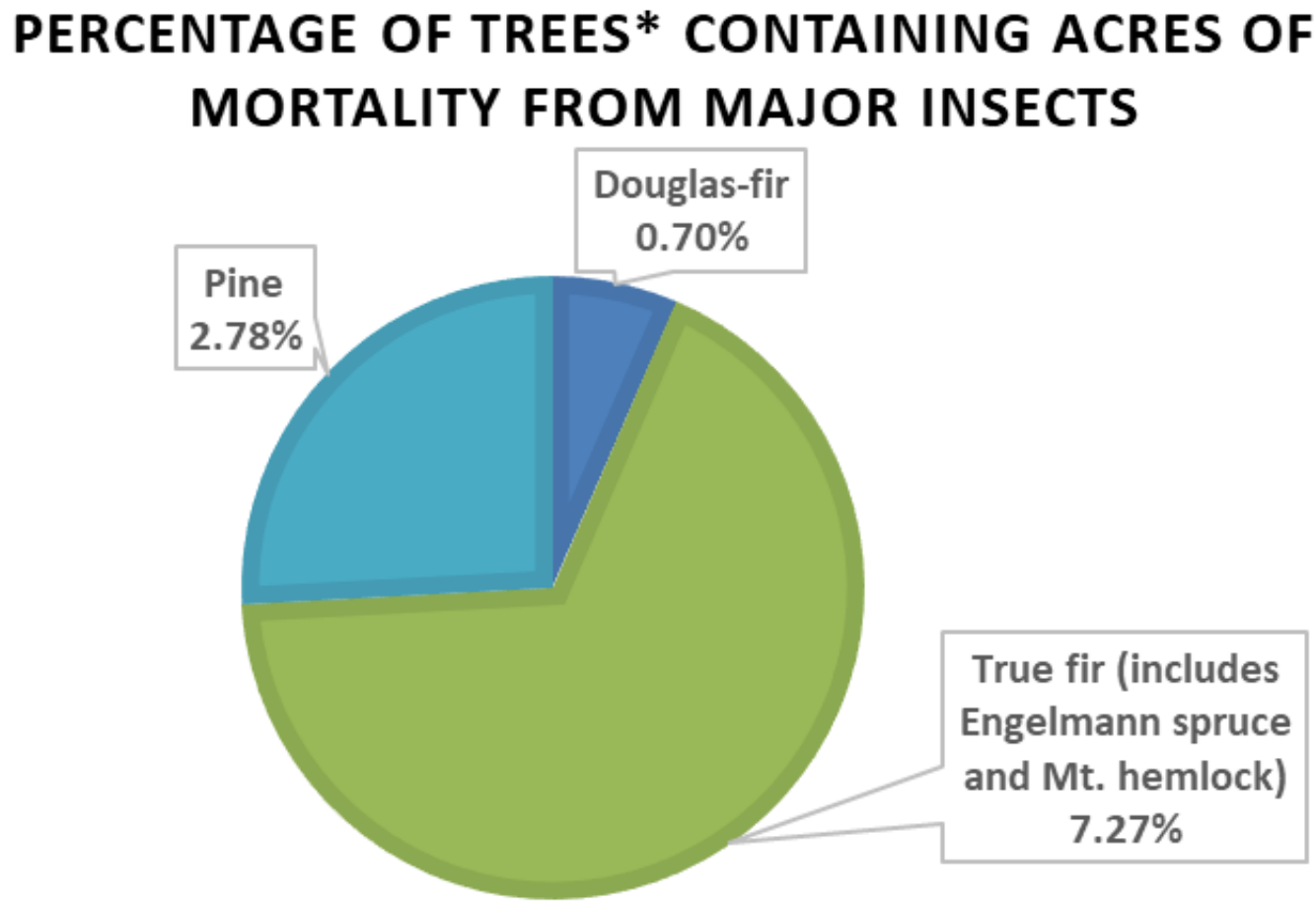
Conifer defoliators

- W. spruce budworm, Doug-fir tussock moth, pine butterfly quiet in recent years
- Pandora in Central OR 2015-present

Hardwood defoliators

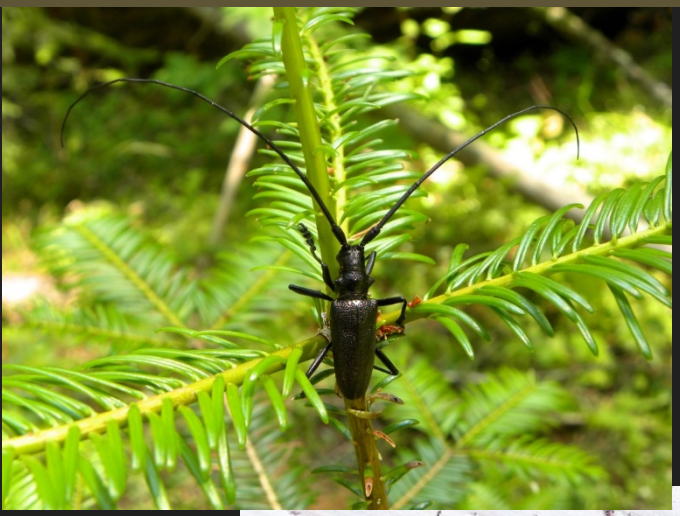
- Fall webworm
- Western tent caterpillar

% of each conifer damaged by insect pests in Oregon



*TREE SPECIES COVERAGE FROM 2001-2010 FIA DATA

Insects not to worry about



Sequoia pitch moth

Some woodboring beetles

Except for this woodboring beetle in merch

Ambrosia beetle

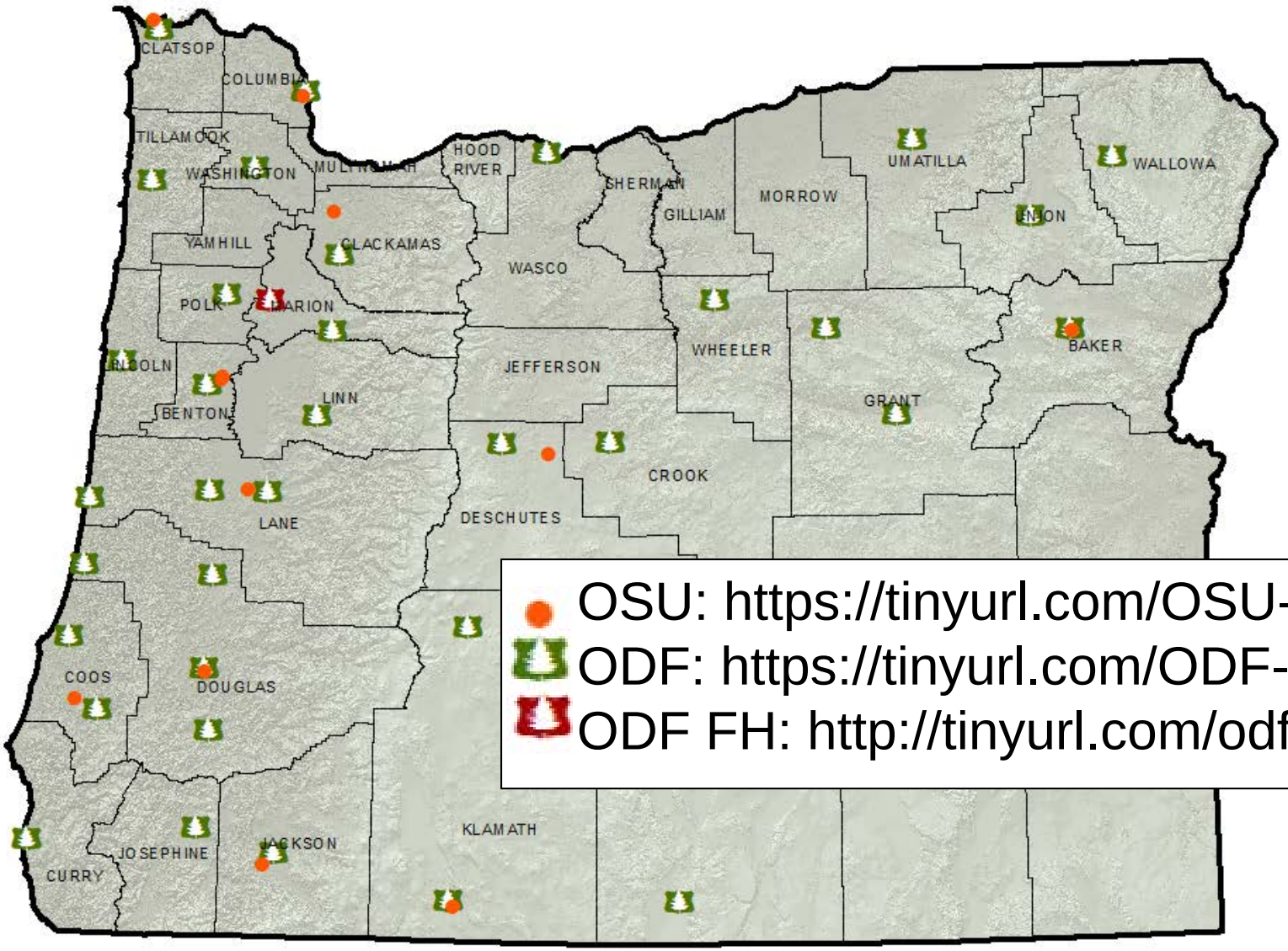
The Oregon Bee project

Mission: Bring together Oregonians to create a science-based strategy to protect and promote native and managed bees through education, pollinator-friendly practices and research.

Goals:

- Protect bees from pesticide exposure
- Promote and incentivize bee-friendly practices
- Collect baseline data on native bee populations and distribution (OR Bee Atlas)
- Research bee health issues (diseases and parasites, habitat needs, etc.)

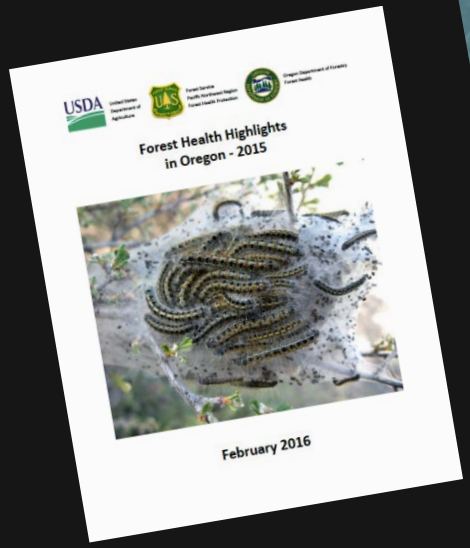
Technical questions?

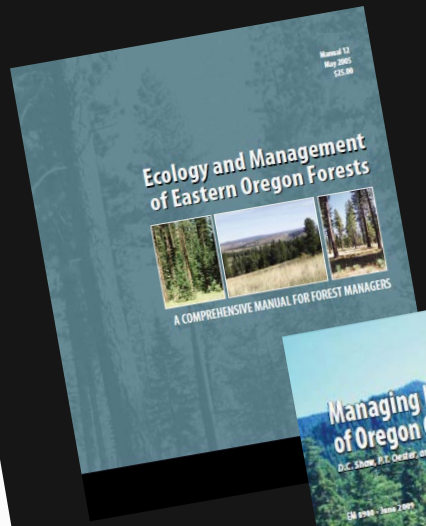


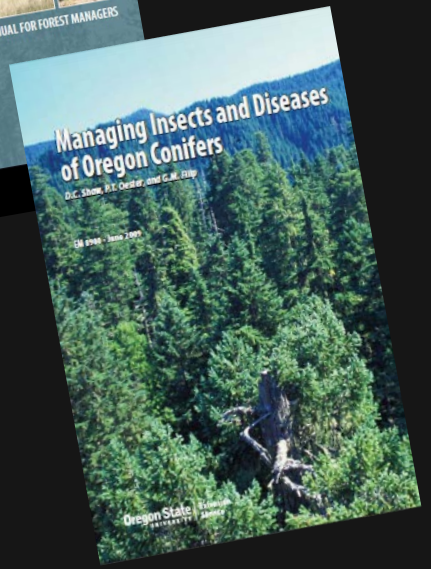
OSU: https://tinyurl.com/OSU-forester
ODF: https://tinyurl.com/ODF-forester
ODF FH: http://tinyurl.com/odf-foresthealth

RESOURCES

- ODF Forest Health Factsheets: http://tinyurl.com/odf-foresthealth
- Forest Health Highlights
- OSU extension guides







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The End