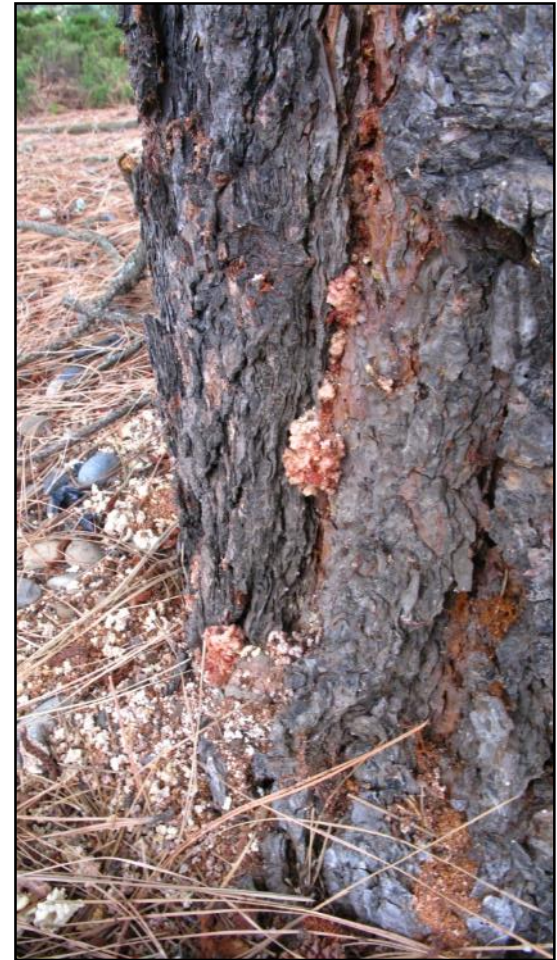


*What's up with the
Trees in the Gorge?
Wind, Fire, Ice, Drought, and
Beetles*

Todd Murray (WSU Extension), Glenn Kohler (WADNR), Chet Behling
& Christine Buhl (ODF), Rob Flowers & Beth Willhite (USDA FH)

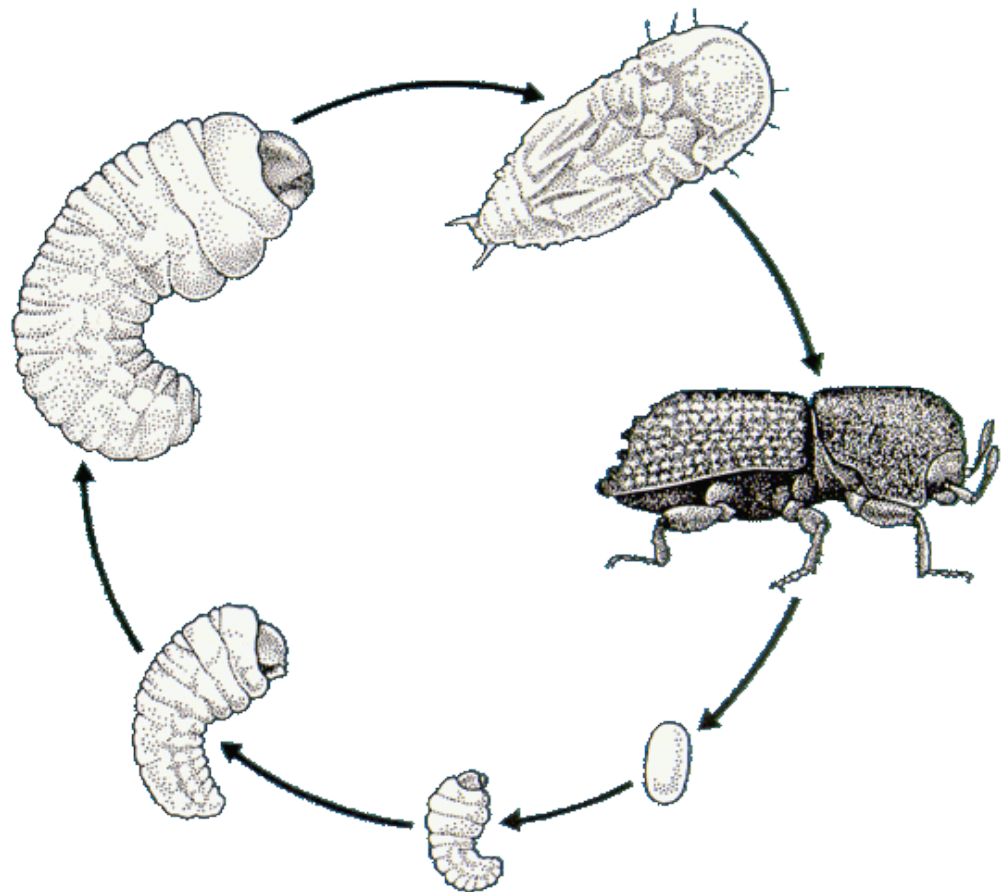
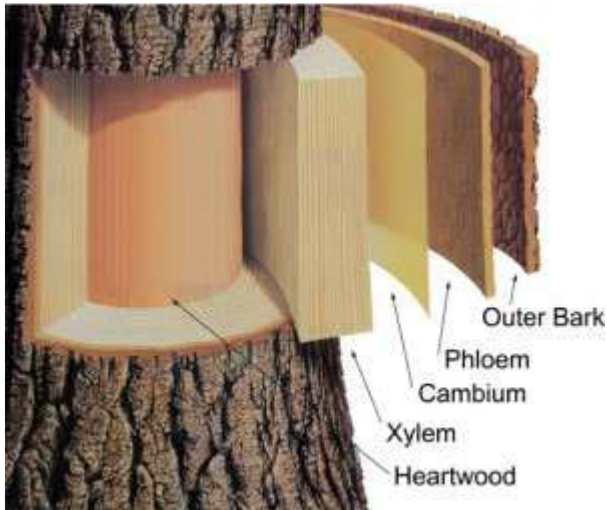


Underwood Landowner calls in 2009

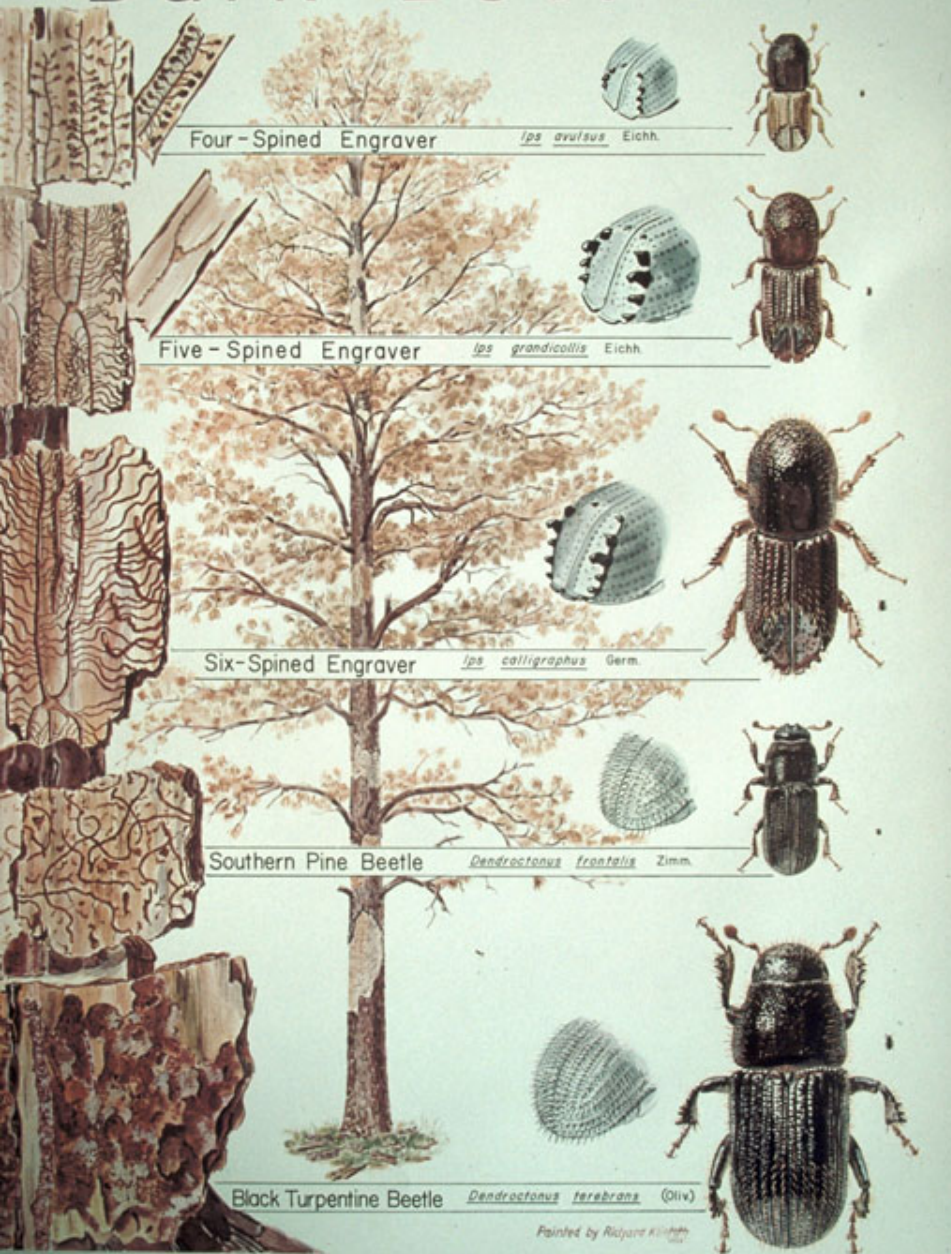




Bark Beetle Life Cycle



Bark Beetles



...e for Plant Research, Forest Research Lab., Beaumont, Tex. 1933

- Most bark beetles are host specific
- Different species attack different tree or branch sizes
- A bark beetle isn't just a bark beetle. There are many different kinds.



Tree defenses



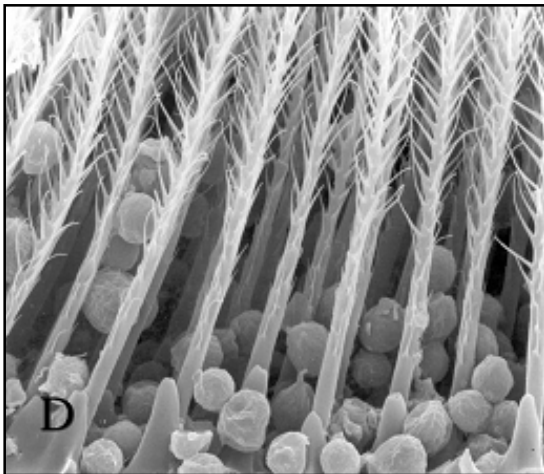
- Bark
- Passive and induced pitch
- Terpene and phenolic compounds





Blue stain Fungus

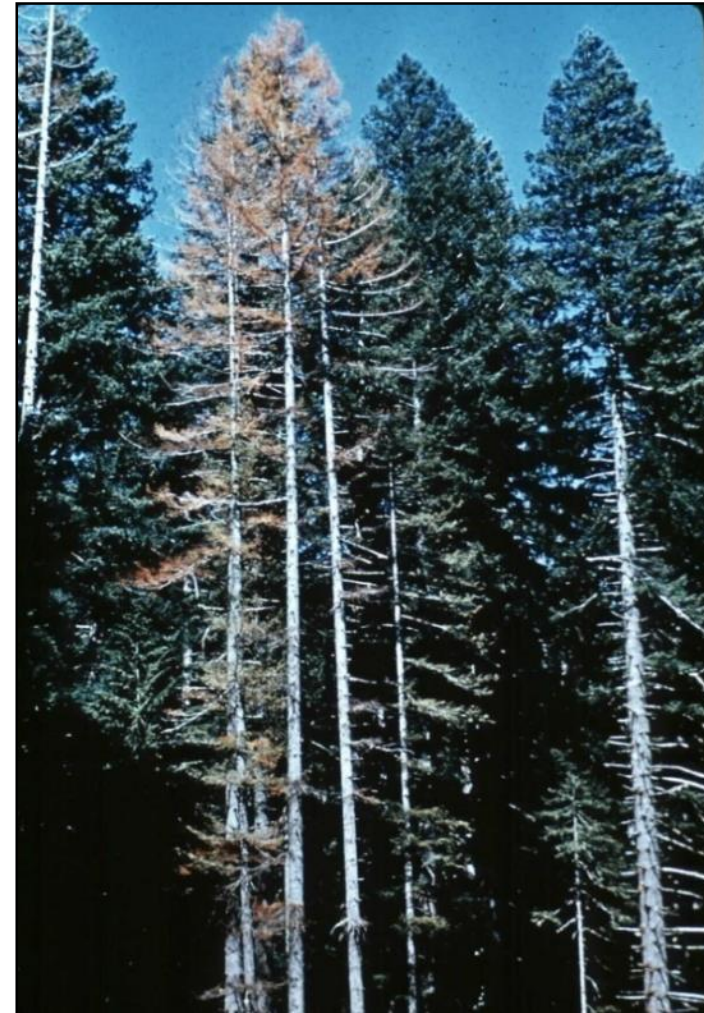
- Fungi are carried in specially adapted pits behind the head called mycangia.
- Blue stain fungi blocks vascular tissue and may hasten tree death





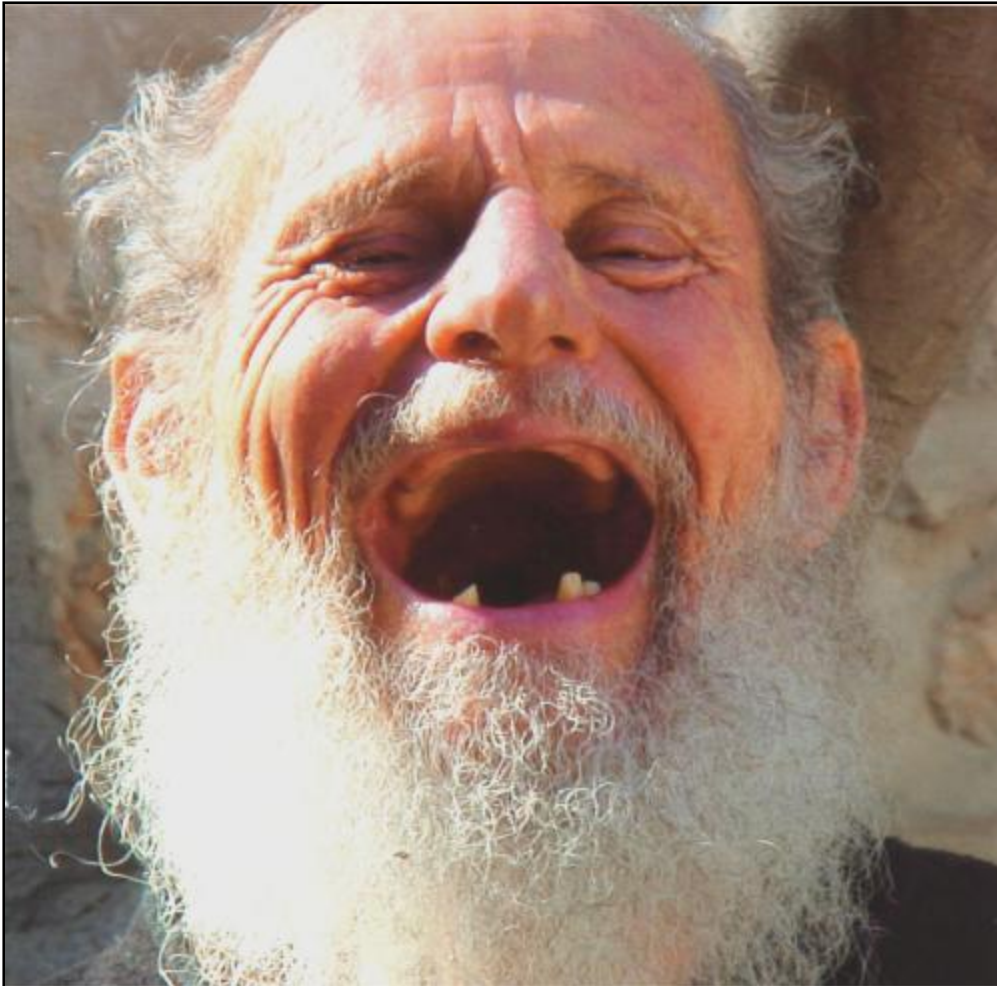
Bark Beetles – general biology

- Focus initial attack on weak or injured trees
- Can switch to a coordinated mass-attack of nearby vigorous trees.
- The combination of weak trees and high populations are characteristic of outbreaks.





February 2010



“I’ve lived here all my life and I ain’t never seen anything kill mature pine trees before. This has to be like them bugs in Colorado! You gotta come out here and kill’em all! I pay taxes dammit!”*

*Skamania County resident dramatization



Underwood – Washington State - February 2010

Complaining Old Guy/Lady + Dead, but otherwise vigorously growing trees = Suspicious!





Underwood – Washington State - February 2010



Geni Cena
WSDA

John Holland
Homeowner

Glenn Kohler
WADNR



California Fivespined Ips (*Ips paraconfusus*)





California Fivespined *Ips* (*Ips paraconfusus*)



- Native to California and W. Oregon
- Not known to occur East of the cascades or in WA

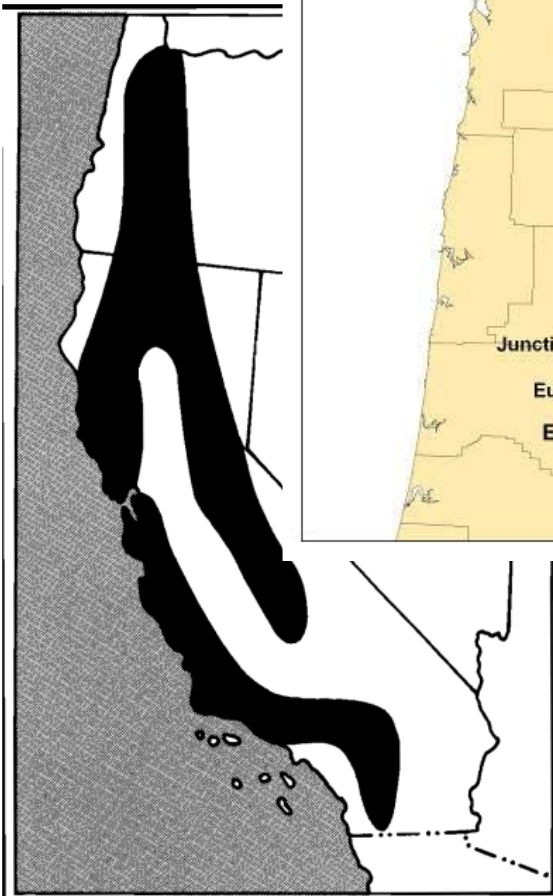


Figure 1—The range of the California fivespined *Ips*.



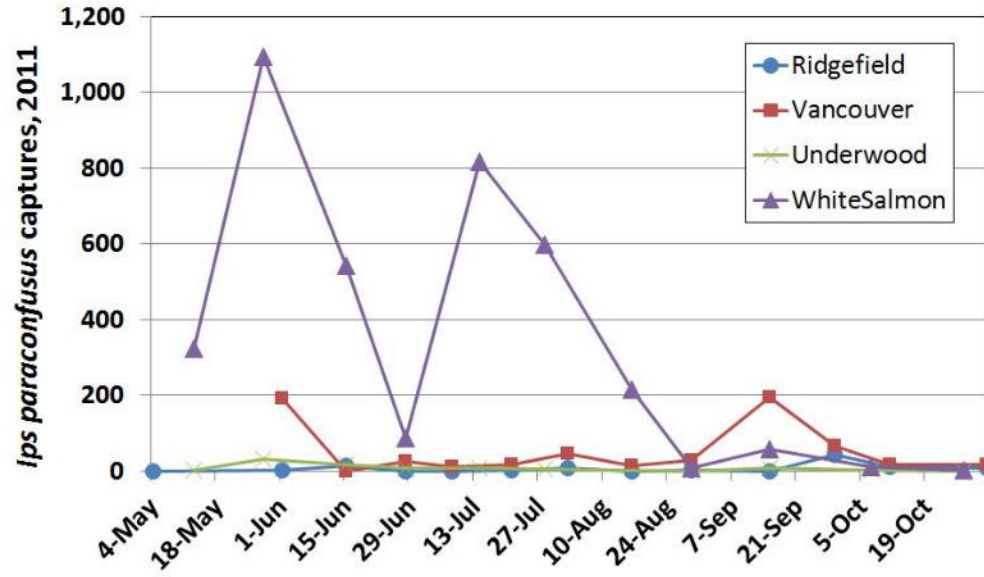
Symptoms and Signs of damage



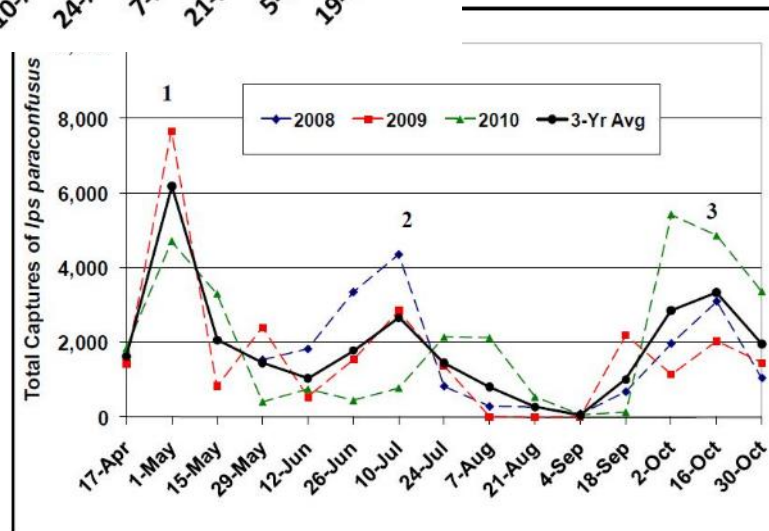




Life Cycle



- Two generations per year
- Three flight periods





Pest Significance

- Non-economic pest prior to 1940's
- Logging practices of second growth pines influenced pest problems





California Fivespined *Ips* (*Ips paraconfusus*)



- Can infest multiple species of pines, it likes ponderosa.
- Outbreaks follow fire or storm damage
- Any event that provides fresh slash during adult flight
- Can kill young trees or top-kill older trees
- ***Normally*** outbreaks last for one year





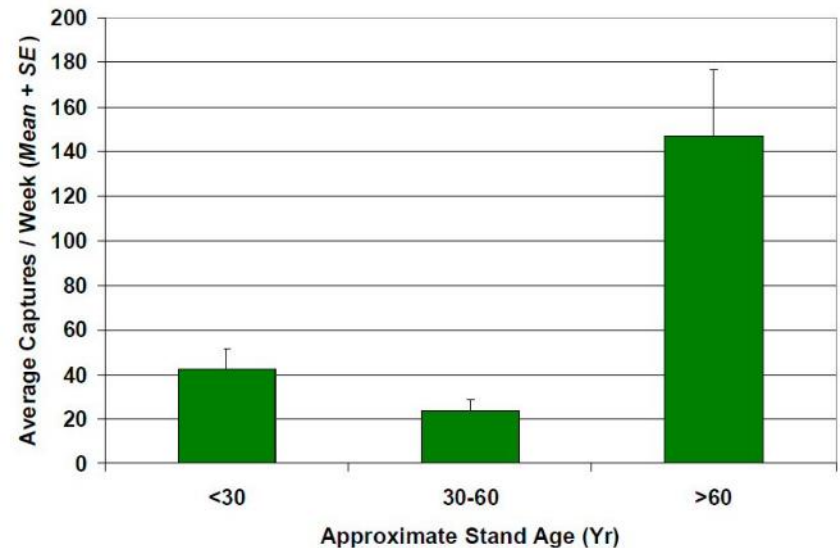
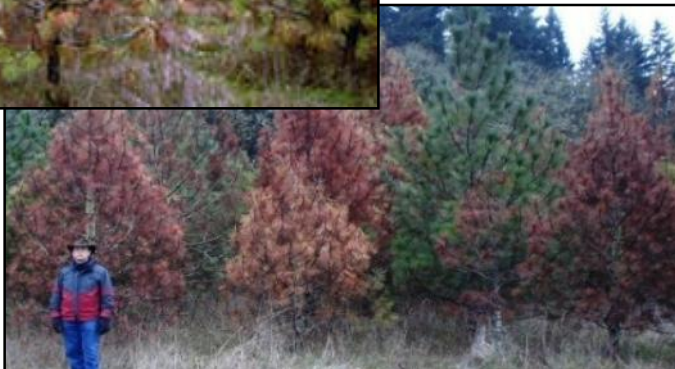
What the California Fivespined Ips Loves to Eat





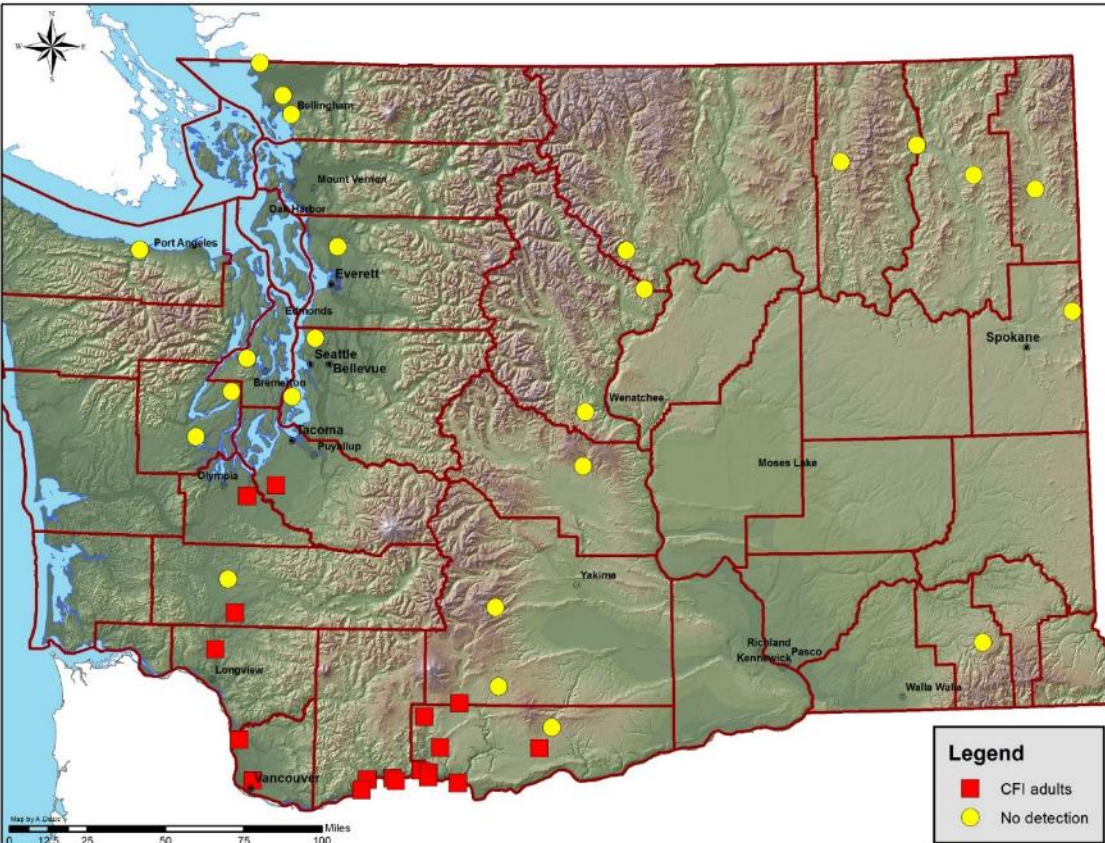
Willamette Valley Pines

- Pest damage first reported in 1999
- Outbreaks continued annually at different locations
- Highest populations found in older age classes; mortality in new orchards





Current Distribution





Mosier Tower Fire 2009





Catherine Creek and Mosier

- Blow down events in 2011





How bad will it get?

What it might look like

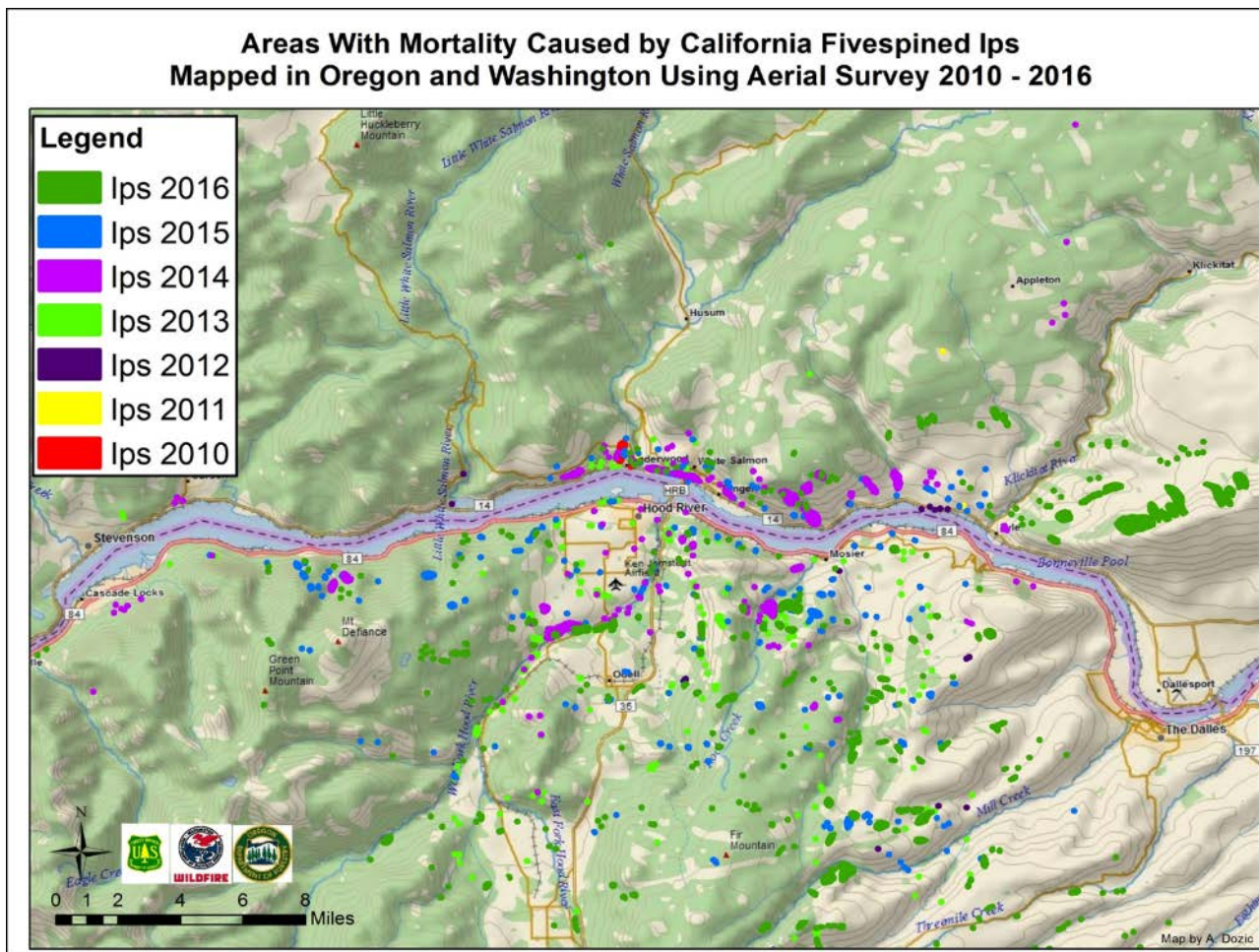


What it won't look like





Localized, small outbreaks 2010-2014





Is this a big deal? Climate Change?

- Range expansion or over due detection?
- Remember preferred habitat age classes?

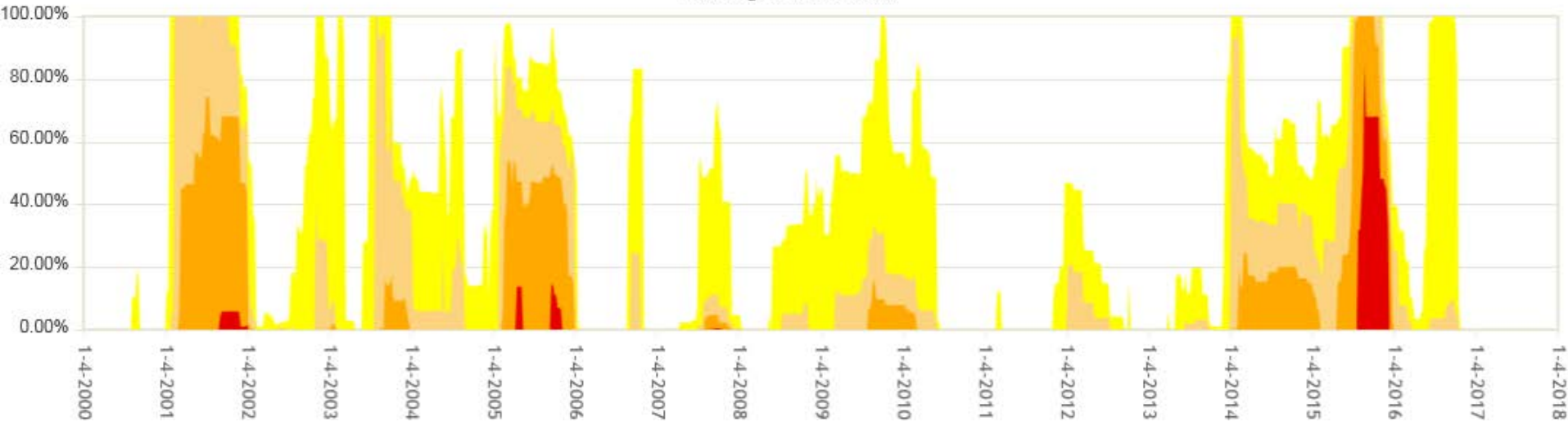




Climate factors

- Droughts – not all years during outbreaks

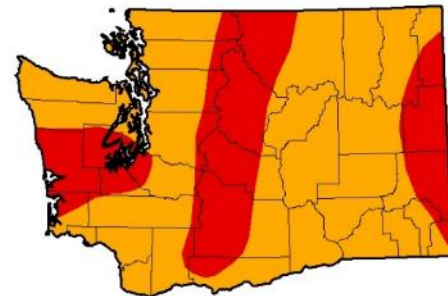
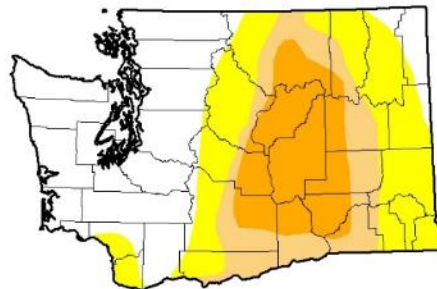
Washington Percent Area



U.S. Drought Monitor
Washington

U.S. Drought Monitor
Washington

U.S. Drought Monitor
Washington



July 28, 2015
(Released Thursday, Jul. 30, 2015)
Valid 8 a.m. EDT

	Drought Conditions (Percent Area)					
	None	D0-D1	D1-D2	D2-D3	D3-D4	D4
Current	0.00	100.00	100.00	99.99	31.74	0.00
Last Week 7/21/2015	0.00	100.00	100.00	98.61	0.00	0.00
3 Months Ago 4/30/2015	32.95	67.05	48.96	15.20	0.00	0.00
Start of Calendar Year 1/1/2015	51.87	48.13	36.15	14.03	0.00	0.00
Start of Water Year 9/30/2014	34.22	65.78	40.27	20.17	0.00	0.00
One Year Ago 7/28/2014	39.56	60.44	33.38	18.27	0.00	0.00

Intensity:
■ D0 Abnormally Dry ■ D3 Extreme Drought
■ D1 Moderate Drought ■ D4 Exceptional Drought
■ D2 Severe Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. See accompanying text summary for forecast statements.

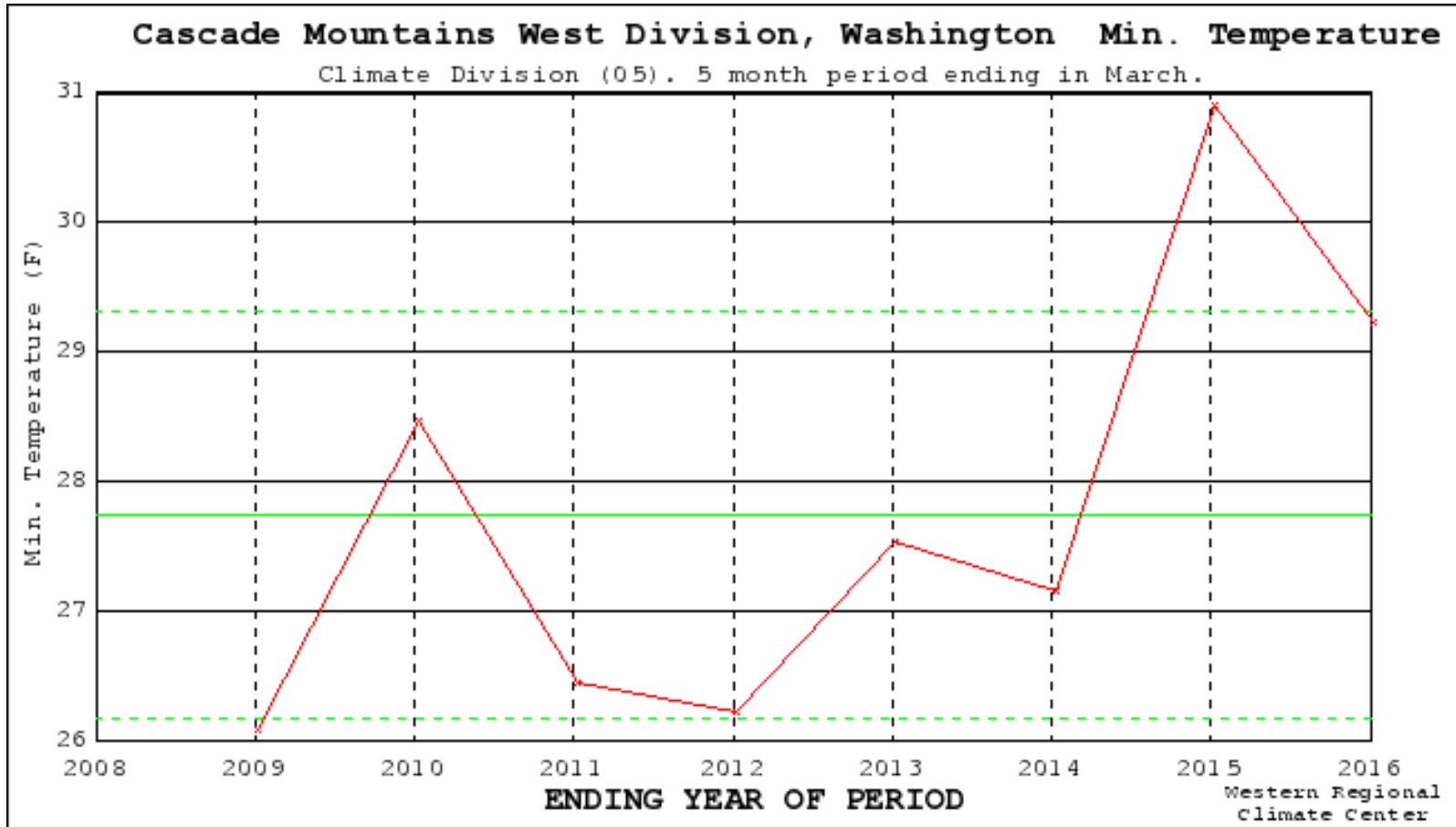
Author:
Richard Heim
NCEI/NOAA





Climate factors

- Mild winter temperatures?





Range Expansion of CFI?

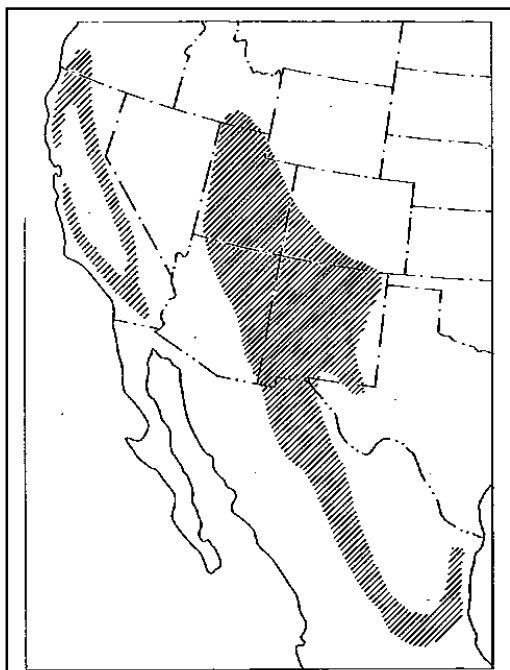


Figure 1.—Generalized distribution of the California five-spined ips.

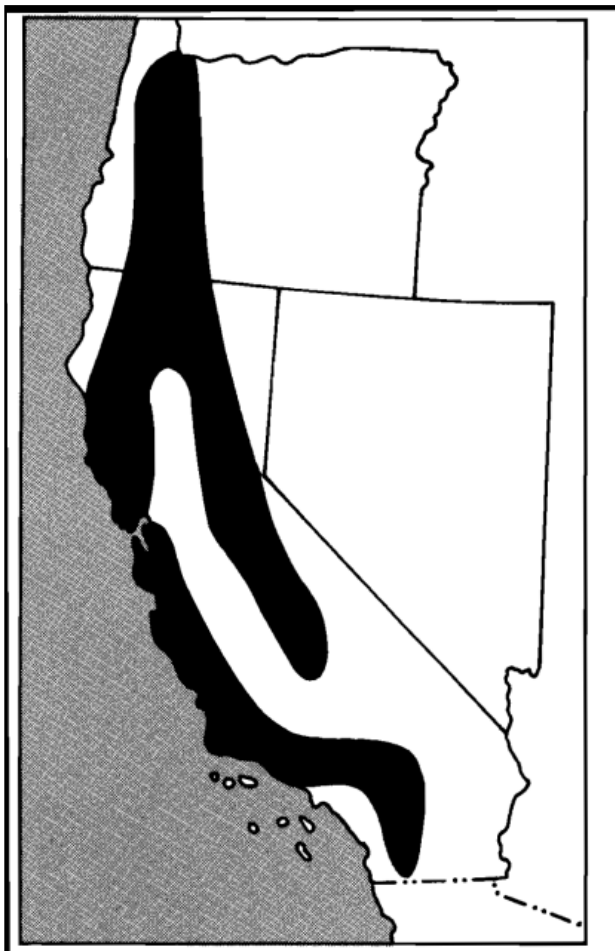


Figure 1—The range of the California fivespined ips.

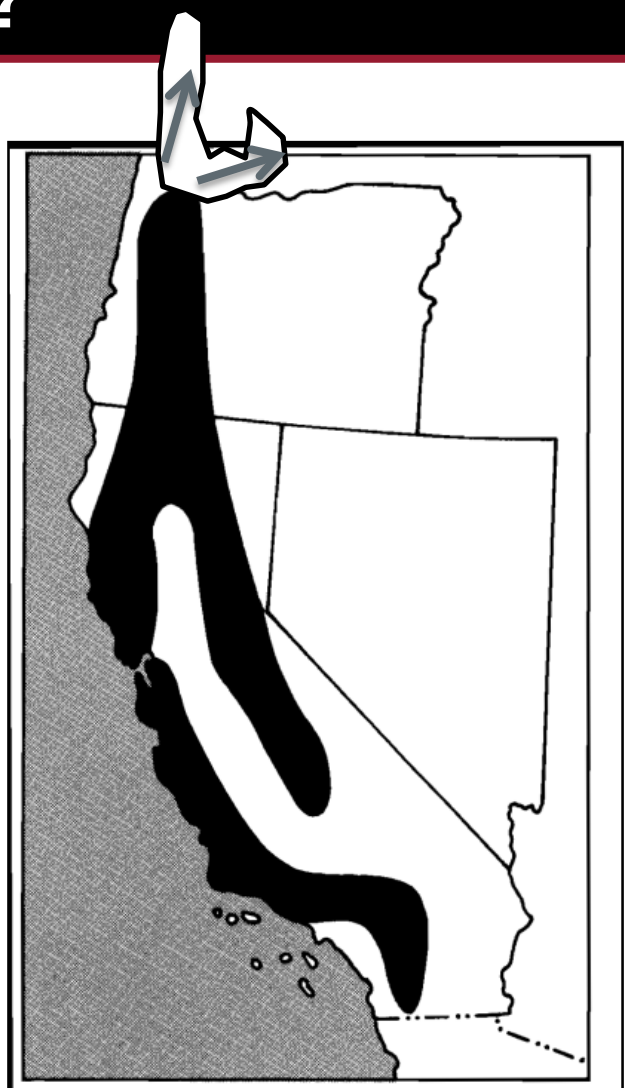
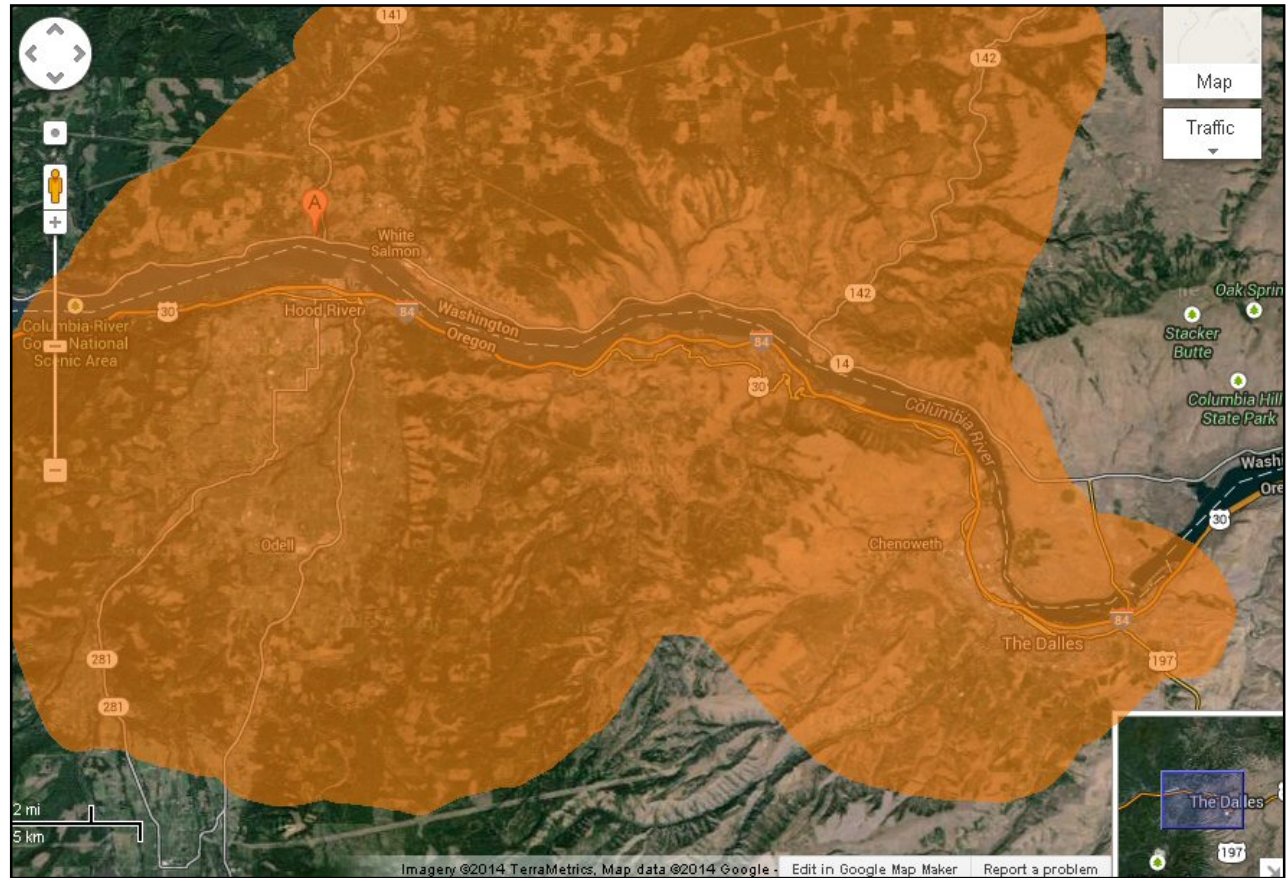


Figure 1—The range of the California fivespined ips.



Areas Affected





Don't Feed the Beetles!

- Avoid creating slash and tree wounds during times of adult beetle activity
 - During outbreaks, wait to do tree work in the fall after mid-October until December
 - This includes tree thinning, pruning and tree removal





Don't Feed the Beetles!



- Remove non-infested slash (over 3") or otherwise dry it promptly before June
 - Chipping
 - Burning (check with Local FD)
- Can I cut it into firewood?
 - Yes, don't stack it next to a pine tree
 - Solarization?





Remove Reddening Trees Timely IF POSSIBLE



- If pile and burn start work October and burn material before April
- Outside of this time:
 - Debark or otherwise remove completely, including slash



Green-chaining or house-sized slash piles

- Consult a professional forester!





Pheromone Disruption



- Pine beetle anti-aggregant “Verbenone” is unlikely effective





Insecticides

- Preventative – yes
- Save a tree that's already infested – no
- Hire a professional for trees over 10'
- Cannot use insecticides on slash



-photo by G. S. Horn



Focus on Tree Stand Health

- Summary
 - Don't do work in pine trees until October and finish by January (THIS IS OPTIMAL)
 - Work with a forester if you are working outside of these recommendations



- Pheromones (Verbenone) are ineffective
- Consult your forester or extension agent before considering an insecticide



Landowner Assistance & Outreach

- WDNR and ODF recently obtained the “Gorge Partnership” grant from the Western Competitive Resource Allocation program to address emerging forest health issues with CFI education, outreach, and technical assistance as the primary focus
- Since 2010, 22 workshops, field days and demonstrations for over 1,200 landowners/land managers have been completed
- Since 2014, 77 landowners have received assistance to treat over 600 acres and 39 hazard trees have been removed from high-priority areas



WSU Extension Pest Watch fact sheets identify new agricultural pests in or near Washington State that pose environmental and economic threats. In the event of a severe pest outbreak, a Pest Alert will be issued with emergency pest management and control information.

Introduction

CFI changes pest and land manager and homeowners will need to adopt effective management practices when localized outbreaks occur. Management strategies vary widely and depend on which pest is present. Other pine bark beetle pests include pine engraver (IP:ph), western pine beetle (Dendroctonus ponderosae), western pine beetle (Dendroctonus brevicornis), and red turpentine beetle (Dendroctonus valens) (Shaw et al. 2009). The purpose of this fact sheet is to alert forest land managers and homeowners with pine trees that there is now an additional species of the pine bark beetle in Washington State.

for the first time in Washington State. As of 2013, CFI has been collected on the eastern slopes of the Cascade Mountains Range east to Elk and north to Dred Lake, along the Columbia River Gorge, and in the western valleys as far west as Vancouver and north to Toledo (Figure 1). It is unclear if this is a range expansion or a previously unknown historical range. Regardless, this is the first time outbreaks have been reported.

Identification and Life Cycle

Adult beetles are small, only about 3 millimeters long, and mostly brown to nearly black in color. They have hallow shaped bodies and clubbed antennae and have five pointed structures (claws) to its species arising from the end of

before 1945, CFI was considered a bark beetle of little pest significance. Since then, it has caused significant damage to pines in California and Oregon. In California, increased pine-mating to nonreproductive five-spined pine created single adults and other conditions that allowed beetle outbreaks for short periods of time, resulting in significant tree mortality and rapid decline and death (1967). Although in more recent times logging practices have been altered to avoid CFI outbreaks, widespread tree mortality can still be observed when tree stress is high, such as during times of drought, or following fires where large numbers of trees are injured. Since 1968, increased beetle activity and associated damage has been observed in young stands of the Willamette Valley east of Pendleton pine established during the late 1980s and early 1990s (Oliver and Knauss 2005).

Distribution

A pine engraver beetle native to California and Oregon has recently been found in Washington State, where it has damaged and killed pine trees. Until 2013, the most northern reported distribution of California Fivespined Ips (CFI) by any authors, was in the southern reaches of the Willamette Valley of Oregon. In 2010, CFI was recorded



Figure 1. Map showing distribution of the California Fivespined Ips (CFI) around the Pacific Northwest. The legend indicates the various locations where CFI adults were sampled in subsequent years during a specific year (Alexander Davis, WACNW).

