FOREST HEALTH IN OREGON: STATE OF THE STATE 2022

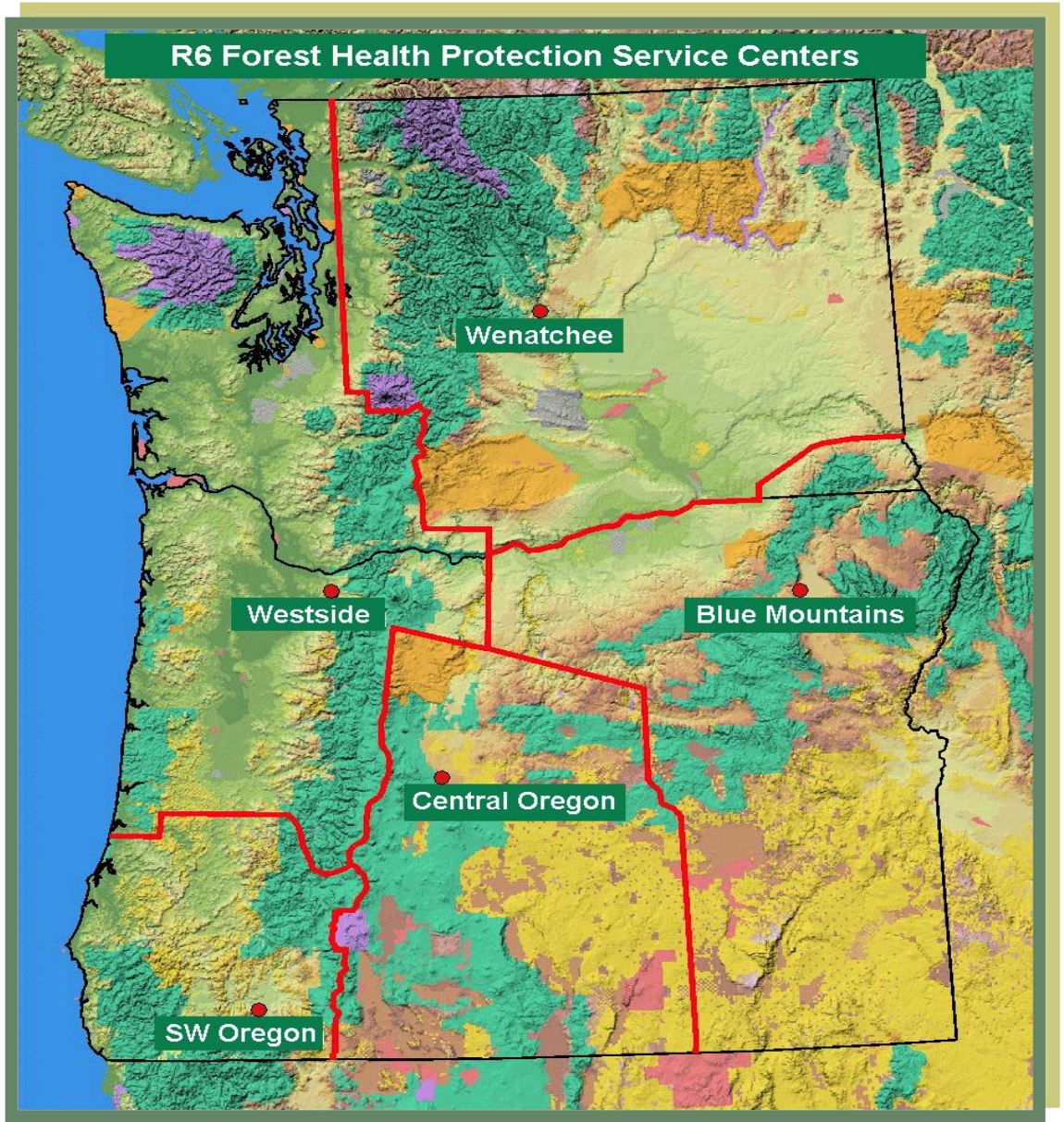
Don’t Call it a Comeback: Recent Forest Health Trends and Emerging Insect and Disease Issues in Central Oregon

Robbie Flowers and Brent Oblinger

USDA Forest Service – Forest Health Protection

Central Oregon Service Center - Bend, OR

USDA-FS Forest Health Protection – PNW Region



5 FHP Service Centers:

Westside SC
Sandy, OR

Central Oregon SC
Bend, OR

Blue Mountains SC
La Grande, OR

Southwest Oregon SC
Central Point, OR

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Wenatchee, WA

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Covering:

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Lakeview District

Forest Service
Deschutes NF
Fremont-Winema NF
Ochoco NF

National Park Service
Crater Lake National Park

Tribal
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USFS Forest Health Protection
Central Oregon Service Center

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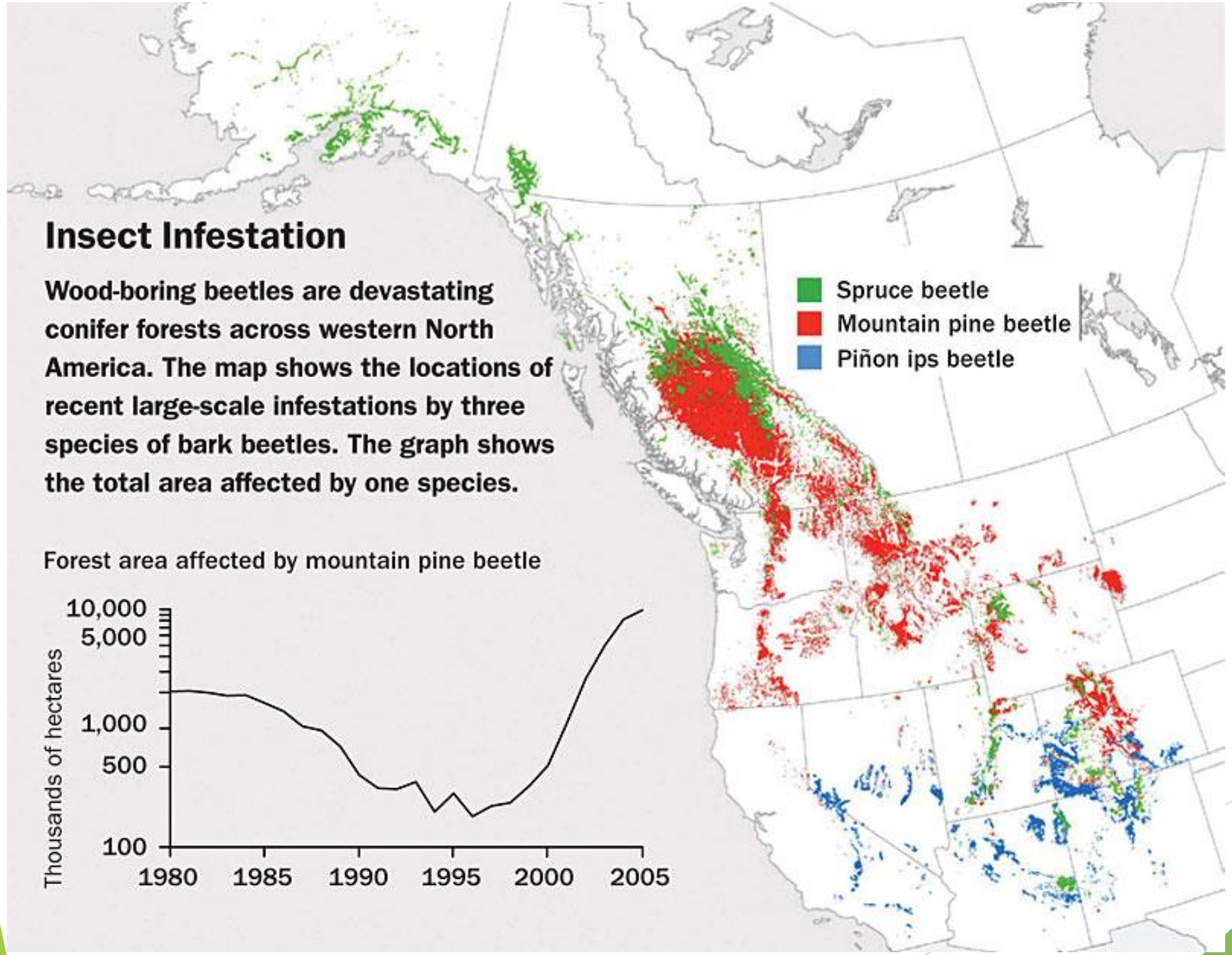
Damaging Forest Insects: Central Oregon in Focus

- **Bark beetles** are the most damaging forest insects in central Oregon and a few species are capable of eruptive outbreaks that can affect millions of acres

- The larval stages of **insect defoliators** consume needles/leaves/buds and while they are not usually tree killers they stress trees and predispose them to damage from other agents


Insect Infestation
Wood-boring beetles are devastating conifer forests across western North America. The map shows the locations of recent large-scale infestations by three species of bark beetles. The graph shows the total area affected by one species.
Spruce beetle
Mountain pine beetle
Piñon ips beetle
Forest area affected by mountain pine beetle
Thousands of hectares
10,000
5,000
1,000
500
100
1980
1985
1990
1995
2000
2005

Mountain Pine Beetle

Mountain Pine Beetle in Central Oregon

- MPB (*Dendroctonus ponderosae*) outbreaks initiate in older, denser lodgepole pine stands
- Lodgepole and 5-needle pines more susceptible than ponderosa
- Site index/density more critical for ponderosa
- Outbreaks can persist >10 years and kill the majority of mature LPP
- Recent outbreaks in late 1980s and early 2000s in Central OR

Mountain Pine Beetle Outbreak in Central Oregon (2002-2010)

Fremont-Winema NF

Bark Beetle Drought Specialists in Central Oregon

- Western pine beetle (*D. brevicomis*) causes scattered mortality in large ponderosa pine, clumped mortality in smaller diameters
- Fir engraver (*Scolytus ventralis*) attack true firs of all sizes
- Increased mortality of late associated with drought, fire damage, and other stress (heat)
- Co-occurrence with other “secondary” bark beetles who are becoming more damaging

Pandora Moth Outbreak in Central Oregon

- PM (*Coloradia pandora*) have a 2-year life cycle alternating b/w larvae and adults
- >20 outbreaks documented in Central Oregon
- Outbreaks occur for 6-8 years and cause defoliation
- Special aerial surveys to map forest damage
- Lots of public outreach needed

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They're back: Pandora moths invade Bend

Baseball stadium sees swarms of the giant insects

SCOTT HAMMERS
THE BULLETIN
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Bend Elks General Manager Michael Hirka uses a leaf blower to clear out Pandora moths from a walkway at Vince Genna Stadium on Thursday in Bend. (Joe Kline/Bulletin photo)

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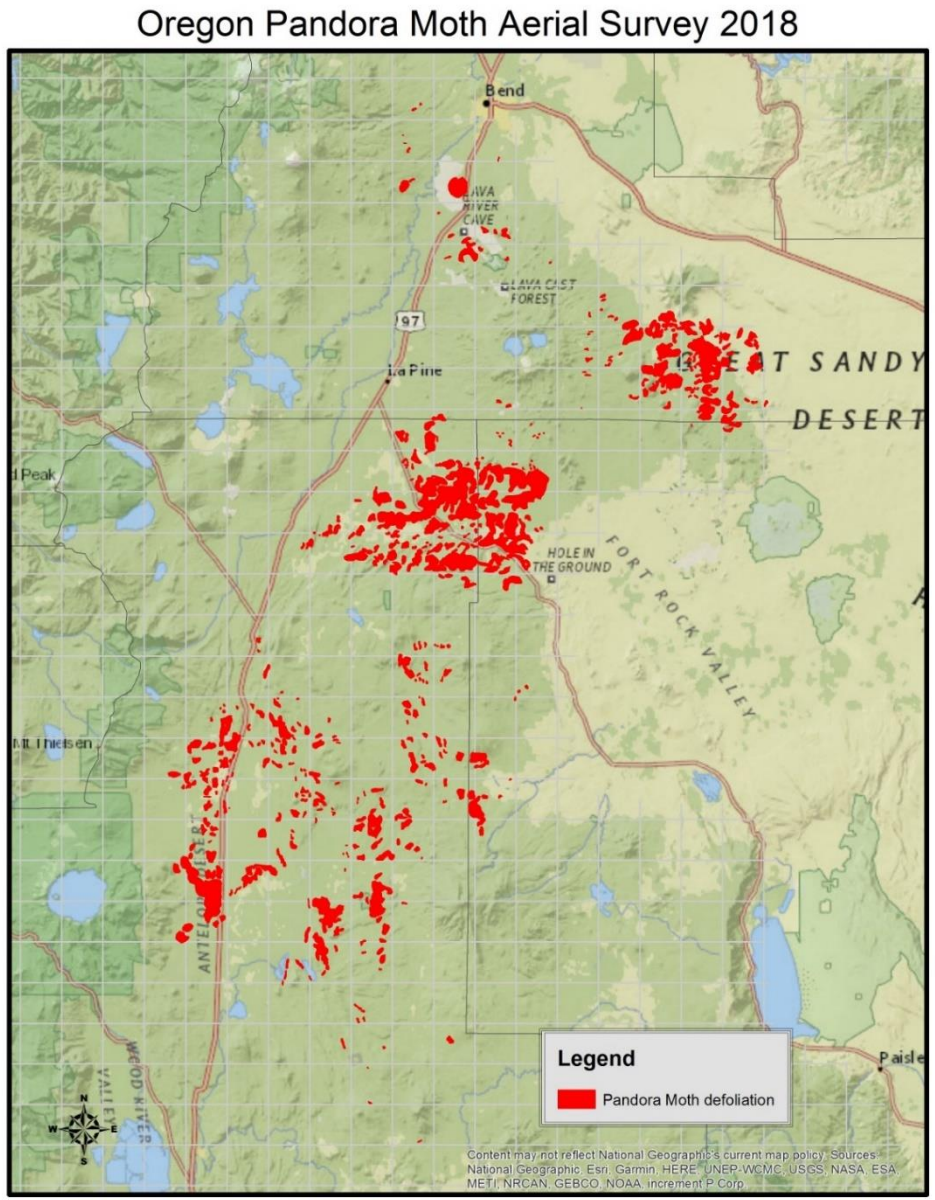
Current Pandora Moth Outbreak in Central Oregon

- Current outbreak appears to have ended after 7 years
- Special aerial survey was done in 2018 (145K+ ac)
- Large adult flights in 2017, 2019
- Current trends and area affected are consistent with historic records
- Previous monitoring plots indicated limited tree mortality



Pine Sawfly Outbreak in Lodgepole Pine

- Pine sawfly defoliation in lodgepole pine in Klamath Co. (*Neodiprion* spp.)
- Previous outbreaks in 1941-1945, 1952-1953 and 1978 (Ciesla and Smith 2011)
- Likely occur more frequently than they are documented
- Create stress that may amplify tree susceptibility

Ips Bark Beetles in Lodgepole and Pondersoa Pine

- Prefer slash but also attack smaller-diameter pines or cause top-kill in larger trees
- Historically, pine engraver (*Ips pini*) occurred on the Eastside and California fivespined Ips (*I. paraconfusus*) on the Westside
- Species range plasticity/expansion?
- Recent increase in in areas affected by defoliators and drought in Central OR

Pine Needleminer Outbreak in Ponderosa Pine

- Aerial survey “signature” appeared to be foliage disease
- Ponderosa pine needleminer in the Warner Mtns (*Coleotechnites ponderosae*)
- Not much history known, lacking recent aerial surveys
- Continuing to monitor the affected areas

Outbreaks of California Tortoiseshell Butterfly and Alder Flea Beetle

- California tortoiseshell butterfly defoliation of *Ceanothus* spp.
- Alder flea beetle feeding on *Alnus* spp.
- Not much is known about the long-term impacts of either species

Emerging Pathology Concerns and Updates in COR by Brent Oblinger, Forest Pathologist, USDA-FS

- Documented a new dwarf mistletoe (mountain hemlock dwarf mistletoe) on sugar pine in the Oregon East Cascades
- Limber pine dwarf mistletoe (*Arceuthobium cyanocarpum*) is more damaging to whitebark pine recruitment than documented before. It poses a greater threat to recruitment of cone-bearing whitebark pine than blister rust at some locations (ie. Newberry National Volcanic Monument)
- *Measured heights to blister rust cankers on young western white pine in the Oregon East Cascades with implications for blister rust pruning guidelines [Stay tuned, not covered today]*

Sugar Pine with Dwarf Mistletoe Infections
Northwest Klamath County, Winema National Forest

- There was only one report of mountain hemlock dwarf mistletoe on two sugar pines from Bob Mathiasen and he tentatively classified sugar pine as a rare host

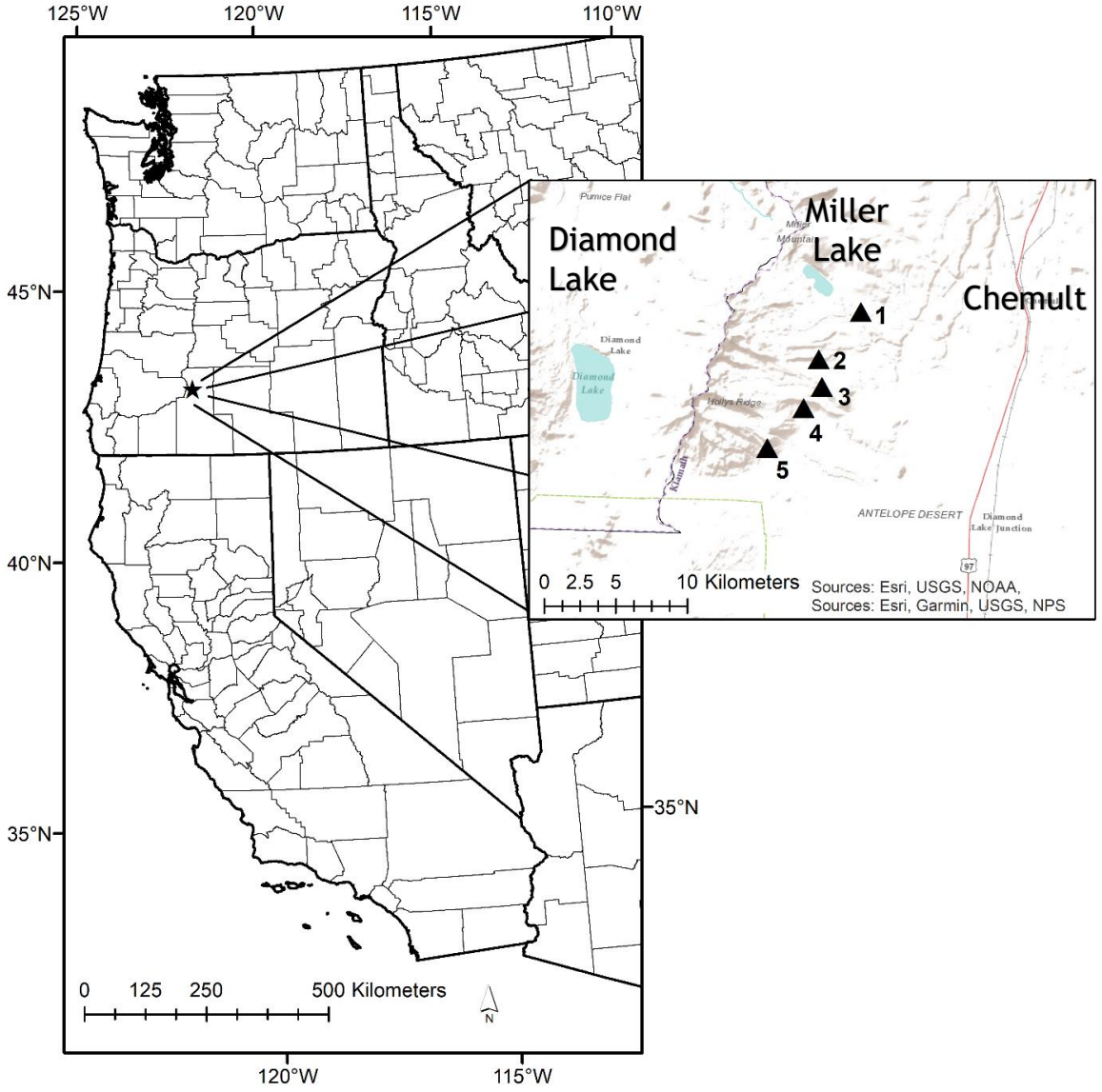
- However, Brent found at least six sites from 2015 to 2019 with sugar pine parasitized by mountain hemlock dwarf mistletoe and host susceptibility needed to be documented

Sugar Pine with Dwarf Mistletoe Infections

Northwest Klamath County, Winema National Forest

Susceptibility of Sugar pine, Shasta red fir and Lodgepole pine to Mountain hemlock Dwarf Mistletoe

- 41 host susceptibility plots were installed on 5 sites
- Trees were pooled from all plots according to past DM host susceptibility evaluations (e.g., Hawksworth & Wiens; Mathiasen).
- **Incidence of mistletoe on sugar pine >30 yr old (>1” dbh) was 76% and sugar pine should be re-classified as a secondary host**
- No mountain hemlock dwarf mistletoe was found on Shasta red fir or lodgepole pine and they should be classified as immune



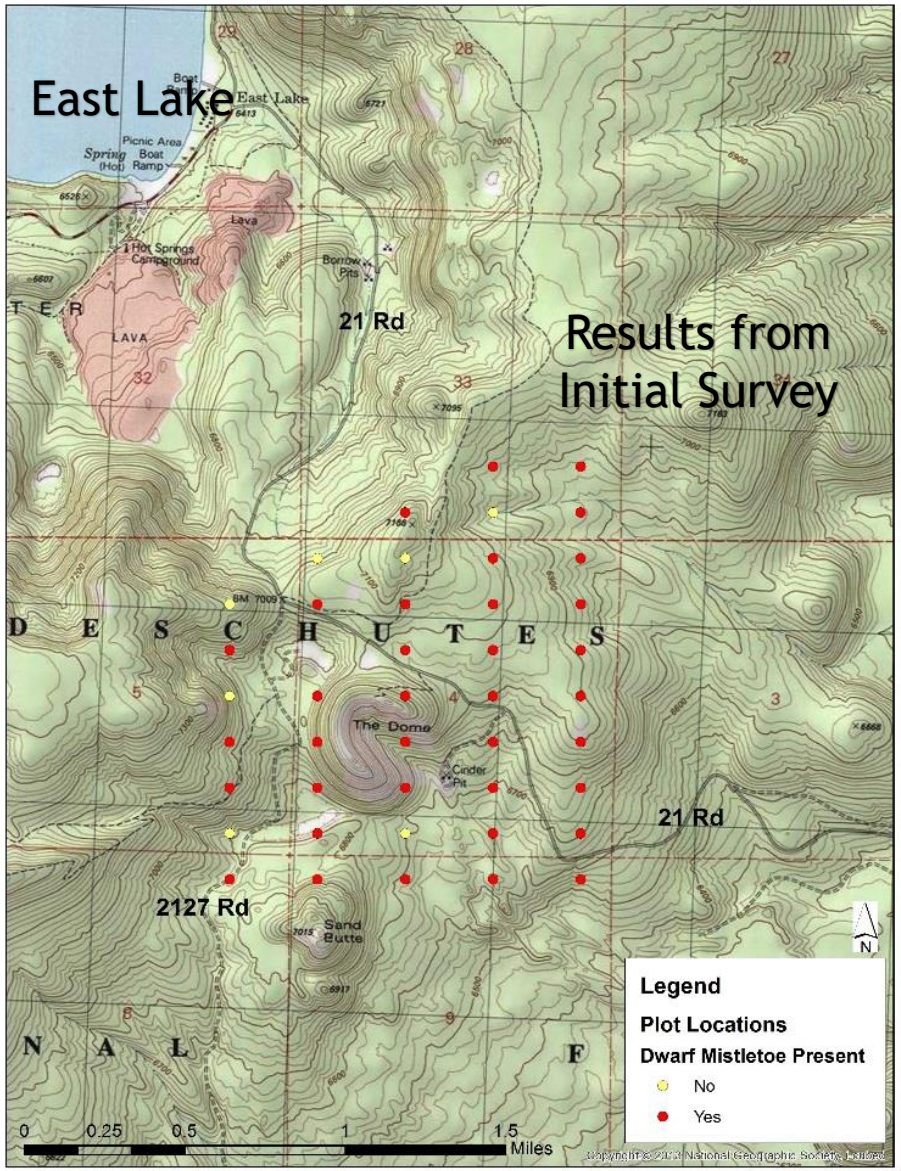
See 2021 *Forest Pathology* Publication for Details

- **Oblinger, B.W. 2021.** Susceptibility of sugar pine, Shasta red fir and Sierra lodgepole pine to mountain hemlock dwarf mistletoe (*Arceuthobium tsugense* subsp. *mertensianae*, Viscaceae) in south central Oregon. Forest Pathology, August, Vol 51 (4), https://doi.org/10.1111/efp.12693

- *Note: this mistletoe was also common on western white and whitebark pines in the area and susceptibility of those hosts should be revisited*

Monitoring Limber Pine Dwarf Mistletoe on Whitebark Pine at Newberry National Volcanic Monument

- Plots installed in 2015-2016 and remeasured after 5-6 years on SE side of Newberry Caldera
- Cameron Stauder helped remeasure the fixed-radius plots and helped with data analysis
- Increase in mortality found with ongoing mortality of whitebark saplings and smaller pole-sized trees due to mistletoe coupled with larger-diameters being killed by mountain pine beetle
- Drought and moisture stress also contributing to ongoing stress and mortality under a warming climate
- White pine blister rust only detected in 2 of 43 plots compared to dwarf mistletoe in 36 of 43 plots



Top-kill and Mortality due to Limber Pine Dwarf Mistletoe in Smaller-diameter Whitebark pine

Top-kill and Mortality due to Limber Pine Dwarf Mistletoe in smaller-diameter Whitebark pine

- Chlorotic crowns due to severe mistletoe infections is common along with poor needle retention and crown thinning or bottle-brush symptoms

- Bole infections can disrupt the normal hydraulic architecture and alter water and carbon relations in trees too

Questions?

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Photo credits: ForestryImages.org and colleagues from ODF, OSU, WDNR, and USDA-FS