



Responsive Management for Emerald Ash Borer

Oregon Department of Forestry
Urban & Community Forestry Assistance Program

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Emerald Ash Borer (EAB)

Agrilus planipennis



Invasive and highly destructive woodboring beetle that kills ash trees (*Fraxinus* spp.).

Larvae feed beneath bark, eventually girdling and killing the tree

100+ million trees killed since 1990s, highest cost forest pest in the Americas



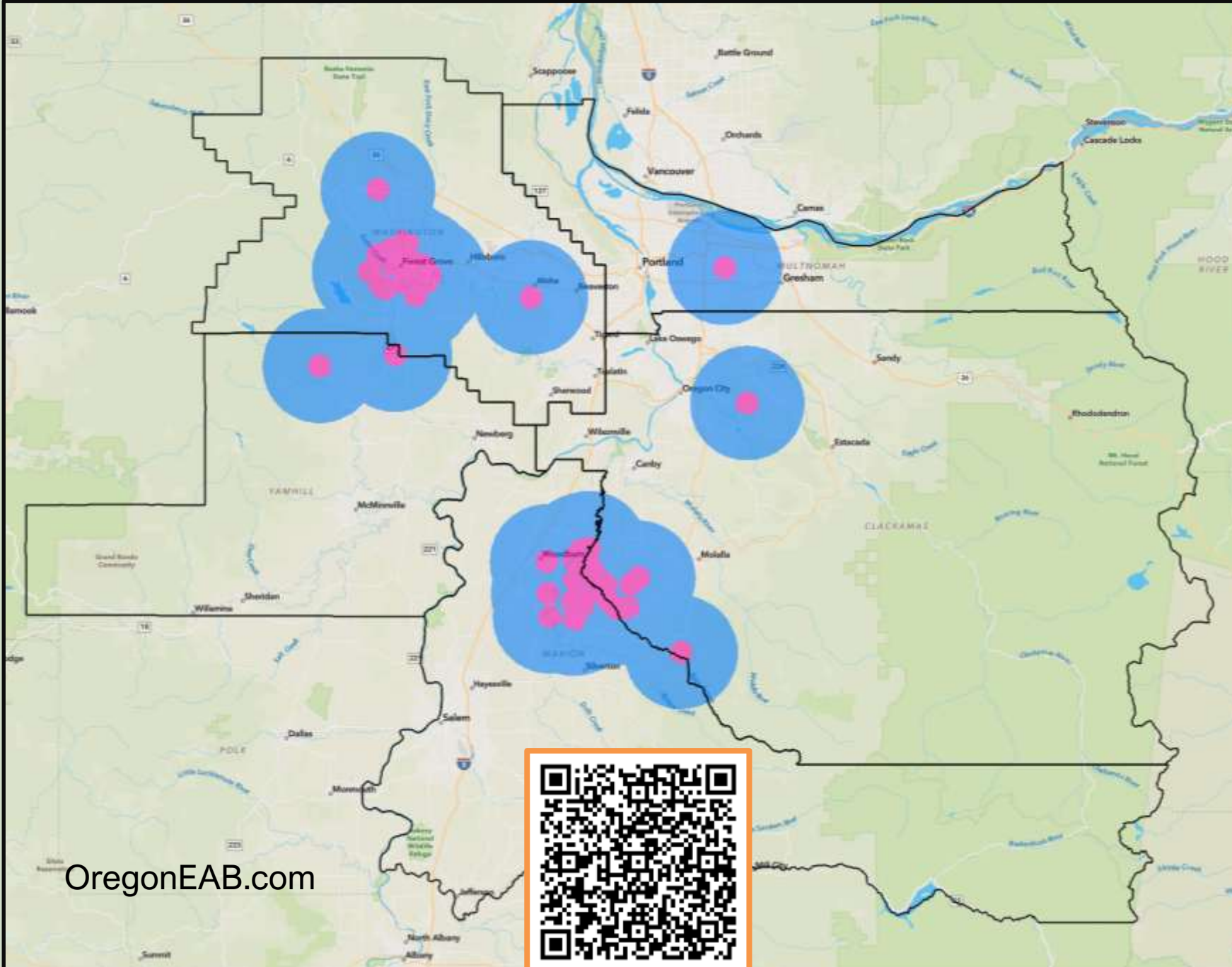
United States Detections

- 2002: Detroit, MI
- 2012: 16 states with known infestations
- 2013: Colorado
- 2022: Oregon



EAB in Oregon

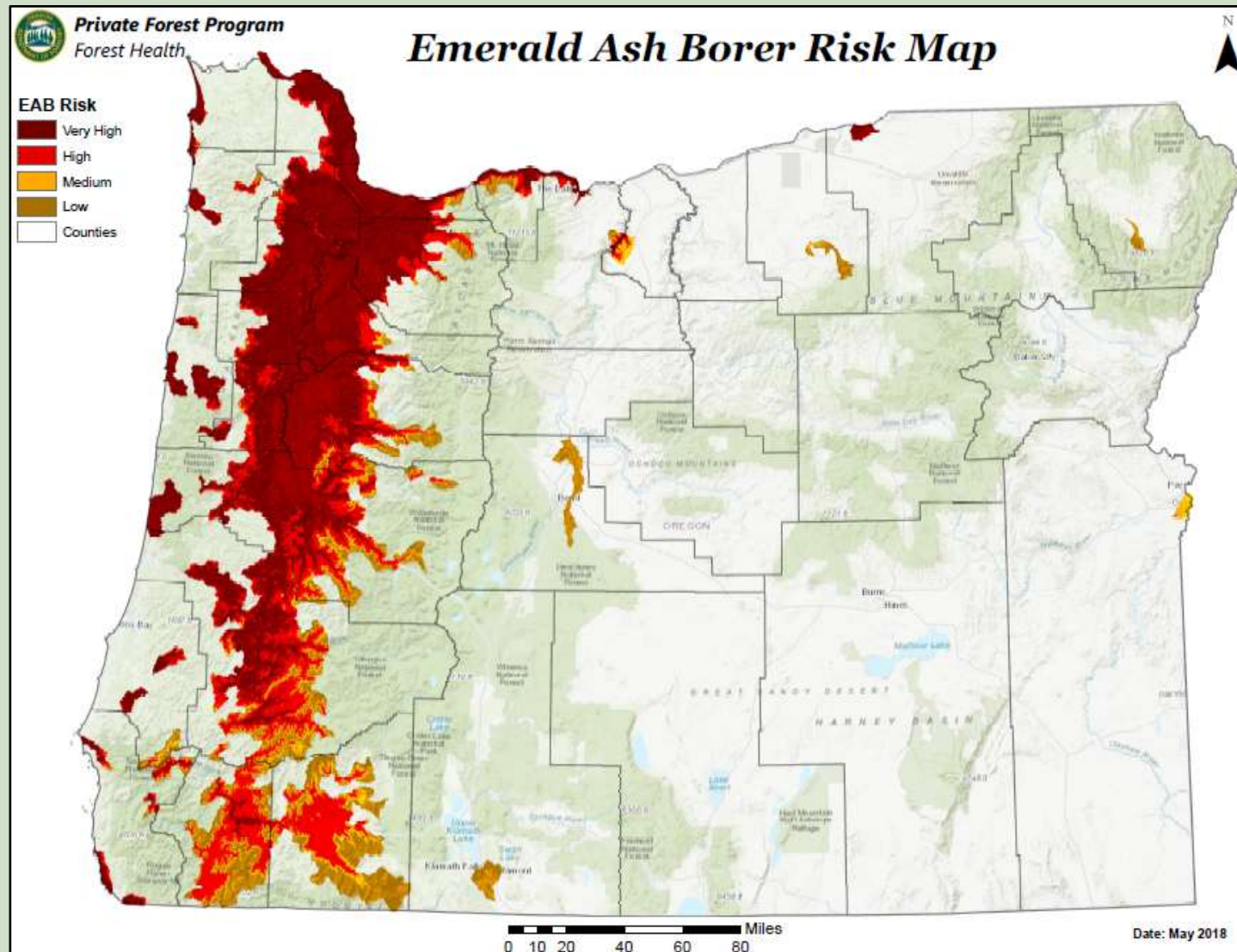
- 5 infested counties
 - Washington - 2022
 - Yamhill - 2024
 - Clackamas - 2024
 - Marion- 2024
 - **Multnomah - 2025**
- Detected in Vancouver, BC 2024



OregonEAB.com



Where's the ash?



Produced by ODF in **2018**

Every HUC-12 watershed
with confirmed presence of
“wild” ash

(More watersheds not on map)

Eastern and Central OR:
green ash from east coast



Ash in Riparian Corridors

Oregon Ash (*Fraxinus latifolia*):

Oregon's only native ash tree

- Important riparian and wetland tree
- Fragmented and altered landscape
- Critical habitat for threatened and endangered species
- Important cultural resource to Indigenous peoples



Who Responds to EAB?

Dept. of Forestry

- **Education + outreach:** trainings to partners
 - Outreach materials and kits
 - Trainings, management advice, and planning
- **Inventory:** TreePlotter
- **Detections:** Trapping program
 - Surveying & monitoring partner

Dept. of Agriculture

- **Regulatory:** Quarantine
- **Biocontrol:** Program manager
- **Detections:** Reporting Hotline
 - Slowing Ash Mortality (SLAM), 2022-2024
 - Visual surveying

Lead partners + contractors

- Clean Water Services
- Metro
- SWCDs & Watershed Councils
- Universities: OSU, PSU, WOU, local community colleges
- Arborists/Tree Care
- Pesticide applicators

Local partners

- **Education + outreach:** Community and members of the public
- **Biocontrol:** Landowner for release plots
- **Detection:** Survey & detection on owned land
- **Management activities:** On managed land
 - Surveying and detection on owned land

USFS + Federal partners

- **USDA-APHIS, NRCS, BLM, NWRP**
- **Biocontrol:** Supplier
- **Detection:** Supplier



EAB: Biology and Lifecycle



May - June
Pupae become adults



June - August
Adults emerge, mate, lay eggs on bark, and die within 6 weeks



July - September
Larvae hatch and burrow under bark to begin feeding



October - April
Cool temperatures cause larvae to go dormant and overwinter in tree



May
Larval lifecycle complete, EAB go deeper into wood for final metamorphosis

EAB Lifecycle
(1-2 years)



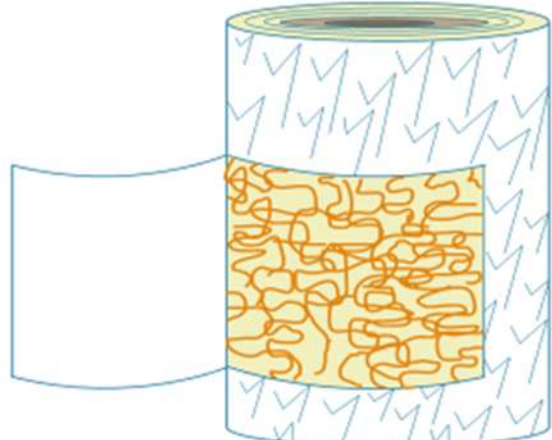
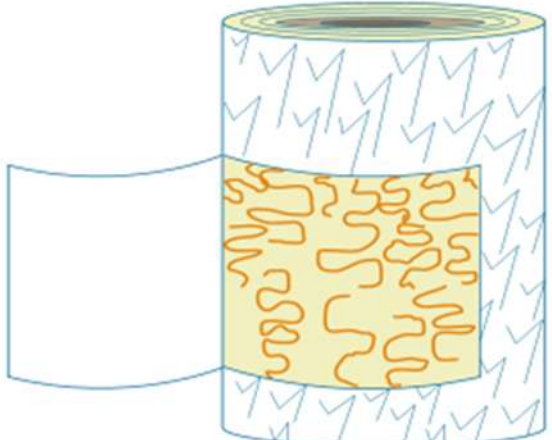
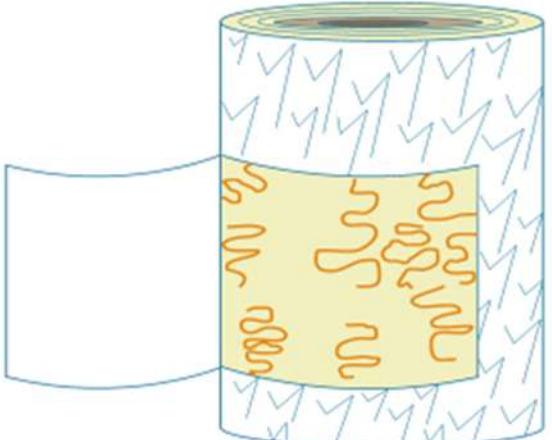
EAB Population Growth



**INFESTED
YEAR
3**

**INFESTED
YEAR
4**

**INFESTED
YEAR
5+**



Rapid
tree
death

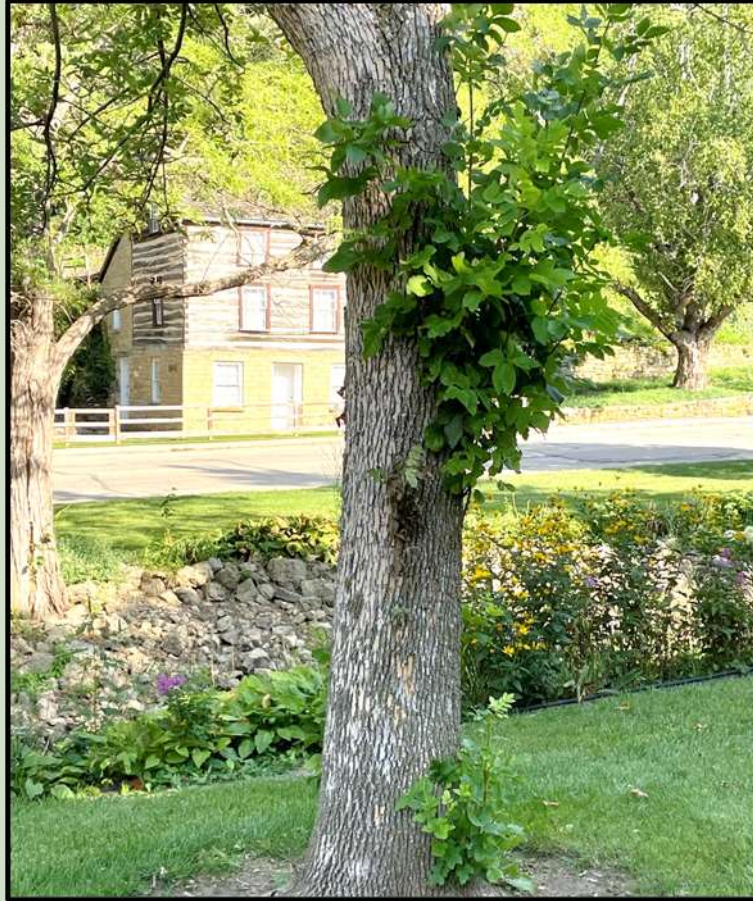


Credit: Rainbow EcoScience

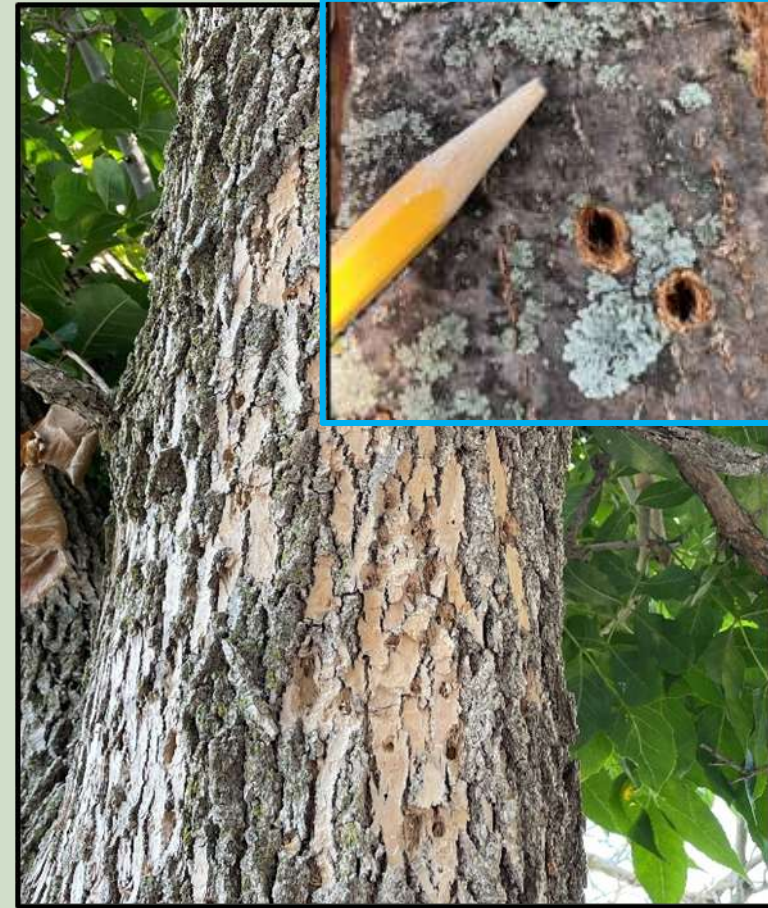
EAB Signs & Symptoms



Thinning crown and canopy decline



Epicormic sprouting or shoots



Woodpecker damage



EAB Signs & Symptoms



Bark splits



Serpentine galleries



D – shaped exit holes

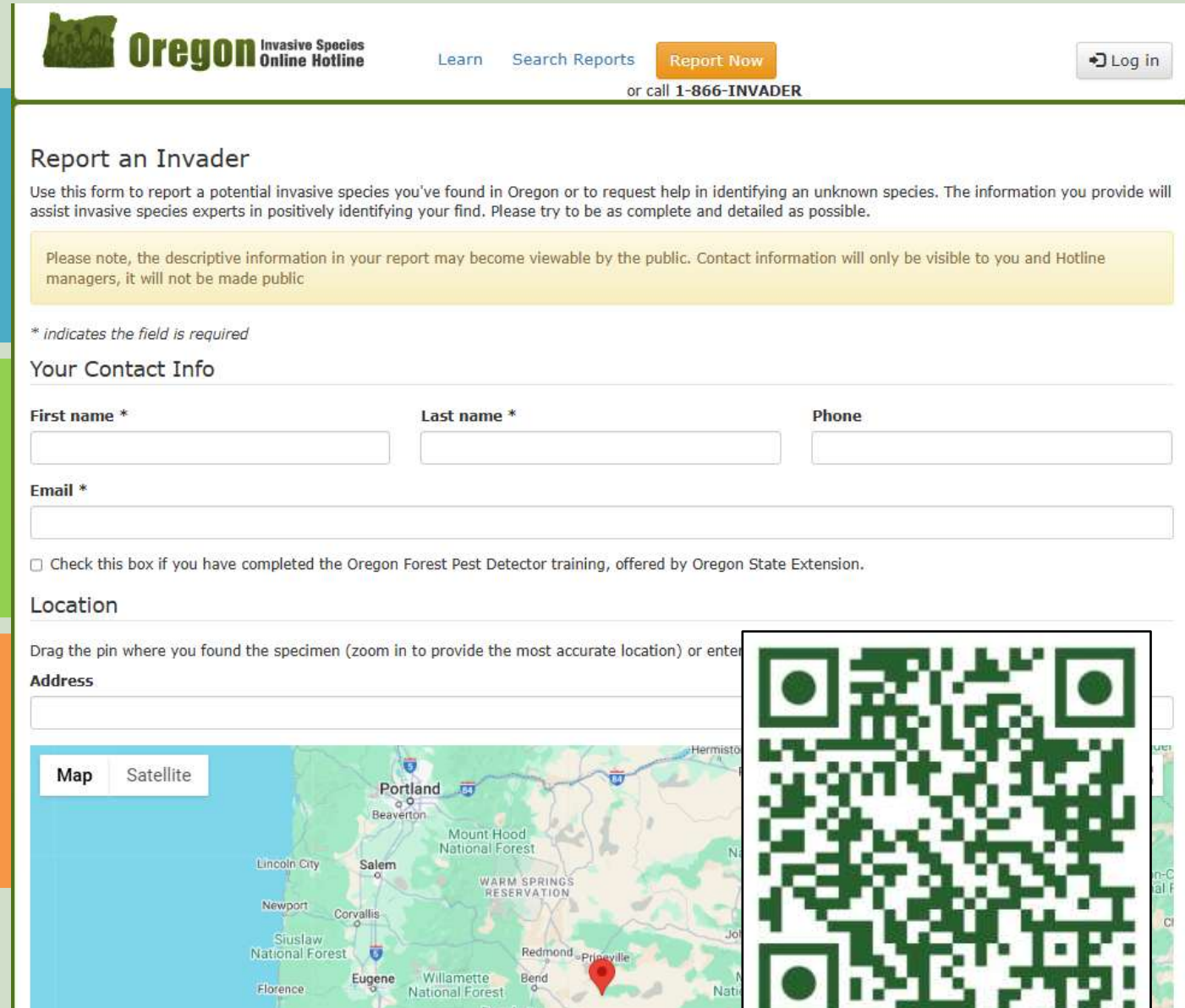


How to Report

Report using Oregon Invasive Species Hotline

Take photos of symptoms

Add tree location



The screenshot shows the 'Report an Invader' form on the Oregon Invasive Species Online Hotline website. At the top, there is a navigation bar with the Oregon state logo, the text 'Oregon Invasive Species Online Hotline', and links for 'Learn', 'Search Reports', and a 'Report Now' button. Below the navigation bar, the page title is 'Report an Invader'. A paragraph of text explains the purpose of the form: 'Use this form to report a potential invasive species you've found in Oregon or to request help in identifying an unknown species. The information you provide will assist invasive species experts in positively identifying your find. Please try to be as complete and detailed as possible.' A yellow warning box contains the text: 'Please note, the descriptive information in your report may become viewable by the public. Contact information will only be visible to you and Hotline managers, it will not be made public.' Below this, a note states '* indicates the field is required'. The 'Your Contact Info' section includes three input fields: 'First name *', 'Last name *', and 'Phone'. Below these is an 'Email *' input field. A checkbox is present with the text: 'Check this box if you have completed the Oregon Forest Pest Detector training, offered by Oregon State Extension.' The 'Location' section has a text input field with the instruction: 'Drag the pin where you found the specimen (zoom in to provide the most accurate location) or enter'. Below the text field is an 'Address' input field. At the bottom of the form is a map of Oregon with a red pin placed near Prineville. The map includes labels for cities like Portland, Salem, Eugene, and Bend, and national forests like Mount Hood and Willamette. A QR code is overlaid on the bottom right corner of the screenshot.



EAB Infestation: What it could look like



Developing a Response Plan

Ready
25+ miles

- Learn signs + symptoms
- Start inventory + risk assessment
- Create management plans and update policies

Set
10-25 miles

- Advise local partners
- Begin proactive management – treatment, underplanting, and pre-emptive removals
- Find local wood use networks

Go
5-10 miles

- Training + education
- Wood utilization
- Ongoing: Treatment, removals, replanting, restoration



Removals: Natural Areas

Removal strategies

- Trees near infrastructure
 - Homes, barns, and bridges
- Selective thinning to open canopy
 - Increase survival of shade intolerant species
- Create habitat
 - Snags
 - Large woody debris piles for wildlife

Replant

- Underplant with desirable replacements
 - What currently grows at the site?
- Habitat type may change
 - Restoration, conversion or reversion to shrubland or wetland prairie
 - Reach out to your local SWCD or OSU Extension agent





Management Plan



Remove & Replace

- Begin as soon as possible
- Increased demand for landscaped and natural plant species
- Replace small and lower quality trees



Treatment

- Begin when EAB is within 10-15 miles
- Licensed pesticide applicator
- Application window and timing (2-3 years)



Do nothing

- Long term, this will have the highest cost
- In natural areas: heat and invasives increase
- Anticipate water impacts

Treatment method: Systemic trunk injection

Emamectin benzoate

- Targets all EAB life stages
- EAB mortality: Excellent
- Non-target effects: Low
- Application method & frequency:
 - Systemic trunk injection
 - Once a year every 2-3 years
 - Low volume
- Should be administered by *a licensed pesticide applicator* trained on trunk injection system



Treatment: Timing and Action Thresholds

- Timing
 - EAB has been detected within 10-25 miles
 - Treat after leaf-out, but before high heat or winter dormancy
 - May and June are the most effective months to treat
- Tree Health: > 70% canopy
 - Infested trees can be treated if healthy



Management Plan: Natural Areas

Use a combination of all three methods to maintain ecosystem and community benefits of a healthy ecosystem

Worst Case Example:

- Full canopy loss
- Invasives increase
- Working in area becomes risky due to standing dead trees
- Water quality impacts experienced
 - Habitat loss
 - Heat increases
 - Decreased fish fecundity
 - Streambank erosion

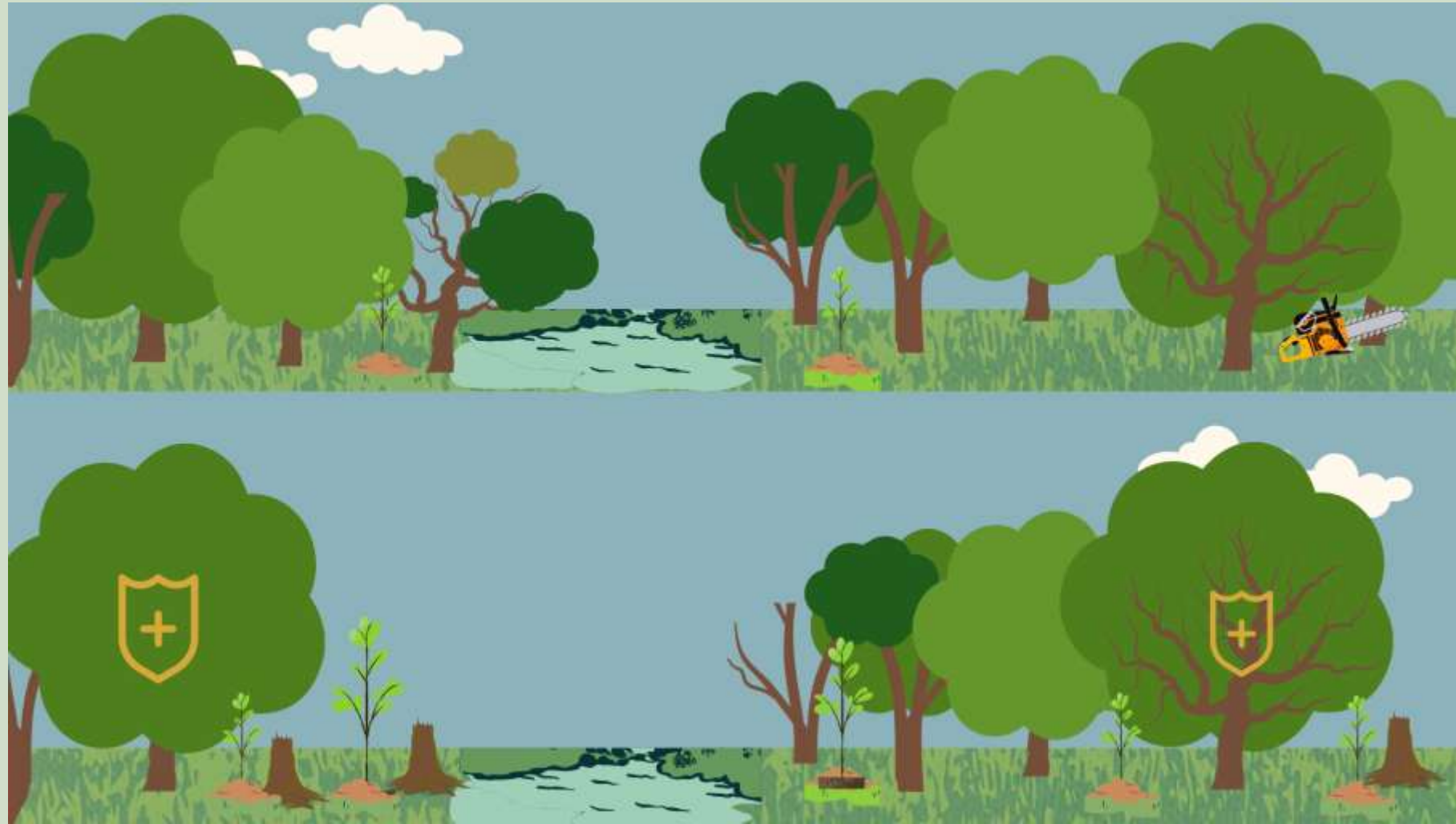


Management Plan: Natural Areas

Use a combination of all three methods to maintain ecosystem and community benefits of a healthy ecosystem

Pre-emptive example:

- Staggered canopy loss
- Can still work in area since high-risk trees were removed
- Water quality impacts reduced
 - Habitat created with snags
- Underplanting with diverse species
 - Climate prepared
 - Streambank stabilized
 - Future shade created



Natural Areas: Species List

- Garry oak
- Western crabapple
- Chokecherry
- Piper willow
- White alder
- Ponderosa pines

Tree species
associated with
ash, clay soils



Pollinator friendly species

- Black cottonwood
- Quaking aspen
- Douglas-fir
- Scouler willow
- Bitter cherry
- Cascara buckthorn

Tree species
associated with
ash, clay
intolerant



- Incense cedar
- California Black oak
- Coastal redwood
- Dawn redwood
- Oregon myrtle

Species for
heat adaption
trials



Dying ash are dangerous

An 80-foot ash tree crashed into a building at Hobby World in Adams, causing significant damage

By Sam Sperella, The Berkeley Eagle | Sep 26, 2024 | 1 min to read

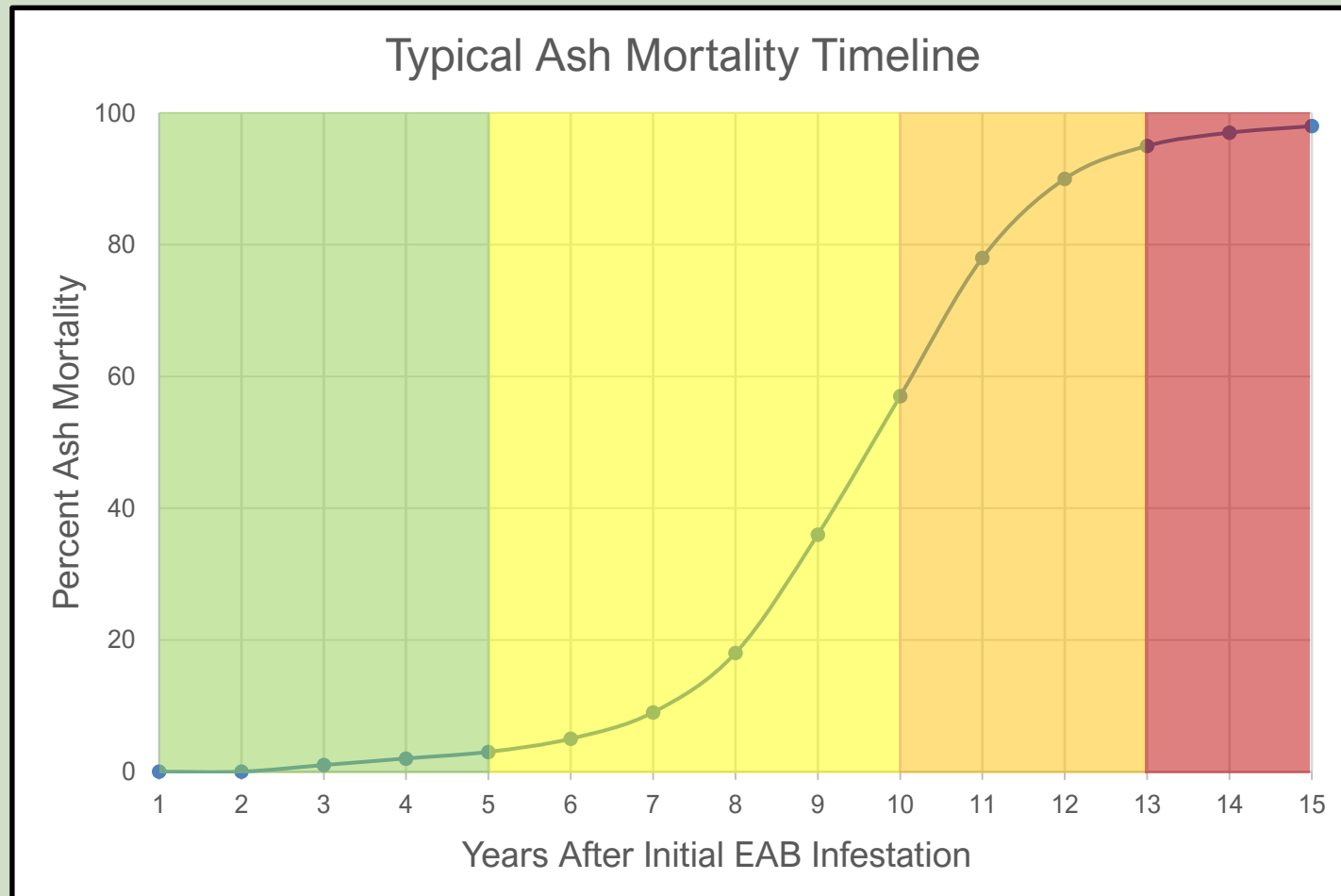


The Hobby World building in Adams was damaged Tuesday when it was struck by an 80-foot ash tree. It's unclear how long it's been dead or why it fell on the building.



Infestation Timeline – Community Scale

The rate of ash mortality may outpace a community's ability to deal with dead/dying trees.



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Value of Preparation



- Preparation is cost effective
 - Invasive species control
 - Loss of ecosystem services
 - Protection of infrastructure
- You manage EAB or it will manage you
 - Plan for wood waste management
- Adapted Management
 - Adjusting your management plan to fit new information
- Collaborate with neighbors and community
 - Pooling removals and treatment costs
 - More effective



EAB Detection: Trapping

- Effective when local EAB population is high
- Hung in May
- Checked every 6 weeks
- Removed in Sept
- Only available from USDA, ODF and partner agencies



EAB Detection: Trap Tree



- Effective at low EAB population
- Trees are girdled in late spring
- Girdled trees draw adult EAB to them, where they lay eggs
- Felled in fall, debarked to look for larvae
- Lethan trap trees: Treated before girdled a not felled



Next Steps



Get connected

Get to know partners

Begin outreach to community

Decide on a management strategy

Will you be managing land or advising?

What further trainings are needed?

Determine detection strategy

Passive vs active monitoring

What resources are available



EAB Resources: [OregonEAB.com](https://www.OregonEAB.com)

The 'one-stop shop' for all things EAB in Oregon

Check out the updated **Oregon EAB Map**, where you can track nearest EAB populations

Managed by ODF's Urban & Community Forestry Program

Link: <https://www.OregonEAB.com>



The screenshot shows the website's header with navigation links: EAB Home, About, Resources, Local Information, Oregon EAB Map, and Report EAB. The main heading is "Emerald Ash Borer (EAB) in Oregon". Below the heading is a paragraph of text describing the Emerald ash borer (*Agrilus planipennis*) as a destructive, invasive beetle that infests and kills ash trees (*Fraxinus* species). It mentions that EAB has spread across North America since its first detection in Michigan in 2002, and that it was confirmed in Oregon in 2022, the first known case on the West Coast. The text states that once EAB arrives in an area, it cannot be eradicated, and that there are steps that can be taken to slow its spread and limit its impacts. To the right of the text is a close-up photograph of an adult emerald ash borer beetle on a green leaf. Below the photograph is a QR code.

EAB Home About Resources Local Information Oregon EAB Map Report EAB

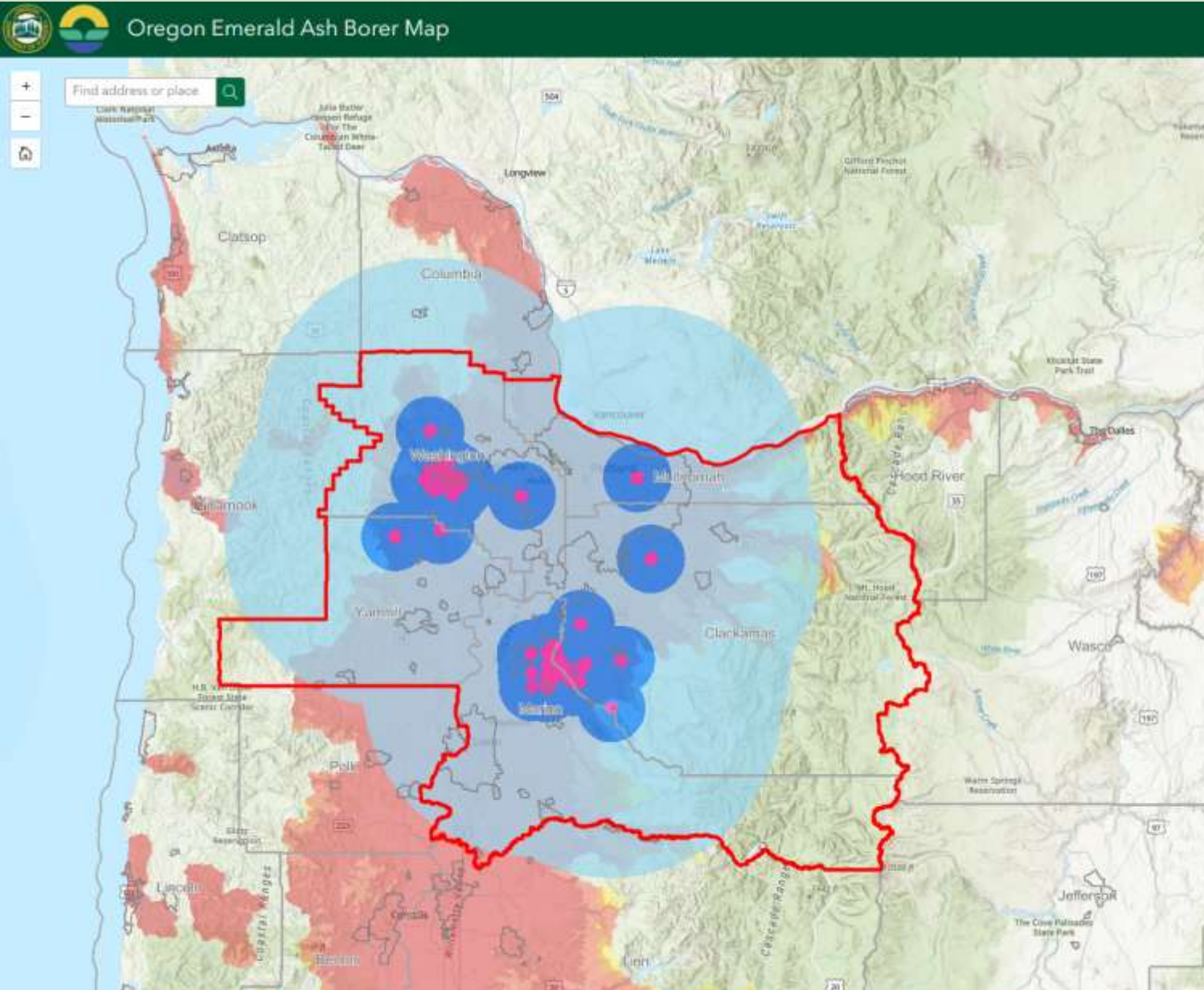
Emerald Ash Borer (EAB) in Oregon

Emerald ash borer (*Agrilus planipennis*) – commonly called EAB – is a destructive, invasive beetle that infests and kills ash trees (*Fraxinus* species). EAB has spread across North America since it was first detected in Michigan in 2002, killing hundreds of millions of ash trees. EAB was confirmed in Oregon in 2022, the first known case on the West Coast. Once EAB arrives in an area, it cannot be eradicated –which means it doesn't go away. Even though EAB will kill many ash trees in Oregon, there are steps we can take to slow its spread and limit its impacts.

Adult emerald ash borer beetle



EAB Resources: Oregon EAB Map



Circle color buffers indicate how close you are to an infestation

Background feature layer highlights ash likelihood in and near watersheds

Updates throughout the trapping and field season



<https://www.OregonEAB.com>

EAB Resources: Readiness and Response Guide

Created by a joint statewide task force,
updated in 2021

Check out chapter IV for preparing to
create a management plan

Join the State Task Force to keep up to
date with ongoing EAB activities in the
state



EMERALD ASH BORER

READINESS AND RESPONSE PLAN FOR OREGON

PUBLISHED BY



OREGON
DEPARTMENT OF
AGRICULTURE

MARCH 2021

EAB Resources: OregonEAB.com

State Resources

- [Oregon's EAB Readiness and Response Plan](#)
- [ODF Forest Health Website](#)
- [Biological Control for EAB](#)

Identification and Fact Sheets

- [Ash Identification](#)
- [EAB Look-Alikes](#)
- [EAB Fact Sheet](#)
- [EAB Quarantine](#)
- [MOB Fact Sheet](#)

OSU EAB Resources

- [Oregon Ash: Insects, Pathogens, and Tree Health](#)
- [Alternatives to Ash in Western Oregon](#)
- [Recommendations for Tree Protection Against EAB](#)

Management Resources

- [10 Recommendations for Managing Ash](#)
- [Managing Northeastern Forests Threatened by EAB](#)
- [EAB Management Review](#)
- [EAB Insecticide Treatment Fact Sheet](#)

Report Invasive Species

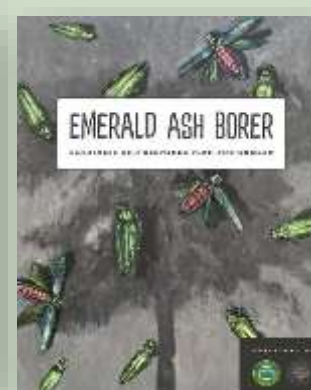
- [Reporting Potential EAB Insects or Infestations](#)

Wood Use

- [Resource Directory of Wood Waste Professionals](#)
- [What To Do with Ash Wood](#)

Other Forest Management

- [Find an Arborist](#)
- [Tree Risk Management](#)





Thanks!

Wyatt Williams

**InvasivePests@odf.oregon.gov
OregonEAB.com**

***Oregon Department of Forestry
Forest Health Unit***

