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

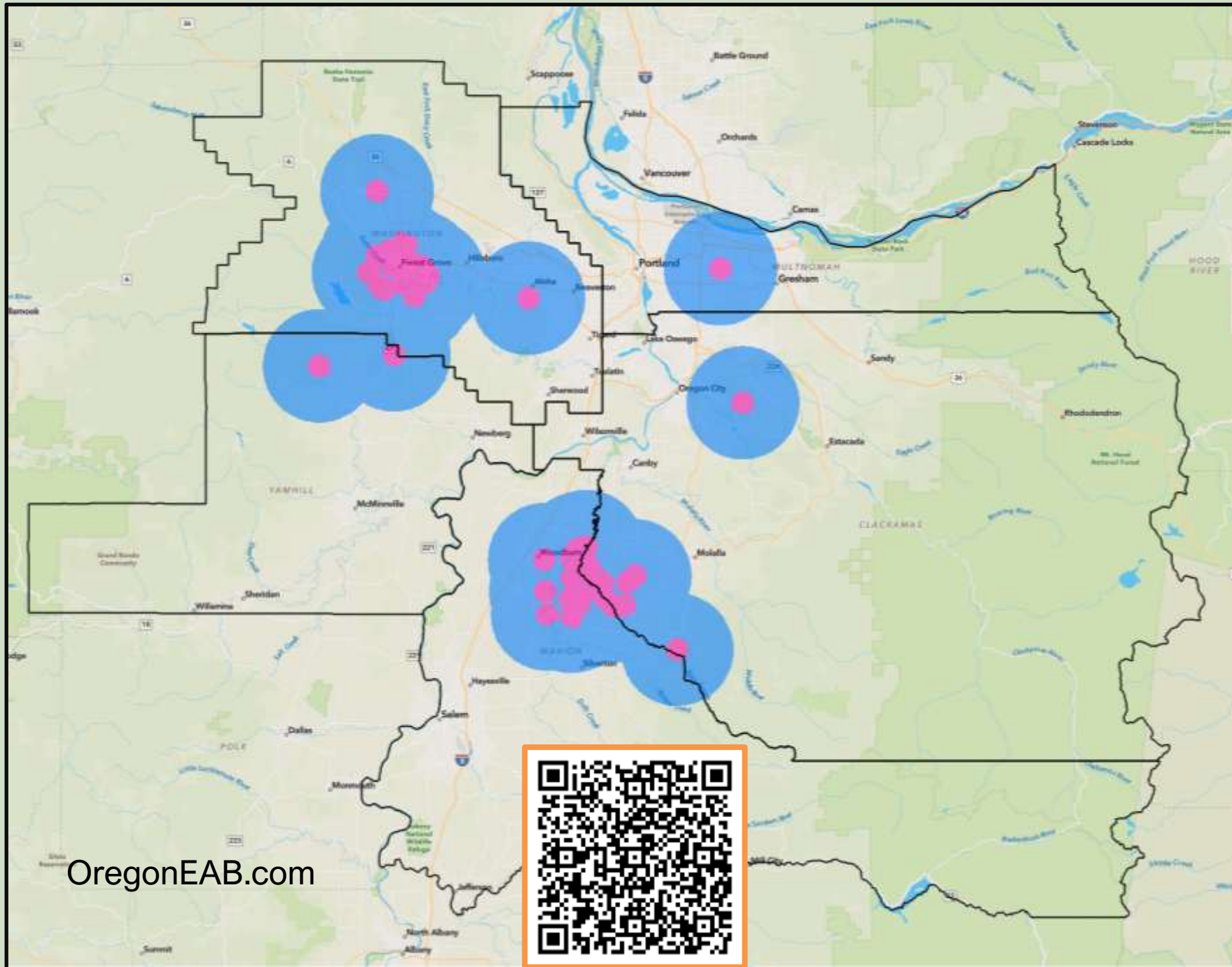
100+ million trees killed since 1990s, highest cost forest pest in the Americas

United States Detections

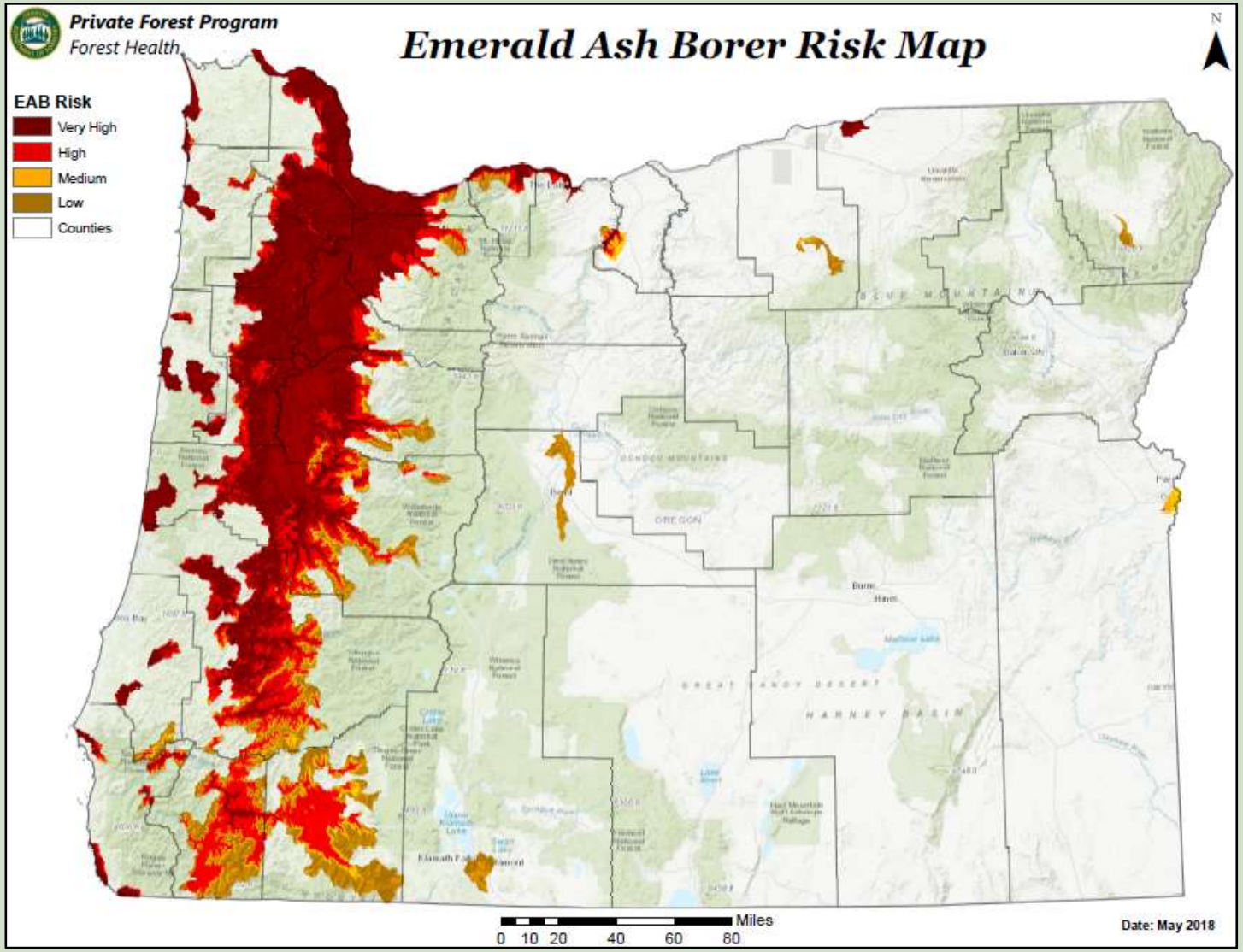
- 2002: Detroit, MI
- 2012: 16 states with known infestations
- 2013: Colorado
- 2022: Oregon

EAB in Oregon

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



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

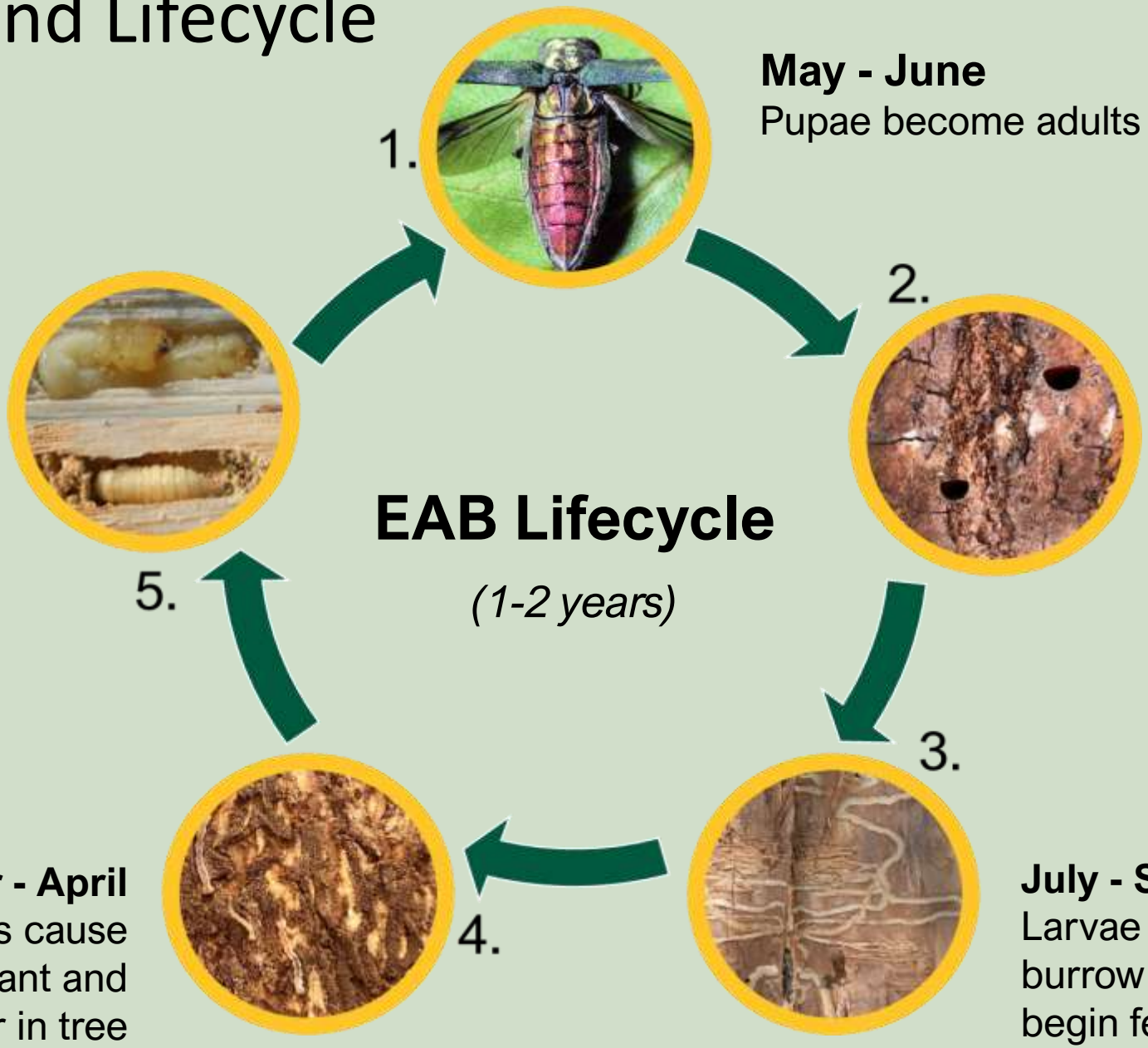
Local partners

- **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, NWRF**
- **Biocontrol:** Supplier
- **Detection:** Supplier

EAB: Biology and Lifecycle



May - June
Pupae become adults

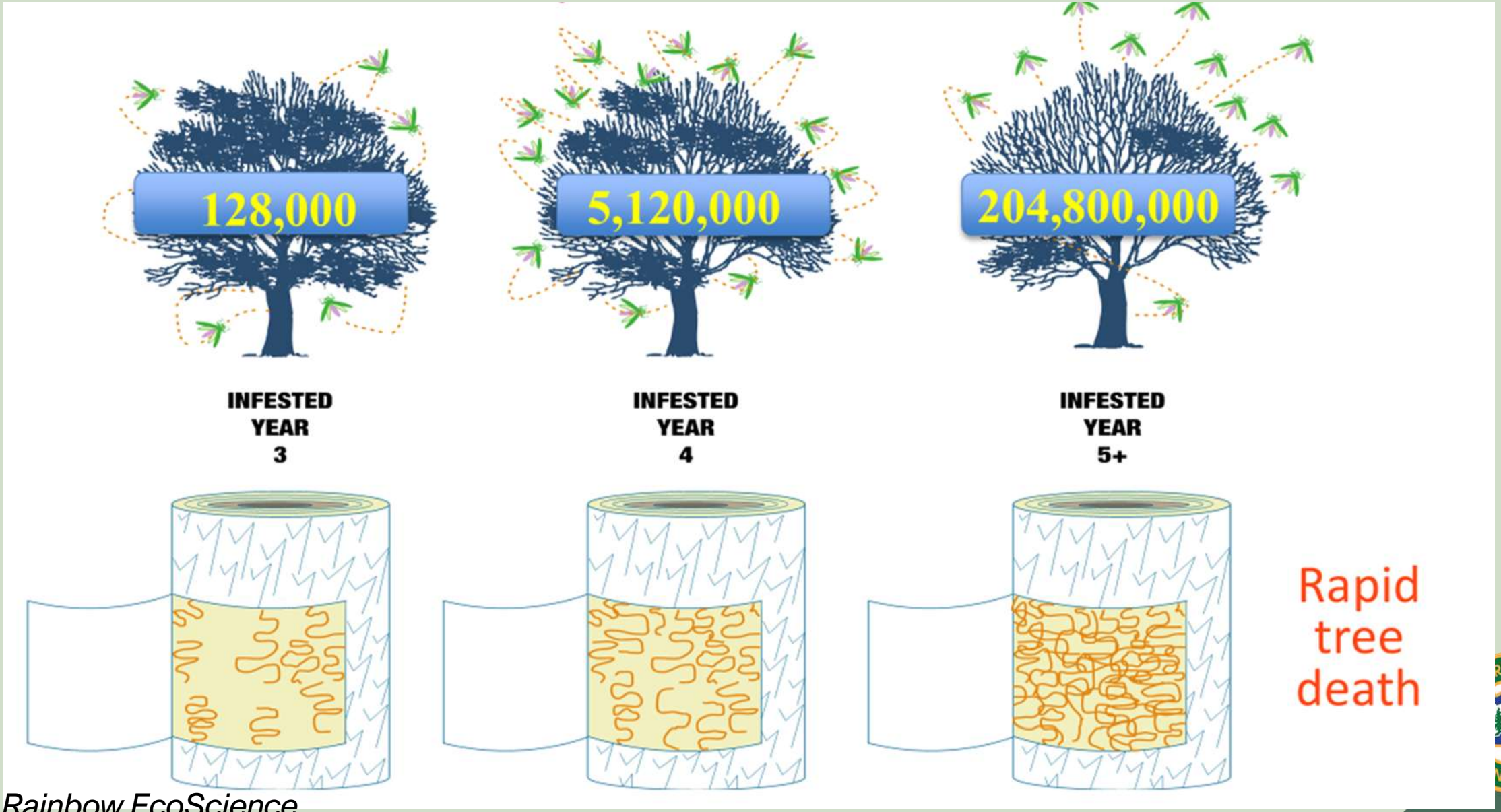
June - August
Adults emerge, mate, lay eggs on bark, and die within 6 weeks

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

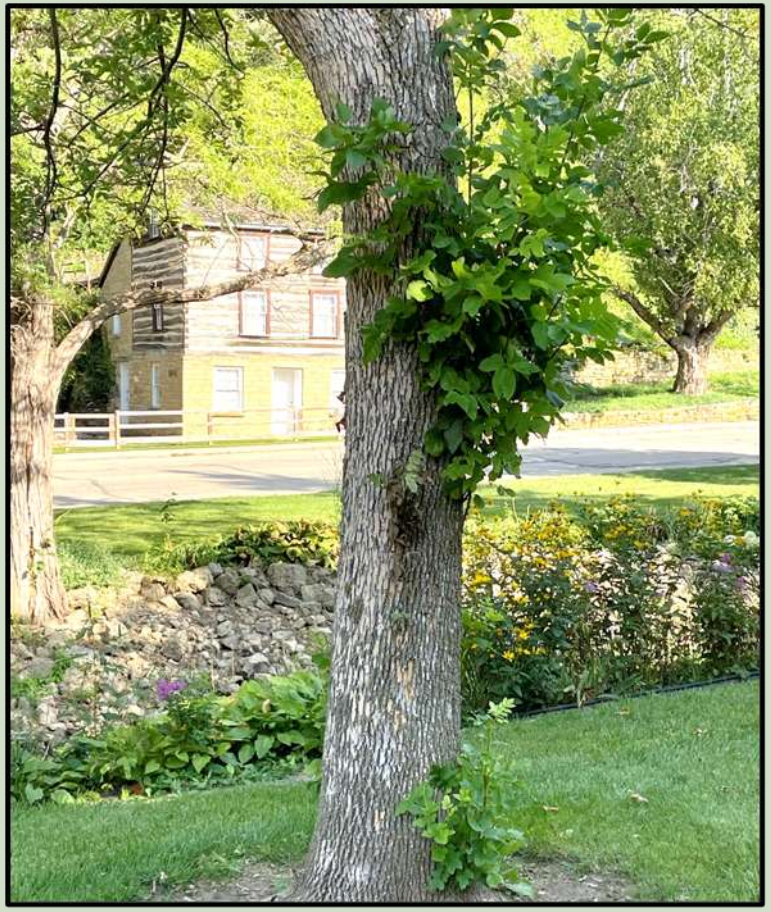
EAB Population Growth



Credit: Rainbow EcoScience

EAB Signs & Symptoms

Thinning crown and canopy decline

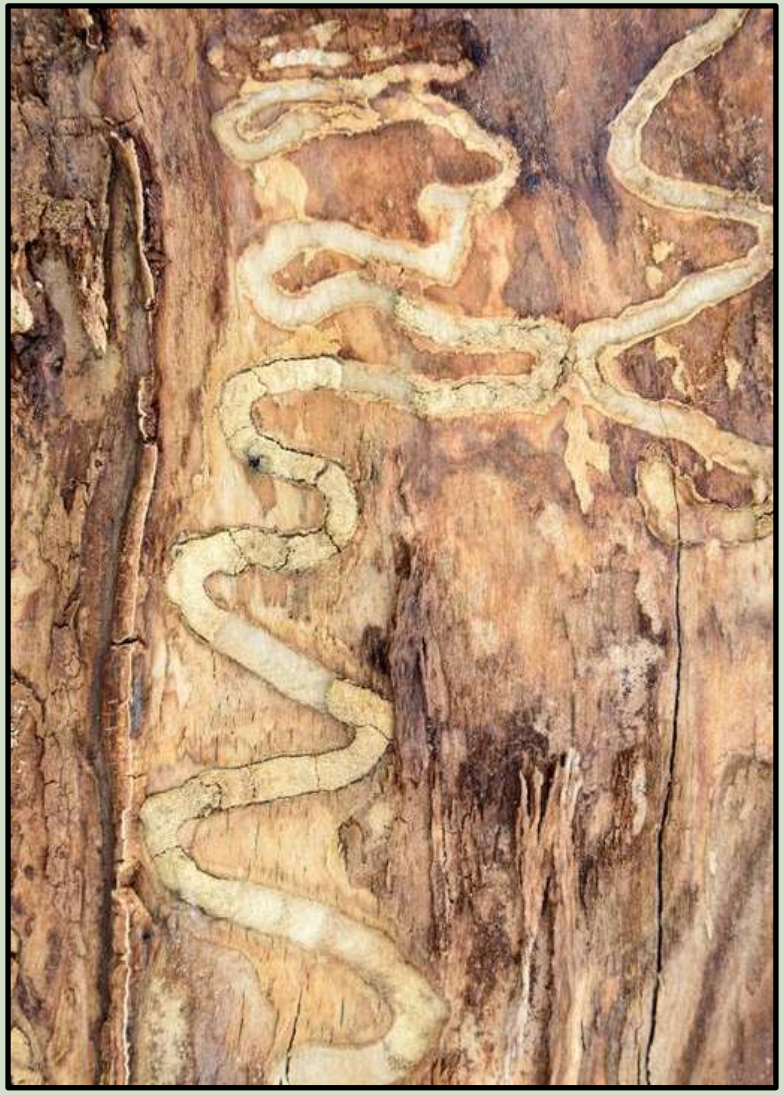


Epicormic sprouting or shoots

Woodpecker damage

EAB Signs & Symptoms

Bark splits



Serpentine galleries

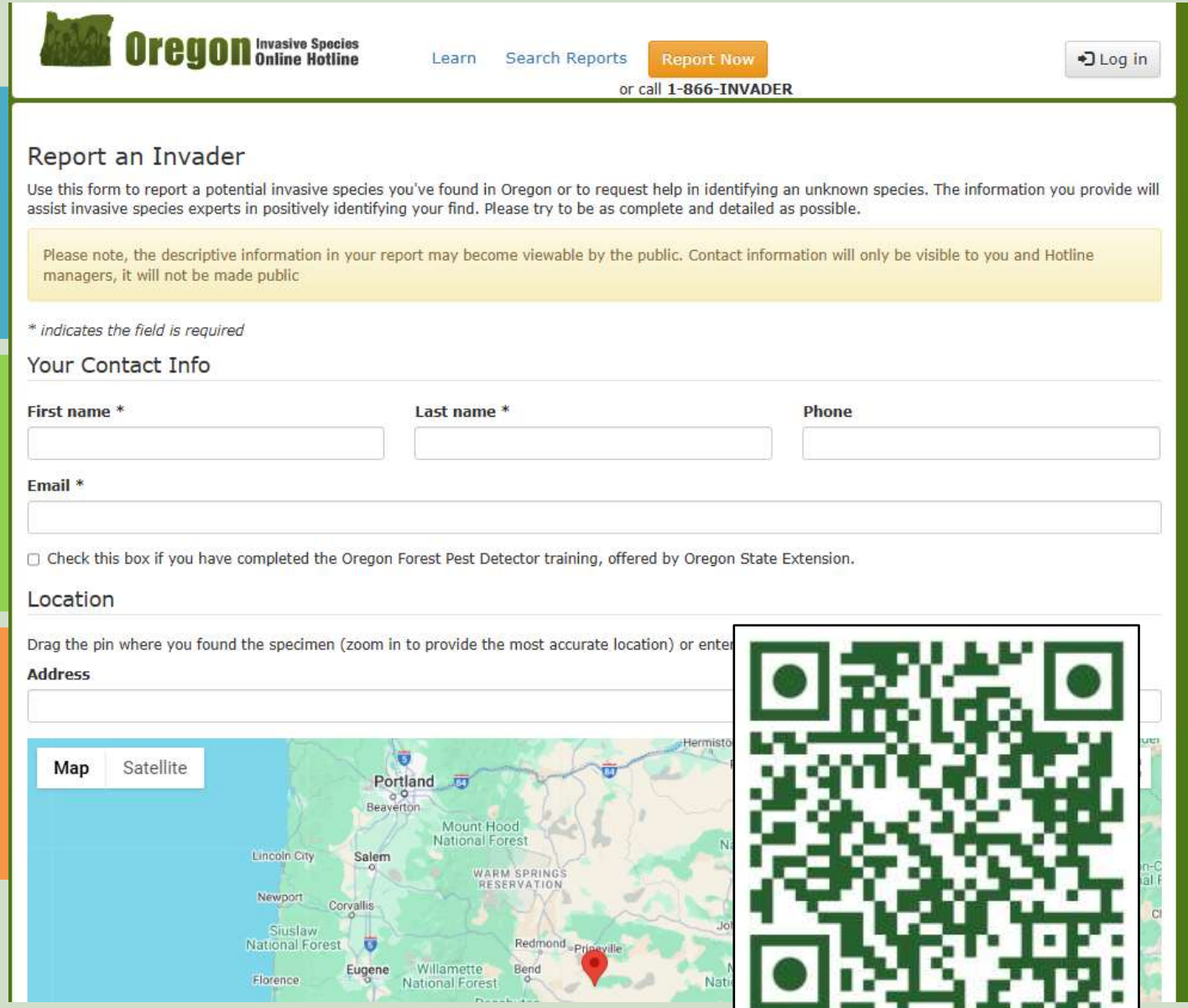
D – shaped exit holes

How to Report

Report using Oregon Invasive Species Hotline

Take photos of symptoms

Add tree location



Anacosta Watershed Society

EAB Infestation: What it could look like

Wyatt Williams, ODF

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

Kral and Shaw | OSU

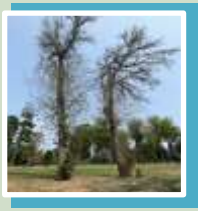
Management Plan

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

Sadof et al., 2023

Treatment: Timing and Action Thresholds

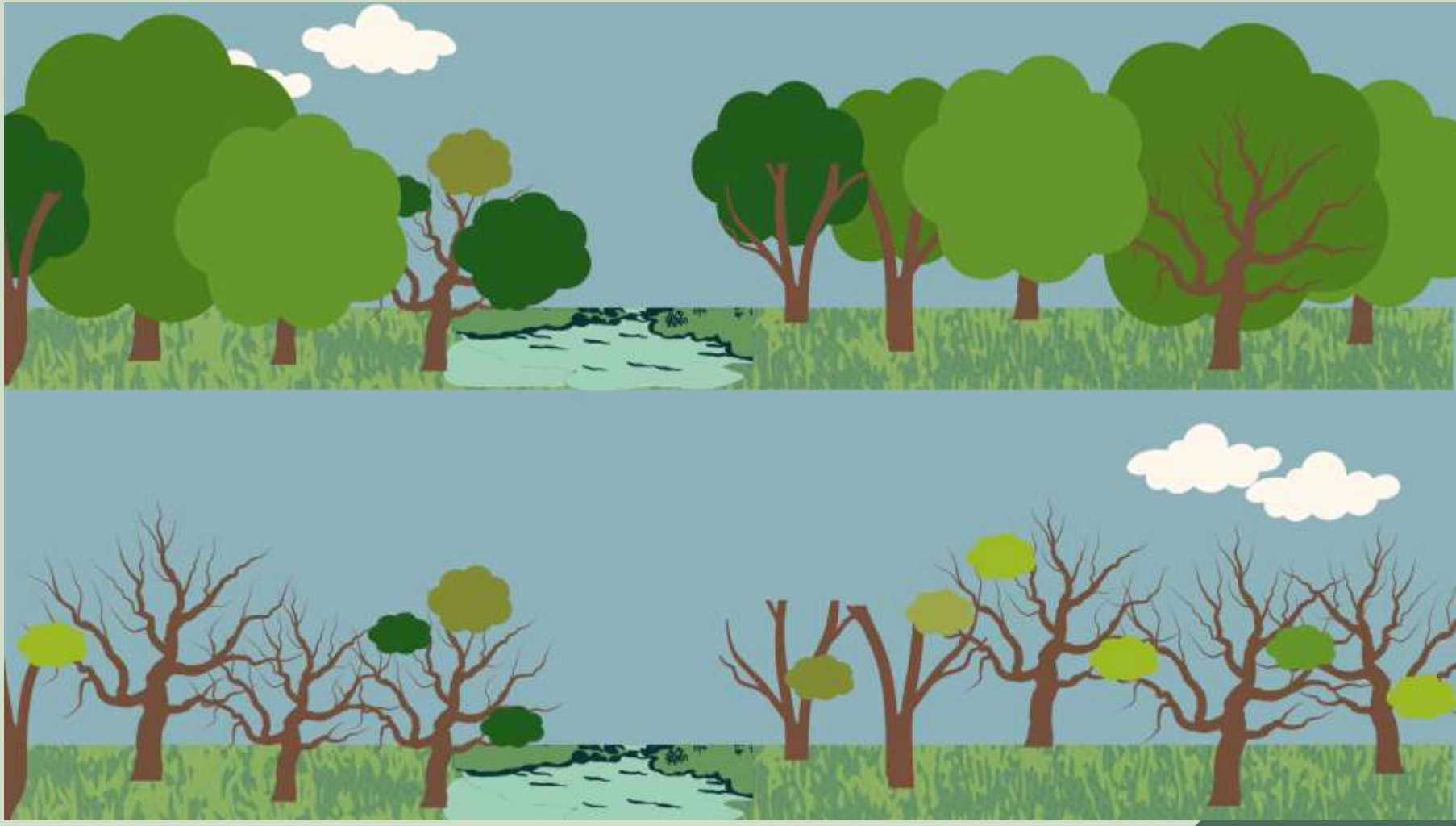
- Timing
  - EAB has been detected within 10-25 miles
  - Treat after leaf-out, but before high heat or winter dormancy
  - May and June are the most effective months to treat
- Tree Health: > 70% canopy
  - Infested trees can be treated if healthy

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

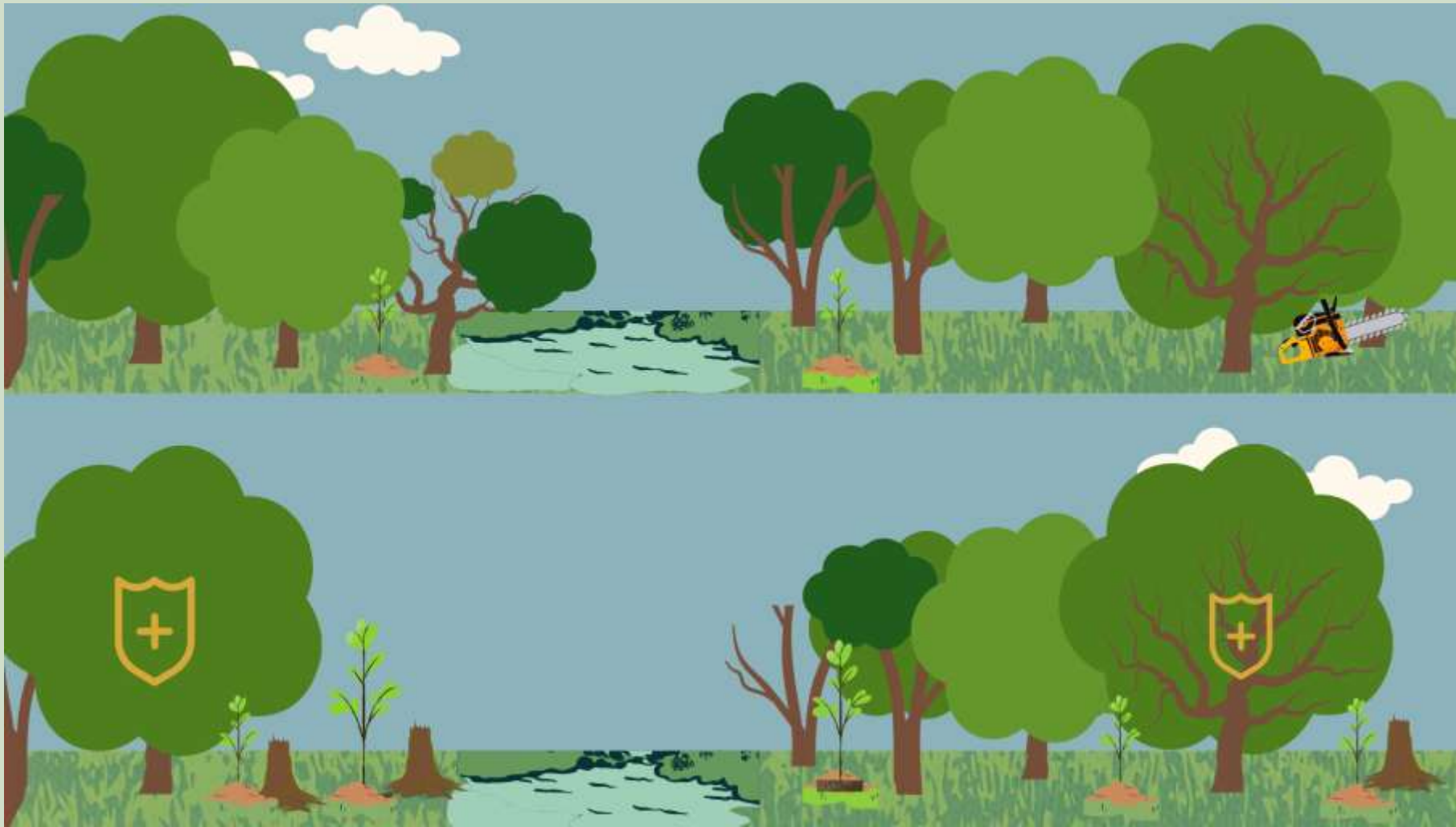


Management Plan: Natural Areas

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

Tree species associated with ash, clay soils

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

Tree species associated with ash, clay intolerant

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

Species for heat adaption trials

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

Pollinator friendly species

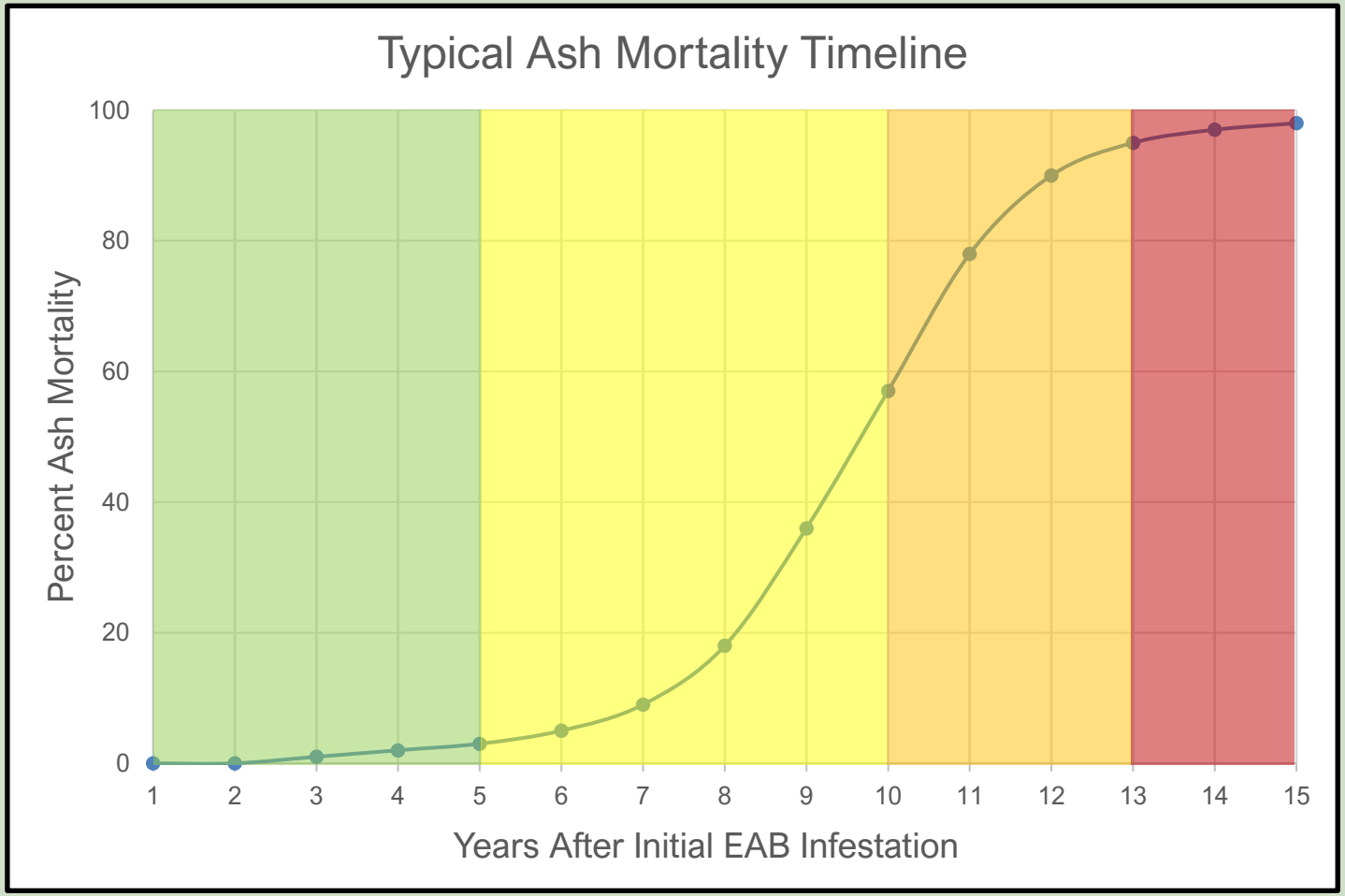
Adapted from Kral and Shaw, 2023 and Hull, 2024

Dying ash are dangerous

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

Infestation Timeline – Community Scale

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



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

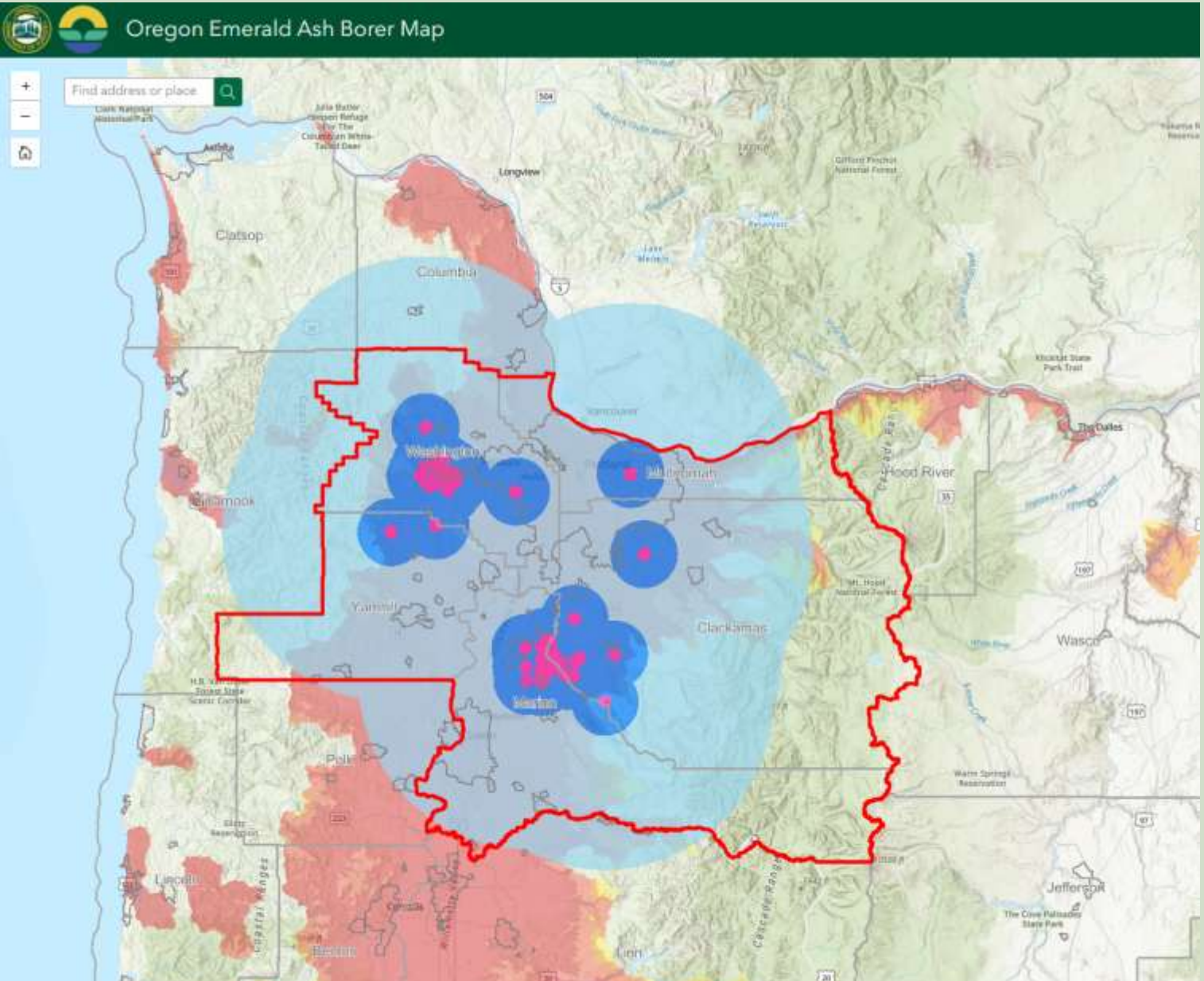
The ‘one-stop shop’ for all things EAB in Oregon

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

EAB Resources: Oregon EAB Map



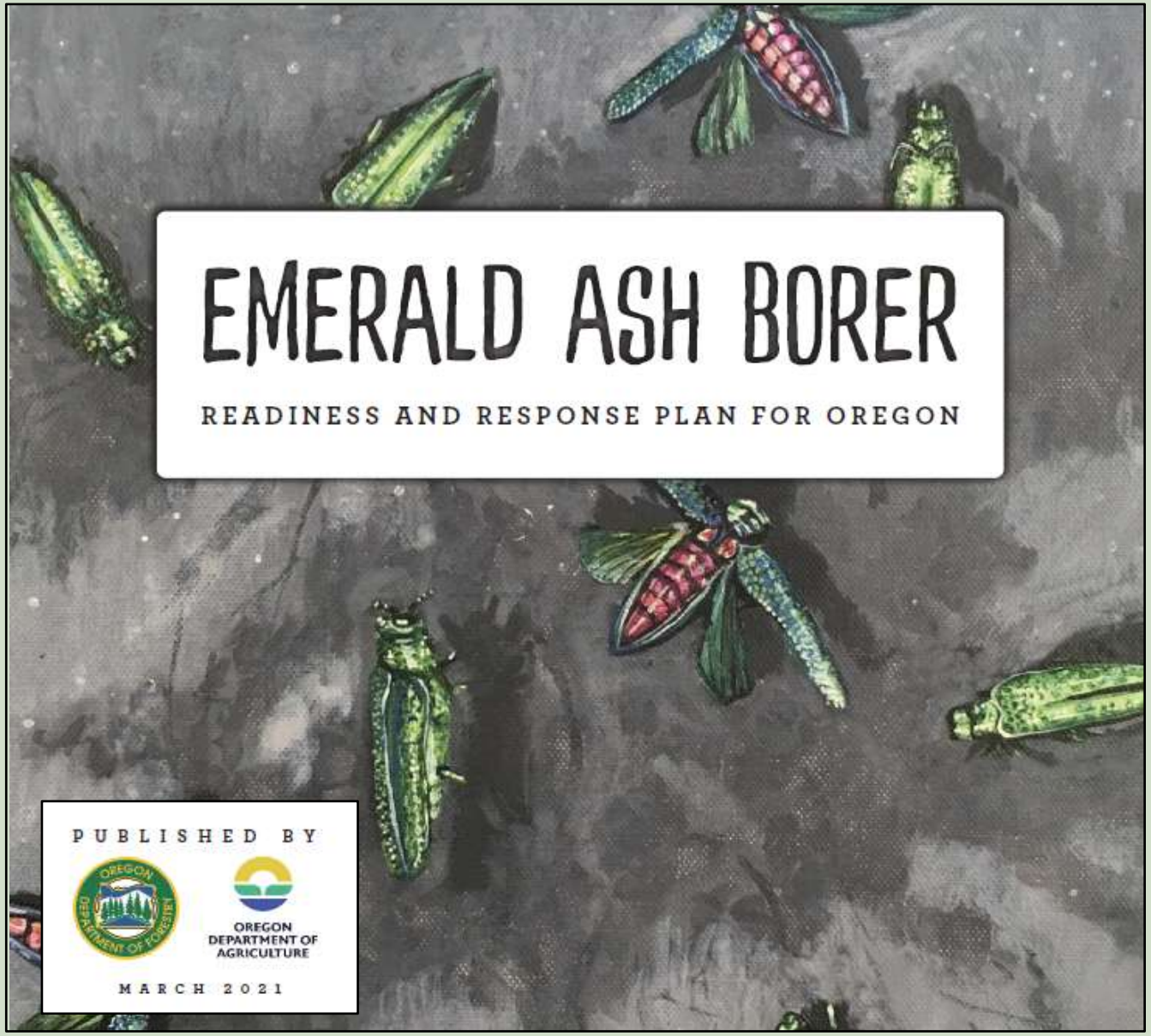
Circle color buffers indicate how close you are to an infestation

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

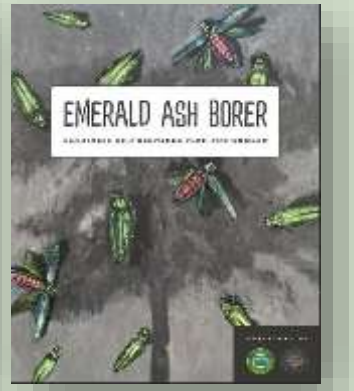


Created by a joint statewide task force, updated in 2021

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

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