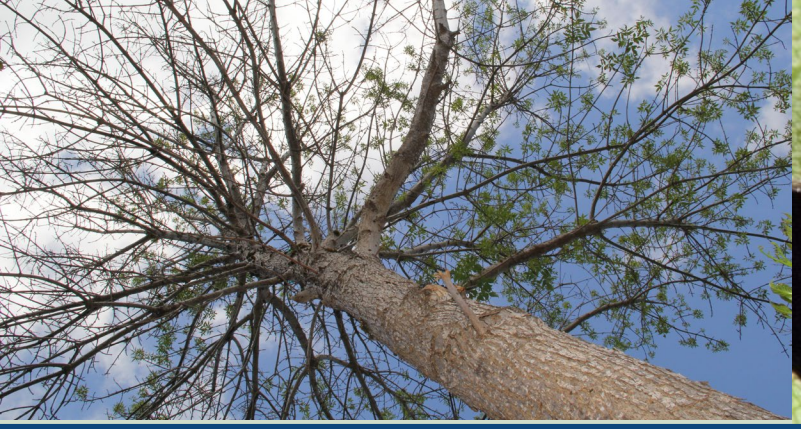


Emerald Ash Borer: Managing a New Threat to Oregon's Trees

Oregon Department of Forestry (ODF)

Urban & Community Forestry Assistance Program

Kat Bethea | EAB Support Specialist

Matt Mills | EAB Support Specialist

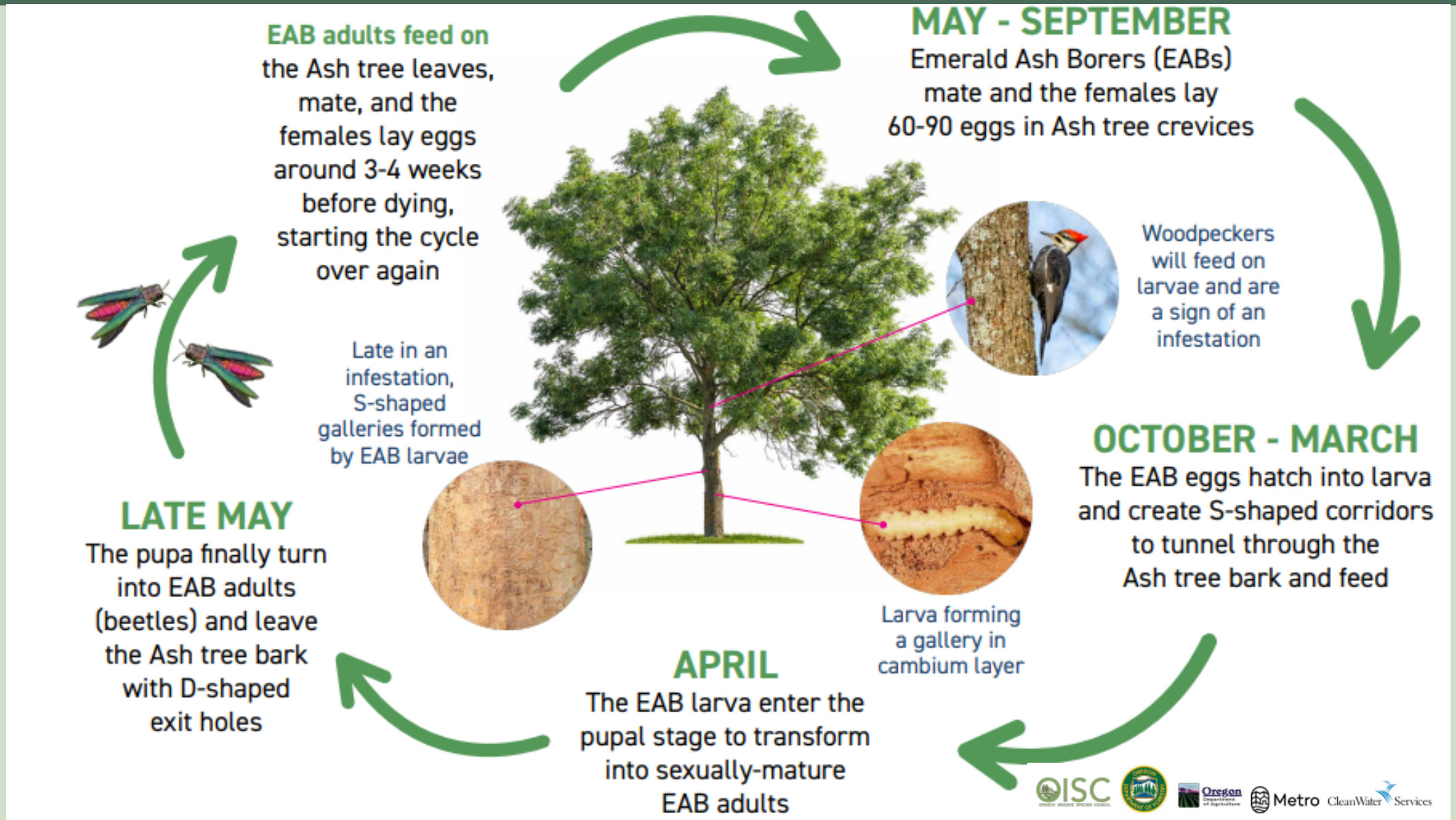
Agenda

- Introduction + History
- Ash Tree ID + Importance
- Management
- Restoration
- Q&A

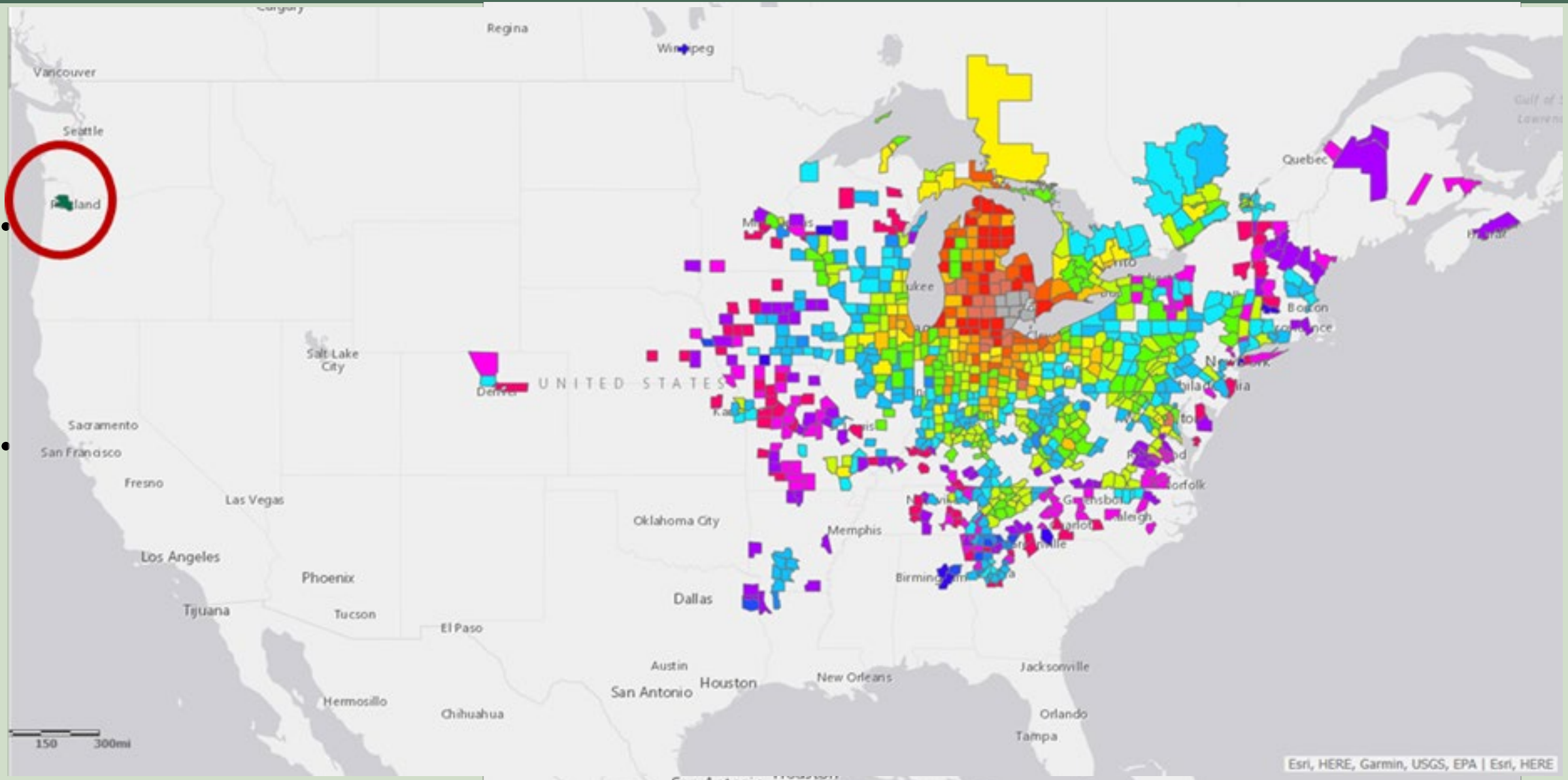
Emerald Ash Borer (*Agrilus planipennis*)

- **Invasive and highly destructive woodboring beetle that kills ash trees of all sizes (*Fraxinus* spp.)**
- **Larvae feed beneath bark, eventually girdling and killing the tree.**

EAB Life Cycle



EAB: History in the US

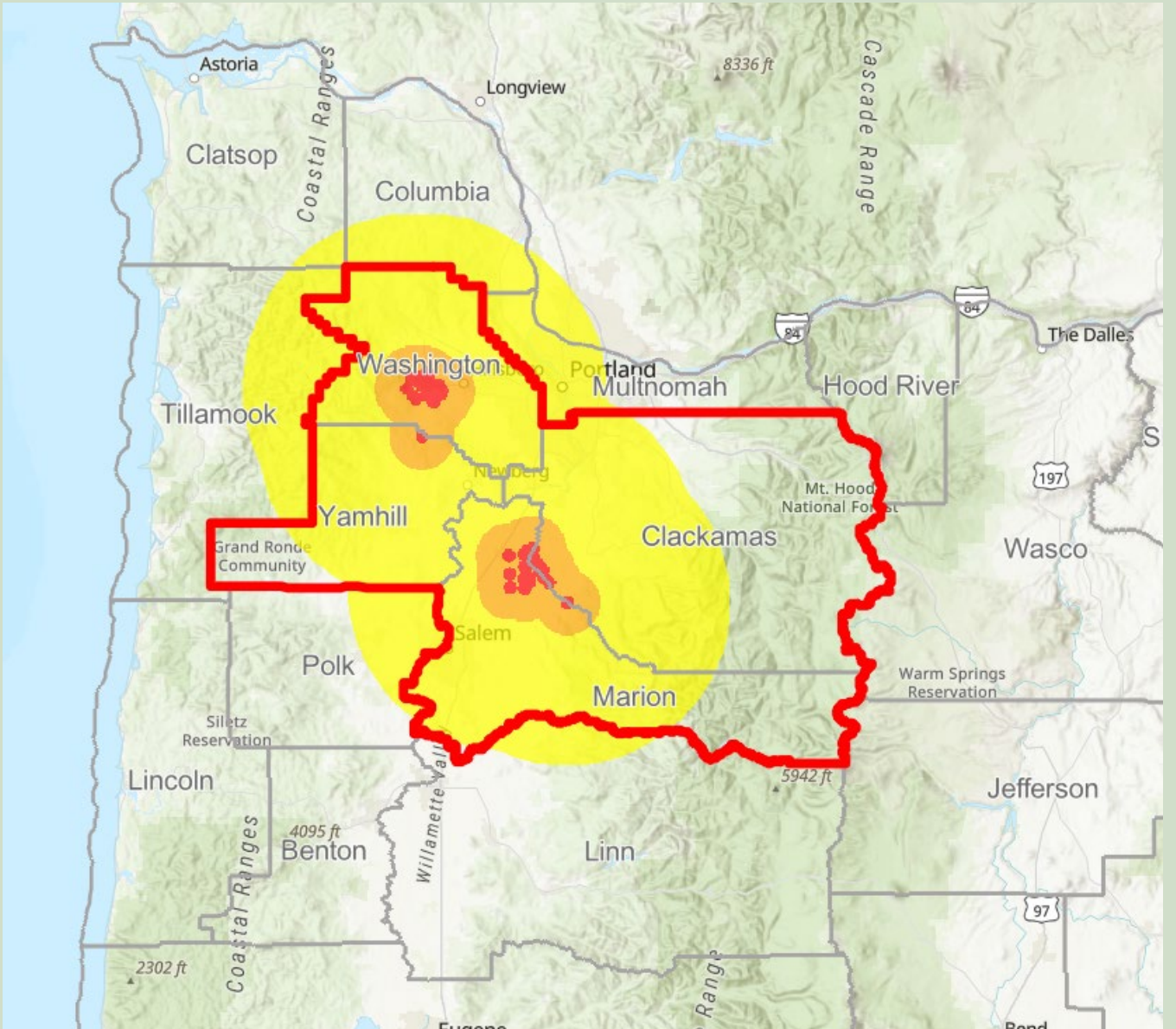


EAB in Oregon: Updates

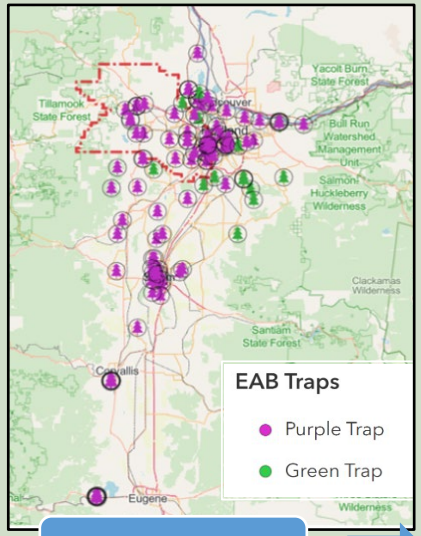
Counties currently under quarantine

- Washington
- Yamhill
- Clackamas
- Marion

Quarantine expands when EAB is confirmed in another county

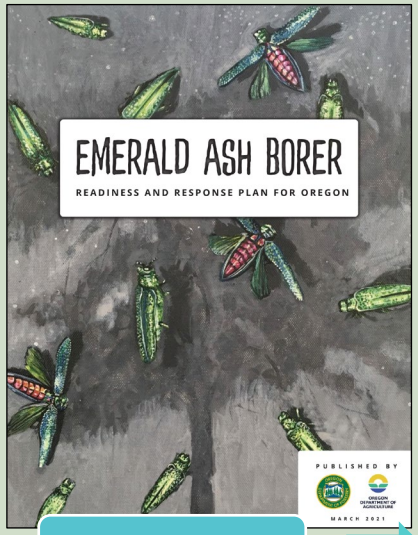


Oregon's EAB Response



Prior to 2013

- Trapping throughout state
- Federal and state cooperation



2018

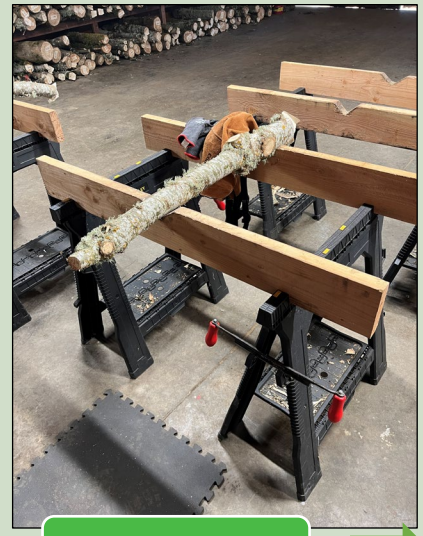
- Created EAB Readiness and Response Plan

2019

- Oregon Ash Seed Collection begins

2022

- First detection in Oregon
- Statewide taskforces created



2023

- Visual surveying + trapping increases
- **SLAM** begins
- Biocontrol release

2024

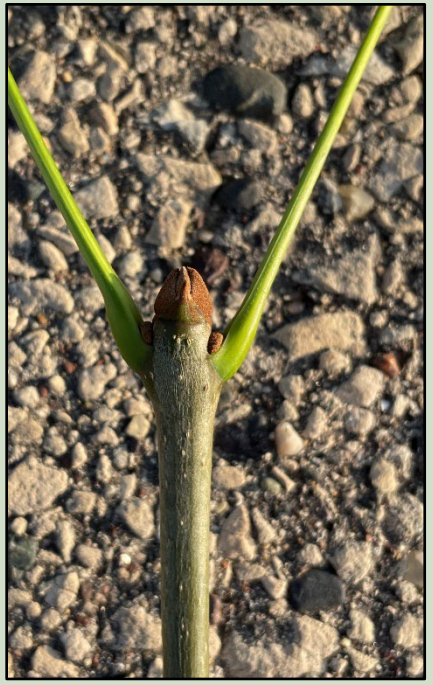
- Additional infestations discovered
- Continuing:
  - SLAM
  - Biocontrol
  - State Task Force
  - Education

Ash in Oregon: Identification

Furrowed Gray Bark

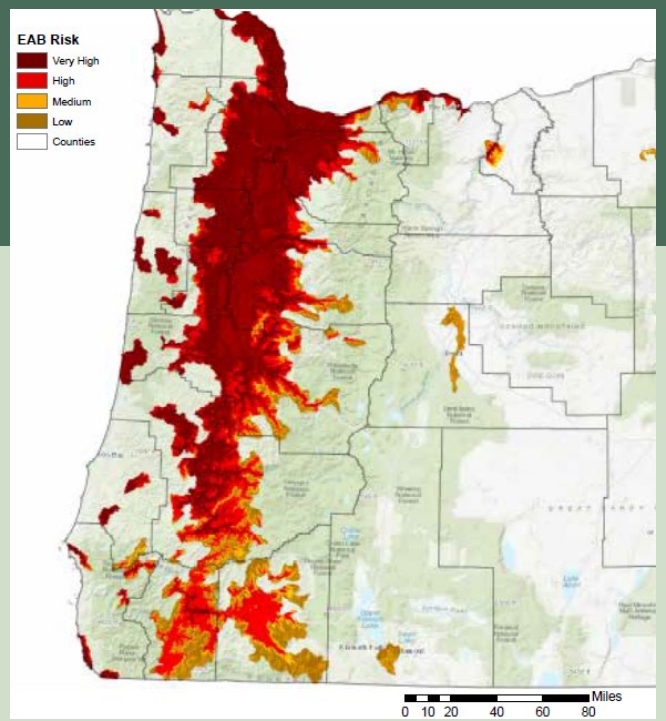
Fuzzy, Brown & Pointy Buds

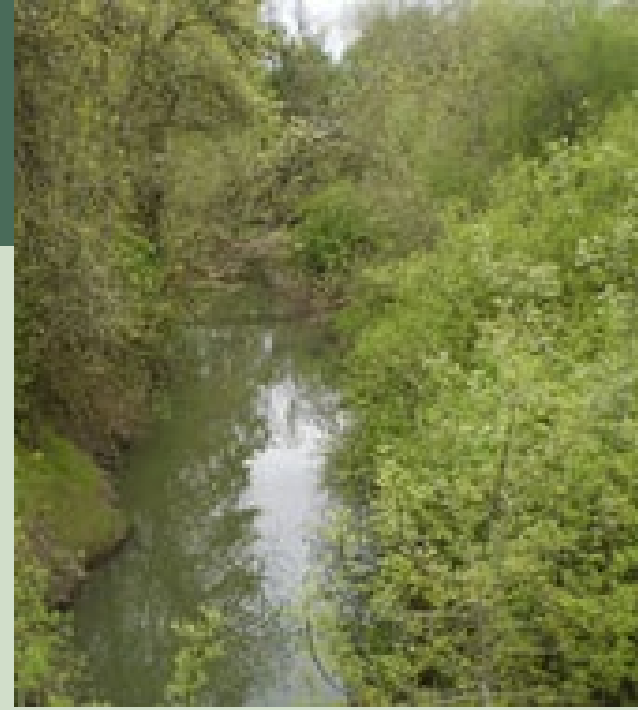
Pinnately Compound Leaves



Opposite Branching

Single-Wing Samaras





Ash in the PNW: Natural Areas

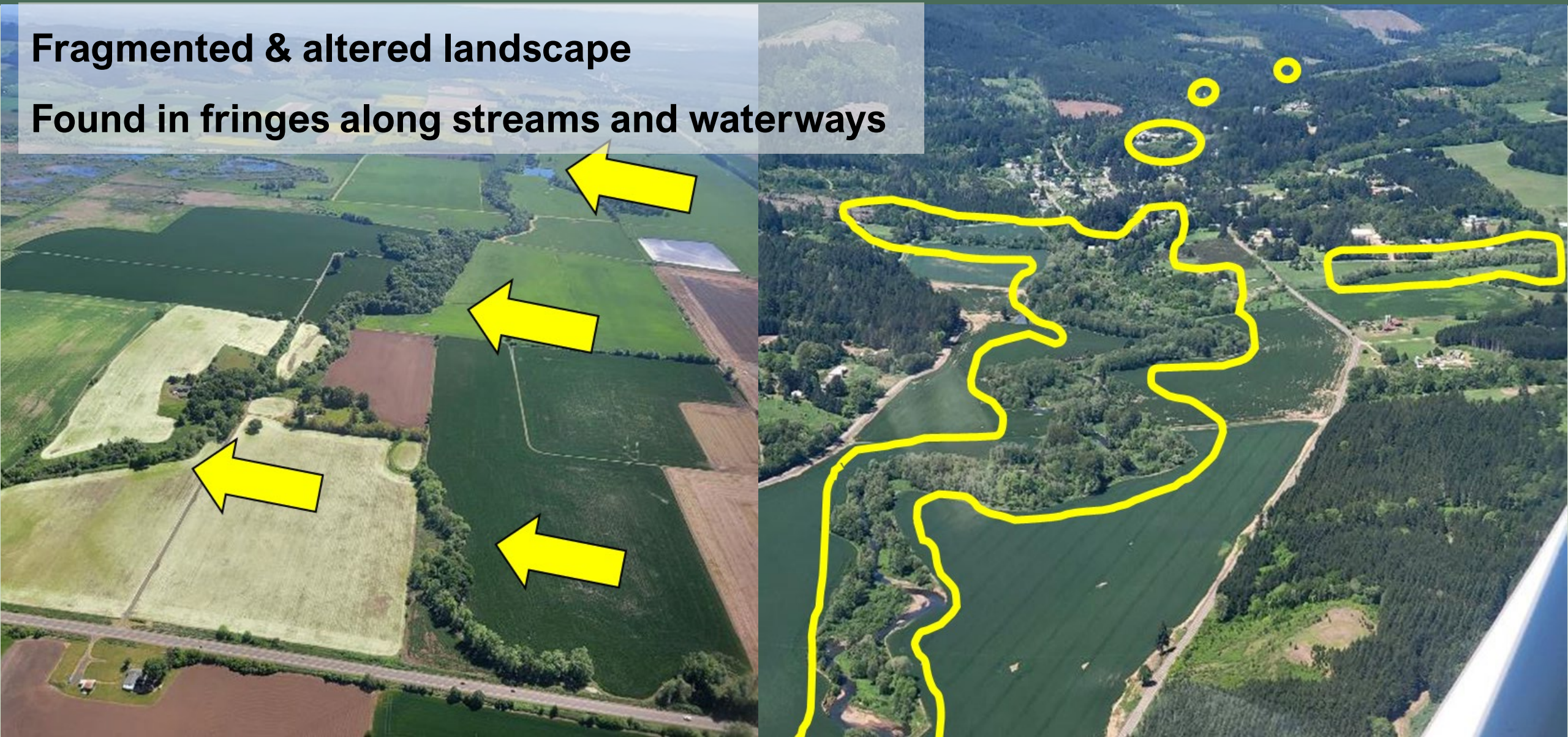
Oregon Ash *(Fraxinus latifolia):* Oregon's only native ash tree

- Important riparian and wetland tree
- Critical habitat for threatened and endangered species
- Important cultural resource to PNW Indigenous People

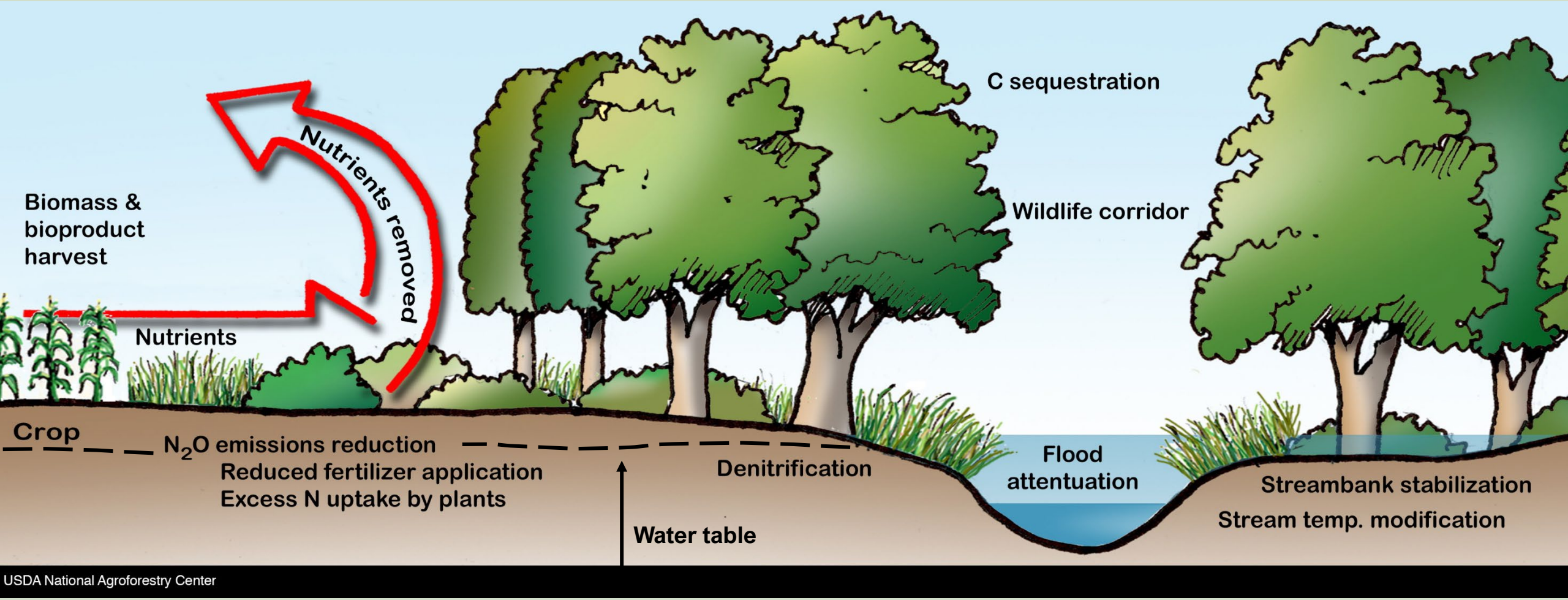
Natural Areas: Riparian Corridors

Fragmented & altered landscape

Found in fringes along streams and waterways



Ecosystem of Riparian Areas



USDA National Agroforestry Center

Ash in Oregon: Planted Areas

Popular landscape ash species

- Green ash
- White ash
- Narrowleaf ash ‘Raywood’
- European ash ‘Golden Desert’

All are susceptible to EAB

‘Raywood’ Narrowleaf Ash (*F. angustifolia ‘Raywood’*)

Green Ash (*F. pennsylvanica*)

White Ash (*F. americana*)

Golden Desert Ash (*F. excelsior ‘Golden Desert’*)

Developing a Response Plan

Ready

- Learn signs + symptoms
- Start inventory + risk assessment
- Create management plans – including detections

Set

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

Go

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

Ready: Inventory

Small land plots

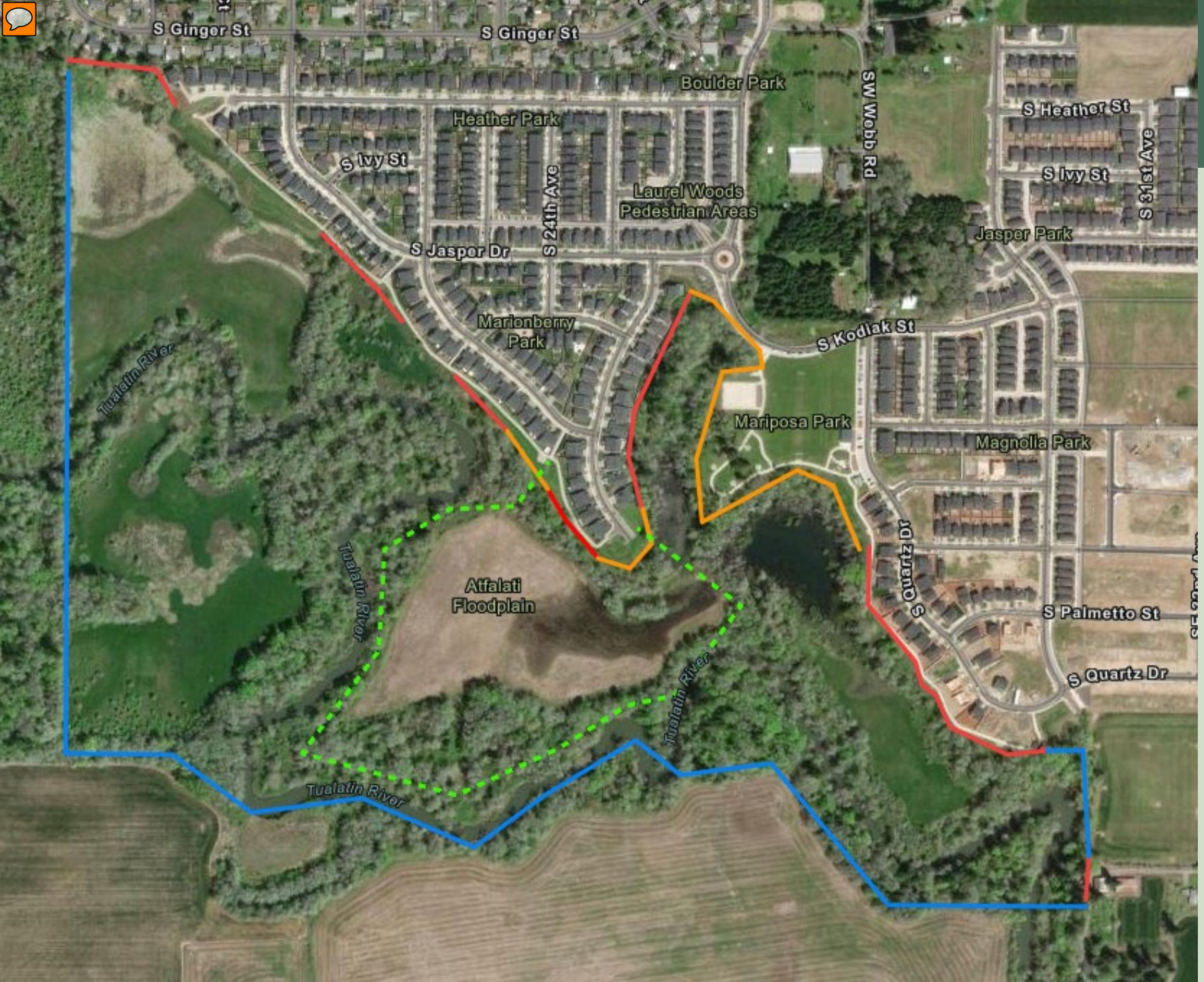
- Management decisions on a tree-by-tree basis

Large land plots

- Manage areas that are high risk or have ecological significance

High use areas (trails, etc.)

- Pre-emptive removals or treatment to reduce risk



Example of an Action Plan:

High Risk trees

- Felling
- Treatment

Moderate Risk trees

- Prune and let fail
- Create snag tree

Low Risk trees

- No management

Ready: Natural Area Management Plan

Removal and Replace

- Snags to create habitat
- Selective removals
- Underplant with desirable replacements
  - Historical ecosystem – what are the restoration goals
  - Conversion or reversion to shrubland, wetland prairie

Treatment

- Halo Effect: treating ~30% to protect the rest
- Preservation patches

Do Nothing

- Safest if low risk area
- Plan to pause area work once EAB arrives

Manage understory weeds

- Ivy, Himalayan blackberry, etc

Oregon Dept. of Forestry

Removals

Removal strategies

- Selective thinning to open canopy
  - Increase survival of shade intolerant species
- Creation of habitat: snags
- SLAM trap trees

Replant

- Underplant with desirable replacements
  - What grows there now?
  - Restoration – can you convert or revert to shrubland or a wetland prairie?
- Resource: “Alternatives to Ash in Western Oregon”
  - “A Valley Without Ash” for range expansion trials

Treatment

Oregon Dept of Forestry

Up to 95% effective, depending on treatment type and proper application

Which trees:

- Tree must be healthy enough to treat
- Medium to large diameter trees
- Not feasible across entire landscape

When

- Must be repeated every 1-3 years depending on chemical choice

Cost: Can be more cost effective than removal, lowest risk

Treatment: Research Consensus

Emamectin benzoate
(systemic trunk injection)

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

Do Nothing

Trees that are:

- Low risk, low target, naturalized areas

Ash tree die-off will impact:

Riparian ecosystem –

- Forest habitat and composition
- Water issues: stream temp, water table issues, erosion

Community benefits – air quality, heat, mental health, recreation sites

(Oregonstate.edu)

Restoration: Preservation Patches

Goal: Create concentrated seed banks

- Ideal selection:
  - Groups of 12-15 ash trees within 1-3 acres
  - Size 12”+ DBH
  - >60% female

Remove

- Open canopy for succession

Treatment

- Treat with EmBen injections every 2-4 years*
  - Trees will be protected and can act as canopy anchor
  - *Remember: if your bootprint fills with water, you need to wait to treat*

Kral and Shaw | OSU

Natural Areas: Species List

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

Tree species associated with ash, clay soils

- 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

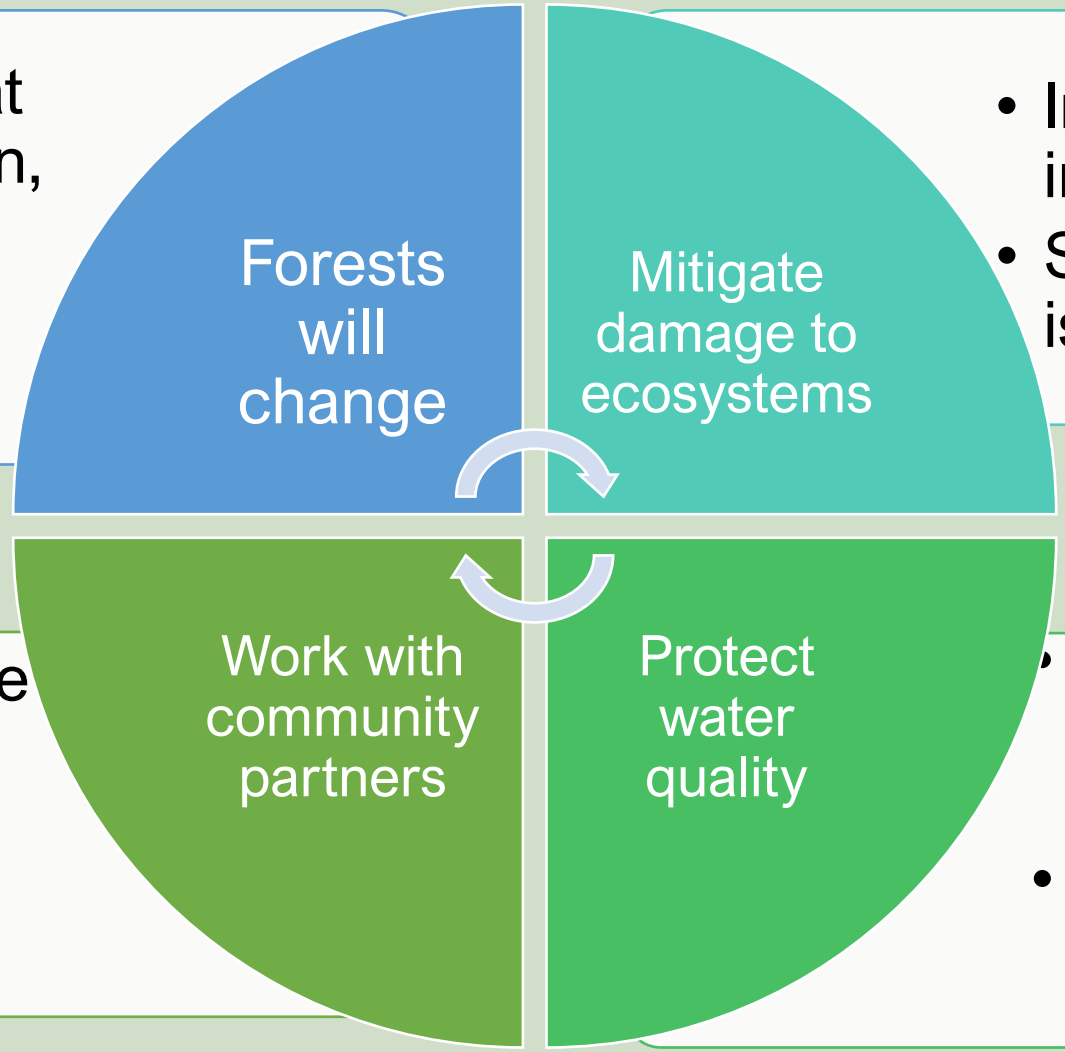
Species for assisted migration trials

Pollinator friendly species

Adapted from Kral and Shaw, 2023
Hull, 2024

Natural Areas: What Comes Next

- Opportunity for habitat restoration, conversion, or reversion
- Challenge: ash as a keystone species



- Invasive species will increase
- Streambank stabilization issues

- There may already be experts in your watershed or natural areas
- Challenge: Funding

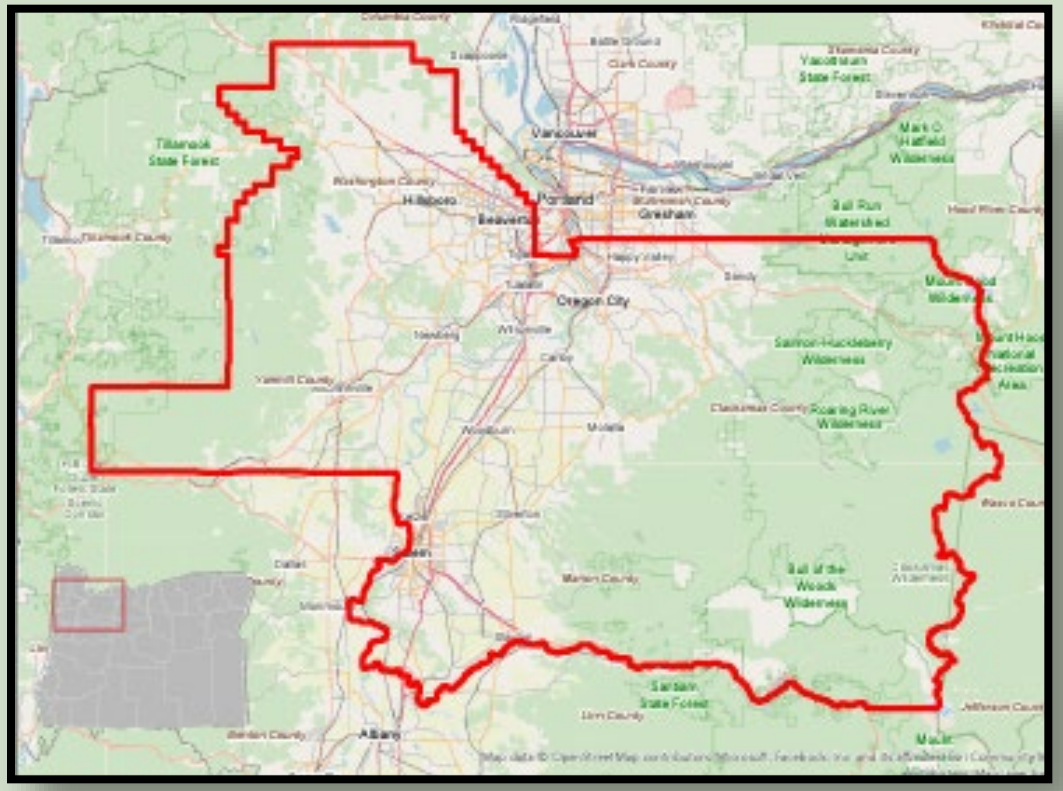
- Look at current understory and plant communities
- Opportunity for assisted migration trials, climate readiness

Active Quarantine

EMERALD ASH BORER QUARANTINE ALERT

OREGON DEPARTMENT OF AGRICULTURE

WASHINGTON, YAMHILL, MARION, CLACKAMAS COUNTIES, OREGON



1. Restricts movement of ash material (e.g., logs, nursery stock, chips, etc.)
2. Requires treatment (e.g. chip < 1”) and compliance agreement to move material outside quarantine
3. Limits ash tree removal and pruning to October 1 – April 30

Wood Waste, Sanitization, & Utilization

- Where does wood waste go currently (woodchip pile, log yard, dump)?
- What is the best available use (chips, lumber, biochar, firewood)?
- Identify networks of companies/organizations involved in wood utilization

David Cappaert | Bugwood.org


Vern Fisher | Monterey Herald

Troy Kimoto | Bugwood.org

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

Wood Use

- Resource Directory of Wood Waste Professionals
- What To Do with Ash Wood

Other Forest Management

- Find an Arborist
- Tree Risk Management

Report Invasive Species

- Reporting Potential EAB Insects or Infestations

Thank you!

Kat Bethea
Matt Mills

Email:

invasivepests@odf.oregon.gov

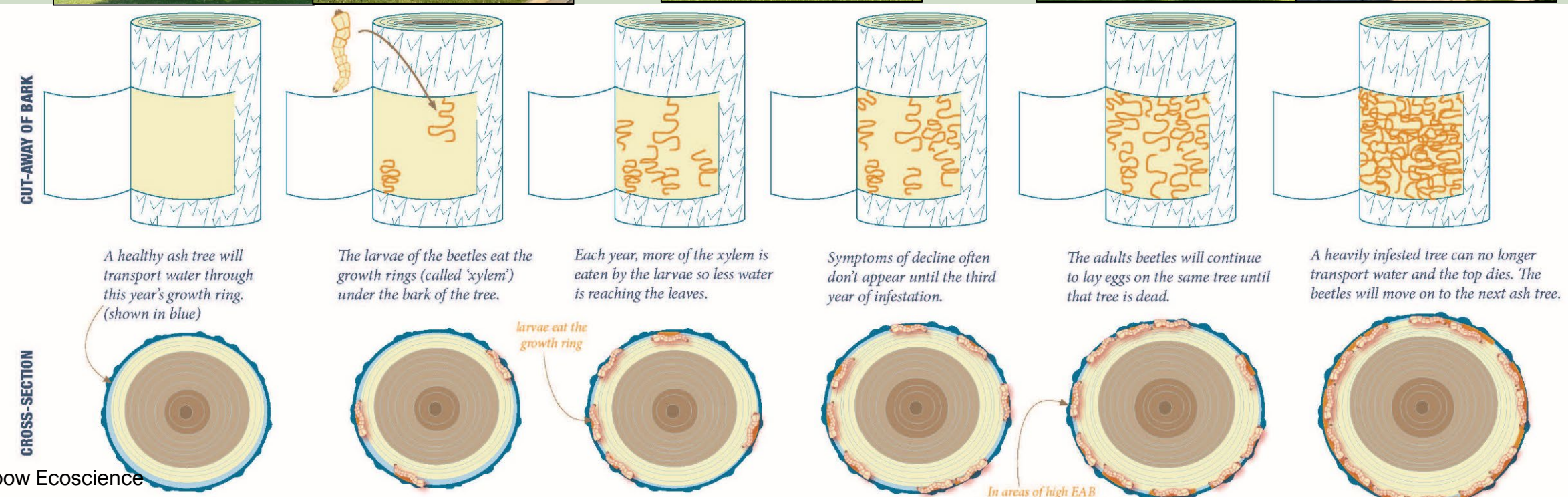
Oregon Department of Forestry

Urban & Community Forestry

Emerald Ash Borer Support Specialists

Rich Hoeg

Infestation Timeline – Tree Scale



Rainbow Ecoscience

EAB Signs & Symptoms

Thinning crown and canopy decline

Epicormic sprouting or shoots

Woodpecker damage

EAB Signs & Symptoms

Thinning crown and canopy decline

Epicormic shoots

Woodpecker damage

EAB Signs & Symptoms

Bark splits

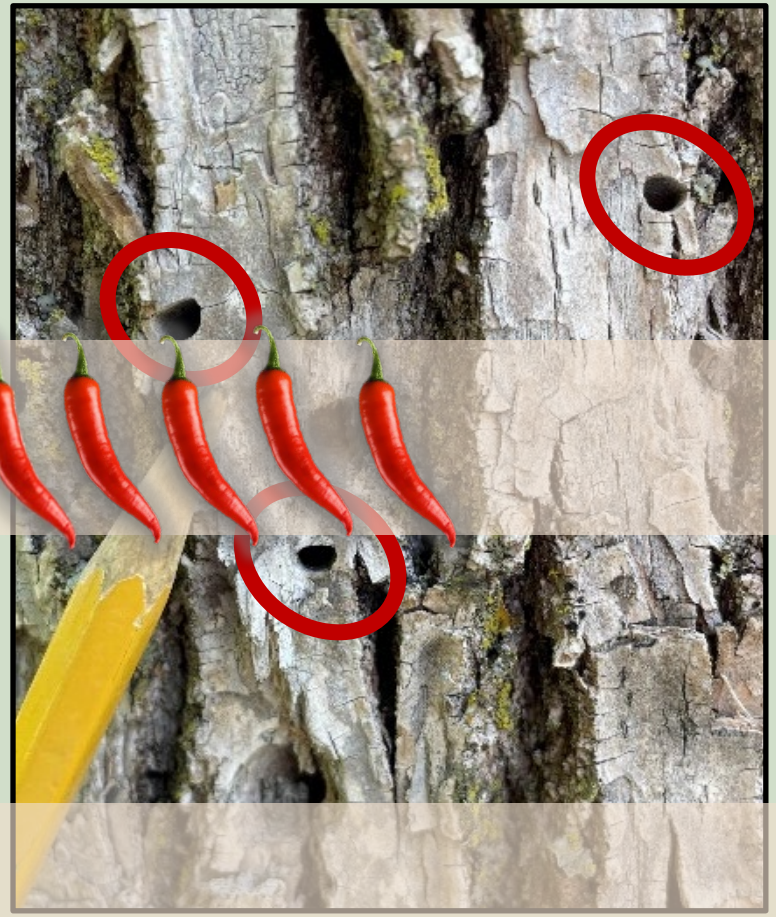
Serpentine galleries

D – shaped exit holes

EAB Signs & Symptoms

Bark splits

Serpentine galleries



D – shaped exit holes

Alarm level

Report at

https://oregoninvasiveshotline.org/

Damage not caused by EAB

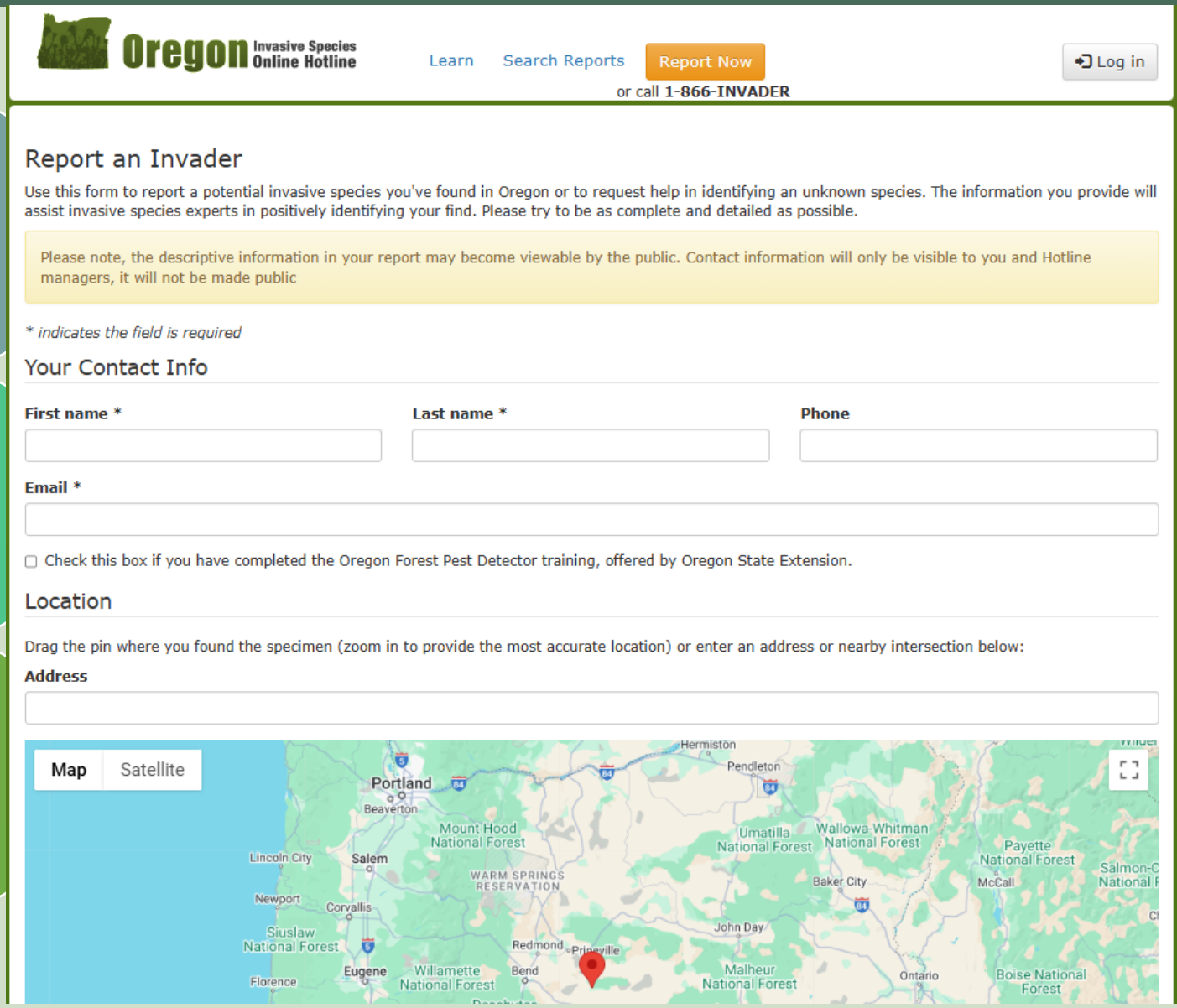
All images from OSU's Oregon Ash: Insects, Pathogens, and Tree Health

How to Report

Report using Oregon Invasive Species Hotline

Take photos of symptoms

Tree location



Detection Methods

Kenneth R. Law, USDA APHIS, Bugwood.org

EAB Detection

Trapping

- Easy
- Covers a large area
- Traps are not very effective
- Traps are currently only available from USDA to ODF and partner agencies

EAB Detection

Visual Survey

- Can be done any time of year
- Time consuming
- Symptoms can be caused by other factors
- Trees can be infested for several years before signs are noticeable
- Many groups can participate

EAB Detection

Natural Resources Canada

Branch Sampling

- Can be conducted any time
- Coincide with pruning
- Great for street trees
- Not tested in natural areas
- Most effective to sample unhealthy branches

EAB Detection

Trap Tree

- Trees are girdled in late spring
- Girdled trees draw adult EAB to them, and lay eggs
- Trap tree is felled in the fall and searched for EAB
- Time consuming, but effective
- Good option in natural areas

EAB Detection

EAB Detection

Case Study: Marion & Clackamas Detection

Jul 30 purple trap

Tree survey

Ash Dash report

Tree survey

Tree survey

Clackamas/ Marion county line

Pudding River

5 miles

Butte Cr.

Woodburn
Hardcastle Ave
E Lincoln Rd
Highway 211
211
214
99E
Elliott Prairie
Oaklawn
Monitor
Kahut Ln NE
Miller Rd NE
Monitor McKee Rd NE
Woodburn Monitor Rd NE
Zollner Creek
Bochsler Creek
Dominic Rd NE
Wilco Hwy NE
Boehmer Rd NE
E Marquam St
E Marquam Rd NE
Mount Angel