Sudden Oak Death on the North Coast

University of California
Agriculture and Natural Resources

UC CE

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January 31, 2025

The Story of Sudden Oak Death (SOD)

- Mid 1990's: "Bleeding" and dying tanoaks and coast live oaks noted around SF Bay area
- The press dubs it "sudden oak death" (SOD)
- Early 2000s: Researchers link disease to new *Phytophthora* species

What is Phytophthora ramorum?

A Brief Introduction

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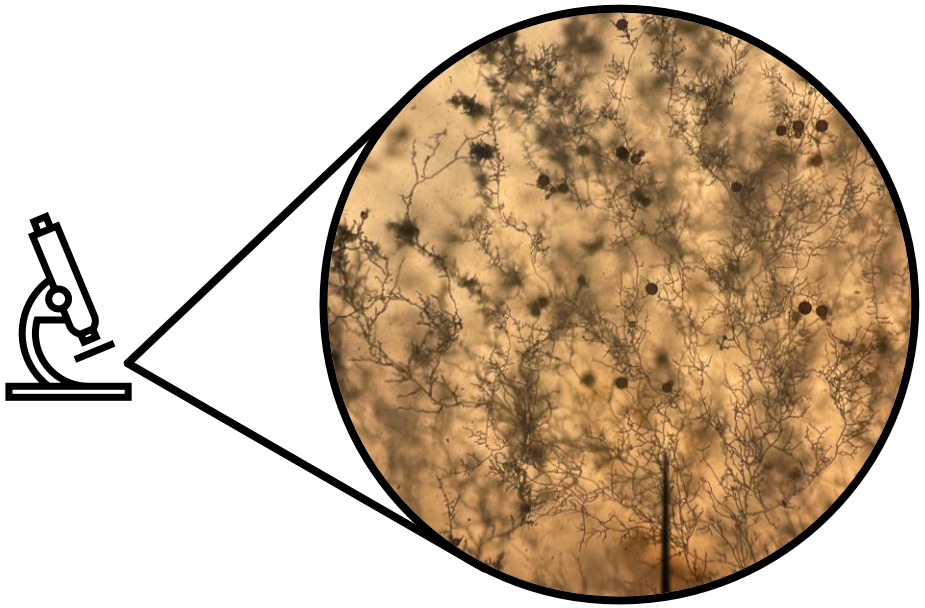

What is Phytophthora ramorum?

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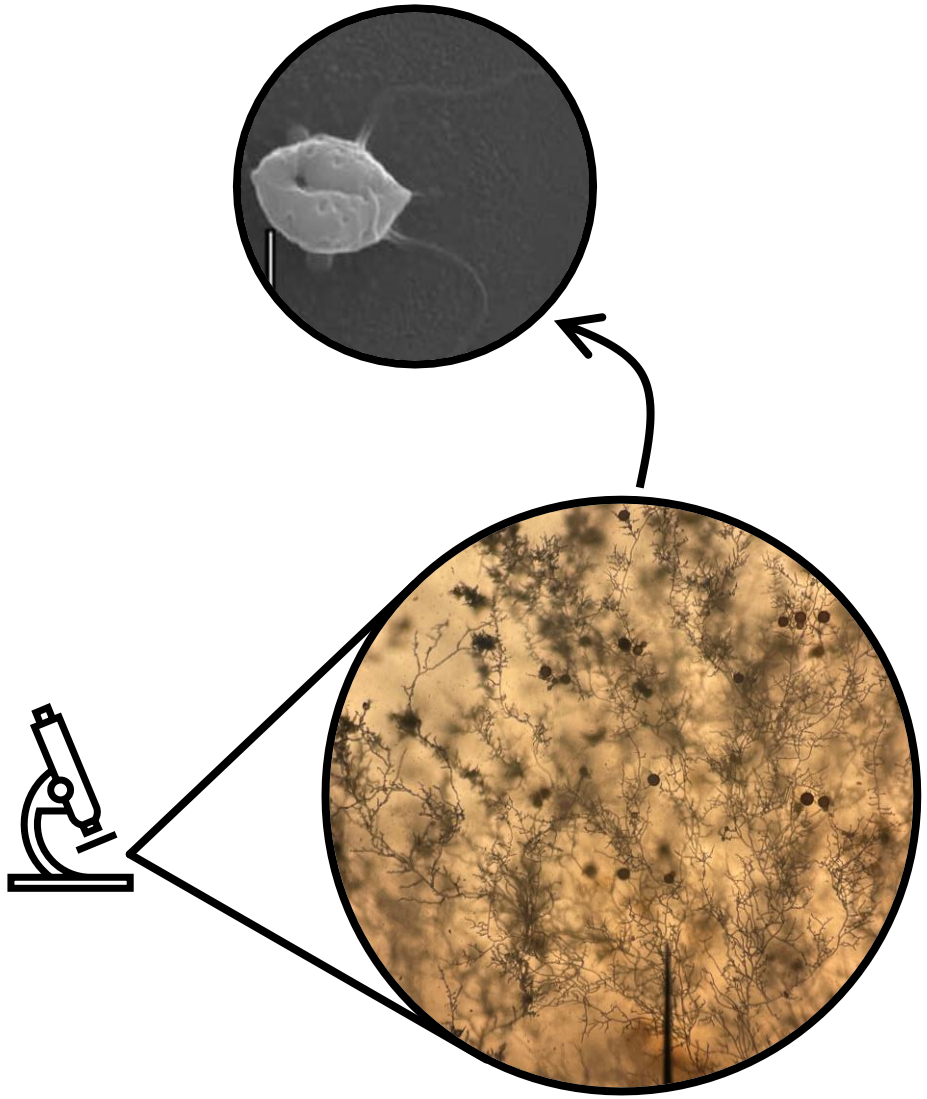

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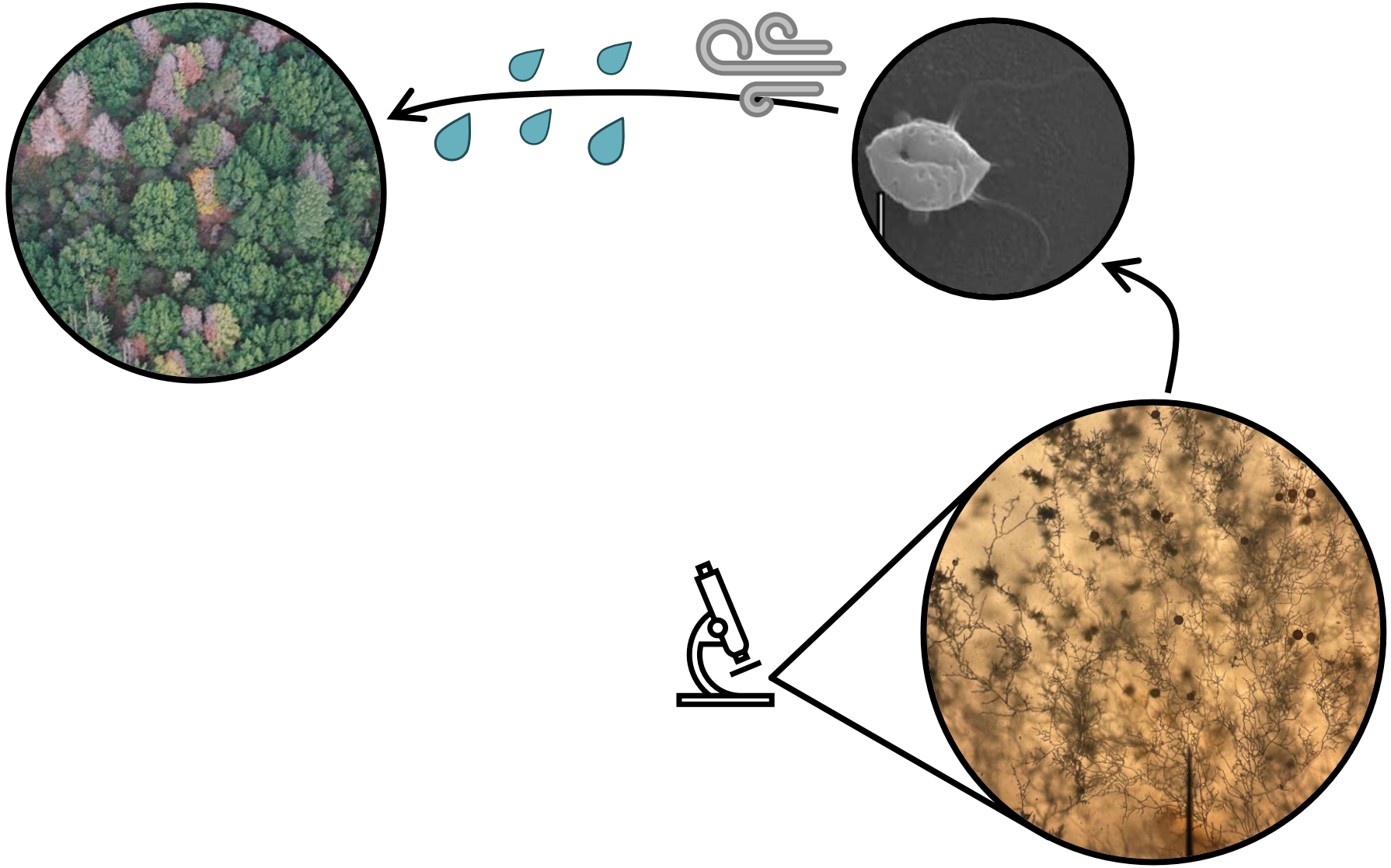

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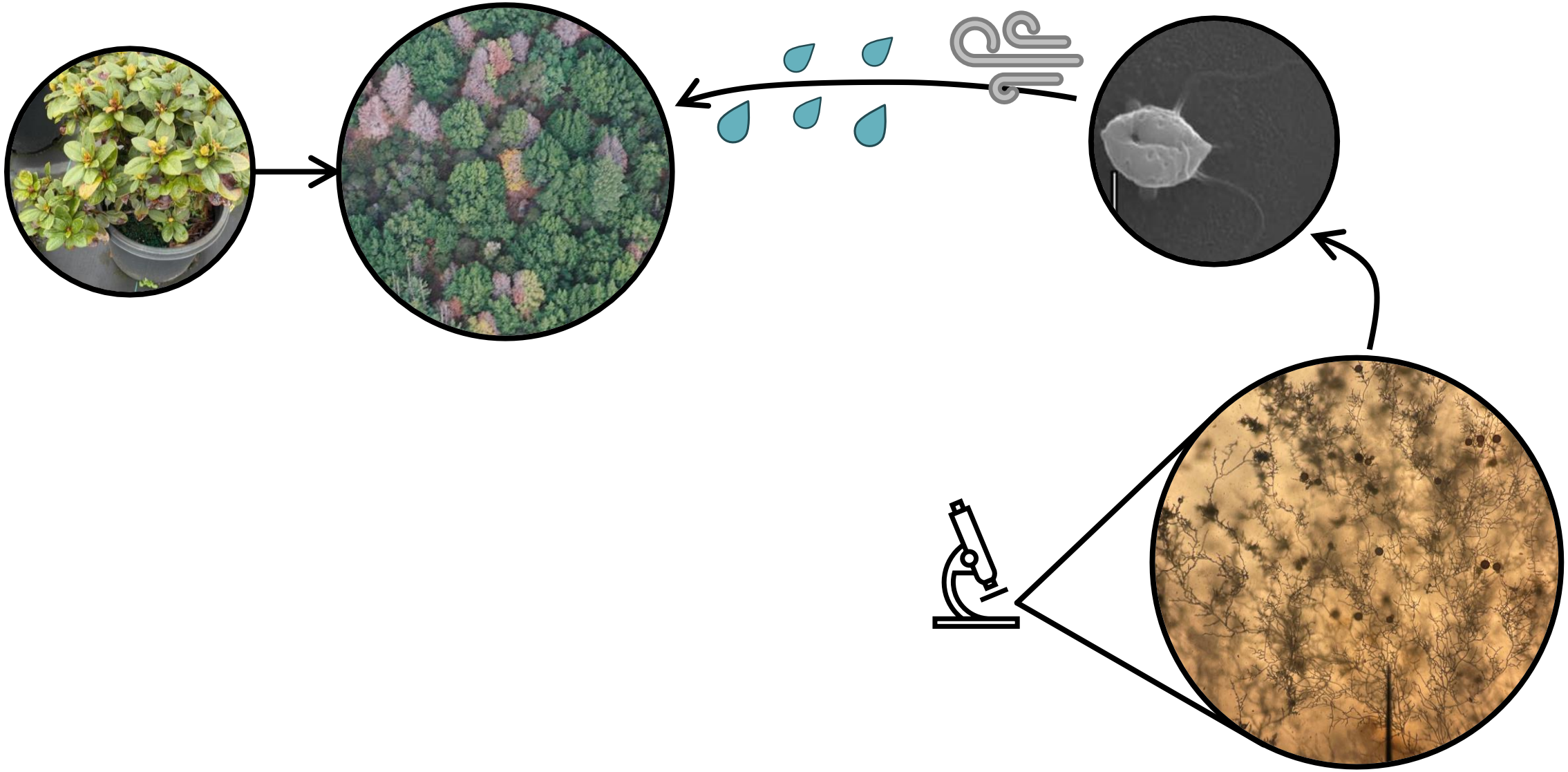

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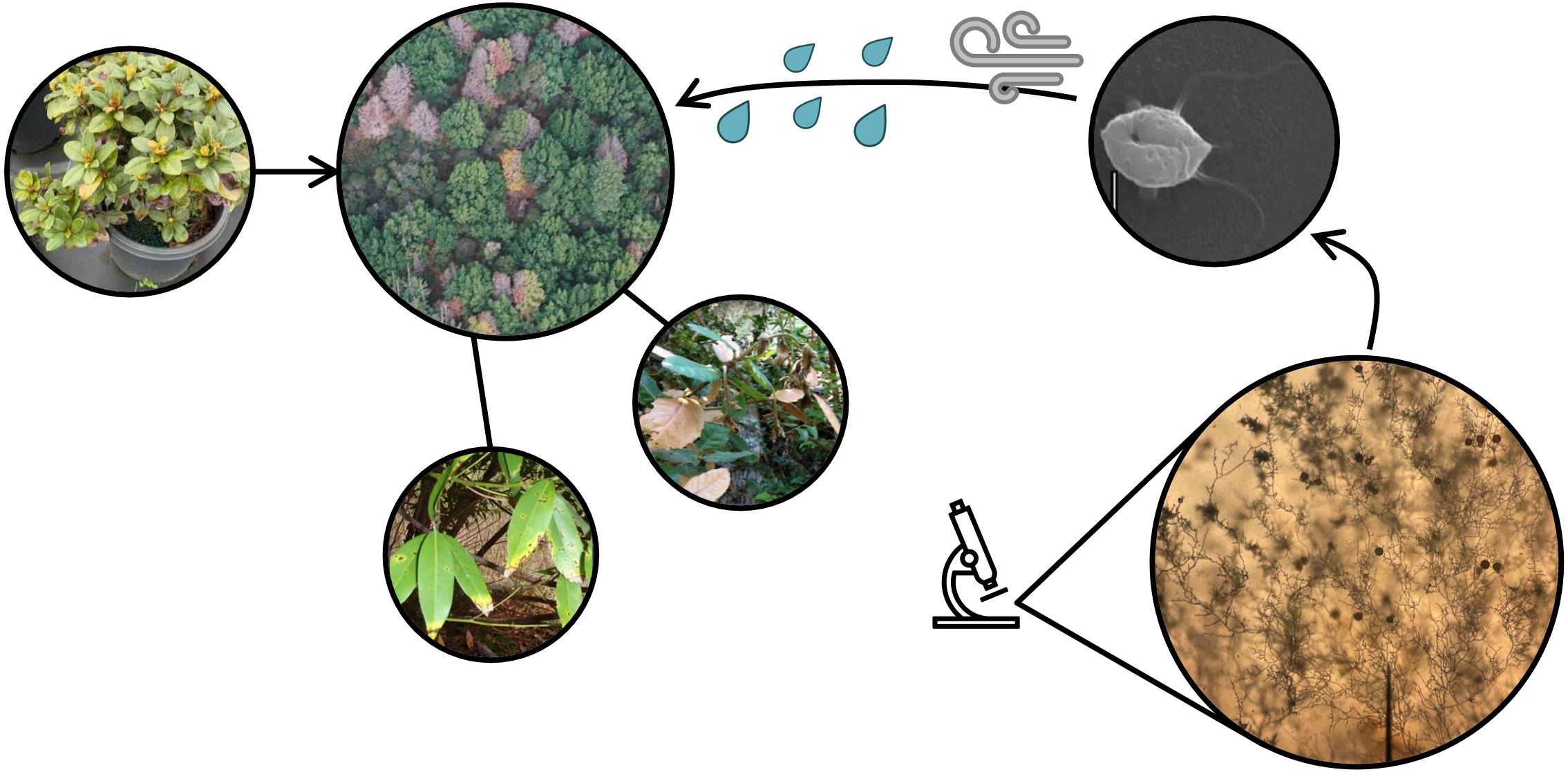
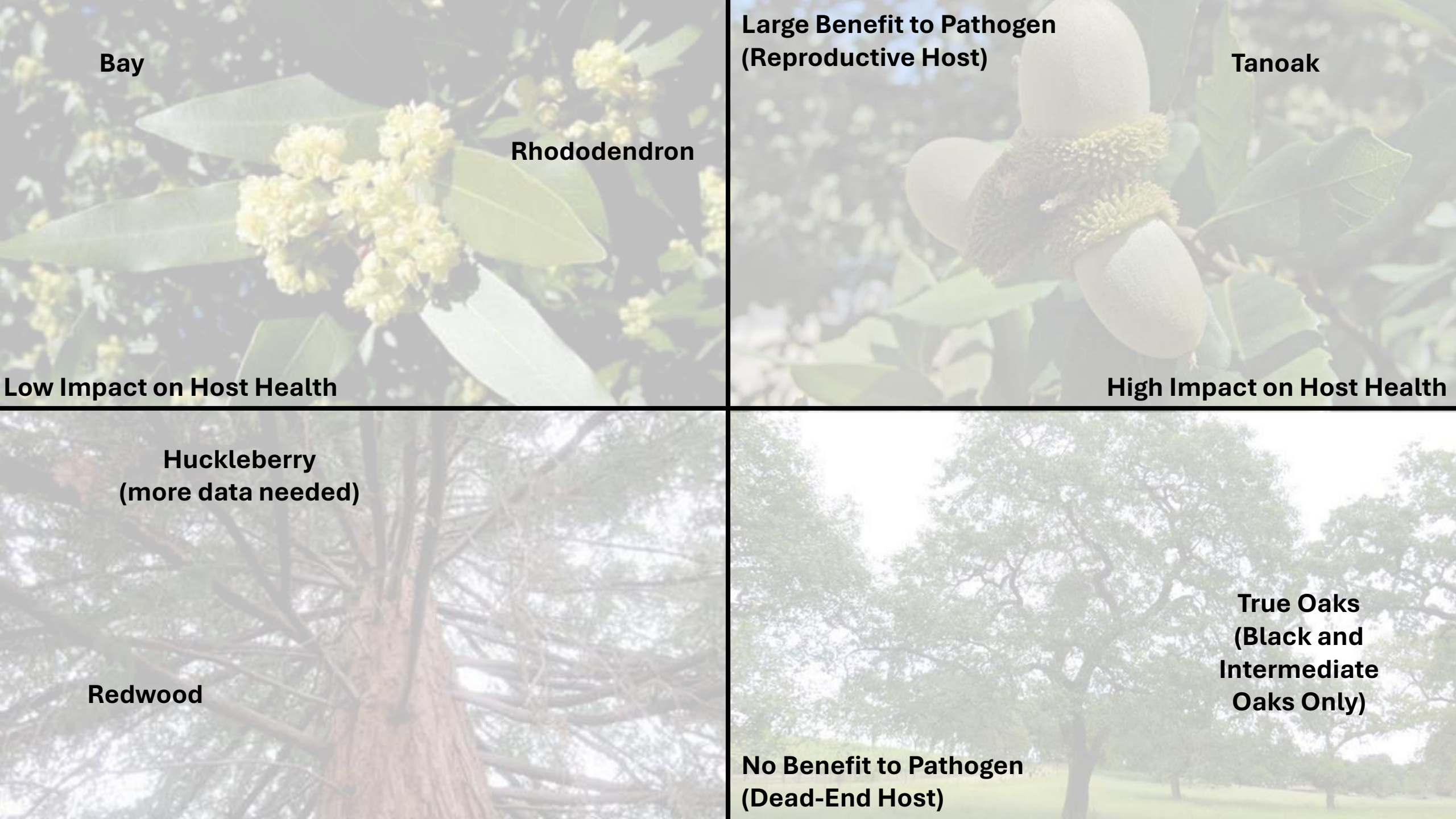



Bay
Rhododendron
Low Impact on Host Health
Large Benefit to Pathogen
(Reproductive Host)
Tanoak
High Impact on Host Health
Huckleberry
(more data needed)
Redwood
No Benefit to Pathogen
(Dead-End Host)
True Oaks
(Black and
Intermediate
Oaks Only)

California Bay Laurel: Vector



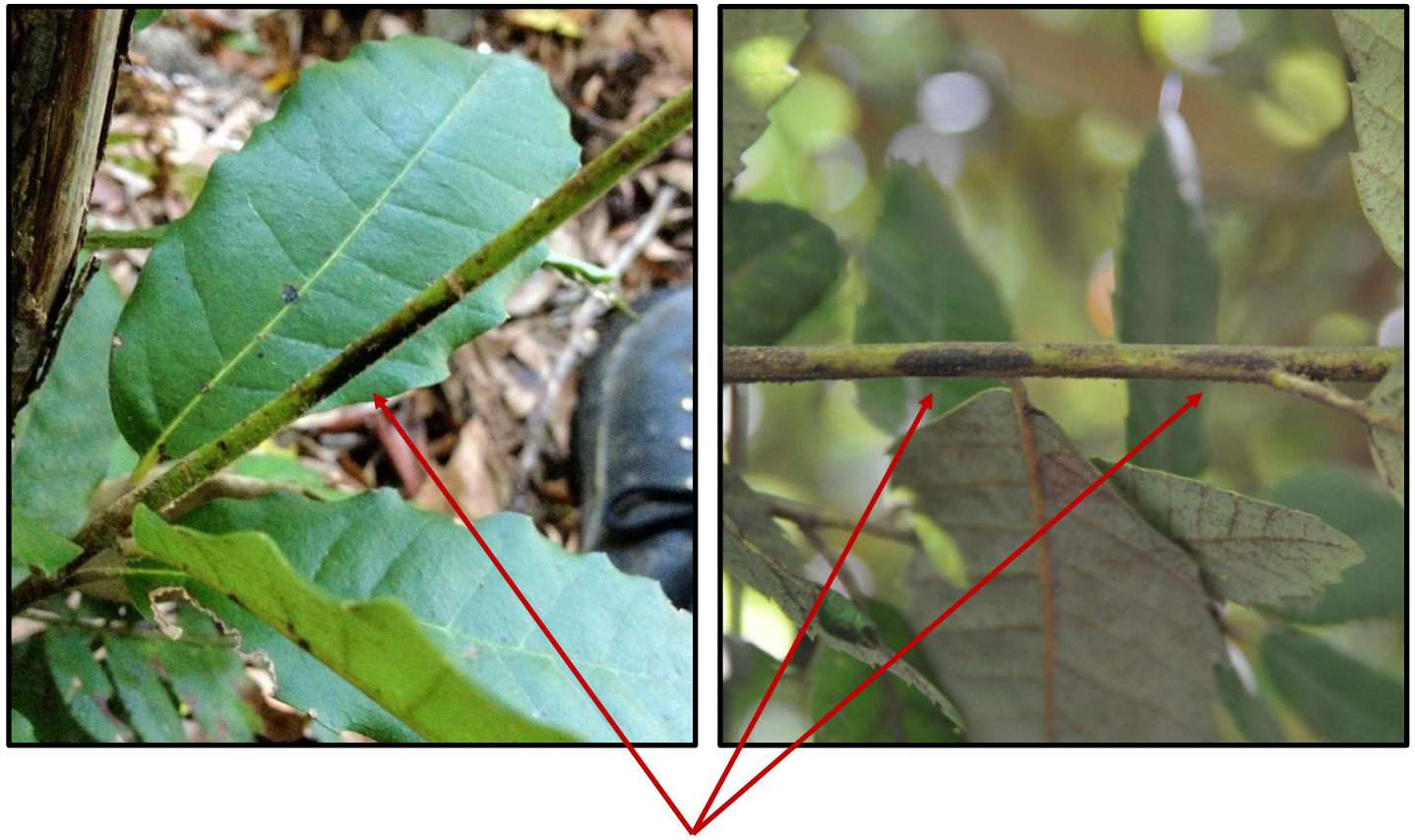

Symptoms on Tanoak

Dead leaves have oily or wet look to them

Branch tips curled into “shepherd’s crooks”

Leaves with darkened midrib, necrosis spreading out from midrib

Symptoms on Tanoak



Oblong black lesions on twigs; the pathogen is growing from the edges of these lesions into the healthy tissue

Bleeding stem canker; possibly a sign of sudden oak death, but other diseases may cause this symptom

Ecological Impacts

- Removal of food sources and habitat
- Reduction in tanoak- and oak-dependent species diversity
- Shifts in forest structure
- Tree regeneration problems
- Increased fuels accumulation

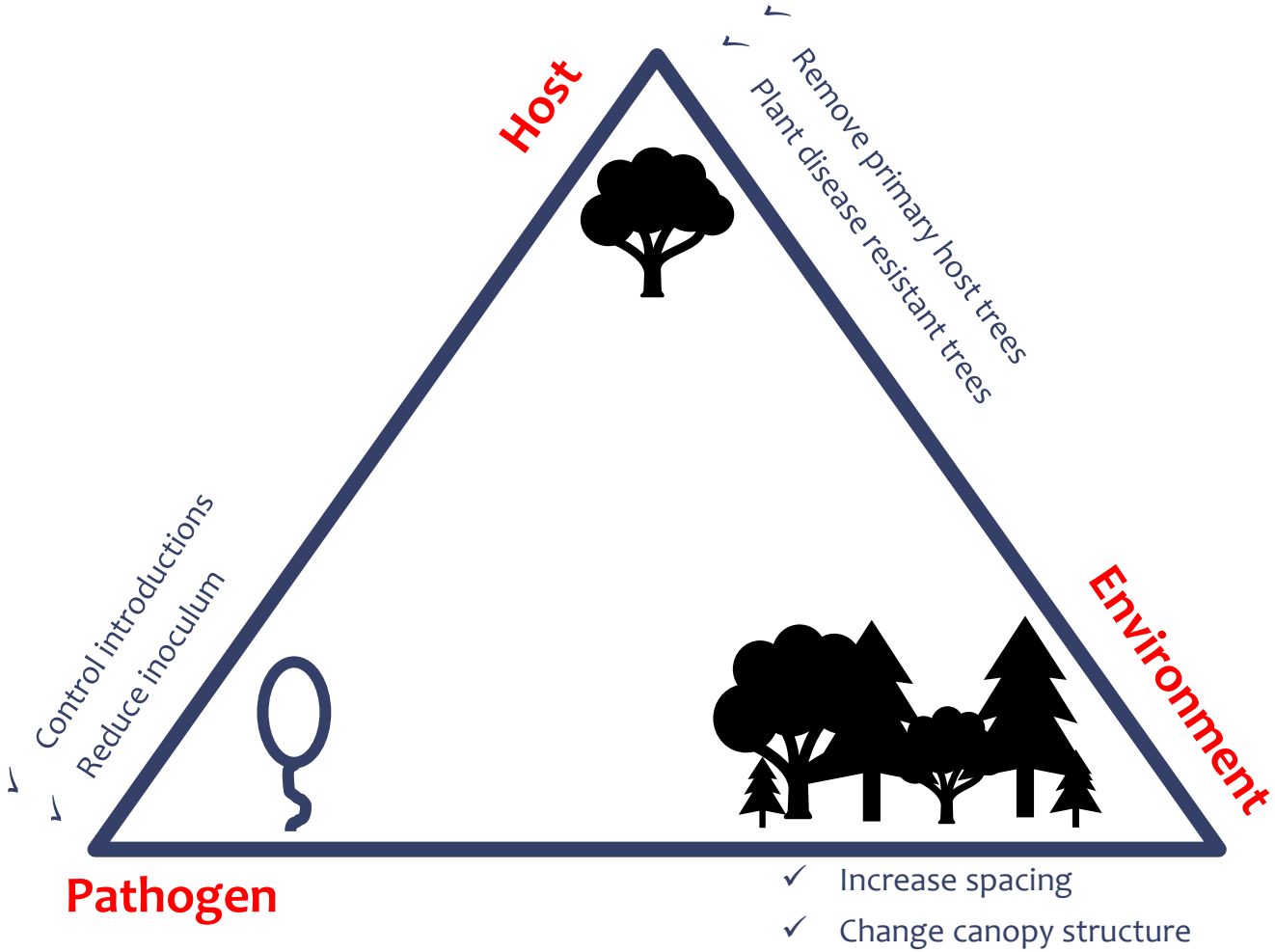
Economic Impacts

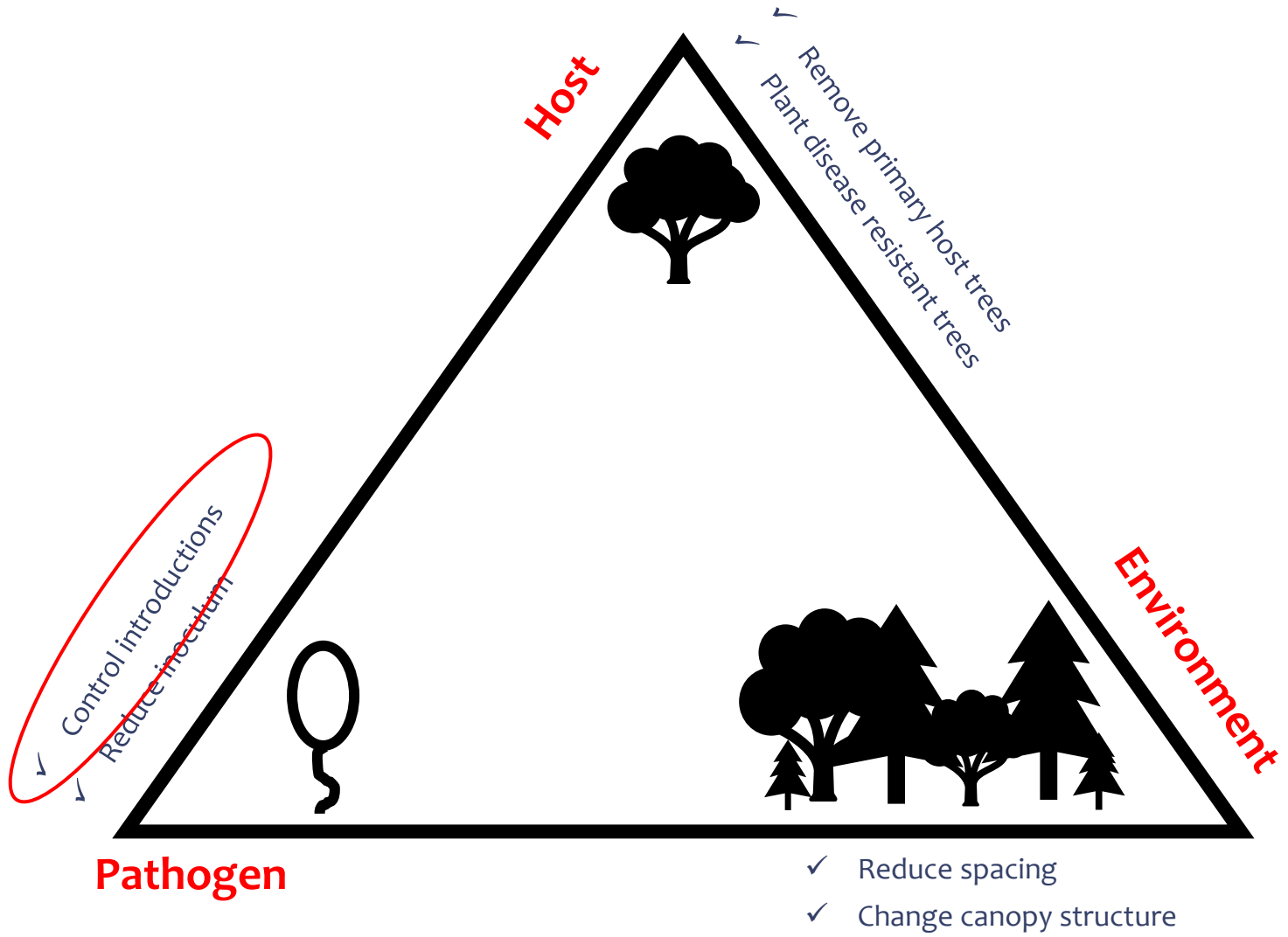
- Damage caused by falling trees
- Increased costs for quarantine compliance
- Loss of recreational opportunities and values
- Decreased property value

Social Impacts

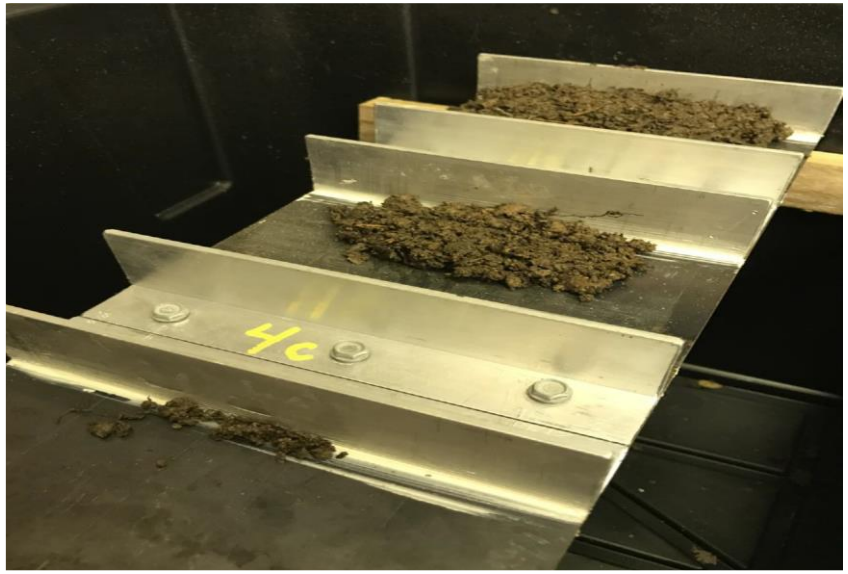
- Loss of cultural and social resources
- Diminishment of landscape aesthetics
- Increased safety hazards during fires and high winds

Reducing Risk



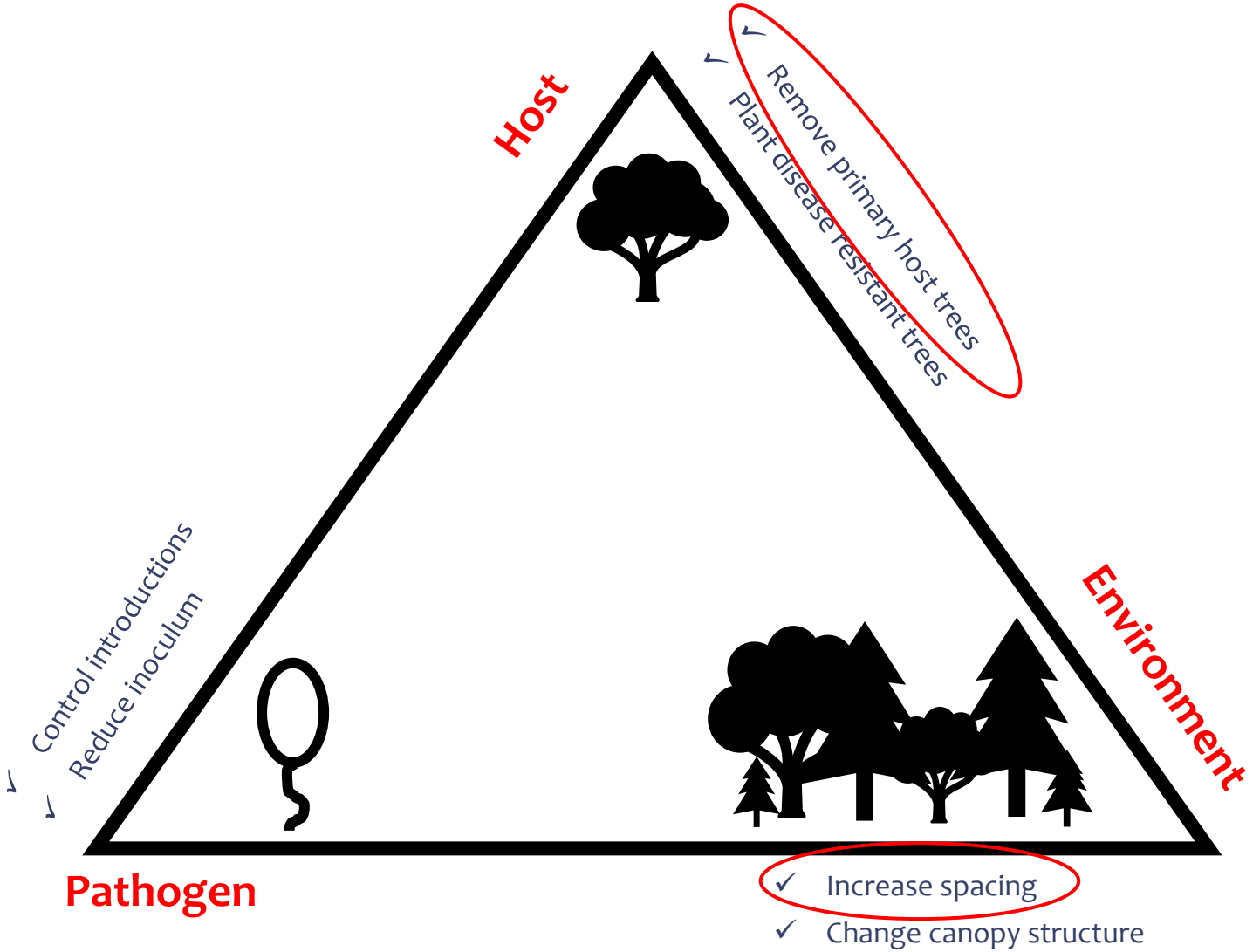

Host
Remove primary host trees
Plant disease resistant trees
Environment
Control introductions
Reduce inoculum
Pathogen
Reduce spacing
Change canopy structure

Equipment Cleaning and Sanitation Study



One Replicate For One Soil Source (1/2 of a full replicate)

No Incubation Time for Soil on Tracks			Chemical:	2-wk Incubation Time for Soil on Tracks		
2 mL	50 mL	400 mL	None	2 mL	50 mL	400 mL
2 mL	50 mL	400 mL	10% Bleach	2 mL	50 mL	400 mL
2 mL	50 mL	400 mL	Peracetic acid	2 mL	50 mL	400 mL
2 mL	50 mL	400 mL	70% Isopropanol	2 mL	50 mL	400 mL


Host
✓ Remove primary host trees
✓ Plant disease resistant trees
Environment
✓ Increase spacing
✓ Change canopy structure
Pathogen
✓ Control introductions
✓ Reduce inoculum

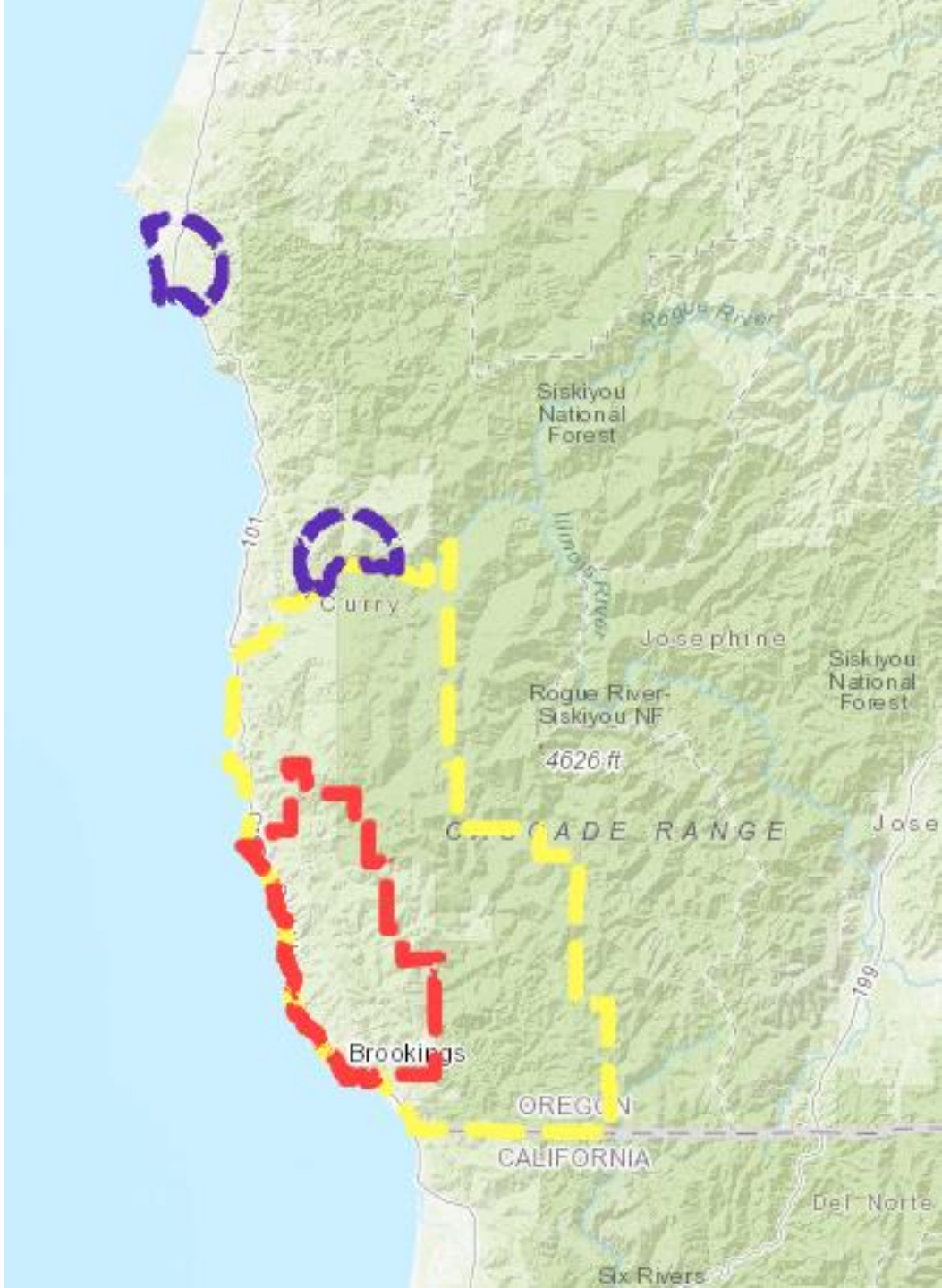
Pre-Treatment

Post-Treatment

And yet, persistence is common

Treatments can slow the spread, but eradication is rare

- Purple = 3-mile emergency quarantines
- Yellow = Quarantine boundary
- Red = Generally infested area



Education and Outreach

Education and Training Resources

Activities for Educators | Handouts & Posters | Training Resources

Activities for Educators

- Trees in Trouble PDF – Information on Oak Communities, the causes and effects of Sudden Oak Death, as well as methods of transport support these student activities. The grade-specific activities help students learn about native oaks and ways they can help stop the spread of Sudden Oak Death.
- Junior Ranger Guide PDF – This activity guide explains the ins and outs of Sudden Oak Death in a dynamic and engaging way, blending games, maps, and activity prompts with kid-friendly background information on the disease.
- Find even more educational activities on other invasive pests at PlantHeros.com

Handouts & Posters

- SOD Fact Sheet – Information on the detection, spread, impact, and treatment for the disease.
- SOD Sanitation Guide – Cleaning recommendations to prevent the spread of *P. ramorum*.
- Fact vs. Fiction – Five common misconceptions about Sudden Oak Death and the

You Can Help Slow the Spread!

The best defense against Sudden Oak Death is to follow established regulations and best management practices to help slow the "artificial" or human-aided spread of the disease. All of the cleanliness measures listed below are helpful to avoid unintentionally spreading *P. ramorum* as well as a variety of other plant pathogens from one area to another.

• Do not collect and move plants from SOD-infested areas.

• Removing mud and plant material from shoes, mountain bikes, horses' hooves, pets' paws, vehicles, and recreational equipment prior to leaving an infested area is the most important part of the sanitation process. Remove material with a brush and pressurized water (not from a local natural waterway as it may be infested) and disinfect surfaces with Lysol® or a diluted 10% bleach solution.

• When hiking and biking, stay on established trails and respect trail closures.

• Clean and disinfect equipment (saws, shovels, pruning equipment, etc.) that has been used in infested areas.

• Report hosts exhibiting symptoms to your local County Agricultural Commissioner, California Department of Forestry and Fire Protection, or UC Cooperative Extension, or online at www.oakmapper.org.

• Before purchasing known *P. ramorum* host plants, ask the nursery about their best management practices for the prevention of the pathogen. Consider quarantining newly purchased plants for 8 weeks before planting them in your yard and check for suspicious symptoms during that time.

Education and Outreach for Casual Recreationalists: Things to Include in Signage

Photo by Alan Kanaskie

Education and Outreach for Casual Recreationalists: Things to Include in Signage

- What does SOD do (i.e. why should you, recreationalist, care?)

Education and Outreach for Casual Recreationalists: Things to Include in Signage

- What does SOD do (i.e. why should you, recreationalist, care?)
- How to prevent spread: Don’t move plants or soil
- How to assemble a cleaning kit (Lysol, scrub brush or hoofpick, guide to sanitizing shoes)

Education and Outreach for Docents and Volunteers

- SOD biology as it pertains to dispersal strategy
- Where known SOD infestations are in local area
- SOD symptoms and who to tell if you see them

Closing Thoughts

- SOD and other invasive pathogens have a different impact on forest health than native pathogens
- Management options limited
- Haven’t tried everything yet, but focus is likely to be on mitigating impact, not on eradication
- Education a prevention tool