# Urban Forest Pest Readiness: Increasing preparedness to introductions of new invasive insects

Justin Bush
**State of Washington**
Recreation and Conservation Office
Washington Invasive Species Council

## Vision

Sustain Washington's human, plant, and animal communities and our thriving economy by preventing the introduction and spread of harmful invasive species.

## Mission

The council provides policy level direction, planning, and coordination that will:

- Empower those engaged in the prevention, detection, and eradication of invasive species.
- Include a strategic plan designed to build upon local, state, and regional efforts, while serving as a forum for invasive species education and communication.

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**Washington Department of Transportation**

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**Columbia Land Trust**

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Mary Fee
**Washington State Noxious Weed Control Board**

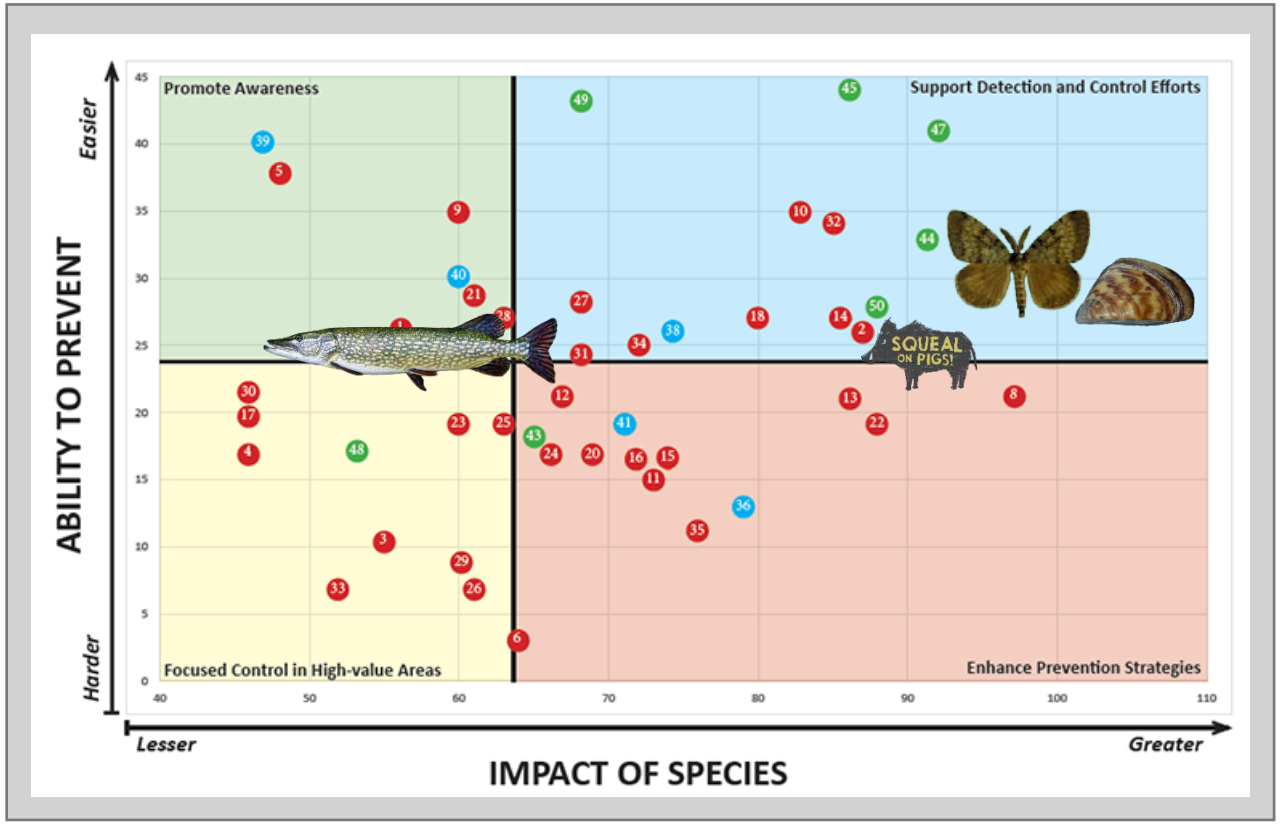
Andrea Thorpe
**Washington State Parks and Recreation Commission**

Todd Murray
**Washington State University**

## Strategic Plan
## Priority Areas of Work

I. Leadership and Coordination
II. Education and Outreach
III. Prevention
IV. Early Detection and Rapid Response
V. Containment, Eradication, and Control

**Invasive Species Management Priorities**





Northern Pike


Gypsy Moths

Feral Swine

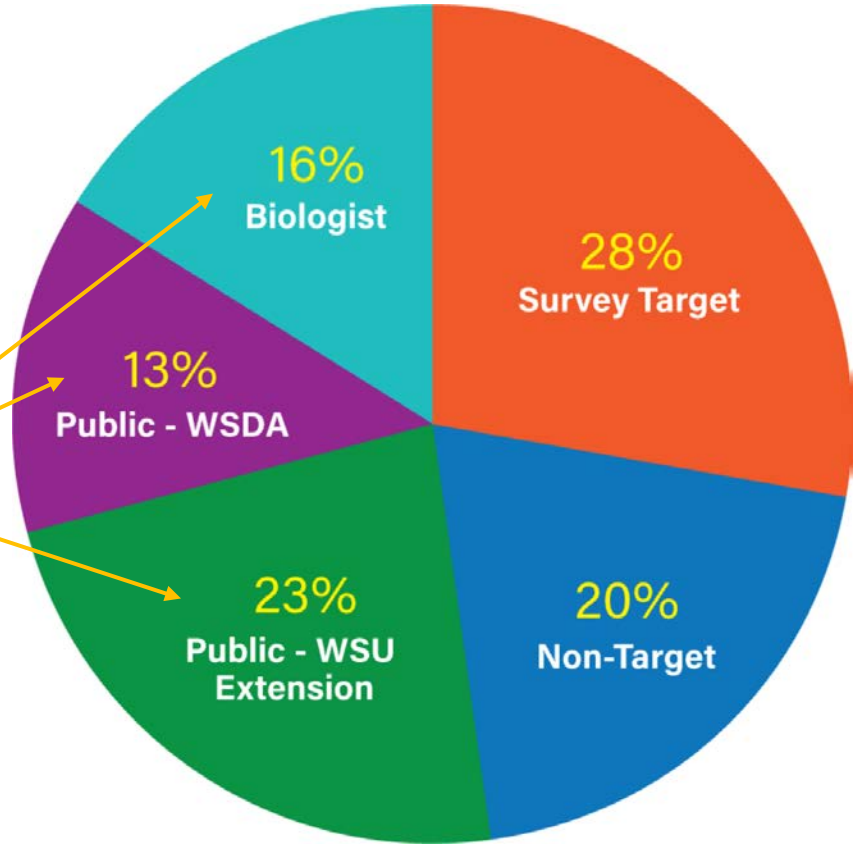

Zebra/Quagga Mussels

- Oregon Department of Agriculture documented 66 new introductions since 2007 (LaBonte 2014)

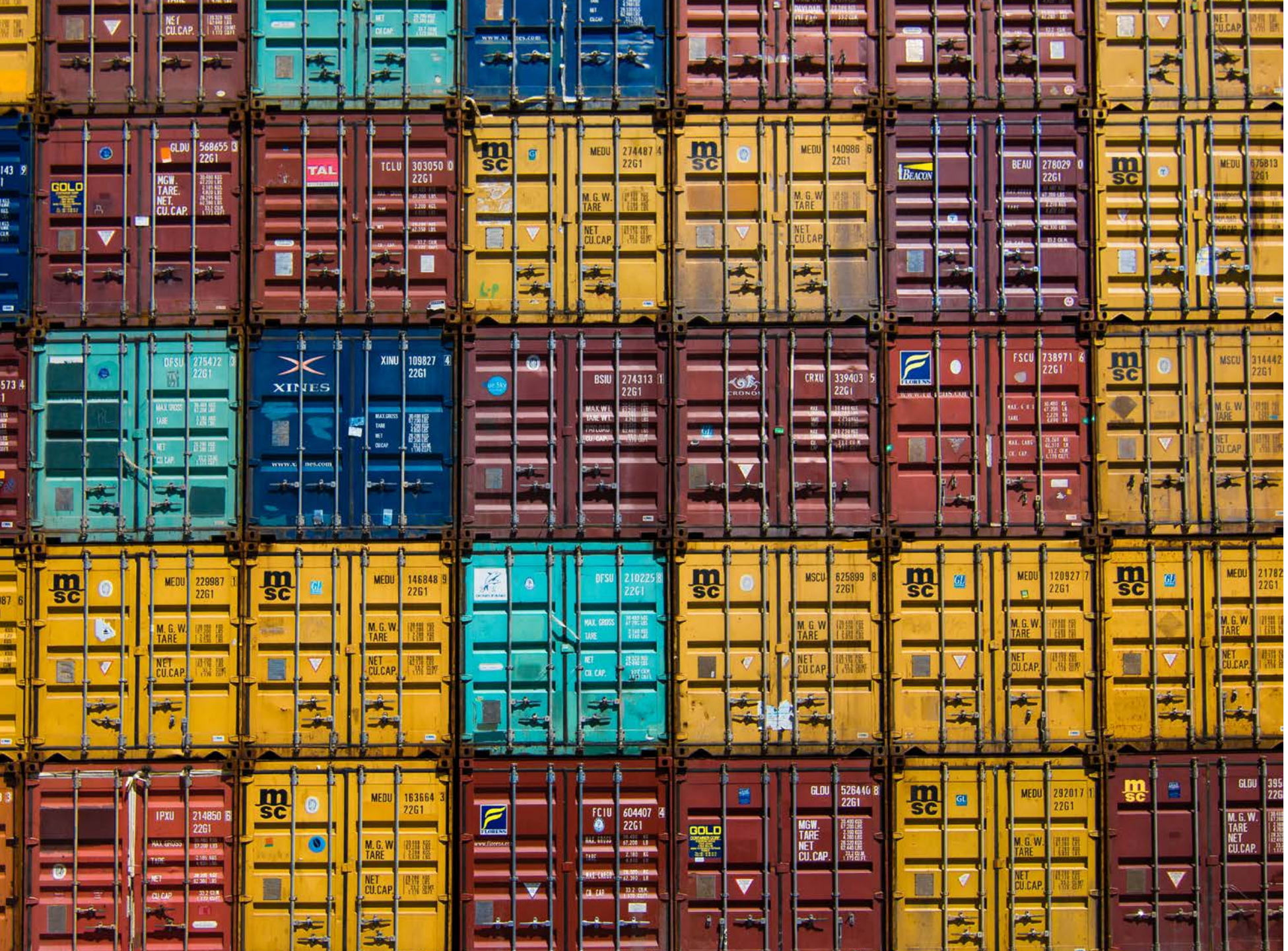
- Washington State Department of Agriculture documented 70 new introductions since 1991 (Looney et al 2017)

T. Shahan ODA


52%




From: Shadow Surveys: How Non-Target Identifications and Citizen Outreach Enhance Exotic Pest Detection
Am Entomol. 2016;62(4):247-254. doi:10.1093/ae/tmw063


GLDU 568655 2
22G1
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CU.CAP.
TAL
TCLU 303050 0
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M.G.W.
TARE
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CU.CAP.
MEDU 140986 6
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BEAU 278029 0
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MEDU 675813
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DFSU 275472 6
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XINES
XINU 109827 4
22G1
BSIU 274313 1
22G1
CRXU 339403 5
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FSCU 738971 6
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MSCU 314442
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MEDU 229987 1
22G1
MEDU 146848 9
22G1
DFSU 210225 8
22G1
MSCU 625899 8
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MEDU 120927 7
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MEDU 21782
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IPXU 214850 6
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MEDU 292017 1
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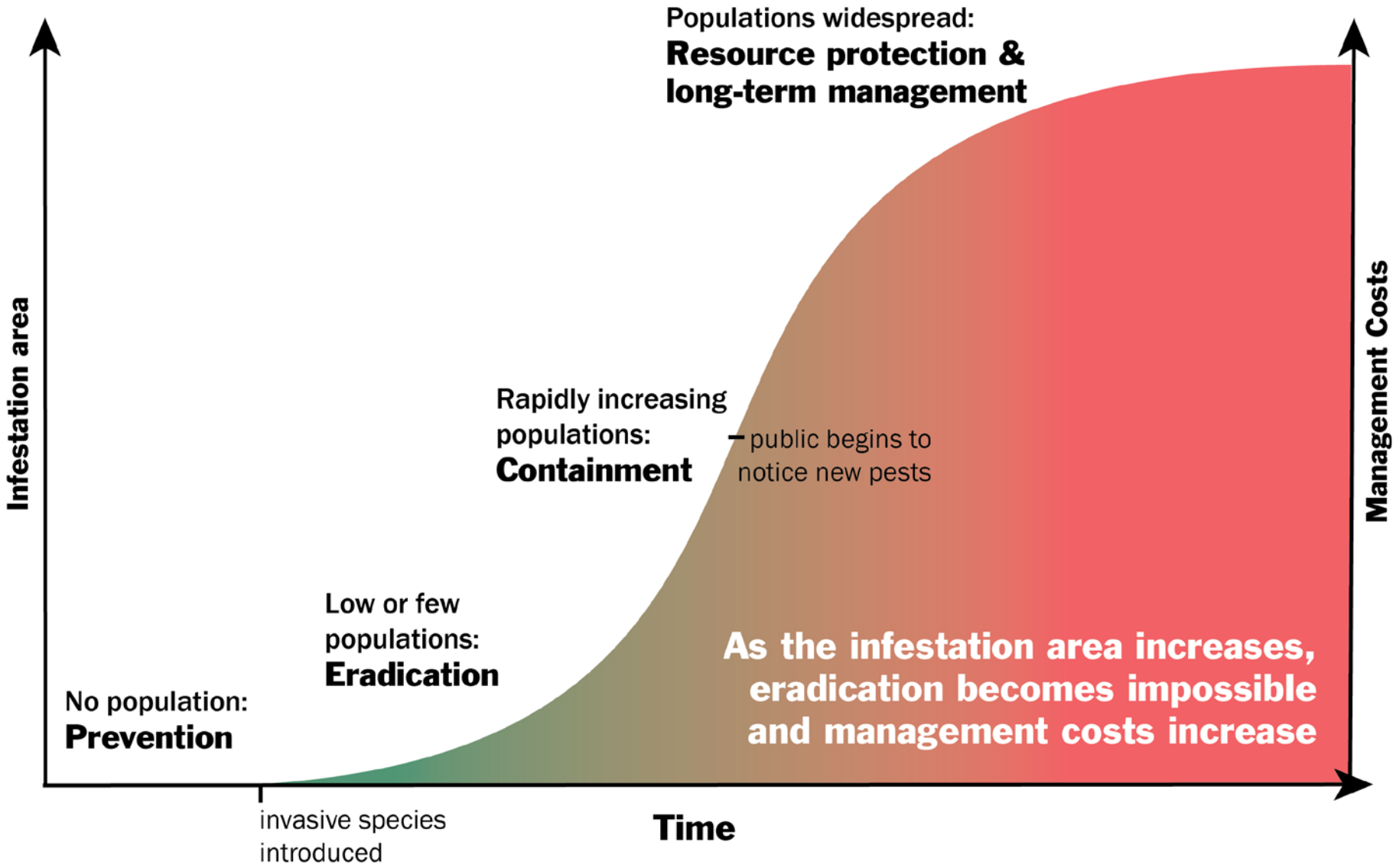
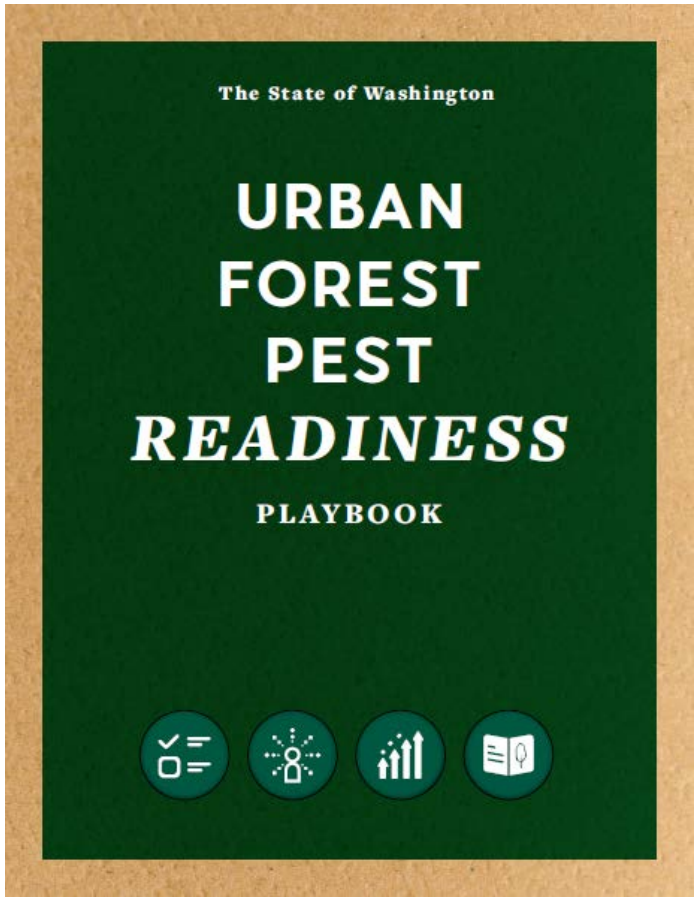

Populations widespread:
Resource protection &
long-term management
Infestation area
Management Costs
Rapidly increasing
populations:
Containment
public begins to
notice new pests
Low or few
populations:
Eradication
No population:
Prevention
As the infestation area increases,
eradication becomes impossible
and management costs increase
invasive species
introduced
Time



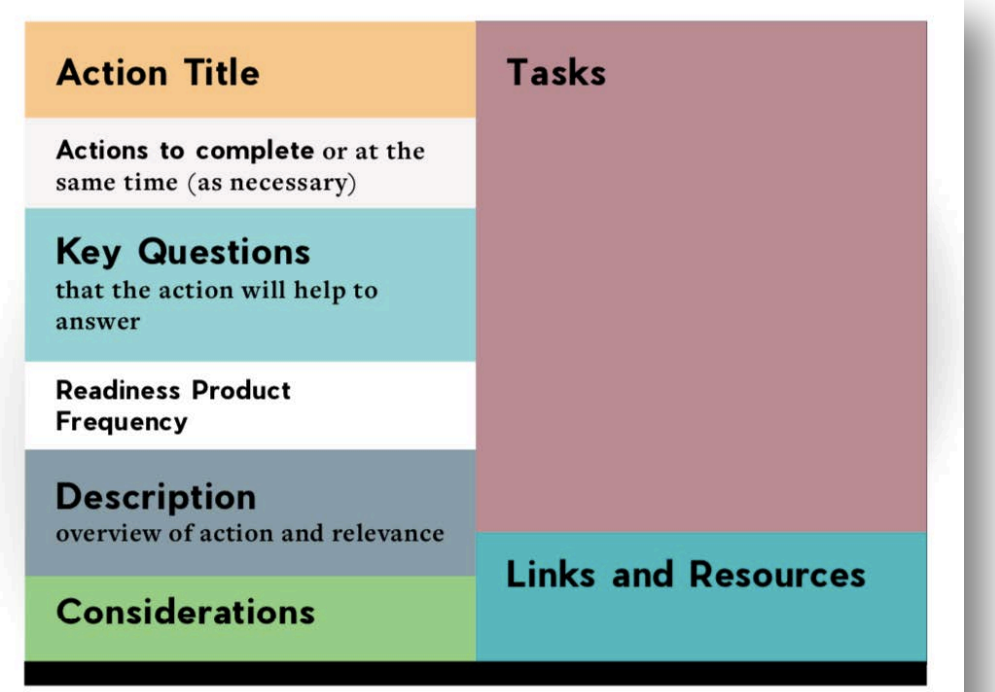

## OVERVIEW

- Executive Summary
- Overview
- Federal & State Authority
- Supporting Organizations & Programs
- Primary References
- Readiness Assessment
- Checklist of Readiness Actions

## HOW TO USE THE PLAYBOOK

Actions include the following:

- Action Title
- Key Question(s)
- Readiness Product
- Frequency
- Actions to complete first
- Description
- Tasks
- Considerations
- Links and Resources




*Example Layout for Actions*

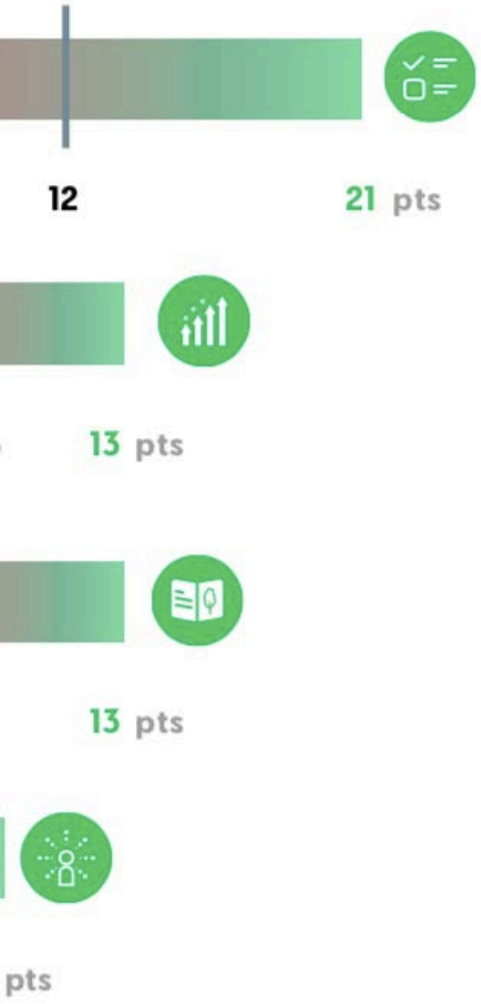
## WHERE TO START

Steps

1. Identify one or more playbook lead(s) to coordinate the planning process
2. Review the playbook overview sections and download the appropriate templates from the online resources.
3. Run through the self-assessment
4. Send contact information for your playbook lead(s) to the State Invasive Species Coordinator
5. Work through necessary actions

You are not on your own. We are here to help!

## SELF-ASSESSMENT




1. Understanding Risk
2. Capacity to Support a Response
3. Ability to Expedite Informed Decision-Making
4. Community Support to Expand your Impact

# SELF-ASSESSMENT

## Urban Forest Pest Ready Assessment

### UNDERSTANDING RISK

| | QUESTION | YES | POINTS | NO/NOT SURE? |
|---|---|---|---|---|
| **Tree Resources** | | | | |
| 1a. | Has your community ever conducted a tree canopy analysis? | ☐ | +1 | |
| 1b. | Has your city ever performed or does your city currently have a tree-by-tree inventory containing data on individual trees' species, sizes, conditions, and locations? | ☐ | +3 | |
| 1c. | Is the inventory less than 10 years old? | ☐ | +1 | |
| 1d. | Is the inventory less than 5 years old? | ☐ | +1 | |

ACTIONS

# Tree Inventory and Canopy Map

## Key Questions

- What are the available tree and canopy data resources and where are they stored?
- What additional information do we need to collect to prevent, detect or respond to urban forest pests and how will this information be collected and stored?

**Readiness Product** → Tree inventory; canopy map

**Frequency** → 5 years

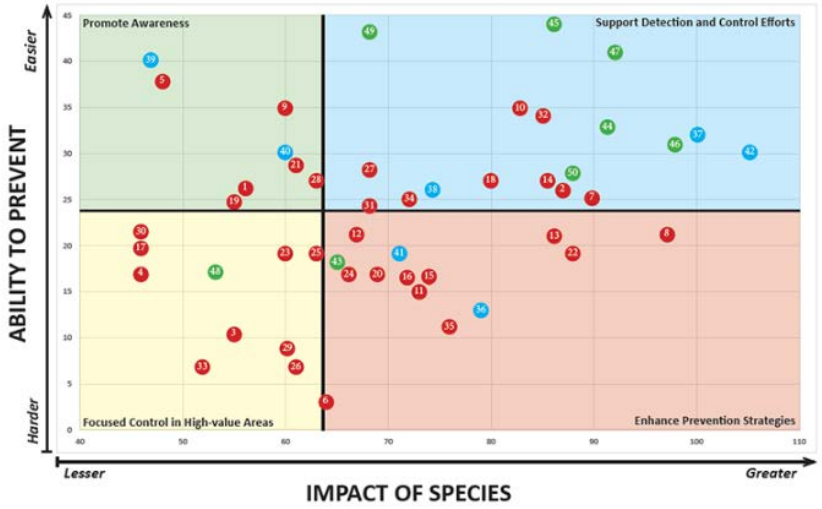
# ACTIONS

## Tasks

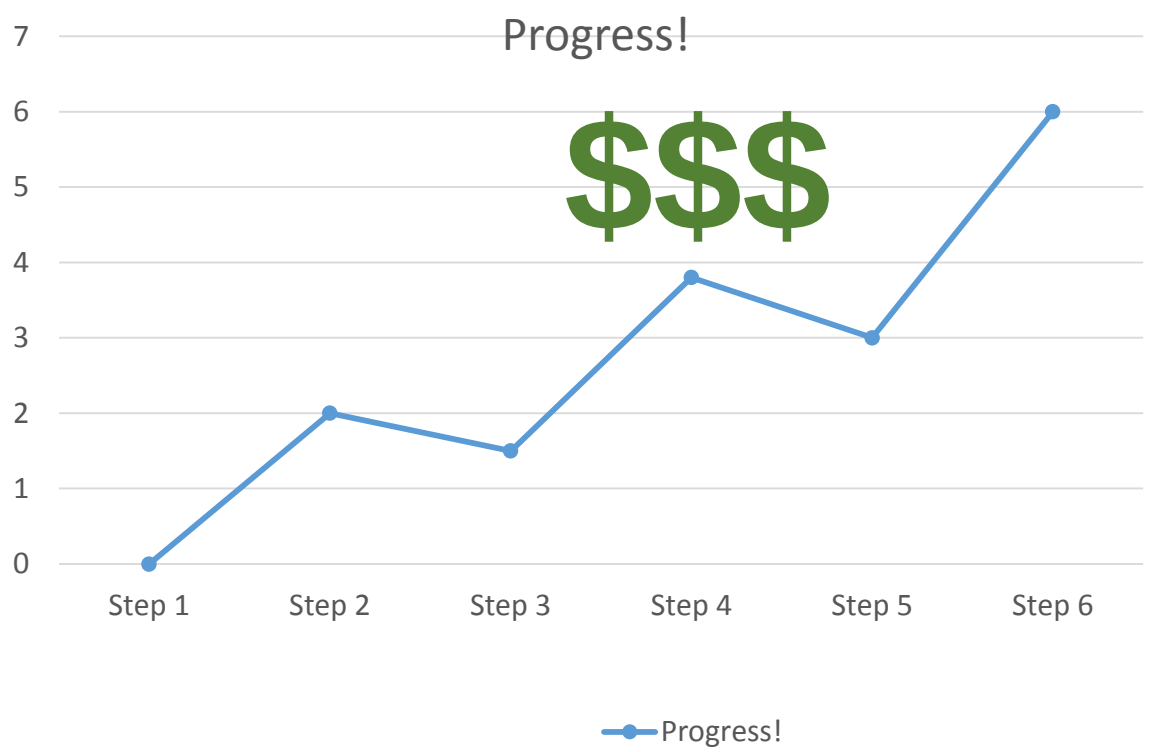
1. Undertake tree inventories and monitoring. A tree inventory should include age, species, size and condition of the trees as well as special designations (e.g. heritage tree) where appropriate. Monitoring and updating tree inventory is vital to effective canopy assessment as well as hazard tree tracking.
2. Create your urban forest canopy map through:
    - Partnering with public entities that may have their own internal records of tree assets such as school districts, university campuses, and publicly owned utilities.
    - Engaging a wide variety of stakeholders in data collection and monitoring by conducting trainings and inventories with staff, volunteers, or tree care professionals.
    - Implement remote sensing technology such as aerial photography or satellite imagery and work with GIS experts to capture all trees within a community.
3. Share your inventory and maps with State Urban Forestry Coordinator.

## ACTIONS

- Identifying Priority Pest Species
- Identifying Available Resources
- Understanding the Legal Environment
- Audience Outreach and Messaging
- Building a General Response Framework
- Building Tree Canopy Resilience




# Next Steps for the Playbook



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**Stephanie Helms**
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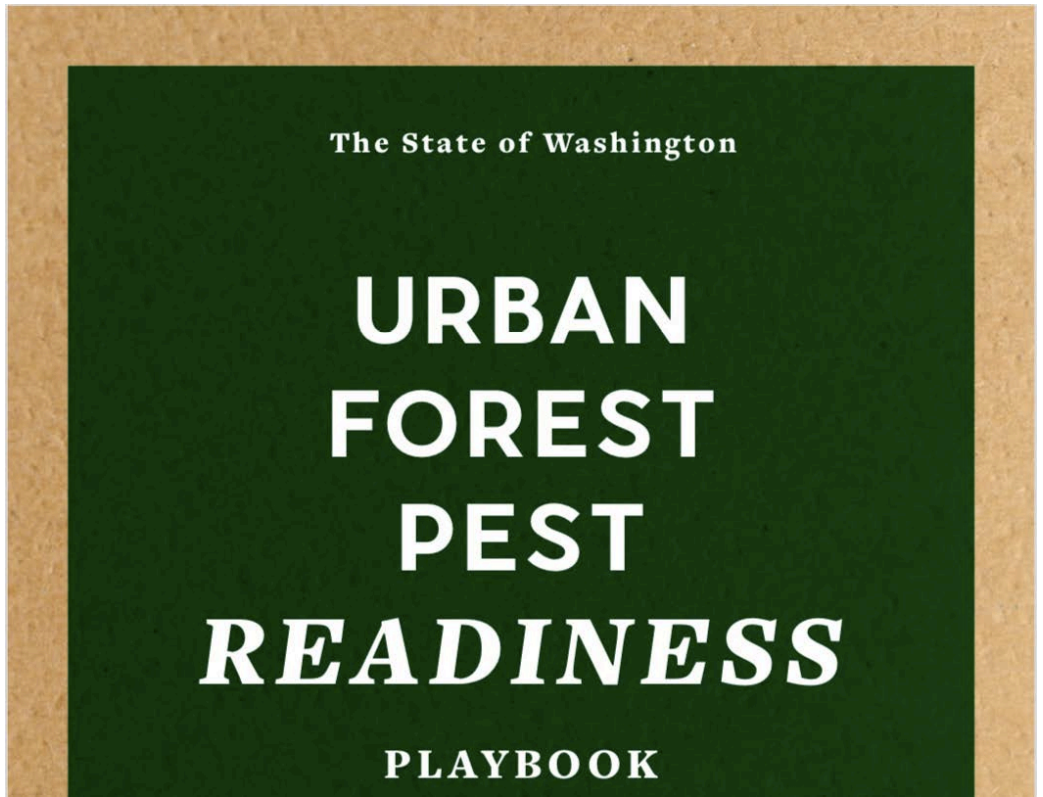
**Sven-Erik Spichiger**
*Washington State Department of Agriculture*

**Todd Murray**
*Washington State University Extension*

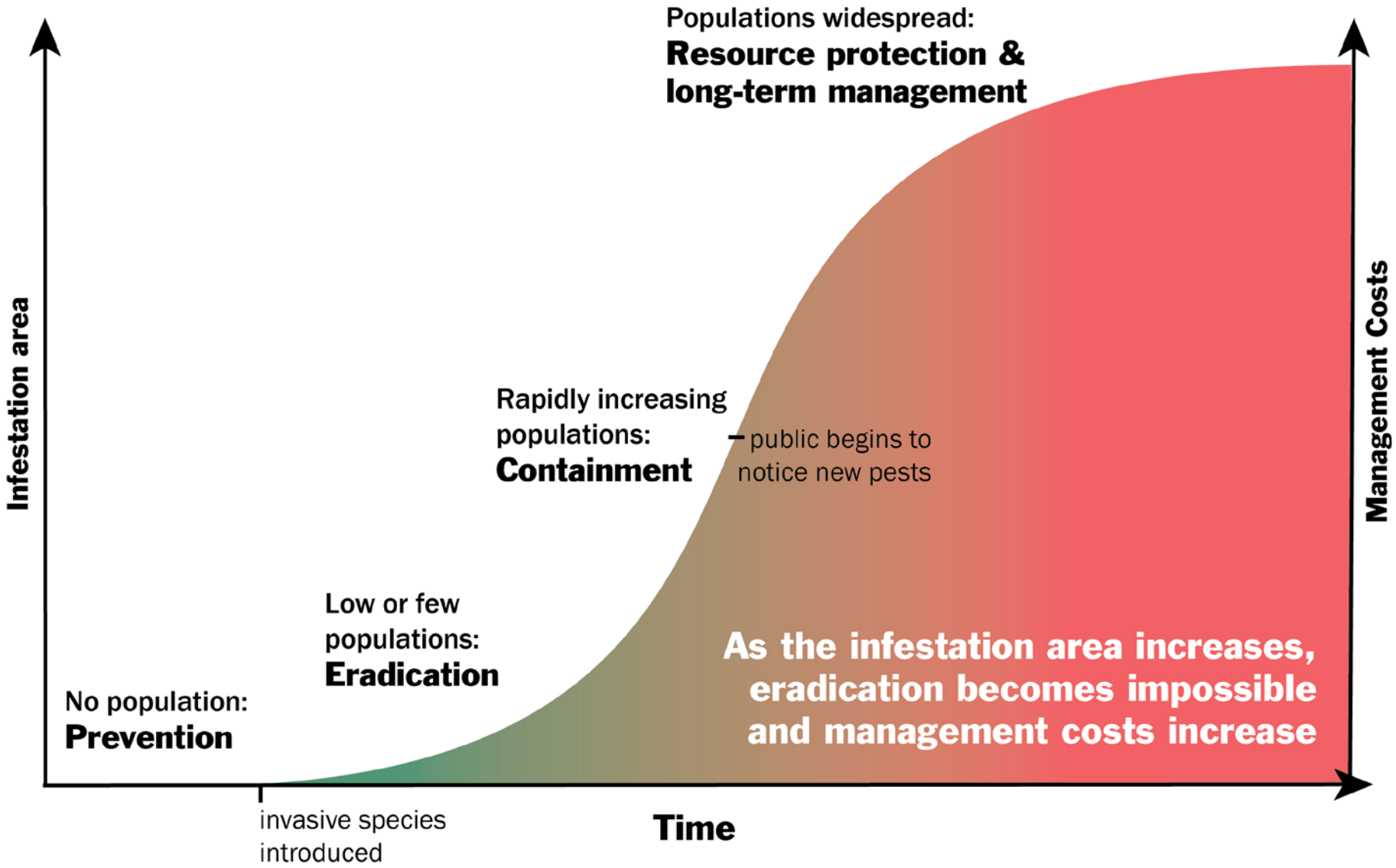
Learn more and keep involved by visiting:

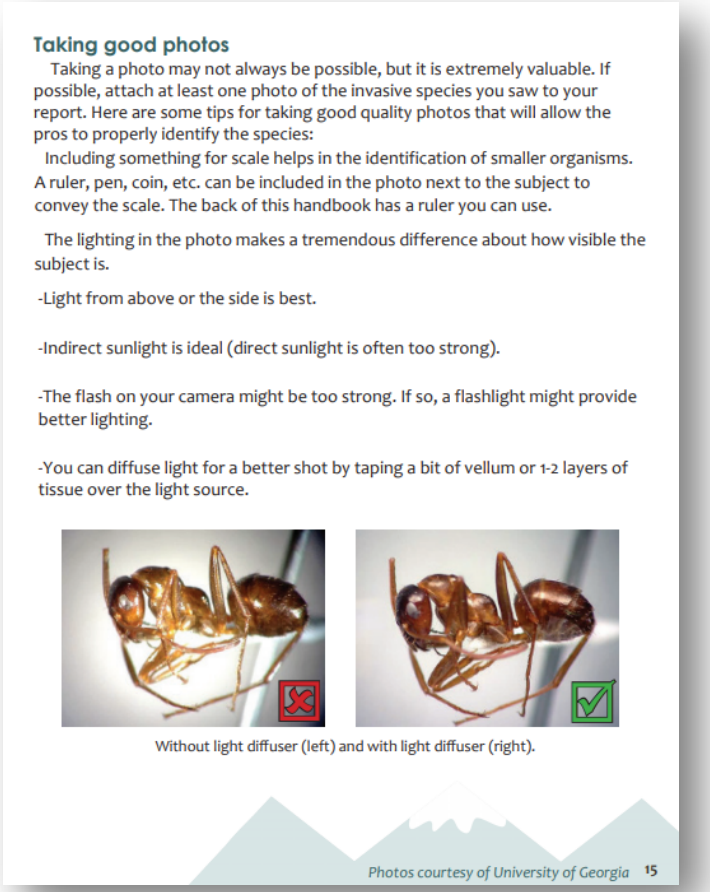
https://invasivespecies.wa.gov/projects/pest-ready




Stay informed and be notified of plan updates, new tools, grants, and other opportunities by joining the Washington Invasive Species Council's email list!

Visit InvasiveSpecies.wa.gov to sign up.


Populations widespread:
Resource protection &
long-term management
Infestation area
Management Costs
Rapidly increasing
populations:
Containment
public begins to
notice new pests
Low or few
populations:
Eradication
No population:
Prevention
As the infestation area increases,
eradication becomes impossible
and management costs increase
invasive species
introduced
Time



## Taking good photos

Taking a photo may not always be possible, but it is extremely valuable. If possible, attach at least one photo of the invasive species you saw to your report. Here are some tips for taking good quality photos that will allow the pros to properly identify the species:

Including something for scale helps in the identification of smaller organisms. A ruler, pen, coin, etc. can be included in the photo next to the subject to convey the scale. The back of this handbook has a ruler you can use.

The lighting in the photo makes a tremendous difference about how visible the subject is.

-Light from above or the side is best.

-Indirect sunlight is ideal (direct sunlight is often too strong).

-The flash on your camera might be too strong. If so, a flashlight might provide better lighting.

-You can diffuse light for a better shot by taping a bit of vellum or 1-2 layers of tissue over the light source.



Without light diffuser (left) and with light diffuser (right).

*Photos courtesy of University of Georgia* 15

adapted from fact sheet by Nick Aflitto provided by WSU (pubs.wsu.edu)

Washington State University Extension

Washington Pest Watch

citrus longhorned beetle, which have distinct black and white bands. The Asian longhorned beetles, however, have smooth, glossy wing covers, as opposed to the pitted, rough-textured wing covers of the Oregon fir sawyer. Further, the color of the scutellum (triangular shape between the wing covers) is different. Asian longhorned beetles have a black scutellum while the Oregon fir sawyers have a white scutellum (see right).

There is one other species worth noting that may be mistaken for Asian or citrus longhorned beetles, the native banded alder borer. This banded alder borer has very definitive black and white bands as opposed to the white dots that are characteristic of Asian and citrus longhorned beetles.

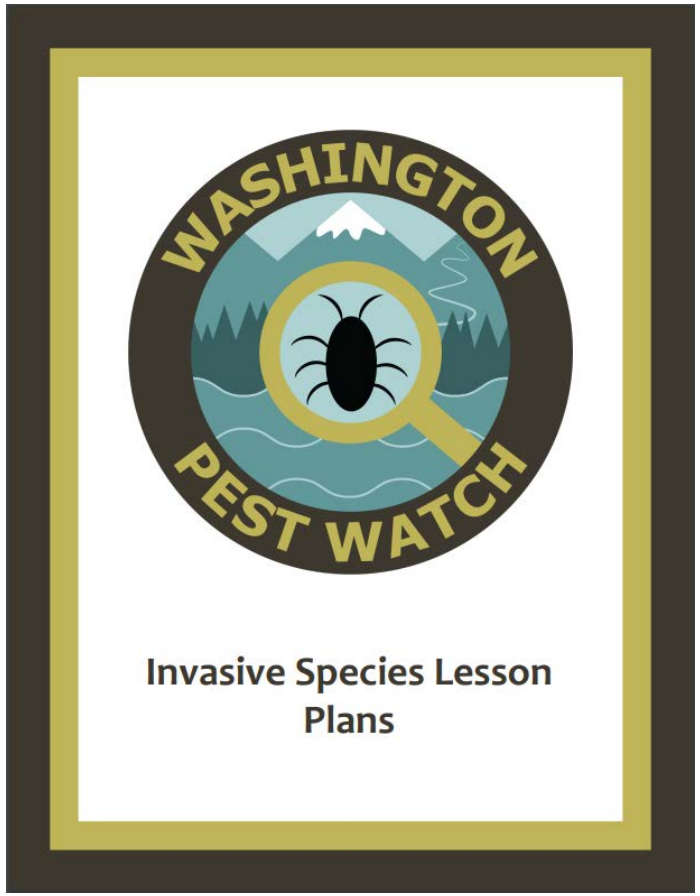
Identifying the larvae is more difficult as they are similar in appearance to native species. Mature larvae of both species are whitish in color and about 2 inches long. Like many other wood borers that are hidden underneath tree bark for most of their life, noticing declining tree health, eggs niches, exit holes, and saw dust on the tree trunk are clues of their presence.

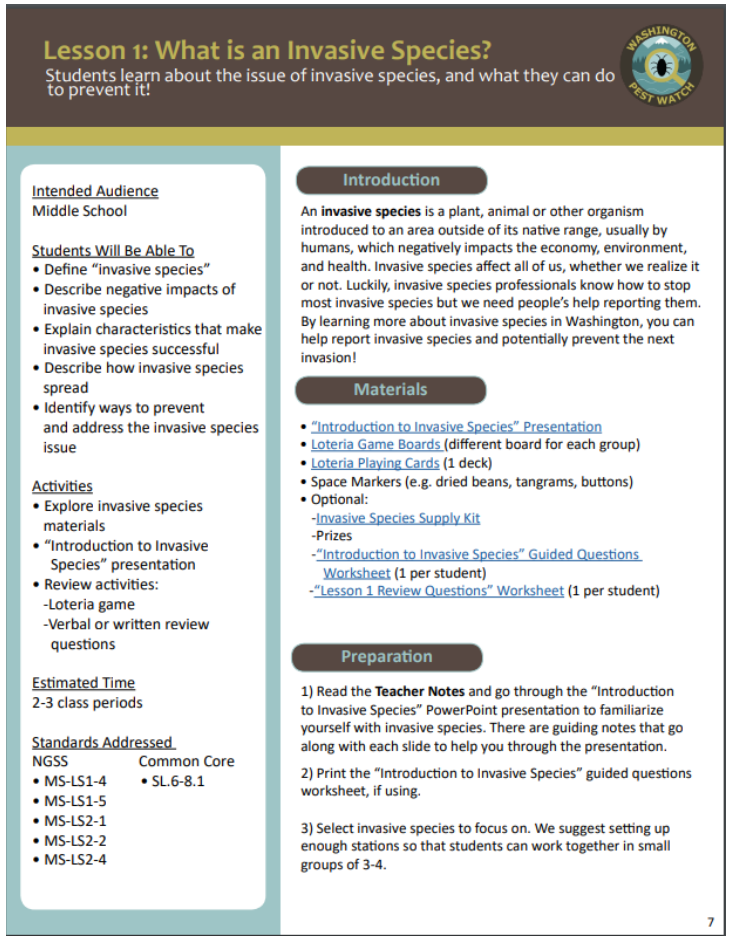


a: Saw dust; b: Exit hole

*Photos courtesy of Steven Valley, Oregon Department of Agriculture; Melody Keena and Dennis Haugen, United States Forest Service* 21

- Washington Pest Watch
- Being a First Detector
- Intro to Invasive Species
- How to Report
  - Taking Good Photos
- Fact Sheets
  - Insects
  - Diseases
  - Animals
  - Plants



## Lesson 1: What is an Invasive Species?

Students learn about the issue of invasive species, and what they can do to prevent it!

Intended Audience
Middle School

Students Will Be Able To
- Define "invasive species"
- Describe negative impacts of invasive species
- Explain characteristics that make invasive species successful
- Describe how invasive species spread
- Identify ways to prevent and address the invasive species issue

Activities
- Explore invasive species materials
- "Introduction to Invasive Species" presentation
- Review activities:
  -Loteria game
  -Verbal or written review questions

Estimated Time
2-3 class periods

Standards Addressed

| NGSS | Common Core |
|---|---|
| • MS-LS1-4 | • SL.6-8.1 |
| • MS-LS1-5 | |
| • MS-LS2-1 | |
| • MS-LS2-2 | |
| • MS-LS2-4 | |

### Introduction

An **invasive species** is a plant, animal or other organism introduced to an area outside of its native range, usually by humans, which negatively impacts the economy, environment, and health. Invasive species affect all of us, whether we realize it or not. Luckily, invasive species professionals know how to stop most invasive species but we need people's help reporting them. By learning more about invasive species in Washington, you can help report invasive species and potentially prevent the next invasion!

### Materials

- "Introduction to Invasive Species" Presentation
- Loteria Game Boards (different board for each group)
- Loteria Playing Cards (1 deck)
- Space Markers (e.g. dried beans, tangrams, buttons)
- Optional:
  -Invasive Species Supply Kit
  -Prizes
  -"Introduction to Invasive Species" Guided Questions Worksheet (1 per student)
  -"Lesson 1 Review Questions" Worksheet (1 per student)

### Preparation

1) Read the **Teacher Notes** and go through the "Introduction to Invasive Species" PowerPoint presentation to familiarize yourself with invasive species. There are guiding notes that go along with each slide to help you through the presentation.

2) Print the "Introduction to Invasive Species" guided questions worksheet, if using.

3) Select invasive species to focus on. We suggest setting up enough stations so that students can work together in small groups of 3-4.

7

Middle School Curriculum with an Elementary School Curriculum is available!

6 lessons that meet Next Generation Science Standards

Incorporate activities to support all styles of learning.

https://invasivespecies.wa.gov/educational-materials/

# REPORTING VALIDATION AND RESPONSE

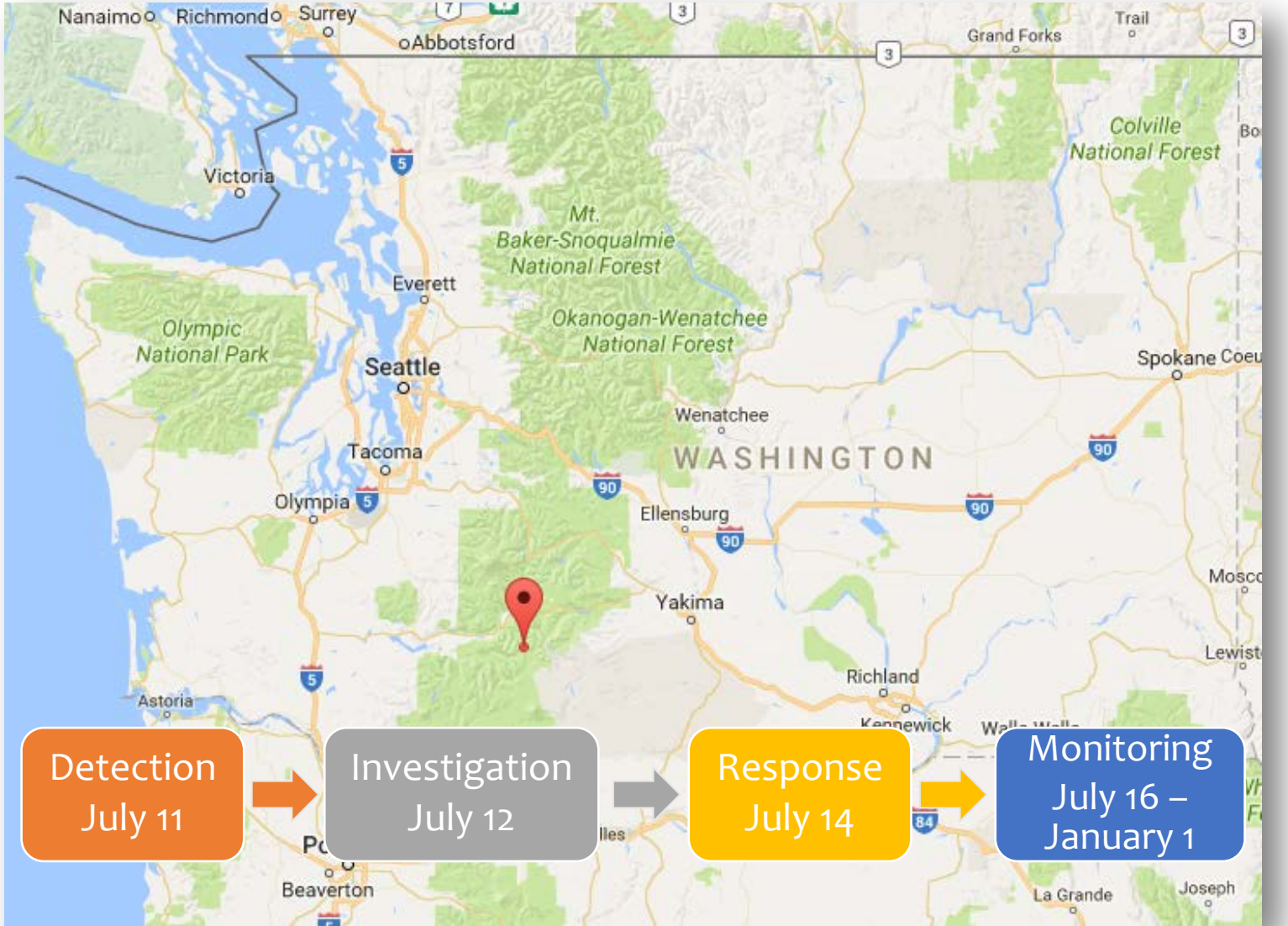
EDDMapS
Early Detection & Distribution Mapping System

**Verification & Action**

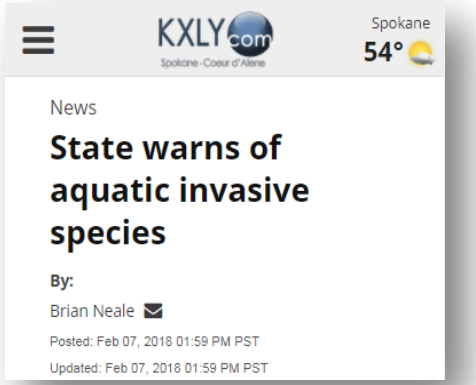
- Mobile app
  - iOS
  - Android
- Website forms

- Immediate notification
  - WISC
  - State/Federal Agencies
  - Local Agencies

- Process depends on
  - Lead agency(ies)
  - Species
  - Area of Report (Distribution)


Nanaimo
Richmond
Surrey
Abbotsford
Grand Forks
Trail
Colville National Forest
Victoria
Mt. Baker-Snoqualmie National Forest
Everett
Olympic National Park
Okanogan-Wenatchee National Forest
Seattle
Spokane
Wenatchee
WASHINGTON
Tacoma
Olympia
Ellensburg
Yakima
Richland
Astoria
Beaverton
La Grande
Joseph
Detection July 11
Investigation July 12
Response July 14
Monitoring July 16 – January 1


21
NF-21




| Social Media Platform | Reach |
|---|---|
| Facebook | 798 |
| Instagram | 158 |
| Twitter | 140 |
| TOTAL | **1,096 people** |

Report February 5 → Investigation February 6 → Wildlife Police Warning February 7 → Wildlife Police Facebook Post February 7 → KXLY Coverage February 7

Report Received → Notification → Validation → Technical Assistance

**Pest Watch:**
European Chafer

WASHINGTON STATE UNIVERSITY EXTENSION FACT SHEET • FS078E

WSU Extension *Pest Watch* fact sheets identify new agricultural pests in or near Washington State that pose environmental and economic threats. In the event of a severe pest outbreak, a *Pest Alert* will be issued with emergency pest management and control information.

**Introduction**

The European chafer (scientific name *Rhizotrogus majalis*, family Scarabaeidae) is a beetle that causes damage to turf and cereal crops when in its larval (or grub) form. Because it is now confirmed as a problem in southwest British Columbia, Canada, it is important that Washington State gardeners and horticultural professionals are aware of this pest, recognize its various life stages, and know how to

June-beetle shape and are about 1/2 inch long (Fig. 2). The larvae are C-shaped and white with a dark head capsule. When mature, European chafer larvae have three pair of visible legs and are about 3/4 inch long (Fig. 3).

Other insect larvae that feed on turf include crane flies and cutworm caterpillars. Crane larvae are legless and tubular, with a retracted head capsule (Fig. 4; see also EB0856, *European Crane Fly: A Lawn Pasture Pest*). Cutworms, also pests to

*Vespa mandarinia* Smith, 1852

Washington State Department of Agriculture | PEST ALERT

**Common name:** Asian giant hornet **Latin name:** *Vespa mandarinia*

After two separate detections in Canada last fall, Washington confirmed a report of a suspected Asian giant hornet in Blaine, WA in December and also received three credible reports of Asian giant hornet attacks on honeybee hives in Blaine and Bellingham. If established, this hornet will have serious negative impacts on the environment, economy, and human health in Washington State.

**PLEASE REPORT SUSPECTED ASIAN GIANT HORNET ATTACKS OR SIGHTINGS, INCLUDING LOCATION AND PHOTOGRAPHS, IF AVAILABLE.**

- The hornets are generally 1.5 - 2" long with black and dull yellow/orange striped abdomen and a large yellow/orange head.
- Asian giant hornets mostly nest in the ground, although nests near the ground in hollow trees have rarely been recorded. They are not known to nest in tree branches.
- They are social insects that form large colonies and are voracious predators of honeybees and other insects. A single hornet can kill dozens of honeybees in a few minutes and a group of hornets can destroy an entire hive by killing the adults and removing bee larvae and feeding them to their own grubs.
- They are not generally aggressive towards people but will sting when threatened. Their venom is very toxic, and multiple stings can require hospitalization and in rare circumstances can cause death.

Contact us for more information:

**WSDA Pest Program**
PestProgram@agr.wa.gov
1-800-443-6684

**REPORT SUSPECTED ATTACKS OR SIGHTINGS AT:**
agr.wa.gov/hornets

AGR 809-769 (N/6/19)









The New York Times

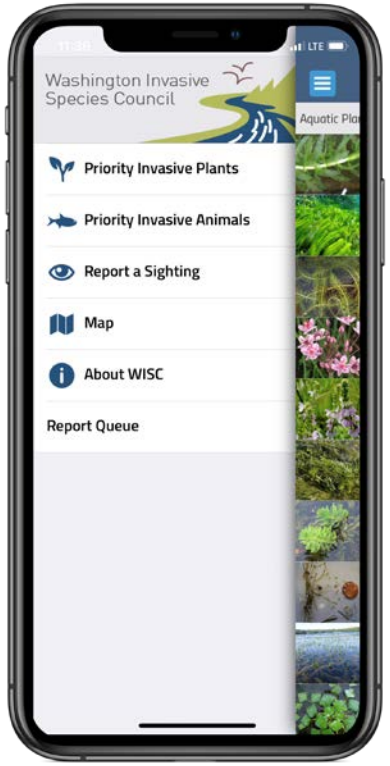
SUBSCRIBE NOW | LOG IN

## *Asian Giant Hornet Invasion Threatens Honey Bees in Pacific Northwest*

An expert said of the hornets: "They are sworn enemies of honey bees. I would say a bee's worst nightmare."

Report December 8, 2019 → Trapping + Surveillance December 12, 2019 → Pest Alert December 19, 2019 → Stakeholder Meeting January 2, 2020 → Delineation and Response Scoping

# Questions?





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