Potential forest health issues from invasions of exotic English ivy

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English Ivy Research Forum
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Oregon Department of Forestry

Promoting and Practicing Sustainable Forestry

What effects does ivy have on forest health?

- Competition for resources
- Growth reduction, deformity of host
- Reservoir for disease
- Other community level effects
- Fire dynamics
- Damages from ivy removal

Competition for Resources - Water

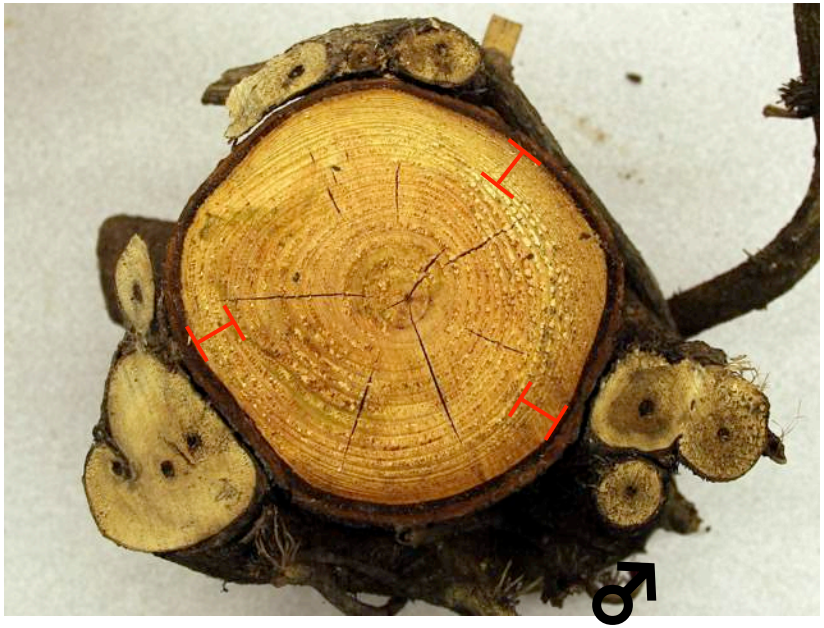
- Douglas-fir wood growth vs. water availability
- Does ivy limit water availability for Douglas-fir?
- If so, then expect reduced growth of wood

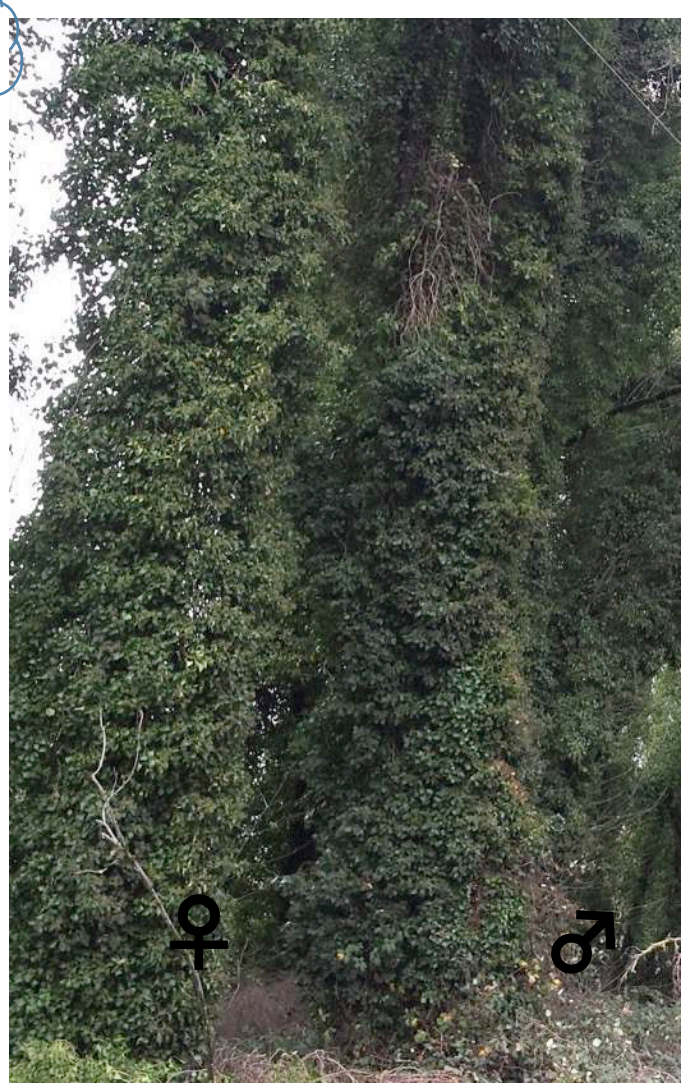
Competition for Resources - Sunlight

- Vines up to 90 feet
- Ivy foliage blocks out host
- At some point (?), photosynthesis and growth of host decline
- In extreme cases, tree death

Other effects of climbing vines

- Encircling vines – cause growth deformities?
- Change microhabitat?
- Alter interactions with insects and disease?





Reservoir for disease

English ivy is a reservoir of bacterial leaf scorch, *Xylella fastidiosa*

Xylella is native to SE U.S., recently detected in Oregon (2015)

Xylella infects xylem vessels in a number of woody, broad leaf and annual grasses, **causing leaf scorch and dieback and sometimes death**.

Often involves insect vectors, such as sharpshooters, leaf hoppers

Concern for nursery industry

WHAT IS

Xylella fastidiosa?

- *Xylella fastidiosa* is a bacterium that infects xylem vessels in a number of woody, broad leaf, and annual grass plants.
- Infection by *X. fastidiosa* disrupts the normal functioning of transportation of minerals and water through xylem vessels, leading to leaf scorch, dieback, and death.
- However, in many hosts the bacterium can remain symptomless.

Disease symptom on grape. *Source: msfruitextension.wordpress.com*

Bacterial leaf scorch of red maple. *Source: www.apsnet.org*

The pathogen is considered native to warmer regions in North America such as the southeastern USA. In recent years, *X. fastidiosa* has been reported in Asia, Europe, and South America.

In October 2015, *X. fastidiosa* was detected for the first time in Oregon infecting 'Perry' pear trees. Previously, *X. fastidiosa* was reported infecting pear only in Taiwan.

REPORTING

Xylella fastidiosa

- Report plants exhibiting suspicious symptoms to the Oregon Department of Agriculture (1-800-INVADER).
- Please take photos of symptoms and details of the suspect plant's location and the conditions its being grown under.
- Nurseries may contact their official Nursery Inspector for assistance.
- Samples from suspect plants must be submitted to lab testing for accurate diagnosis.
- An appropriate sample for diagnostic testing consists of a twig about as thick as a pencil with symptomatic leaves still attached.

MORE INFORMATION ON THE DISEASE

edis.ifas.ufl.edu/in174
nature.berkeley.edu/xylella

SAMPLE COLLECTION

Oregon Department of Agriculture
Nursery Inspection Program
(503) 986-4644

PATHOGEN DIAGNOSIS

Oregon Department of Agriculture
Plant Health Laboratory
(503) 986-4620

Oregon State University Plant Clinic
(541) 737-3472

OREGON DEPARTMENT OF AGRICULTURE

Market Access & Certification
Plant Health Program
635 Capitol St NE, Salem, OR 97301
(503) 986-4620 — www.oregon.gov/ODA

Created: 11/2015

PLANT DISEASE ALERT

Xylella fastidiosa

Bacterial leaf scorch on blueberry, caused by the bacterium *Xyella fastidiosa*. *Source: apps.caes.uga.edu/gafaces*

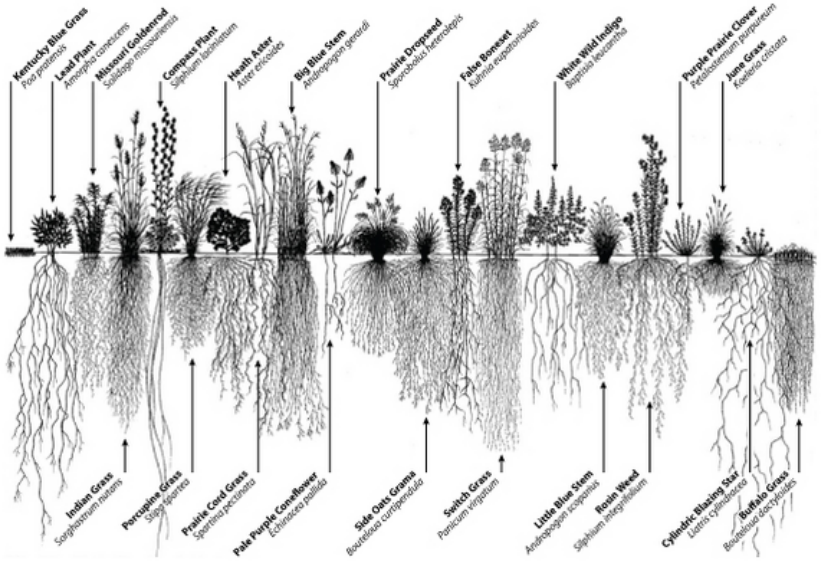
COMMON NAMES

Pierce's disease, California vine disease, Anaheim disease (grapevine), dwarf (lucerne), phony disease (peach), leaf scald (plum), leaf scorch (almond, elm, maple, mulberry, pear, plane, and oak), variegated chlorosis (citrus)

Oregon Department of Agriculture

Community ecosystem effects

- Changes in the rhizosphere?
- Refuge for predators?
- Compete with T&E plants or desired understory plants?



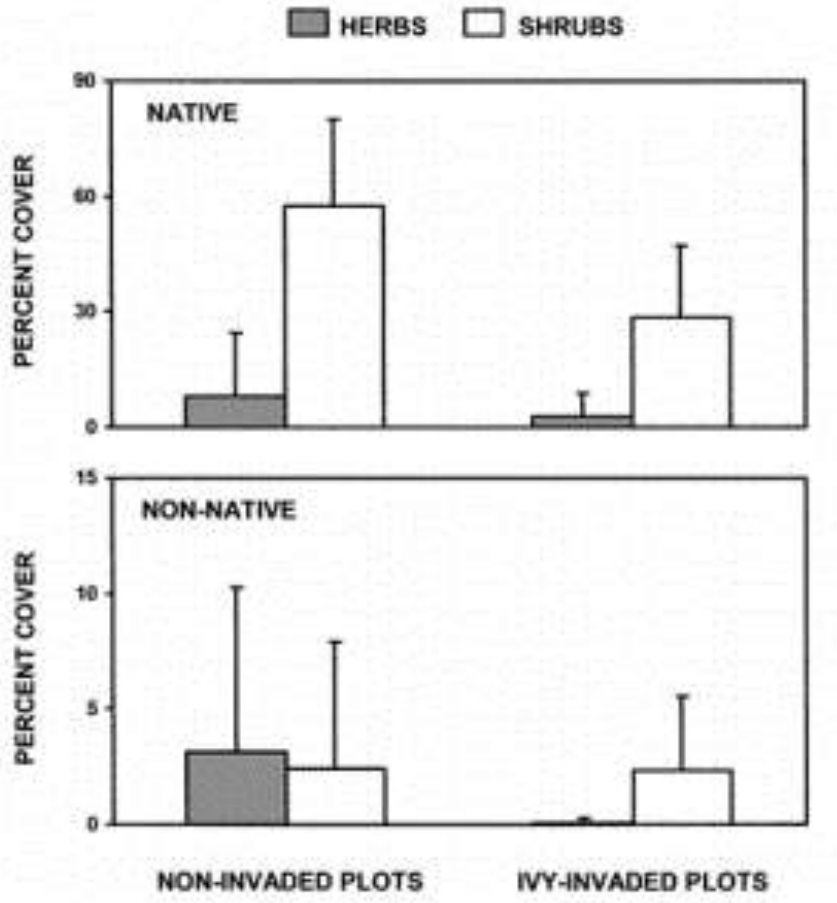
Northwestern Garter Snake,
Thamnophis ordinoides

Effects of English ivy on community ecology

- Surprisingly, very few studies
- Dlugosch. 2005. Northwest Science. 79: 53-60
- Paired study: 11 sites, with and without ivy
- **Measured species diversity, percent cover, and tree regeneration**
- No differences between ivy-invaded plots and control plots for:
  - Species diversity
  - Tree regeneration

Figure 1. Map showing location of study sites. Pairs of plots (dots) were located in three parks in Seattle, WA.

Effect of English ivy on plant community



Native shrub cover significantly reduced in ivy-invaded plots

Dlugosch. 2005.
Northwest Science. 79: 53-60

Spring 6-11-2014

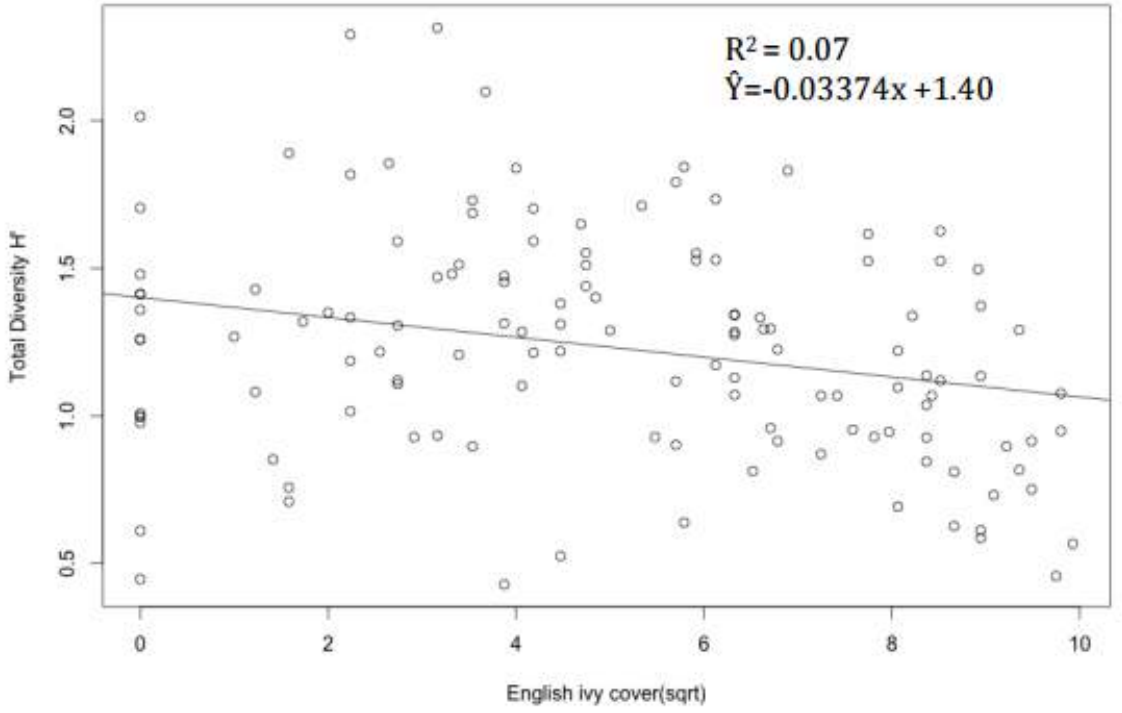
Community level impacts associated with the invasion of English ivy (Hedera spp.) in Forest Park: a look at the impacts of ivy on community composition and soil moisture.

Sara Rose Copp
Portland State University

Copp. 2014. PhD dissertation. Community level effects of ivy

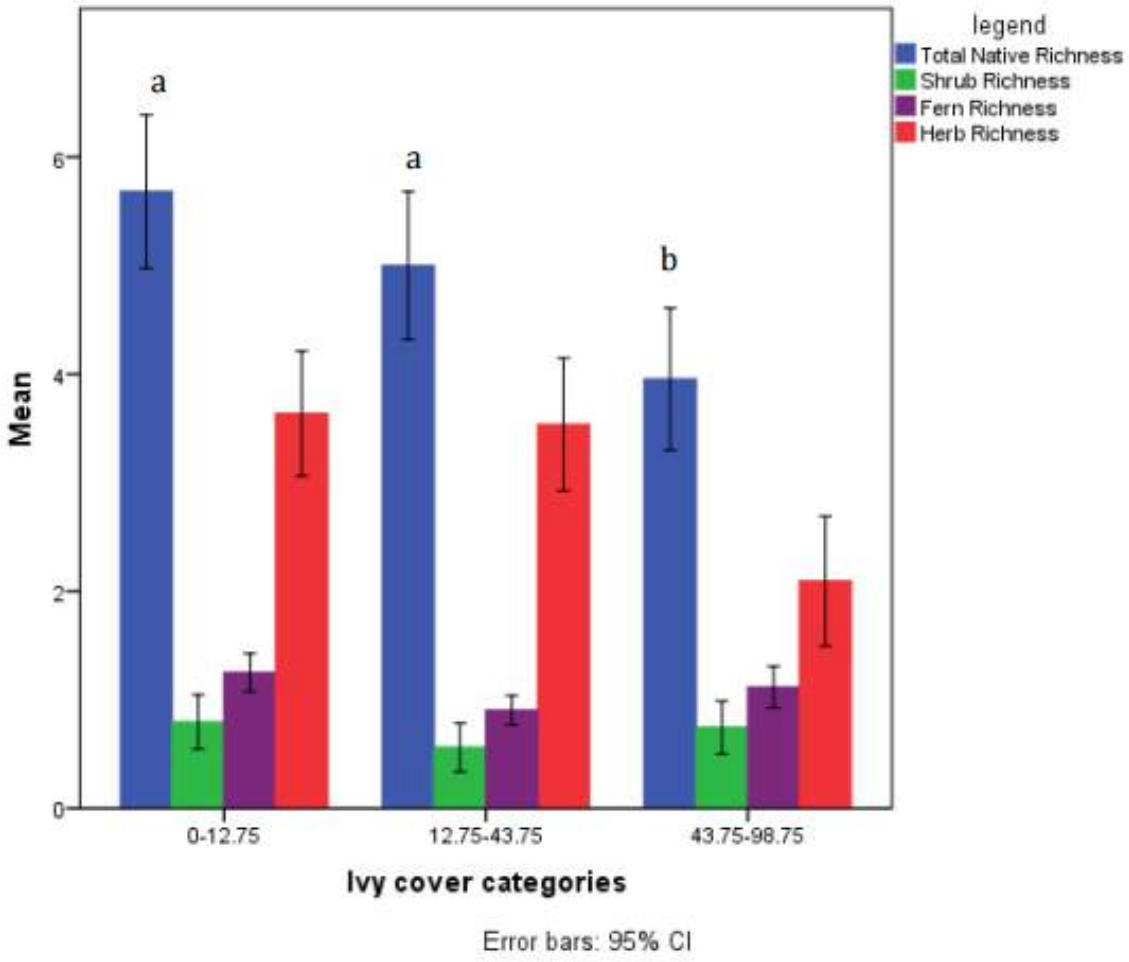
- Between 2010 and 2013, % cover of English ivy increased 14%.
- Native cover increased 0.29%

- Ivy cover had negative relationship with total plant diversity



Copp. 2014. PhD dissertation. Community level effects of ivy

- When Ivy cover reaches >44%, native species <u>richness</u> goes down



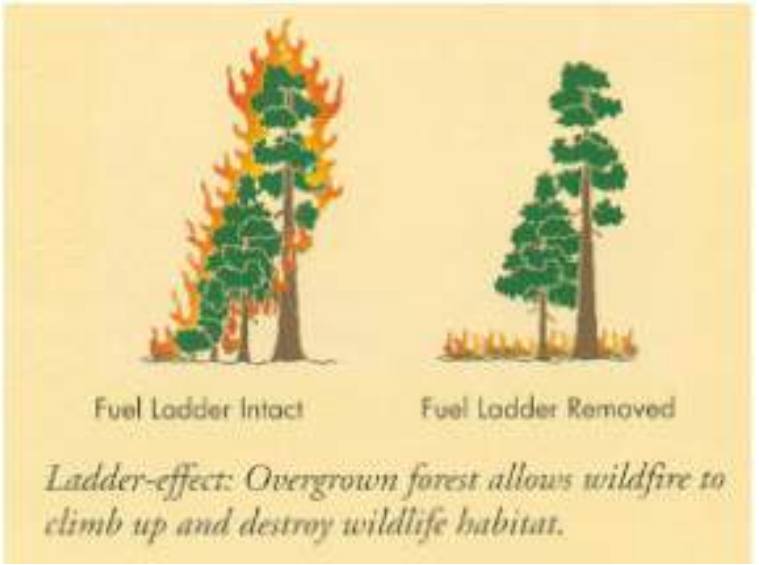
Fire dynamics

- One concern is “ladder fuels”
- Ladder fuels allow small ground fires to climb into tree canopies
- Once a tree’s canopy is ignited, much greater chance for uncontrolled burn
- Catastrophic fires are almost always uncontrolled canopy fires
- Will ivy increase occurrence or severity of canopy fires?

available (Dibble and others 2007).

Invasive vines such as Oriental bittersweet (fig. 5-4), Japanese honeysuckle, kudzu, Chinese wisteria (*Wisteria sinensis*), porcelainberry, and English ivy (*Hedera helix*) have potential to alter fuel characteristics of invaded communities. They could increase fuel loading and continuity by growing up and over supporting vines, shrubs, and trees, and by killing the vegetation beneath them. Invasive vines could increase the likelihood of crown fire, especially under drought conditions, by acting as ladder fuels. Such changes have not been quantified. In the southern Appalachians, Oriental bittersweet contributes substantial vine biomass (Greenberg and others 2001). It can also support later-successional vines and lianas (Fike and Niering 1999), possibly enabling other species to become ladder fuels

USFS. 2008. Wildland Fire in Ecosystem. Tech Report RMRS-GTR-42



Ladder-effect: Overgrown forest allows wildfire to climb up and destroy wildlife habitat.

English ivy removal and forest restoration

- Removing ivy can damage trees
- Injured trees much more prone to attack by insects and disease

English Ivy/Forest health restoration project


KUBOTA

English ivy removal and restoration project

Time frame	Activity
Fall/Winter 2013	Girdle ivy; cut-stump applications
Winter/Spring 2014	Excavate, plow, grade
April 2014	Sow grass seed
Fall/Winter 2015	Tree removal; burning
April 2015	Sow grass seed
Fall/Winter 2016	Aerial application
Winter 2016	Replant with natives

~$2000 in costs to restore 1 acre

Chemicals used

Cut-stump:
Triclopyr + 2,4-D (Crossbow)

Aerial:
Triclopyr + adjuvant

HERITAGE seedlings & liners

MARION COUNTY SOIL AND WATER CONSERVATION DISTRICT

Summary

- Still much to learn about resource competition and community ecosystem effects
- Unknown effects on insects and disease (other than Xylella)
- Fuels for fire? Affects wood quality?
- Care for trees when removing ivy

Questions?

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