Invasive plants: threats, challenges, and solutions

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Cape Perpetua Visitor Center
Siuslaw National Forest

Photo credit: theworldlink.*com*

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Who am I?

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Questions

- What is an invasive species?
- What invasive plants are common in W. Oregon?
- What problems do invasive plants cause?
- How do we manage invasive plants?
- What can you do to help?

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What is an invasive species?

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Invasive species are…

- **Non-native** (introduced, exotic, alien)

- **Harmful** (cause unacceptable loss, etc.)

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Facts about invasive species*

- The U.S. spends **$138 billion per year** for losses and control costs from invasive species

- Invasive species responsible for the **decline of half of all threatened and endangered species**

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*2006. www.fs.fed.us/projects/four-threats/facts/invasive-species.shtml

Besides plants, invasive species include:

Insects

Emerald ash borer

Mollusks

Zebra mussel

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Fungi

Dutch elm disease

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Mammals

Coypu (nutria)

Birds

Starling

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Fishes

Flying Asian carp

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Reptiles

Boa constrictors!

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Facts about invasive *plants*

- Infest >130 million acres w/ annual increase of 1.7 million acres

- 3.6 million acres of forest land have been lost to invasive plants

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*2006. www.fs.fed.us/projects/four-threats/facts/invasive-species.shtml

Are all non-native plants invasive?

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No.

Of the estimated 4,000 non-native plants in the U.S., 400 are considered to be ‘invasive’ (harmful).

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www.fs.fed.us/projects/four-threats/facts/invasive-species.shtml

Teasel

Musk thistle

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Musk thistle infestation

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All non-native!

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How do invasive plants get here?

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Accidentally via transportation routes

- Cargo
- Luggage
- Tourists

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Deliberately because of desirable qualities

European beach grass

Purple loosestrife

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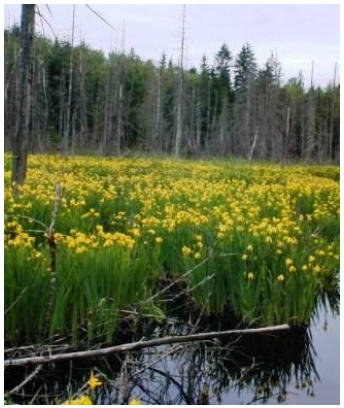
Common invasive plants in western Oregon

Gorse

Himalayan blackberry

Scotch broom

European beach grass



Yellow flag iris

Foxglove

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And more…

English ivy

Japanese knotweed

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What problems do invasive plants cause?

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Compete with and eliminate native plants

English ivy

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Threaten habitat for birds/ other wildlife

European beachgrass

Snowy plover

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Make land unusable for grazing

Tansy ragwort

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Increase fire threat

Gorse

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Reduce water quality and quantity

Saltcedar

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Other problems…

- Reduce biodiversity
- Alter ecosystem function
- Change soil characteristics

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Programs that manage invasive plants help USFS fulfill its mission:

"To sustain the health, diversity and productivity of the nation's forests and grasslands to meet the needs of present and future generations"

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Similar goals and priorities

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How can we manage invasive plants?

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Chemically (herbicides)

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Physically
(mechanical/cultural control)

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Biologically
(biological control)

Leaf beetles

Purple loosestrife

Root weevil

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Why use biological control?

Outbreaks of invasive plants linked to

biological traits that allow them to be successful

absence of effective natural enemies

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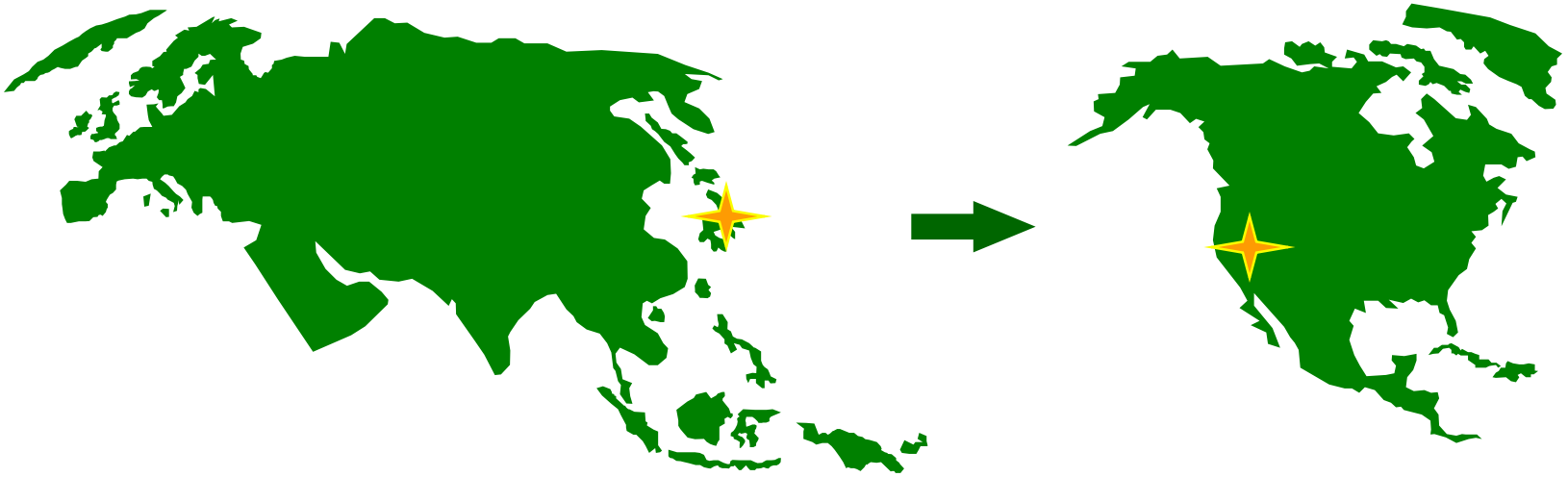
Goal: Reunite invasive plants with natural enemies that specialize in feeding on them



Search in native country

Import and release

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Advantages of biological control over other methods

- Low cost*
- Less labor*
- Low environmental risk
- Feasible for widespread invasive plants →

*After initial investment

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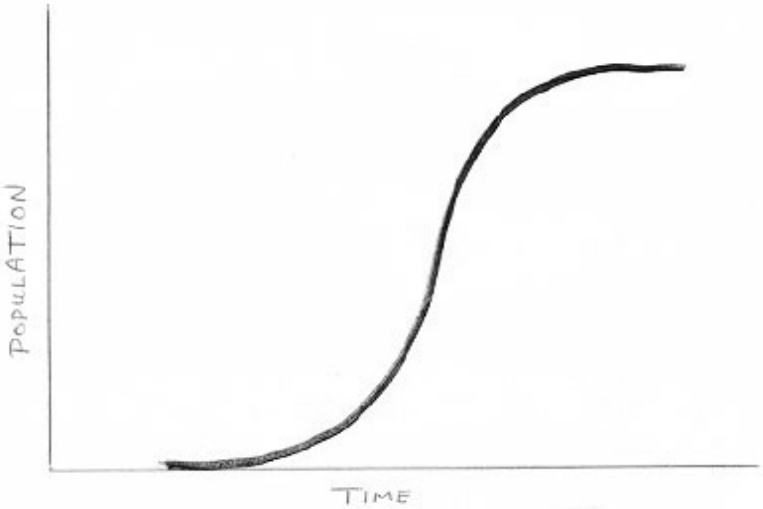
Outbreaks cannot be contained chemically or mechanically



$$dN/dt = rN\,(K-N)/K$$

Logistic growth curve for populations

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Biological control of klamath weed

Imported beetle

Before release

3 years after release

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Tansy ragwort program

Cinnabar moth and caterpillar

Ragwort
flea beetle

- 90% control in Oregon
- Savings: $5 million *per year*
- Program took 17 years to develop

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What happens when a biological agent controls the invasive plant?

A. They feed on other available plants

B. They starve and the population dies out

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What happens when a biological agent controls the invasive plant?

A. ~~They feed on other available plants~~

B. ~~They starve and the population dies out~~

C. Neither. As plant resource goes down, so does the biological control, which allows plants to grow again, which allows more plant feeding, etc.

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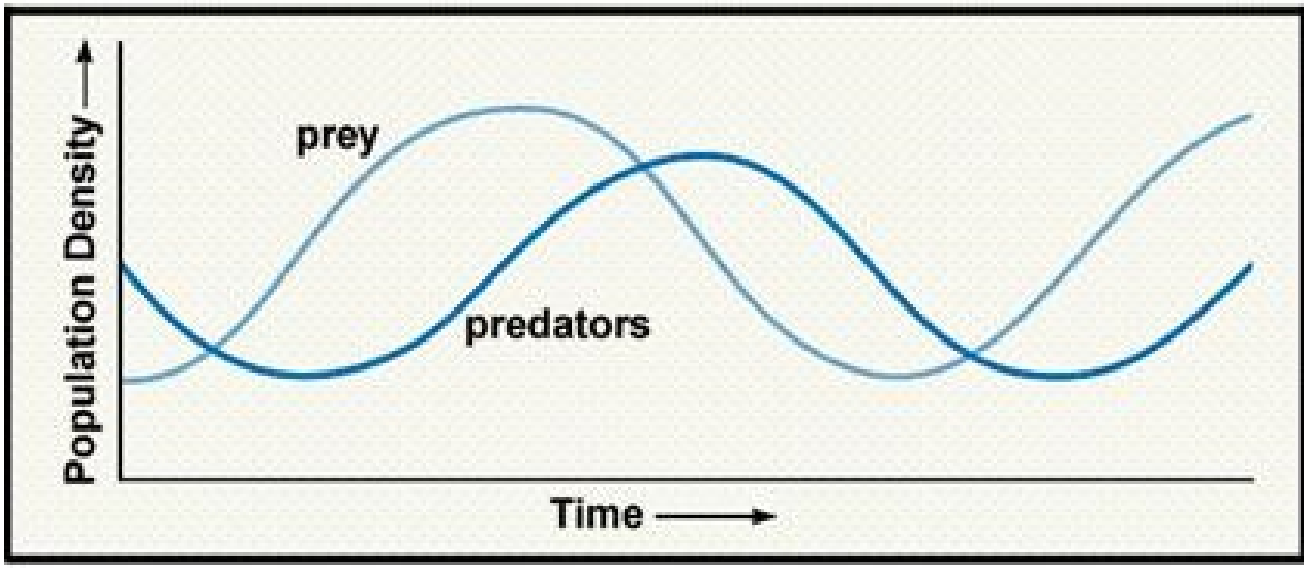
Plant abundance determines amount of feeding pressure



Biological control agents fluctuate up and down, but rarely die out

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Target-specific feeding is essential. Why?

Biological control agents carefully screened before approval for release

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Field bindweed

300 prospective agents evaluated for biological control.

How many were approved for release?

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Two!

Tyta luctuosa

Moth

Caterpillar

Aceria malherbae

Mite

Galled foliage

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Does everyone agree that biological control (or other management) should be done for invasive plants?

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Paterson’s Curse

Echium plantagineum

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"This weed sucks up all the available water, poisons animals which eat it, kills plants, crops and every-thing else in its way." - Dan Patterson

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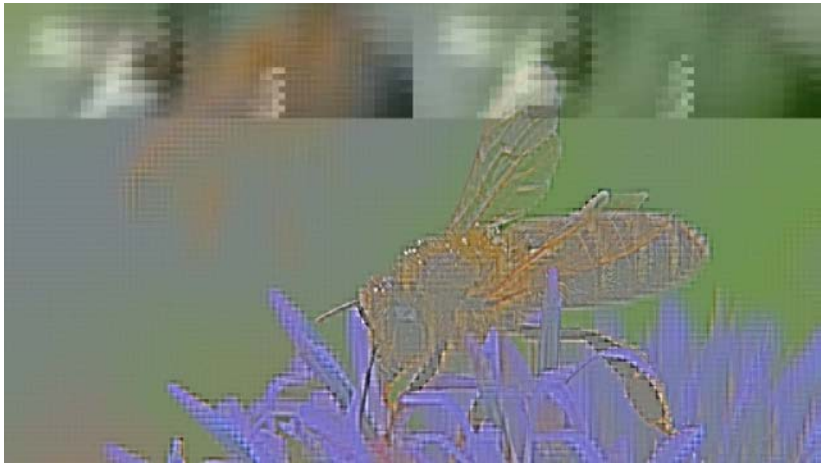
Conflict of interest



Lawsuits by beekeepers…

…and goat herders

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Restoration ecology is an essential component of invasive plant management

Why?

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Oregon invasive plants targeted for biological control

Gorse

Scotch broom

Japanese knotweed

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Biological control: Japanese knotweed

Apalaris itadori

Ostrinia ovalipennis

Gallerucida bifasciata

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Biological control: Japanese knotweed

- Plant-sucking bug
- Causes stunted growth
- Final stages: USDA-APHIS

Apalaris itadori

-- F&W approval done
-- Beginning Environ. Assessment

- Available for release spring 2019?

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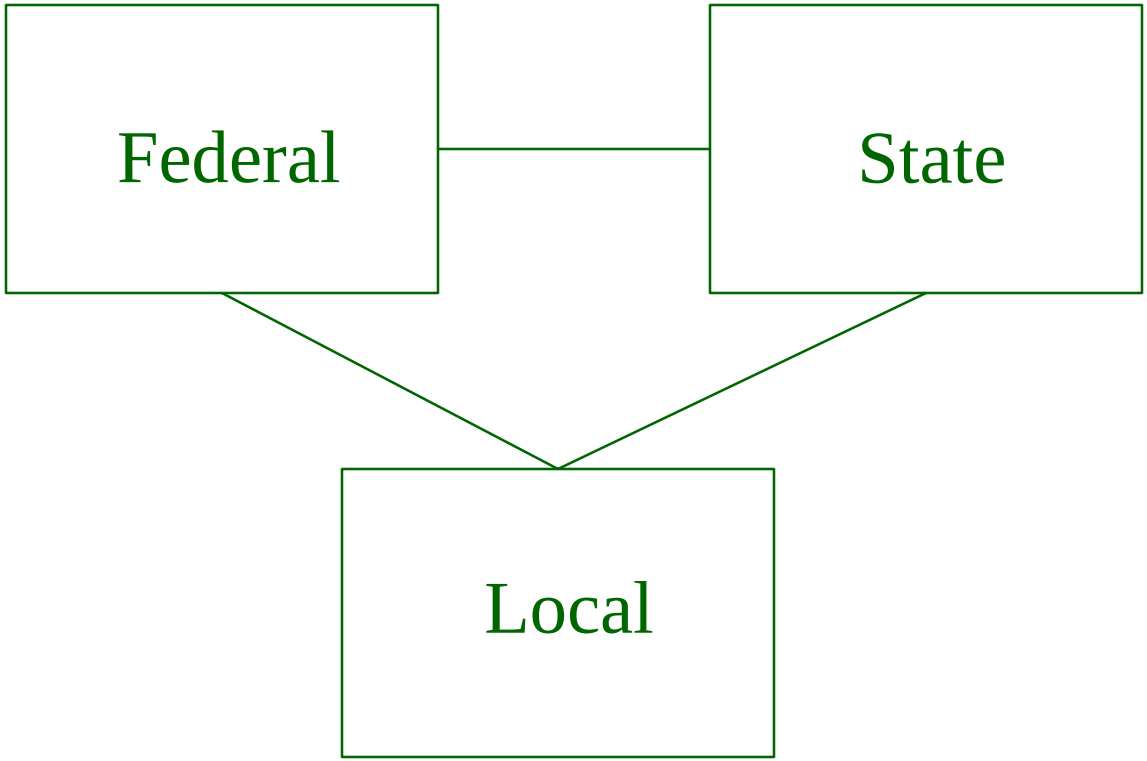
Partnerships



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What can you do to help?

Prevention

Monitoring

Clean up

Encourage alliances

Educate others!

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Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.

Margaret Mead

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Thank you!

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