Overview of the Impacts of Invasive Riparian and Wetland Plants on Pacific Northwest Biodiversity, and the Best Approaches for Management
Impacts of Invasive Species...

Kudzu (*Pueraria montana*) in the southeastern U.S.
Salt cedar (*Tamarisk* sp.) in the desert Southwest
Cheatgrass (*Bromus tectorum*)

- Invades vast areas in West
- Devalues forage
- Changes fire regimes
  - Wildfires more common
  - Hotter fires
  - Continuous source of fuel
**Assumption:**
That invasive species directly threatens management goals & objectives.
Impacts of reed canarygrass (*Phalaris arundinacea*) on native plant species richness

Impacts of giant knotweed (*Polygonum sachalinense*) on plant community composition and tree regeneration.

Impacts of giant knotweed (*Polygonum sachalinense*) on the quantity and quality of leaf litter, altering plant community nutrient cycling.

Invasive Species Impacts

• **Ecosystem Level Impacts**
  – Disturbance Regimes (e.g. fire)
  – Hydrology
  – Geomorphological Processes (erosion, sedimentation)
  – Soil Chemistry (nutrients)

• **Community & Population Level Impacts**
  – Vegetation Structure
  – Community Composition
  – Resource Competition
  – Negative Impacts on Native Animals
  – Promotion of Non-native Invasive Animals
  – Population Reductions, Eliminations
  – Reduced Recruitment of Natives (Succession)
  – Vector pathogens and pests (e.g. chestnut blight vectored by Asian chestnut)
  – Hybridization with Native Species

• **Lack of Impacts**
• **Positive Impacts**
What can be done to abate the invasive species threat??

English ivy
So many inv spp...
So little staff and $!
Need to avoid wasting time, $$$ and other resources on invaders that are not real threats to your MANAGEMENT GOALS
Develop a Management PLAN!!

Using an Adaptive Management Approach

1. Establish conservation goals & objectives

2. Identify & prioritize those species/infestations that threaten goals

3. Assess strategies & techniques; Develop management and monitoring plan

4. Implement management plan & conduct monitoring

5. Summarize, analyze, interpret, and communicate results

6. Review and adjust management and monitoring approach and goals as needed
What can be done to abate the invasive species threat?

Strategies should include:
1. Assessment of the threat(s)
2. Prevention
3. Early detection & rapid response
4. Management & restoration
1. Assessment of the Invasive Species Threat

- Maps & predictive models of current and potential threats
- Who are the main stakeholders?
- What are their mandates, roles and responsibilities?
- Legal gaps in authority?
2. Prevention

- Identify invasion pathways
- Who/what are the legal authorities?
- Who are the primary stakeholders?
- Roles & responsibilities?
- How can you prevent spread at local and larger scales?
Pathways of Weed Invasion:

**Accidental introductions**
- contaminant in hay/feed
- contaminant in seed
- packaging material
- seeds carried on shoes, clothing, autos, etc.

**Intentional introductions**
- erosion control
- water/heavy metals treatment
- forage or pasture
- forestry or fiber
- ornamental use
Overall: ~ 65% of invasive plants introduced for horticulture
- Reichard 1997
3. Early Detection & Rapid Response

- What species to watch for?
- Who will do the searching?
- What are the reporting pathways?
- Who will do the work?

OISC 100 Worst List – watch list

1-866-INVADER Hotline!! – for reporting
Present, but **Not Yet Widespread** in PNW…

Garlic mustard
NOT present (yet) in western WA or OR…

Flowering rush
4. Management & Restoration!

- What species and sites should you manage?
- What about new species with unknown invasive potential?
- How should you prioritize your management?
What control methods and tools are available?
Manual Control
Manual Control

Can show GREAT successes!
But... very time and labor intensive
Manual & Mechanical Control
Mechanical Control

Tillage

Mowing
Prescribed Fire
Controlled Flooding
Solarization or Mulching
Grazing
- Animal
- Timing
- Intensity
Chemical
Chemical

Aerial application

Boom sprayer
Rope-wick applicator

Backpack sprayer

Chemical
Biological Control (Biocontrol)
Purple Loosestrife and Introduced Biological Control Agents

Nanophyes marmoratus

Hylobius transversovittatus

Galerucella spp.

slides courtesy Oregon State, Corvallis
To Summarize:

- There can be many impacts from invasive species on what you are managing for.
- Focus on your goals and objectives (what you really want).
- Need to prioritize management actions, and develop a strategic **PLAN** of action!
- Collaborate with many others, and use a variety of tools (including IPM) best suited for your particular situation.
- Continue doing management at the site and larger scales, but…
- Put significant resources towards prevention, and early detection and rapid response!