

# Purple Loosestrife:

identification and control of this  
wetland noxious weed

*Ben Peterson – King County NWCP, WA State*



# Purple Loosestrife talk outline

- Plant identification and history
- Distribution and impacts
- Control methods and strategies
  - Manual control
  - Chemical control
  - Biocontrol
  - IPM integration and strategies



# Purple loosestrife - identification

- Purple loosestrife (*Lythrum salicaria*)
  - a dicot in the *Lythraceae* family
- Perennial herb, 2-9 ft. tall
- Taproot and spreading root stock
- Leaves opposite (or whorls of 3), lanceolate, up to 4" long
- Flowers in dense spike, magenta
- Branched stems are square (sometimes six-sided)



# Look-alikes:

Purple Loosestrife vs. Spiraea, Fireweed, & Watson's Willowherb

**Noxious weed**

**Native plant**

**Native plant**

**Native plant**



King County Noxious Weeds

King County Noxious Weeds

Slichter 2005

Slichter 2005

**Purple Loosestrife**

**Douglas Spiraea  
(hardhack)**

**Fireweed**

**Watson's  
Willowherb**

# Purple loosestrife - reproduction

- Flowers July to October  
*(at least in western Washington)*
- Up to 2.7 million seeds/plant  
(the size of ground pepper)
  - Dispersed by water, fir & feathers, human activity, wind
- Seeds have been found to remain viable at least 2-3 years
- Can root at nodes and reproduce from plant fragments
  - Dispersed by water, animals



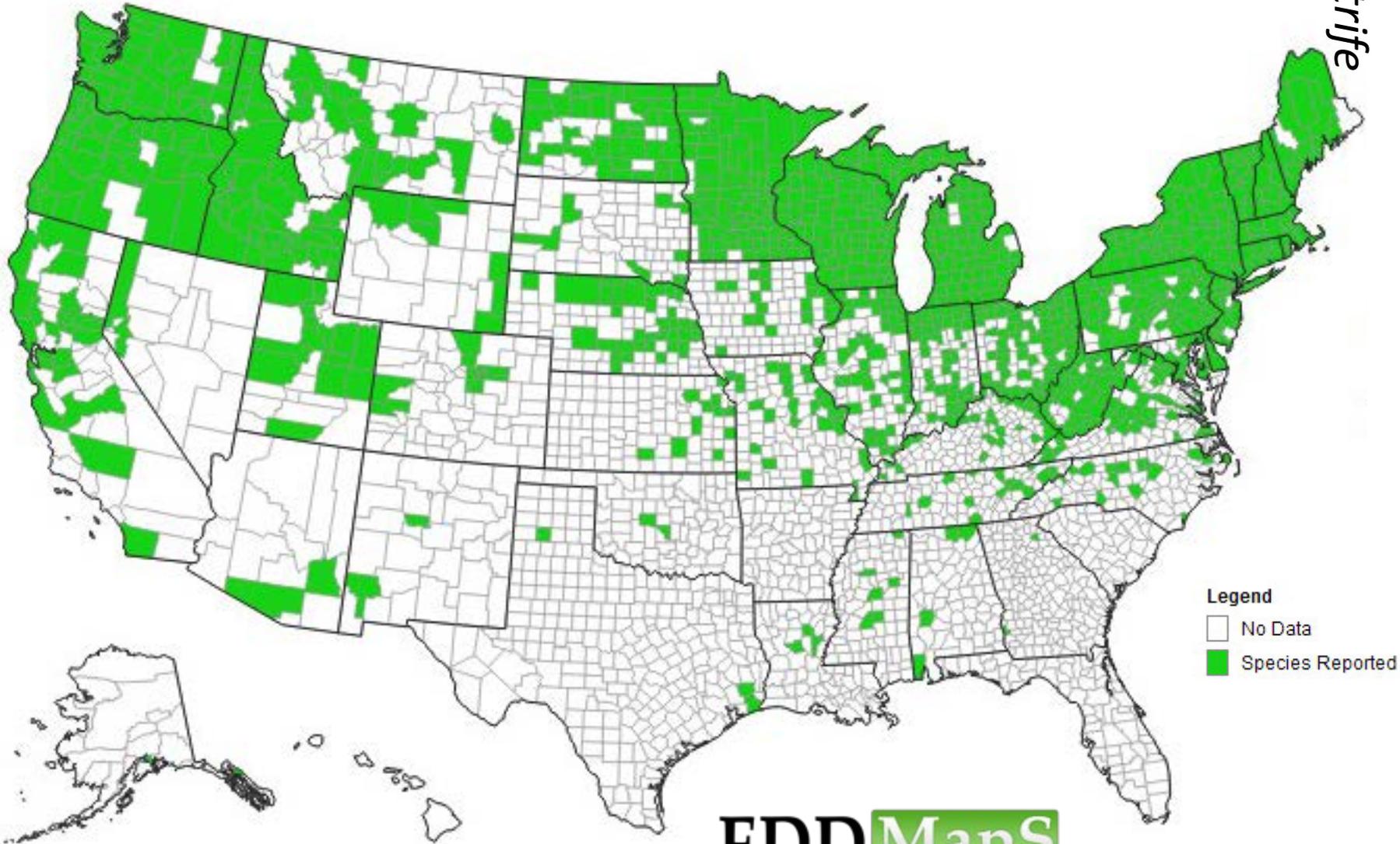
# History of the plant

- Native to Europe and Asia
- Introduced to the East coast of the United States in ship ballast in early 1800's
- Has spread to 47 US States and 10 Canadian Provinces



# Purple Loosestrife occurrence by county

Purple  
Loosestrife



Map produce 13 April 2016 by:

**EDD Maps**  
Early Detection & Distribution Mapping System  
[www.eddmaps.org/](http://www.eddmaps.org/)

# Purple loosestrife - habitat

- In wetland environments including ponds, rivers, meadows, roadside ditches, gardens and irrigation canal
- Thrives in both freshwater and brackish water
- Perennial plants - live up to 20 years
- The plant is emergent: can grow in sites from moist soil to standing water
- Can tolerate a range of soil pH and nutrients
- Requires partial to full sunlight





# impacts

- Infestations replace native and beneficial plants
- Displace wetland specialist animals' and birds' habitat
- Larger plants not palatable to cattle;
  - animals graze preferentially on pasture grasses, giving purple loosestrife an advantage in grazed areas
- Degrade land used as pasture and hay fields
- Can trap sediments and raise the water table



# Manual - Purple Loosestrife Control

- Removal of plants, roots and all, from soft mucky soil by hand or with a shovel
  - If the plants are in flower or seed, **cut off and bag all flower stalks and seed heads**
  - Plant fragments will root if left behind
  - Always dispose of purple loosestrife in a landfill, do not compost
  - Permits may be required locally
- Mowing will temporarily stop seed production but cutting alone will not kill the plants and can spread plant fragments
  - Covering w/weed cloth won't kill mature plants.



King County Noxious Weeds



J. Andreas, WSU Extension

# Digging purple loosestrife

Purple  
Loosestrife

- Suitable for small infestations
- Causes soil disturbance



# Chemical control

- Suitable for large infestations
- Systemic herbicides needed to kill roots
- Use an approved aquatic surfactant
- Permits and licensing are likely required (varies by state); **Follow all label directions**
- Ideally spray an area 2x year to get hard to find vegetative plants. Follow-up next year.
- When treating an area intermixed with native monocots (cattails, grasses, sedges), using a selective herbicide is recommended
- Careful spot-spraying = less soil disturbance than manual control



# Chemical control with systemic herbicides

Herbicide	Results seen:	Selectivity	Application time	Rate (foliar spray)
Glyphosate	Slow (2-3 weeks)	Non-selective	Actively growing plants at early flower	1.0-1.5%
Triclopyr TEA	Moderate (within two weeks)	Selective, targets only dicots	When plants are in the mid to full-bloom stage	1.0-1.5% (thoroughly wet plants)
Imazapyr	Slow (3-6 weeks)	Non-selective (can move thorough soil)	Any time the plant is actively growing	0.75-1.0%
Imazamox	Slow (weeks -months)	Non-selective	When plants are bud to mid-flower stg.	1.0%+

*\*If possible, cut and bag flowers even when spraying to prevent seed production*

# Biocontrol – what is it?

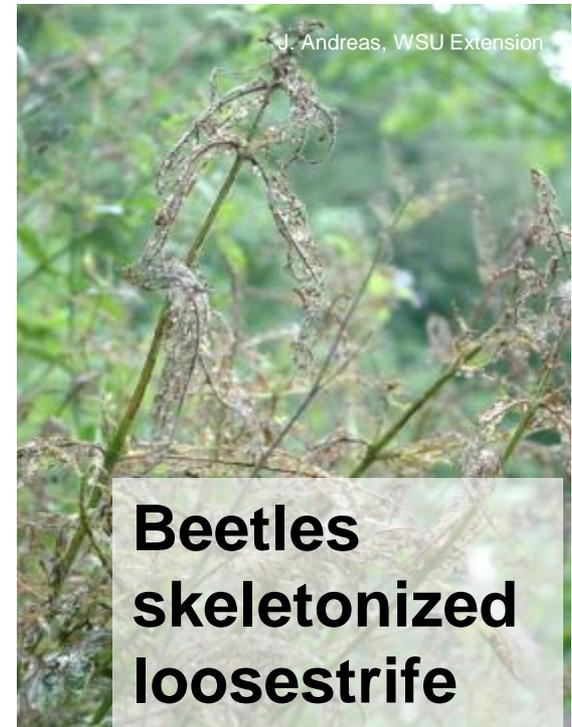
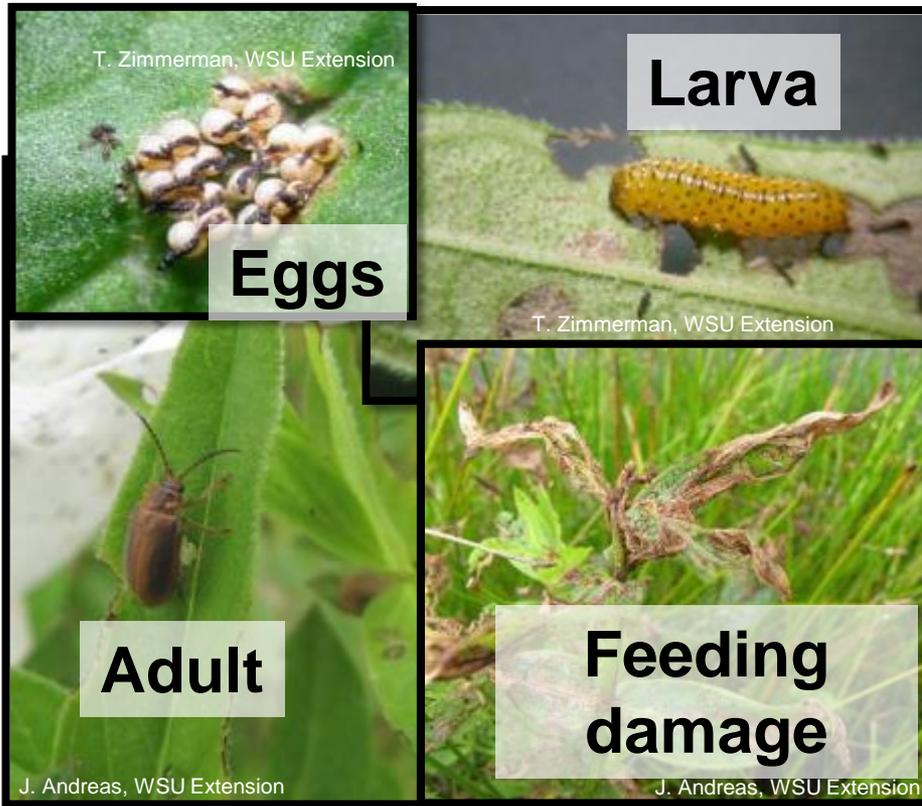
- Use of an organism (often an insect) from a weed's native range to control the plant
- Rigorous studies by USDA to confirm:
  - Host specific
  - Will die without target plant
  - Regulated by UASA APHIS (Animal & Plant Health Inspection Service)
- *Not appropriate* for:
  - Small or sparse infestations
  - where eradication is the goal
- Insects take 4-10 years to make an impact at a site



# Purple Loosestrife Biocontrol

Purple  
Loosestrife

*Galerucella californiensis*  
*Galerucella pusilla*



- foliage-feeding beetles
- highly effective; larvae & adults consume foliage
- eggs, larvae & adults found May-August
- not appropriate for areas of fluctuating water
- not compatible with spraying/mowing (but can clip seed heads)

# Winchester Wasteway (eastern Washington State)



Purple Loosestrife  
before *Galerucella* spp.  
beetle introduction

Purple Loosestrife  
after *Galerucella* spp.  
beetle introduction



# Purple Loosestrife Biocontrol

Purple  
Loosestrife

*Hylobius  
transversovittatus*

Adult



J. Andreas, WSU Extension

- root-feeding weevil
- best combined with leaf beetles
- can kill small roots within 2 years if several larvae present
- difficult to collect

Larva mines root



Eric Coombs, Oregon Department of Agriculture, Bugwood.org

**\*\*Important\*\***

- lab reared; not easy to acquire, not widely available
- cutting may be possible

# Purple Loosestrife Biocontrol

Purple  
Loosestrife

*Nanophyes marmoratus*

- bud/ flower-feeding weevil
- outcompeted by leaf beetles
- ↓ seed production



Adults

Eric Coombs, Oregon  
Department of Agriculture,  
Bugwood.org

Larva mining flower head



Gary L. Piper, Washington State University, Bugwood.org

UGA1291020

**\*\*Important\*\***

- these insects are fairly difficult to collect, not widely available
- **cannot** clip seed heads when using this species

# Obtaining biocontrol agents (insects)

- Some states, such as Washington, have biocontrol programs through the extension office of their land-grant university.
- A few businesses in Montana will collect insects for you; maybe others locally to you
- Need a **USDA APHIS PPQ 526 permit** to bring biocontrol agents across state lines



Purple  
Loosestrife

King County Noxious Weeds

A beetle release on purple loosestrife near Seattle

# Integrated Pest Management (IPM)

- Select control methods based on site to:
  - maximize effective control
  - minimize negative
    - Environmental impacts
    - Economic impacts
    - social impacts
- Use a long term, multifaceted and adaptive approach
- Often a combination of strategies is most effective
- First step is always prevention of spread/infestation



# IPM strategies

- Clip flower just before herbicide treatment (to ensure plants don't produce seed)
- Disturb the soil as little as possible
- Consider using a selective herbicide to allow the persistence of native monocots
- Theoretical timeline:
  - Year 1- mapping, two round of flower clipping and herbicide spot treatment
  - Year 2- mapping, two round of flower clipping and herbicide spot treatment
  - Year 3- mapping, hand digging and removal
  - Year 4- mapping, hand digging and removal



# Early Detection and Prevention

- Look for new plants
- The best time to survey is in July and August when the plants are flowering; however, seedlings may not flower in the first year.
- Look for seedlings starting in June.
- Dig up or pull small isolated patches.
- Prevent plants spreading from existing infestations: clean off equipment, boots, clothing and animals that have been in infested areas
- Get plants in nearby areas upstream and up wind controlled



# Questions?

**Ben Peterson– Aquatic Weed Specialist  
King County Noxious Weed Control Program  
Seattle, WA**

**(206) 477-4724**

**[Ben.Peterson@kingcounty.gov](mailto:Ben.Peterson@kingcounty.gov)**

**[www.kingcounty.gov/weeds](http://www.kingcounty.gov/weeds)**