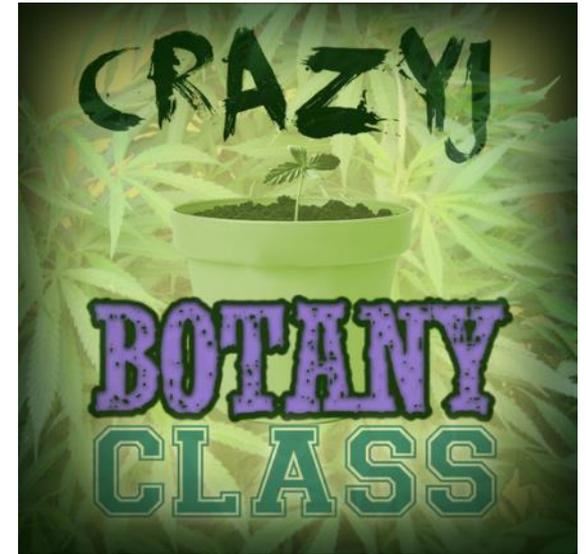


# Identification and Control of Selected Noxious Weeds



Part One: Trish MacLaren

Part Two: Sasha Shaw

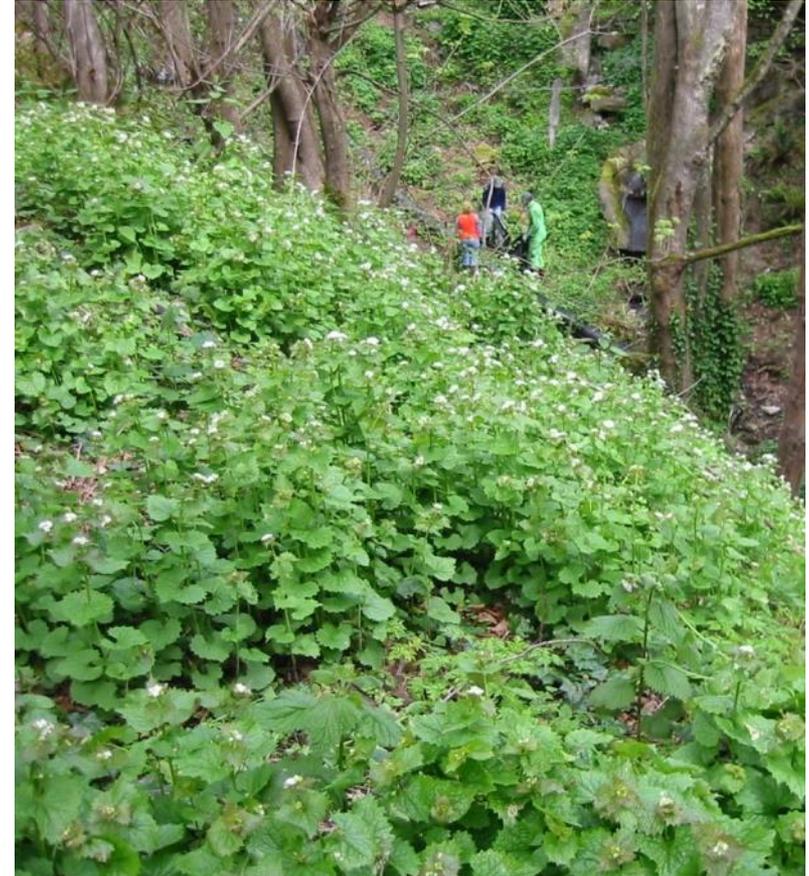
King County Noxious Weed Control Program

# Garlic Mustard

# Garlic Mustard (*Alliaria petiolata*)



Garlic mustard is a European species that harms trees and our local flora and fauna and has no natural enemies in North America.



A single garlic mustard seed can populate a large area in a very short time!!

# Garlic Mustard



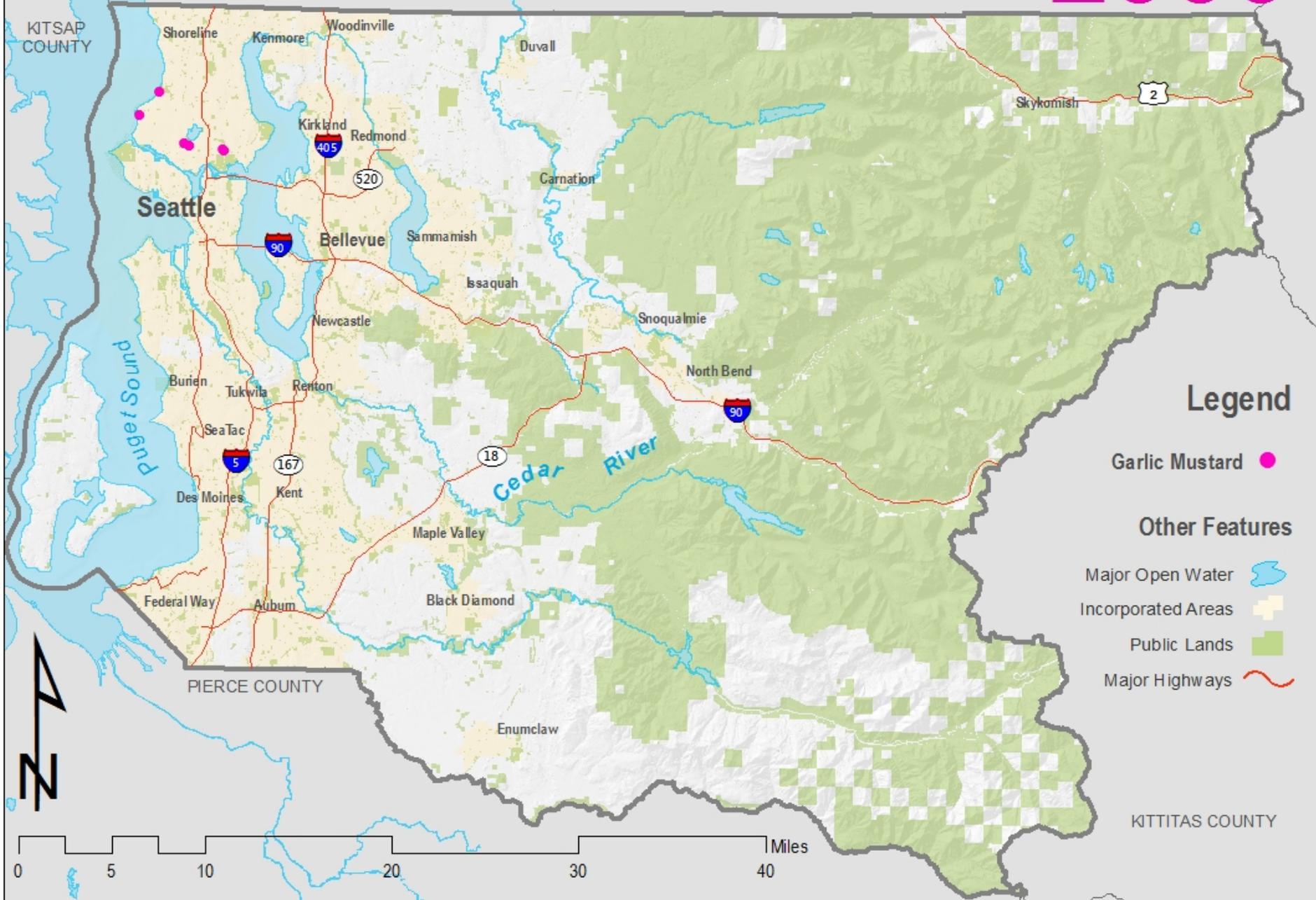
In forests, garlic mustard spreads up to 120 feet in one year. It inhibits tree growth through negative impacts on beneficial fungi and has no natural enemies in North America.



Now spreading on the Cedar River and Coal Creek area, garlic mustard is on the move in King County

# Garlic Mustard in King County

# 2000



## Legend

Garlic Mustard ●

### Other Features

Major Open Water

Incorporated Areas

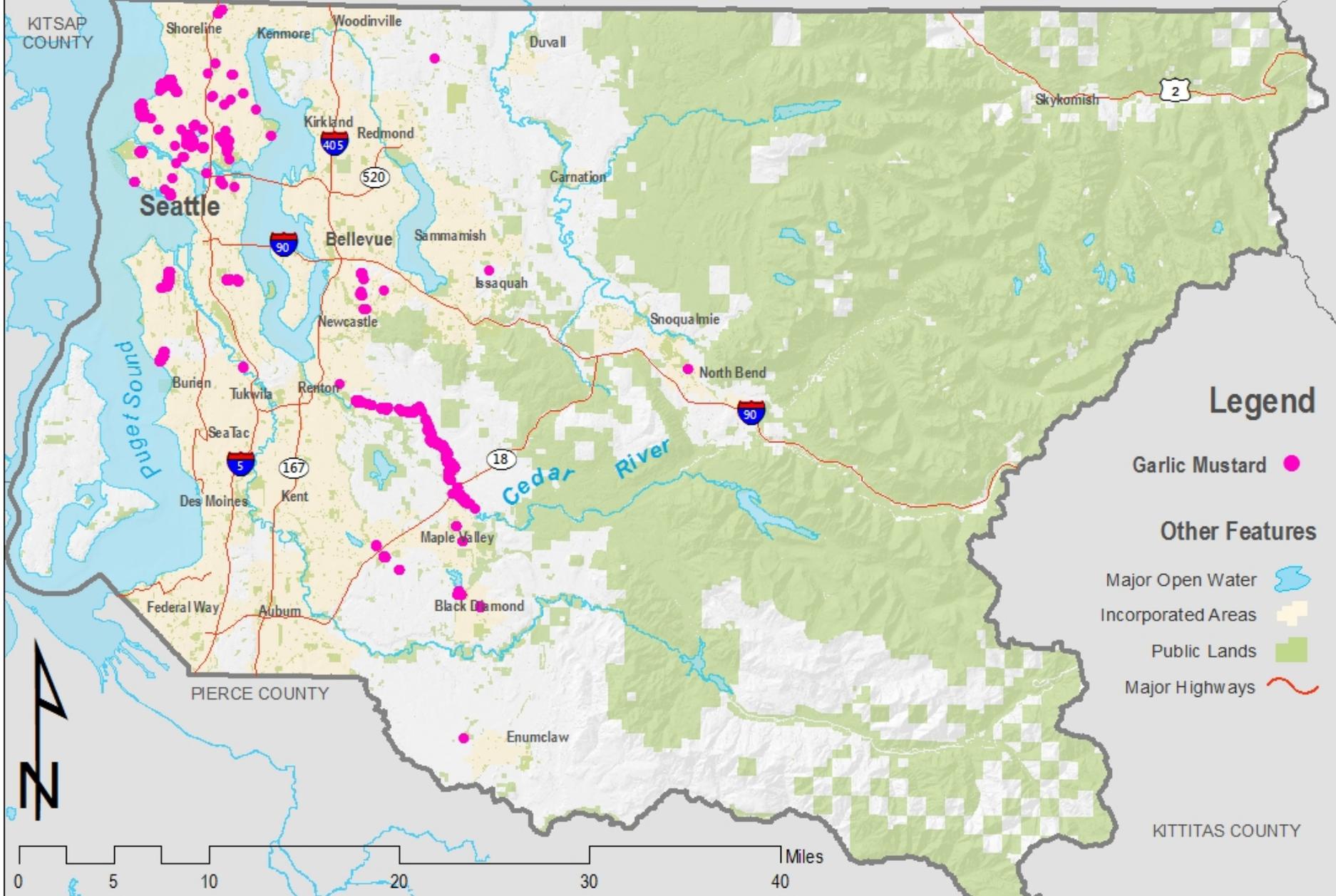
Public Lands

Major Highways

KITTITAS COUNTY

# Garlic Mustard in King County

# 2014



## Legend

- Garlic Mustard ●
- Other Features
  - Major Open Water
  - Incorporated Areas
  - Public Lands
  - Major Highways



# Garlic Mustard Identification



- Small white flowers with 4 petals
- Lower leaves rounded
- Upper leaves longer, more like triangles
- Garlic smell when crushed



- Thin seed pods
- Curved roots

# Garlic mustard has lots of look-a-likes



**Garlic Mustard**  
**(*Alliaria petiolata*)**

Leaves are thin and smooth



**Nipplewort**  
**(*Lapsana communis*)**



**Money Plant**  
**(*Lunaria annua*)**



**Large-leaf Avens**  
**(*Geum macrophyllum*)**



**Fringecup**  
**(*Tellima grandiflora*)**

Leaves on most of the look-a-likes are fuzzy

# Early detection is the best hope for stopping garlic mustard



**Over an acre of garlic mustard in Coal Creek Natural Area discovered by its garlic smell**



**Once established, garlic mustard is very hard to eradicate**

# Backyard garlic mustard infestation in Bellevue



# Garlic Mustard Control



Control Method depends on growth stage and site conditions:

- Pull plants with flowers and immature seed pods\*
  - Pull slowly to avoid breaking at bend in root, for older plants best to loosen soil with hori hori hand trowel or shovel
  - Bag and discard, do not compost
- \* rosettes almost always break off and regrow if pulled
- Rosettes & seedlings: dig up or spray
  - Glyphosate: 1 to 3% in early spring or late fall
  - Triclopyr: 1%, early spring
- Mulch with 4-6" of wood chips
- Propane torch - can control young plants if exposure to the flame is long enough to destroy the root

# Get the whole root!



# Ineffective Control Options

- Mowing /Cutting/Weed whacking
  - Will re-sprout from root and lower stem
  - Will flower again and seed
- Burning
  - Plants have thick, difficult to kill roots. (only seedlings can be controlled with a torch).
- Leaving on ground after pulling
  - Will continue to flower and set seed



Two dead stalks surrounded by new growth

<http://www.fosc.org/GM-Technique.htm>

# Prevention of Spread

Don't take it with you



**Clean your boots and equipment**

Don't move it around



**Don't move mulch from infested sites**

# Giant Hogweed

# Giant Hogweed

*(Heracleum mantegazzianum)*



**15 feet tall with a stout, purple-blotched stem, large white umbrella-shaped flower clusters, and giant, sharply toothed leaves**



**Giant Hogweed – truly giant**

# Caution: Giant Hogweed Can Cause Burns

- Juice of giant hogweed contains skin toxins
- Causes skin to be hypersensitive to sunlight
- Burns occur when skin is exposed to sunlight, even a day or two after contact with hogweed
- Causes blisters followed by purplish-dark blotches that persist and can continue to be sun-sensitive for several years
- Washing or flushing with water before sap dries can help reduce blisters
- People vary in their sensitivity



Sap from hogweed causes painful burns

# Giant Hogweed Identification





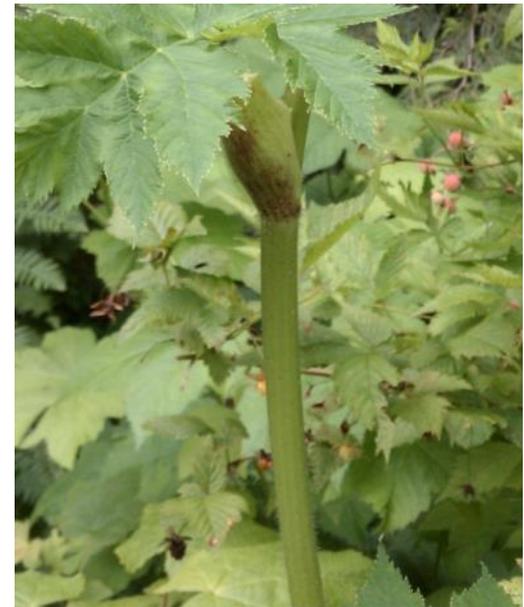
Giant Hogweed (*Heracleum mantegazzianum*)

# Use Caution When Handling Giant Hogweed



**Don't get hogweed juice on your skin. Always wear gloves, long sleeves, long pants and boots.**

# Good Guy Look Alike: Native Cow Parsnip



# Another Hogweed Look Alike: Poison-Hemlock (*Conium maculatum*)



Non-Regulated Noxious Weed – Control Not Required

# Giant Hogweed Control



First, cut off and bag flower heads



Next, dig up roots completely



The key is to control the roots – don't be fooled by small upper growth



Or, you can spray the plants with herbicide, either glyphosate or triclopyr

# Giant Hogweed Control



Chopping off flower heads with long-handled pruners is a safe way to go.

Tansy Ragwort

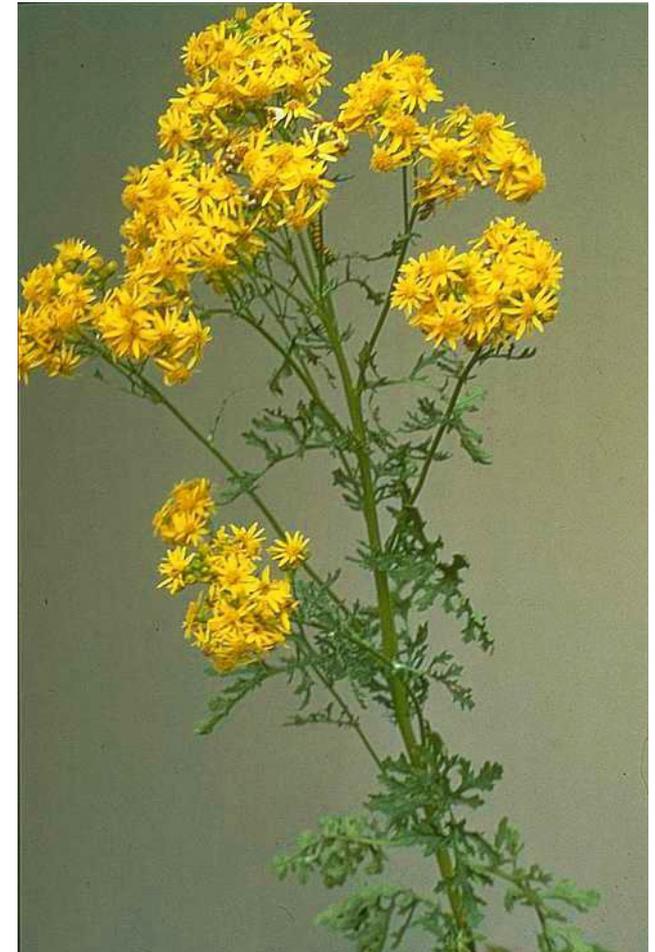
# Tansy Ragwort (*Senecio jacobaea*)



First year rosettes are low-growing with round-lobed leaves, visible spring to fall (even winter)



- Bolts May-July
- Flowers June-Sep (later if mowed)
- Seeds in August



Flowering stems are 1-6 ft tall with clusters of yellow, daisy-like flowers

# Tansy Ragwort (*Senecio jacobaea*)



- Spreads into fields, forest openings and roadsides
- Seeds are viable for 10 -16 years
- Toxic to horses, cattle and some goat breeds
- Often spread by mowing, animals, or in hay

# Tansy Ragwort Infestation



# Tansy Ragwort Control



- Can dig up rosettes when soil is moist
- Pull bolting plants (can leave on site, won't seed)
- Herbicide: selective broadleaf herbicide in spring and again in fall; 2,4-D or aminopyralid on rosettes; triclopyr, metsulfuron or dicamba up to bud stage

- Pull and bag flowering plants
- Don't leave cut or dried plants on ground (cut flowers can make seeds)
- Re-seed disturbed areas, maintain healthy competitive grass cover

# Don't Be Fooled: Tansy Ragwort Look-Alike: Common Tansy (*Tanacetum vulgare*) (control not required)



Button-like flowers are clustered at top of plant

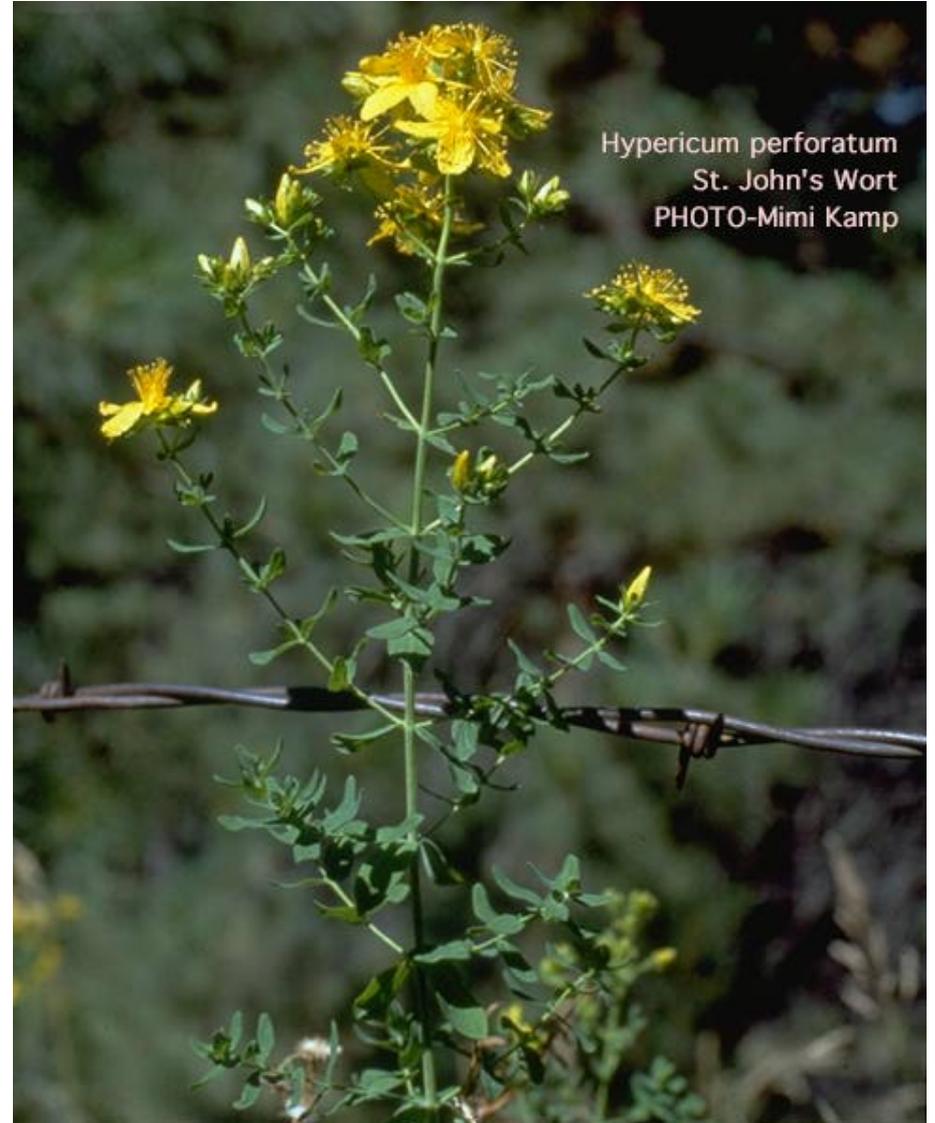
Leaves are fern-like with sharply toothed edges and a strong odor



# Common Tansy (**not** Tansy Ragwort)



# St. Johnswort (*Hypericum perforatum*)



# St. Johnswort (*Hypericum perforatum*)



<http://tncweeds.ucdavis.edu/photos/hyppe01.jpg>

Knapweeds

# Spotted Knapweed (*Centaurea stoebe*)

- Grows 3 - 5 feet tall, perennial
- Pink to purple flowers, on the tips of stem branches
  - Dark fringe on bracts
- Bolts: April to July
- Flowers: May to October



# Spotted Knapweed Habitat



# Diffuse Knapweed (*Centaurea diffusa*)

**Class B  
Noxious  
Weed**

- Biennial: can be annual or short lived perennial
- Can produce up to 18,000 seeds



# Diffuse Knapweed Habitat



**Class B  
Noxious  
Weed**

# Meadow Knapweed (*Centaurea x moncktonii*)



# Meadow Knapweed Habitat



# Bighead Knapweed (*Centaurea macrocephala*)

**Class A  
Noxious  
Weed**



- Large yellow flowerheads
- Bracts with papery fringed margins
- Flowers mid-July to Aug



- Tap-rooted perennial
- 2-5 ft tall
- Lower leaves up to 10 in. long and 3 in. wide
- Woody root crown
- Has been sold under the names "Lemon fluff", "Globe centaury", and "Pineapple thistle"

# Bighead Knapweed (*Centaurea macrocephala*)

- Reproduces by seed, (200/head) can propagate by root division
- Locally, it can be aggressive in gardens, but hasn't escaped beyond that
- Has been grown for cut flowers by farmers not familiar with the state quarantine list



Bighead knapweed is a threat to mountain meadows and open grasslands

# Knapweed Control

- Dig up or pull isolated plants unless soil is hard
- Mowing only temporarily suppresses seeding; plants will re-grow and flower again in the same season
- Chemical: broadleaf foliar
  - 2,4-D: rosette to early bolt (late April to early May)
  - 2,4-D+dicamba: up to early flowering stage
  - Aminopyralid: spring to early summer or in fall
  - Triclopyr: rosette to early bolt stage
- Goats – similar to mowing but more fun to watch!



# Hawkweeds

# Hawkweeds

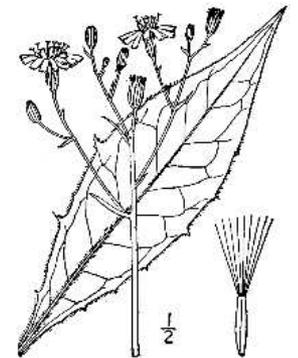
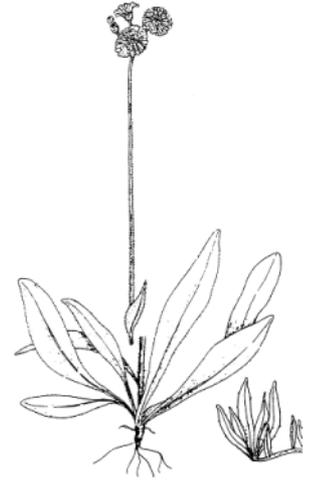
(*Hieracium* spp.)

- Among the most troublesome weeds in the PNW
- First species arrived about 50 yrs ago and now there are over 14 species of invasive hawkweeds in the PNW
- Grow well in disturbed areas with soils that are well-drained, coarse-textured, low in organic matter
- Road shoulders are perfect habitat and seeds disperse with traffic and mowers



# Hawkweeds in Western WA

- MEADOW HAWKWEED GROUP – Leaves mostly basal without obvious teeth
  - **Mouseear Hawkweed** (*H. pilosella*); Class B
  - **Orange Hawkweed** (*H. aurantiacum*); Class B
  - **Yellow Hawkweed** (*H. caespitosum*); Class B
  - **Tall Hawkweed** (*H. piloselloides*); Class B
  - **Yellow Devil Hawkweed** (*H. floribundum*); Class B
- WALL HAWKWEED GROUP – Has leaves on stems, leaves toothed, flower heads often in looser cluster
  - **European Hawkweed** (*H. sabaudum*); Class B regulated
  - **Common Hawkweed** (*H. lachenalii*); Class B non-regulated



# Meadow Hawkweed Group – Key ID Characters

- Stems and leaves have stiff hairs
- Spatula shaped leaves, no teeth
- Often have stolons
- Small flowers, in tight clusters near tops of stems, buds and bracts covered with black hairs



# Orange and Yellow Hawkweed

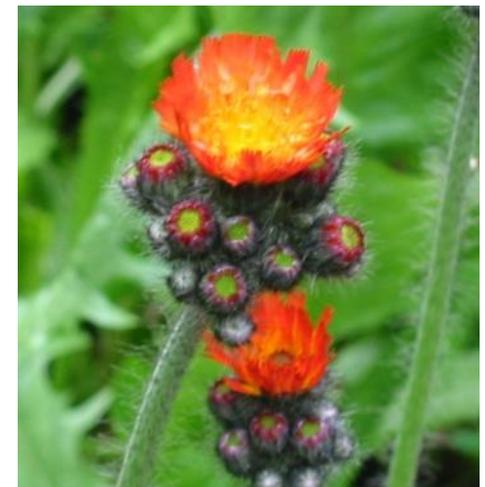


Orange and yellow hawkweed have escaped gardens to invade mountain meadows in the Cascades

# Orange and Yellow Hawkweed (*Hieracium aurantiacum*, *H. caespitosum*)



- Yellow or orange flowers in tight, flat-topped clusters
- Black hairs on buds and around base of flower heads
- Leaves are hairy on top and bottom and are not lobed
- Spreads by stolons and seed
- Flowers from May to July



# Orange and Yellow Hawkweed





# Wall Hawkweed Group – Flowers yellow

## Leaves on stem, toothed

- No basal leaves at flowering; heads small, numerous, hairy; stem leaves about 50, crowded at base, plants 1 to 4 ft tall
  - **European (*H. sabaudum*)**
- Basal leaves persistent, leaf base tapered, heads large, 4-12, hairy, stem leaves 4-7, plants ½ to 2 ½ ft tall
  - **Common (*H. lachenalii*)**



# WALL HAWKWEEDS

## European and Common Hawkweed



# European Hawkweed



<http://botanika.wendys.cz>



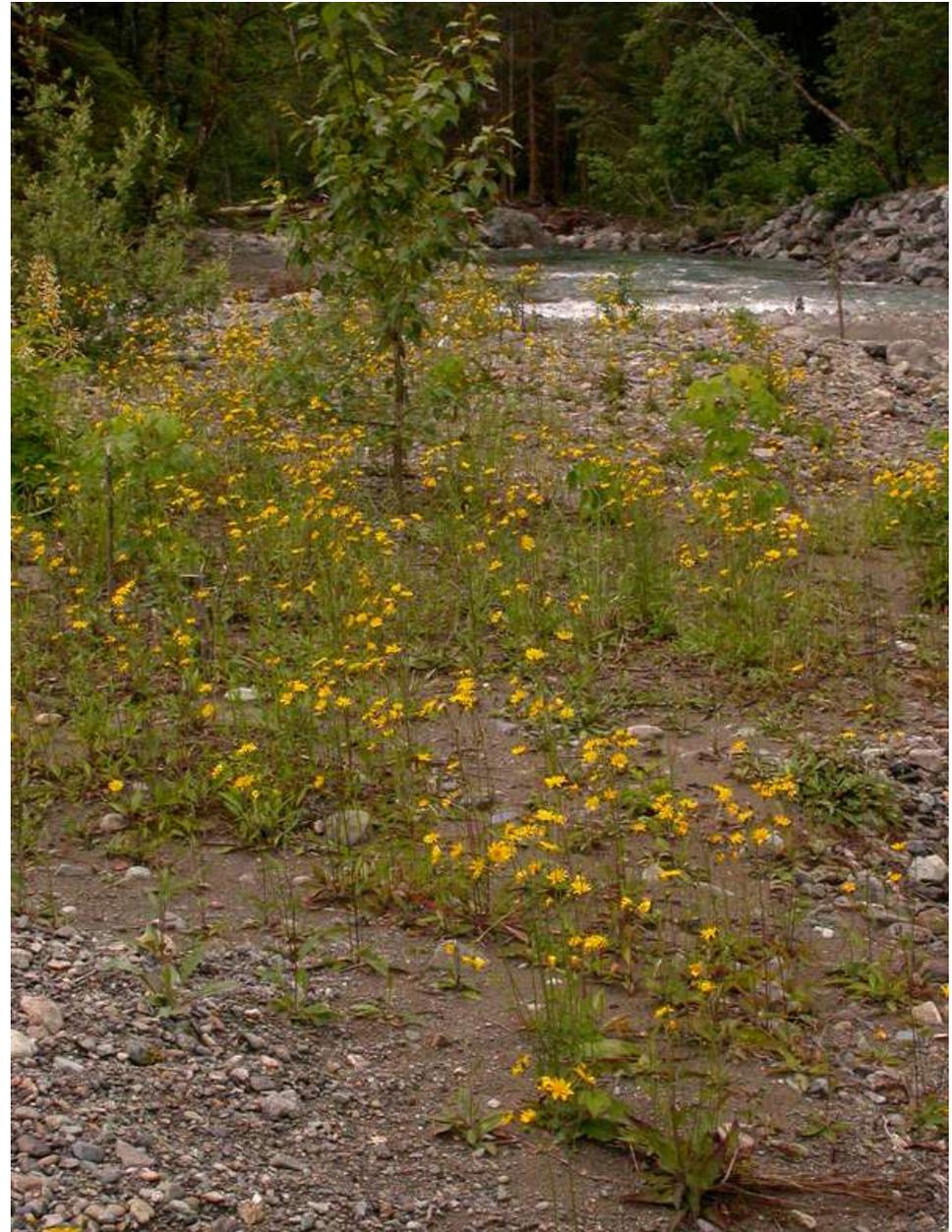
# European Hawkweed

(*Hieracium sabaudum*)



- Lots of stem leaves crowded at base, becoming smaller upwards
- Yellow flower heads small, numerous, hairy, in open, flat-topped cluster (candelabra-shape)
- Lower stem and lower leaf surface with long, firm, bulbous based hairs
- Plants 1 to 4 ft tall
- Flowers late July to September

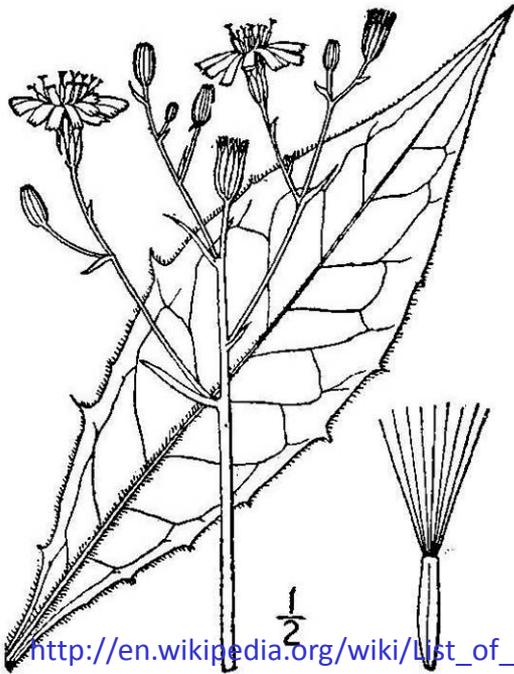
# Common Hawkweed





## Common Hawkweed (*Hieracium lachenalii*)

- Basal leaves coarsely toothed, tapered at base
- 4-7 stem leaves, also toothed, upper ones smaller, sessile
- Flowers yellow, 4-12 heads, open flat or round topped cluster
- Up to 2 ½ ft tall
- Flowers May to July



[http://en.wikipedia.org/wiki/List\\_of\\_Hieracium\\_species](http://en.wikipedia.org/wiki/List_of_Hieracium_species)



# Common Hawkweed



# Common Hawkweed



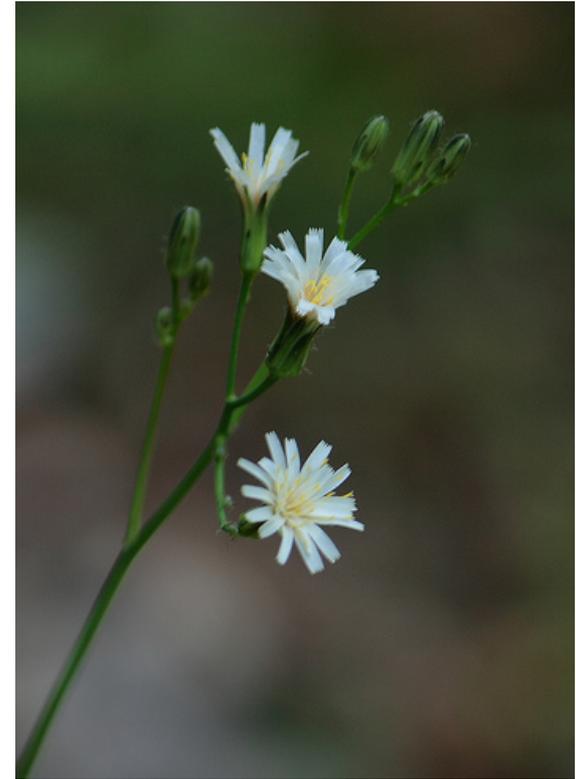
# Hawkweed Control

- Look for budding plants in late April to late May (later at high elevations)
- Dig up small patches (remove all runners)
- Bag flowering stems; will seed if left on ground
- Spray spring to early summer (bud to flower)
  - triclopyr; 2,4-D+dicamba; aminopyralid or clopyralid





# Native Hawkweed Look-alike: White Hawkweed



# More Hawkweed Look-alikes



# Dalmatian Toadflax

# Dalmatian Toadflax (*Linaria dalmatica*)



- Leaves bluish-green, waxy coating, heart-shaped, clasp stem
- Flowers yellow tinged with orange, like snapdragon flowers



- Bolts: April-June
- Flowers: May-Sept
- Seeds: Aug-Sept



# Dalmatian Toadflax

## Impact

- Typically found on dry sandy soil in full sun
- In King County, found mainly on roadsides, railroads, industrial areas and vacant urban land
- Extensive root system allows it to survive adverse soil and/or climatic conditions
- Serious problem in eastern WA, re-invades King County via roads, railroads, fill and hay

# Typical Dalmatian Toadflax Habitat



Gravelly, dry soils with little competitive cover from grass, full sun



# Dalmatian Toadflax Control

- Dig up isolated plants making sure to get entire root
  - Roots are deep and extensive and can break off easily near the surface
- Large roadside/ROW areas:  
Telar 3 oz/acre
- Bud to full flower
- Treat 10 ft area around plants
- Glyphosate where no grass is present
- Repeat treatment as needed; likely to take multiple years



# Rush Skeletonweed

# Rush Skeletonweed (*Chondrilla juncea*)



- Leafless-looking perennial to 4 feet tall
- Flowers June to August
- Milky sap in stems and roots

Stiff, brown, down-turned hairs on the lower part of the stem is the diagnostic characteristic



# Rush Skeletonweed



- Flowers approx 1/2" in diameter
- Each flower is open for 1 day then seeds mature in 14 days
- Pappus can float seeds up to 20 miles
- Mature, healthy plants can produce 1,500 flower heads and up to 20,000 seeds

# Rush Skeletonweed



UGA1459567



Image courtesy of Arnie Grammon, Baker County

## Rush Skeletonweed at Bolting Stage



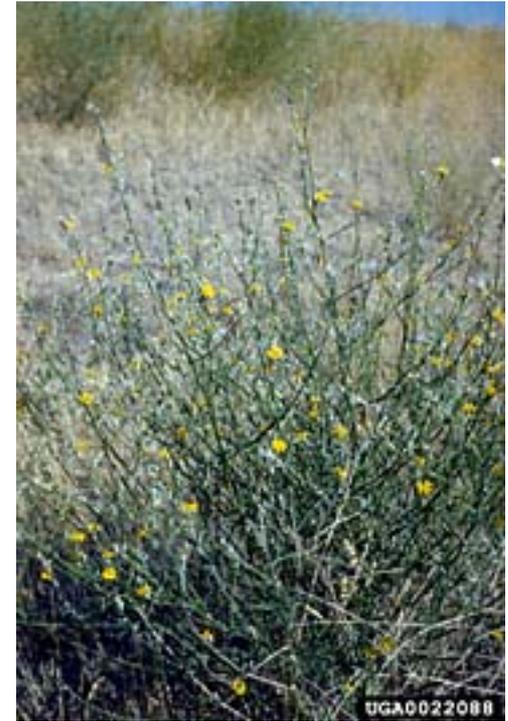
# Rush Skeletonweed Habitat and Impacts

- Disturbed areas, mainly with sandy or well-drained soils, agricultural lands, and roadsides
- In King County, it is uncommon, either on the highway or isolated patches in fields
- Invades wheat fields and can reduce yield by up to 80%
- Once it is established, it is very expensive and difficult to control



# Rush Skeletonweed Spread and Control

- Spreads from lateral root buds and by seeds moved by wind, water, vehicles, equipment
- Taproot can be 8+ feet deep
- Key to control is early detection and control of rosettes before bolting
- Grubbing out roots is effective for small patches if repeated a few times a year for several years
- Spray rosettes late April to early June, before bolting, and again in the fall after the first frost
- Use a MSO surfactant like Dyne-amic or Hasten
- Milestone, Escort, Telar and Curtail/Redeem all work on rosettes
- Biocontrols are available for large populations and can reduce seed production



Sulfur Cinquefoil

# Sulfur Cinquefoil (*Potentilla recta*)



# Sulfur Cinquefoil (*Potentilla recta*)

- Long-lived perennial with woody crown
- 1-2 feet tall
- Bolts late April-June, flowers: June-August
- Invades fields, meadows, disturbed areas
- Spreads mainly by seed
- Most competitive in poor, rocky soils



# Sulfur Cinquefoil Infestation



# Sulfur Cinquefoil Control

- Control before plants flower
- Mowing can spread weeds
  - Knocked down stems can produce roots at the nodes
- Dig up small infestations
  - Bag flowers and seed heads
- Selective herbicides for large infestations: triclopyr, aminopyralid, 2,4-D+Dicamba
- Fertilize and overseed grass to help resist re-invasion



End of Part One!

Beginning of Part Two!

Policeman's Helmet

# Policeman's Helmet (*Impatiens glandulifera*)



# Policeman's Helmet (*Impatiens glandulifera*)



Flowers resemble  
English policeman's  
helmet



Foto: Anna-Lena Anderberg

Annual with fleshy, reddish  
stems, 3-10 ft tall



Roots often buttress

# Policeman's Helmet (*Impatiens glandulifera*)



Often found invading along creeks

Can grow to 10 feet tall in one season

# Policeman's Helmet on Roadside



# Policeman's Helmet Control



- Hand pulling is best and easy due to shallow roots
- Pile stems on tarps, crush and allow to compost

# Purple Loosestrife

# Purple Loosestrife (*Lythrum salicaria*)



## *Key characteristics:*

- Perennial rhizomatous emergent with showy magenta flower spikes
- Branched stems are square, can root at nodes
- Leaves opposite, lanceolate
- Up to 2.5 million tiny seeds/plant
- Flowers July and August



# Look-alikes:

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



Purple Loosestrife



Douglas Spiraea  
(hardhack)



Fireweed



Watson's Willowherb

# Purple Loosestrife Control



## Manual/Mechanical:

- It is possible to pull even large emergent plants, roots and all, from soft mucky soil.
- Mowing will temporarily stop seed production. Cutting alone will not kill the plants.
- Plant fragments will root if left behind.
- Always dispose of purple loosestrife in a landfill, do not compost.

Chemical: Glyphosate, triclopyr and imazapyr are all effective (1 – 2%).

Cultural: Covering with weed cloth will not kill mature plants.



Before bugs



# Purple Loosestrife Biological Control

After bugs



Leaf feeding beetles  
*Galerucella spp.*



Root feeding weevils  
*Hylobius spp.*



# Garden Loosestrife

# Garden Loosestrife

*(Lysimachia vulgaris)*

Class B  
Noxious  
Weed

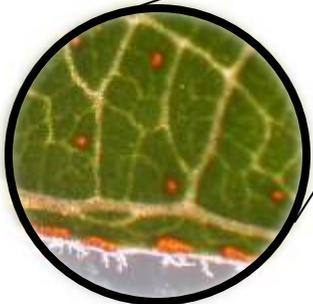


**2-10 foot tall perennial of wetlands and shorelines**

Flowers: showy yellow primrose-like flowers clustered at top of stem (terminal pannicle)

Flowers in July and August

Leaves: opposite or whorled (in threes or fours), leaves usually have small orange or black glands visible with magnification



# Garden Loosestrife

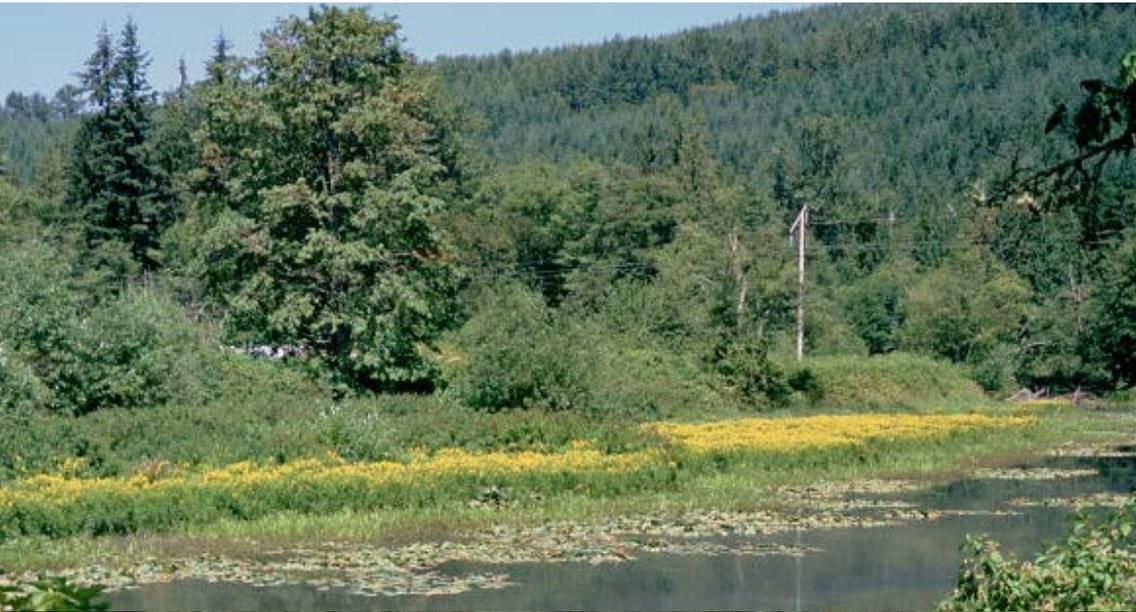
Produces extensive red stolons that will reach out more than 10 feet into the adjacent open water

Stems have soft hairs and are round, occasionally flattened (fasciated)



# Garden Loosestrife - Impacts

Outcompetes other plants, even tough ones



**With purple loosestrife**



**With common cattail**



**Even Himalayan blackberry**

# Garden Loosestrife - Control

Manual/Mechanical: Does not pull well. Rhizomes break off and create new plants. Careful digging can work on isolated patches rooted in sand, muck or loose soil without other plant roots around. Removing/pulling red stolons in late summer may help prevent spread.

Chemical: glyphosate, tricopyr and imazapyr all reduce vigor, but do not kill all plants. More research is needed.

Cultural: weed fabric recommended to suppress plants on sensitive shorelines, but won't kill mature plants.



Poison-hemlock

# Poison-Hemlock (*Conium maculatum*)



# Poison-Hemlock Identification

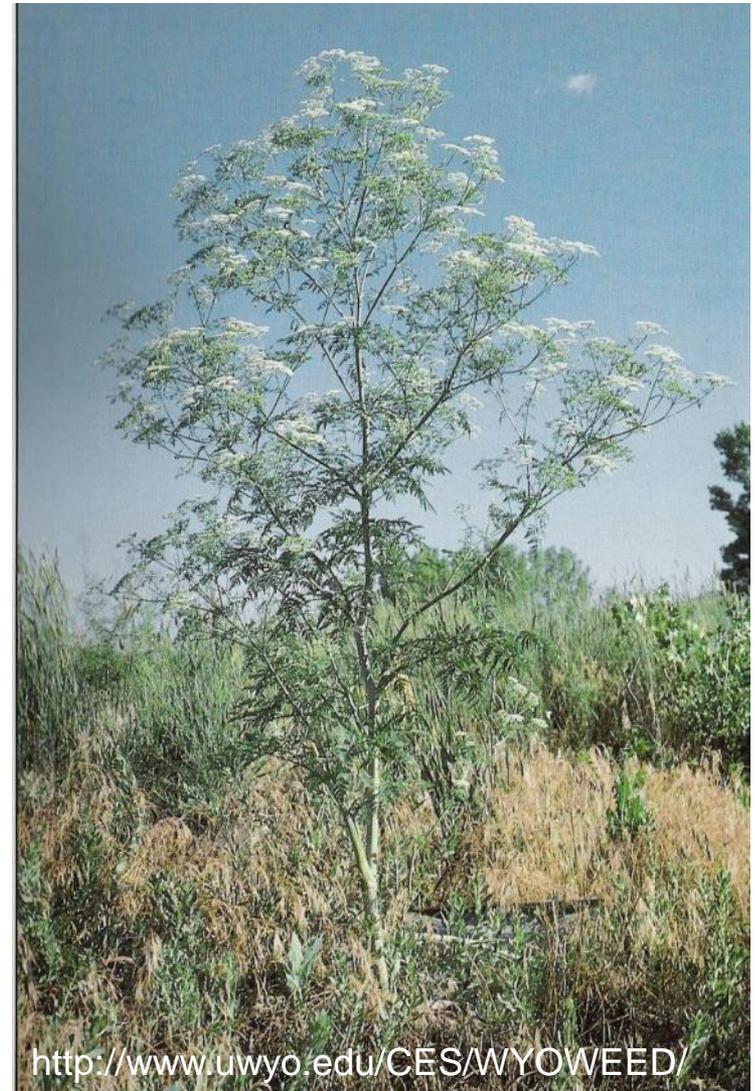


# Poison-Hemlock Infestation



# Poison-Hemlock Control

- **Poisonous – use caution**
- Dig up plants when soil is moist
  - Wear gloves
  - Remove entire root
  - Throw away plants in garbage or yard waste containers
- If can't dig, cut stems below root crown before seeds mature
  - Mow with a face mask to avoid breathing in toxins



Thistles

# Milk Thistle (*Silybum marianum*)



Flower heads have stout, spiny bracts



Distinct, white marbling on leaves, even on seedlings

# Milk Thistle (*Silybum marianum*)



Grows up to 6 feet tall



Found in dairy farms and neighboring fields in south King County, difficult to control once established

# Milk Thistle Control

- Dig up small patches; bag flowers and seed heads
- Spray large populations early spring and fall; in grass use 2,4-D ester or aminopyralid, or glyphosate if not in grass
- Monitor for seedlings and treat again as needed
- Do not mow flowering plants; this spreads the plant



# Canada Thistle (*Cirsium arvense*)

**Non-Regulated  
Noxious Weed**



# Canada Thistle Control



Spreads by seed to new sites



Spreads underground to form dense infestations in sunny fields

- In pastures, avoid over-grazing, mow thistle after grazing and fertilize to promote grass
- Mowing alone: once a month over several growing seasons
  - Mow when green buds appear
- Mow in summer followed by fall herbicide treatment on regrowth
- Spring spraying (early bud stage) and again in the fall (late September/early fall)
  - 2,4-D, triclopyr, dicamba, clopyralid, or aminopyralid
- **Competitive grass cover helps contain thistle**

# Bull Thistle (*Cirsium vulgare*)



Biennial thistle with large spines on stems, leaves and under the flower head

# Bull Thistle Control



Best Control: Dig up or cut 1 to 2 inches below ground level with a sharp shovel (remove flowering plants to avoid spreading seeds)

- Cutting twice a season close to the ground will prevent seeding if done before flowers open
- Herbicides – many products are effective, depending on site
  - Best time is late fall or early spring on rosettes before stalks appear
  - Don't treat when under drought stress

# Identifying Thistles at Rosette Stage

Canada



Bull



# Gorse and Brooms

# Gorse (*Ulex europaeus*)



# Gorse in King County: Rural to Urban



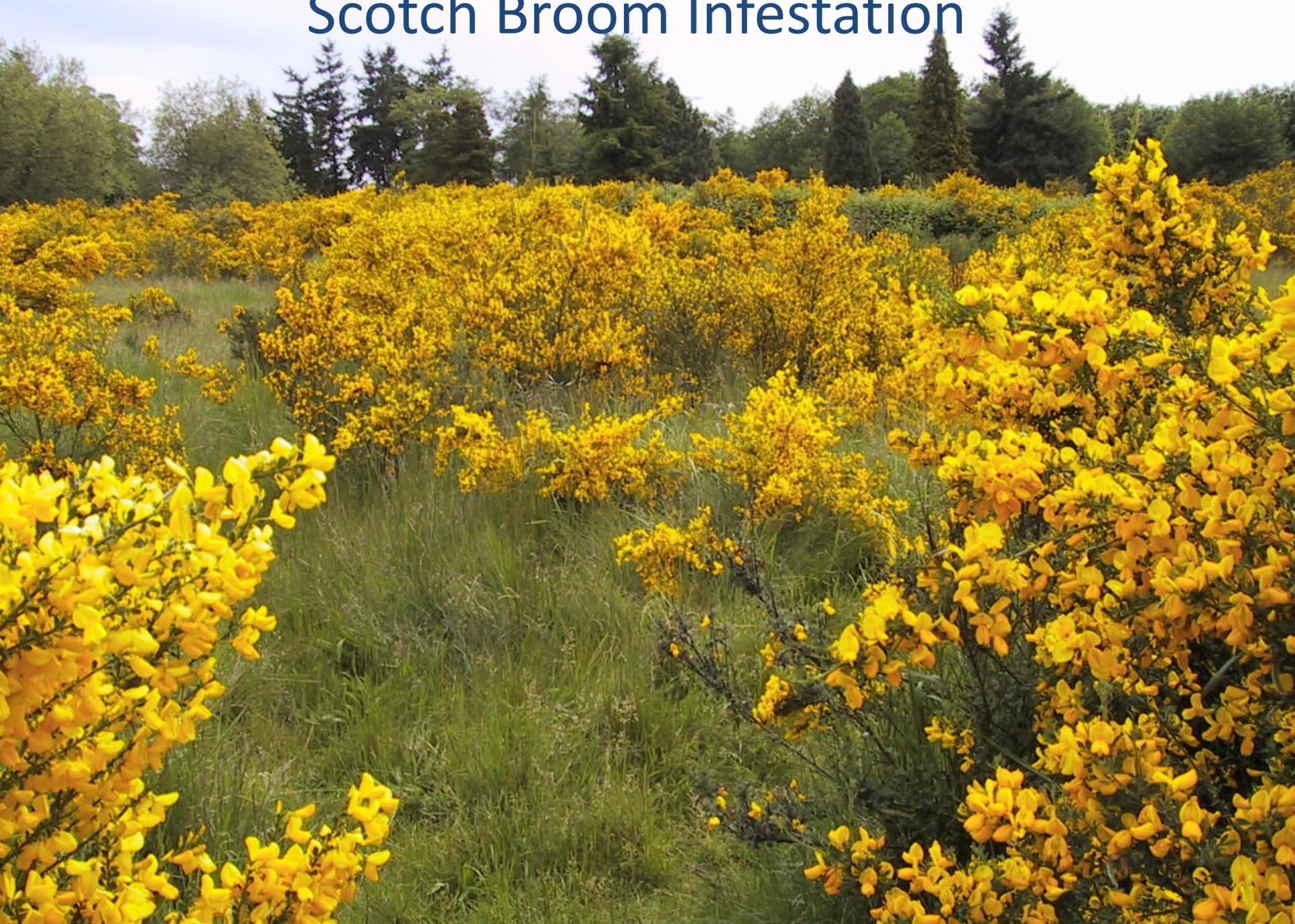
# Gorse in Western Oregon



# Scotch Broom (*Cytisus scoparius*)



# Scotch Broom Infestation



# Spanish Broom (*Spartium junceum*)



# Spanish vs. Scotch Broom



Spanish broom has round, smooth stems, very few leaves, and leaves always single



Scotch broom has ridged stems, more leafy, and leaves usually divided into three leaflets

# French Broom (*Genista monspessulana*)



*Genista monspessulana*

Photo: L. Fontanini



This invasive shrub is a noxious weed on the west coast. It can form infestations that outcompete native and forage plants, interfere with reforestation efforts and aid the spread of wildfires into tree canopy layers. With high seed production, established infestations are difficult to eradicate.



# Broom and Gorse Control

- Minimize soil disturbance, monitor for new seedlings
- Plants under 3 feet can be hand pulled
- For larger plants pull with weed wrenches or other tools
- For older plants (stems are yellow or brown), can cut plants near ground level in the dry season
- Spraying most effective spring to mid-summer
- For less dense sites, use selective treatment – cut stump (late spring), basal spray (in fall)
- Glyphosate (Roundup):
  - Apply in spring to actively growing plants (before leaf fall)
  - Not recommended in grassy areas (kills grass)
- Triclopyr (Garlon 3A, Garlon 4, Crossbow):
  - For Garlon 3A, it is especially important to use a high volume of water (100 gal/A or more)
  - Garlon 4 and Crossbow can be used for basal bark applications any time of year



Scotch broom pulls up more easily with weed wrenches

# Weed Wrench Alternatives



**Puller Bear** – Many sizes: \$189 to \$89 Canadian; similar to Weed Wrench but no base for leverage (need to add in soft soil)



**Extractigator** – Two sizes: \$155 and \$135 Canadian; works somewhat differently, has Big Foot option for base, \$24 Can.



**Uprooter** – One size: \$150 plus \$25 shipping (discounts for 3+), Weed Wrench copy (but white)

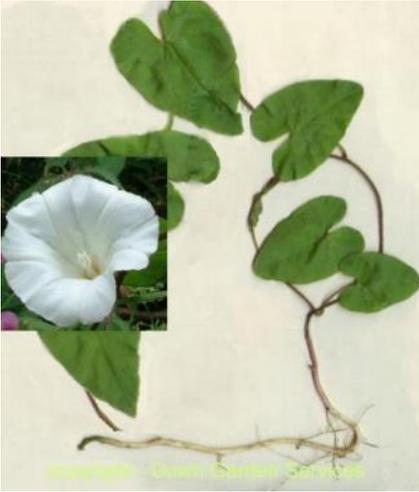
Bindweed

# Bindweed (Morning Glory)

(*Convolvulus arvensis* and *Calystegia sepium*)



# Bindweed Control



- Frequent hand-pulling will eventually control plants
  - Need to pull up as much root as possible
  - Take care not to leave root fragments behind, they make more plants!!
- Covering plants with geotextile fabric/black plastic – at least 3 years of complete coverage
- Early detection/rapid response is crucial after clearing areas of blackberries and other invasives



# Ivy and Clematis

# English Ivy (*Hedera helix*)



# English Ivy Control Usually Non-Chemical



Kill upper growth by cutting the vines all around the tree at about shoulder height and clearing the trunk. Pull up ivy about 6 ft from base of tree and maintain ivy-free area.



Then get a big group of volunteers or crew to pull up the ivy vines on the ground.

# Ivy Chemical Control Tips

- **Challenges**

- Waxy leaves and overall toughness of plant
- Often growing with desirable plants

- **What's worked for some folks**

- Combo of glyphosate plus triclopyr
- Use rates given for tough perennials and brush species
- Portland recommendation 2 to 5% Roundup plus 1-2% Garlon 3A plus 1-2% MSO surfactant (like Competitor).
- According to Portland, most effective timing is summer to fall (July-Sep)
- Earlier TNC trials suggested late winter (Jan-Feb) spraying but more recent trials showed this was not as effective as summer

# Old Man's Beard (*Clematis vitalba*)



# Old Man's Beard on the Snoqualmie River



# Old Man's Beard Control

- Combination of cutting and chemical treatment
- Cut climbing vines in the winter at waist height (leave the top stems to wither)
- Spray the foliage in the spring to summer with triclopyr or glyphosate, avoid natives
- Mature plants – use cut stump method
- Stem and root fragments should be collected and burned or disposed of; do not compost



English Holly

# English Holly (*Ilex aquifolium*)

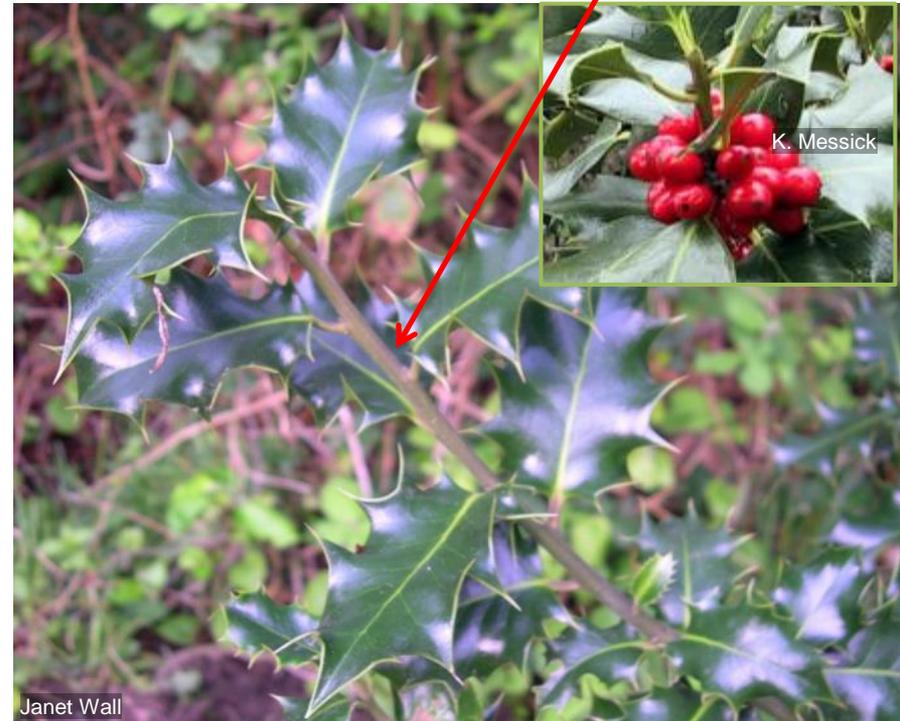


# Oregon Grape is a Look-Alike For Young Holly

Oregon Grape – leaves in pairs, berries blue



English Holly – leaves not in pairs, berries red



# English Holly Control at Lake Youngs Preserve

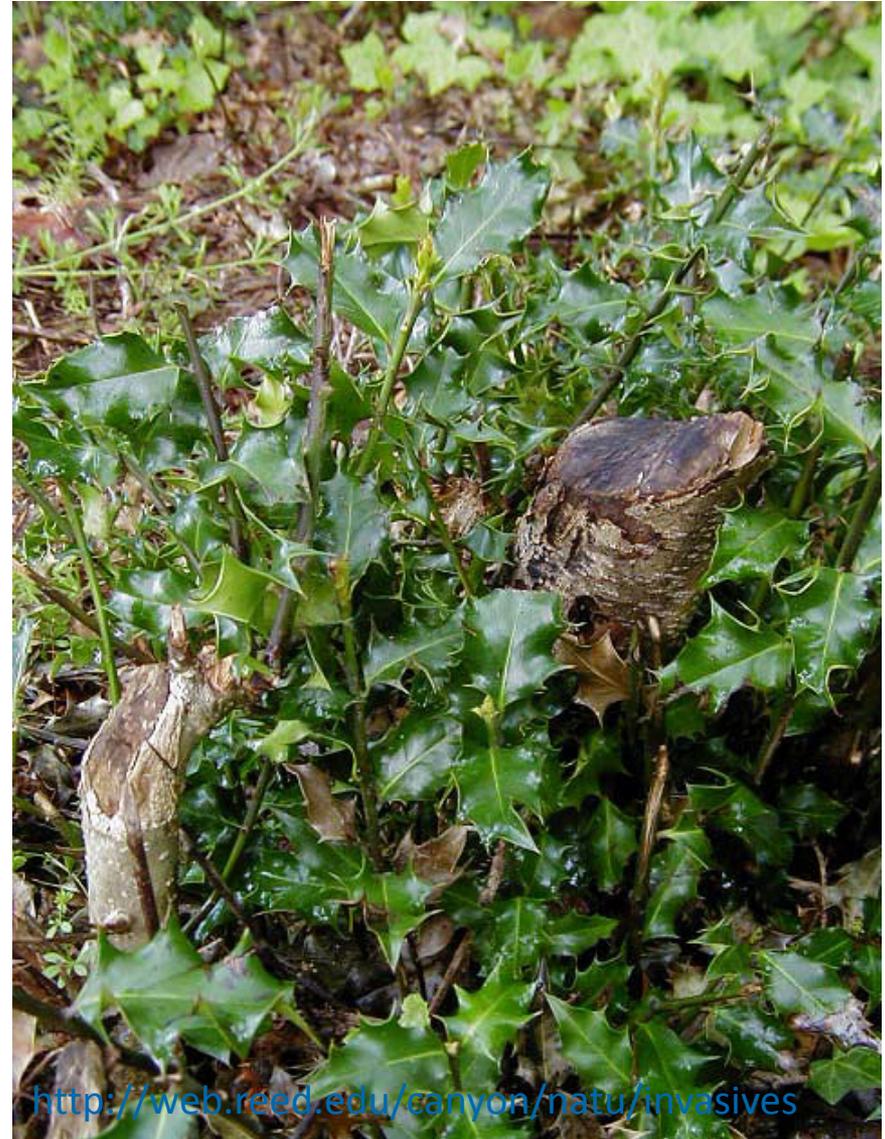
Before: no holly removed from this area

After: holly removed from this area



# English Holly Control

- Young plants can be pulled but larger plants have to be dug up
  - Holly has extensive, tough roots
  - If you can't remove all the roots, cut them below ground
- Cutting is not very effective
  - Holly sprouts from root crowns and stems
  - Follow up by removing new shoots
- Can apply herbicide to freshly cut stump or use the hack-and-squirt, girdling or injection methods



# EarthCorps Holly Control Study

- Most effective methods:
  - Frilling or cut stump with triclopyr ester
  - EZ-Ject with imazapyr



# Info on Noxious Weeds in King County:

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

Weed Photo Page:

Search by Weed Name

Annual bugloss	▲	Abutilon theophrasti	▲
Bighead knapweed	▬	Acroptilon repens	▬
Bittersweet nightshade	▬	Alliaria petiolata	▬
Black knapweed	▼	Anchusa arvensis	▼

Click thumbnail picture to get more information and photos



bighead  
knapweed

# King County Noxious Weed Control Program



## Contact us:

206-477-9333 (206-477-WEED)  
noxious.weeds@kingcounty.gov  
kingcounty.gov/weeds

- **Manager:** Steve Burke
- **County Lands:** Roy Brunskill
- **State Lands:** Trish MacLaren
- **Aquatic Weeds:** Ben Peterson
- **Riparian Projects:** Justin Bush
- **Education:** Sasha Shaw
- **Admin:** Denise Liguori
- **Regional Weed Specialists:** Matt Below, Mattia Boscolo, Mary Fee, Edward McFarlin, Ben Peterson, Karen Peterson, Eric Walker, Maria Winkler
- **Field Technicians:** Justin Brooks, Sayward Glise, Randy Ladowski, Joe Neumann
- **Weed Board:** Scott Moore, John Browne, Eldon Murray, Becky Chaney, Grace Stiller