



# Garden Loosestrife:

*a history in King County, WA and  
the latest control methods*

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*King County Noxious Weed  
Control Program*



# Garden Loosestrife *Lysimachia vulgaris*

Class B Noxious Weed in WA state



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

Native to Eurasia

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

Flowers in July to September

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





Produces extensive red **rhizomes** that will reach out up to 10 feet into the adjacent open water



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



*garden loosestrife*



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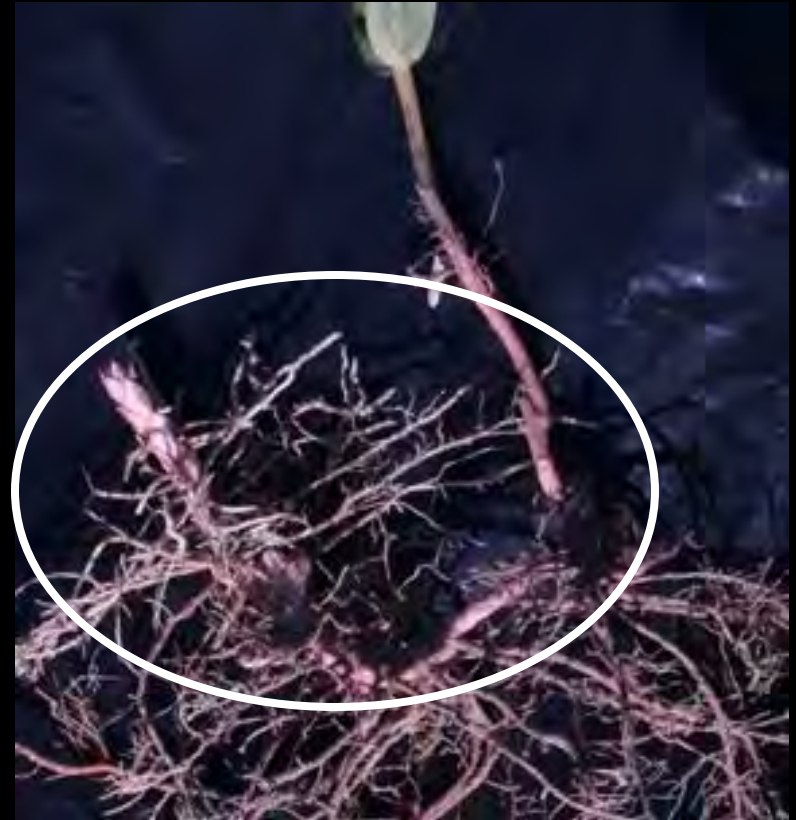


*garden loosestrife*



Reproduces by both rhizome...

garden loosestrife



...and by seed.

- Seeds average 82% viability when exposed to summer temperatures

-Kevin Dillon 2012, Senior research project on seed viability, School of Environmental and Forestry Science, University of Washington



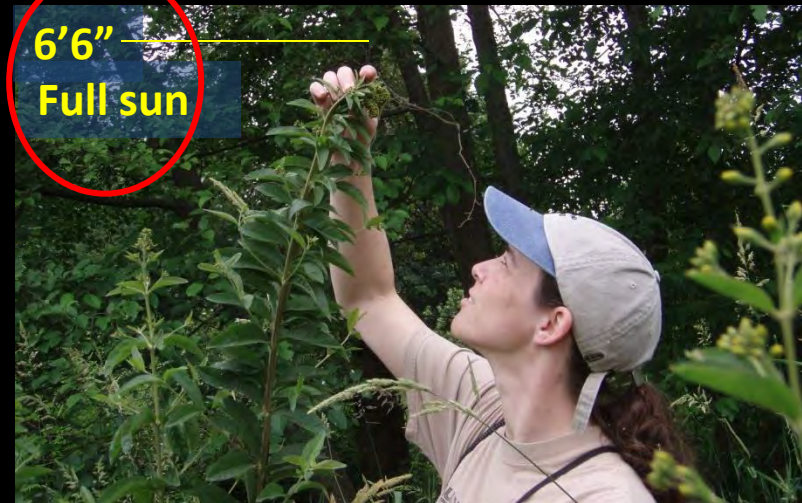
Garden loosestrife seeds



# How tall does it get?



|                               |            |
|-------------------------------|------------|
| Flora of China                | 2-4 ft     |
| University of Wisconsin       | to 3.3 ft  |
| Connecticut Botanical Society | 2-4 ft     |
| England                       | 2-4 ft     |
| Germany                       | 1.4-4.9 ft |
| Australia                     | to 4.9 ft  |
| Flora of Europe               | to 4 ft    |



# what garden loosestrife isn't:

purple loosestrife (*Lythrum salicaria*),

- a different Order and Family
- Square stem
- Purple/magenta flowers



yellow loosestrife (*Lysimachia punctata*), Same Genus

- Start-shaped flowers occur all along the stem only (never in a terminal cluster like *L. vulgaris*)





*L. vulgaris* (garden) and *L. punctata* (yellow) together



garden loosestrife



# Garden loosestrife distribution in Washington

Updated: 9/23/2011

## Distribution 2011



Lake Whatcom



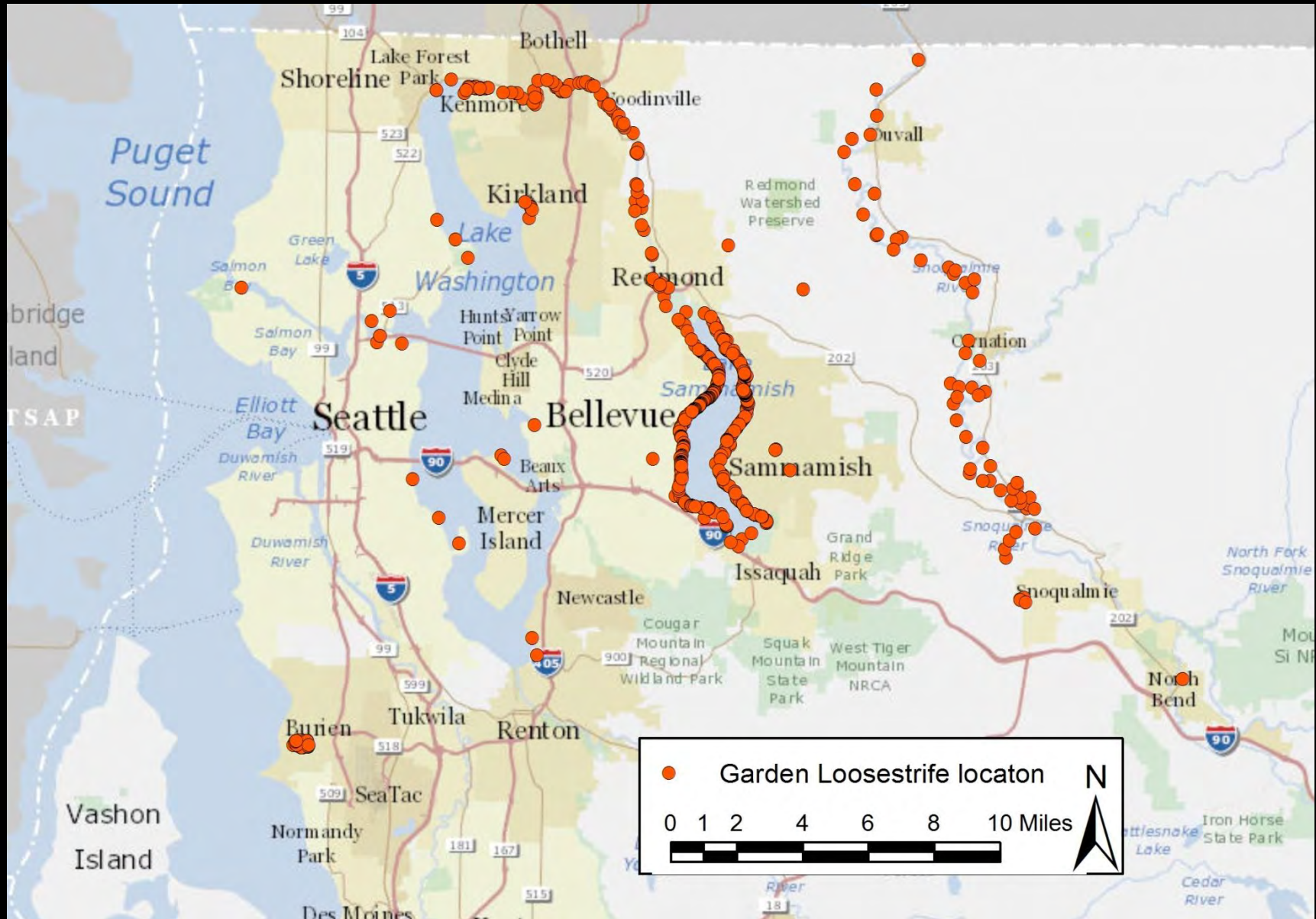
Loon Lake



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# Garden Loosestrife Distribution in King County, WA 2014





# Garden loosestrife Impacts

Ecological – displaces native plants and animals; interferes with wetland food web and habitat; clogs small streams

Economic – clogs irrigation systems & water control structures; dominates wet pastures





# Garden Loosestrife - Impacts

Outcompetes other plants, even tough ones

*garden loosestrife*



**With purple loosestrife**



**With common cattail**



**Even Himalayan blackberry**



# Why so aggressive in King County? Could it be polyploid?

- Polyploidy = inheriting more than the usual 2 copies of DNA ( $2n =$  normal vs.  $3n =$  polyploid)
- Polyploid plants = potentially more genetically diverse and able to grow more aggressively
- Rhizomes were collected from three sites in the county in June 2011 (Lake Sammamish, Rutherford Slough, Lake Burien)
- Analyzed by Brenda Grewell at USDA-ARS University of California, Davis
- All samples came back as  $2n$  – not polyploid





# Control - what doesn't work so well

Manual: Really only feasible for individuals or pioneering stands; could dig out as much root as possible; this plant doesn't pull well (breaks off from long rhizomes leaving lots of root behind).

Mechanical: Repeated mowing may keep it contained and slow dispersal by seed, but won't kill it. Plant fragments will root if left behind.





# Control - Cultural

- Weed fabric or tarp recommended to suppress plants on sensitive shorelines, but won't kill mature plants.
- Potentially useful in small area without moving water
- Requires careful monitoring, high maintenance



*garden loosestrife*





# Cultural: Tarp over garden loosestrife plants at Oxbow Farm

*garden loosestrife*



- Heavy opaque tarp
- Stake down corners well
- Lay debris (wood) over top
- Check in July and September for :
  - Tarp integrity
  - Sneaky plants



Plants growing through rip in tarp





# Control – Chemical (herbicide)

- Needs to be systemic – to get at those rhizomes
- Needs to be an aquatic –approved herbicide
- Have tried many herbicides over the years:
  - Triclopyr –seems to act too fast, plants return
  - Glyphosate- not complete kill
  - Imazapyr – works pretty well– acts very slowly
  - Imazamox?
  - Combinations of herbicides?





# A herbicide study is in process:

- Conducted by **Tim Miller\*** at **WSU Extension Mt. Vernon** (I helped too)
- Rhizomes collected and potted-up May 2014
- Grown for 6 weeks in greenhouse
- Treated with both single and combinations of herbicides
- Herbicide allowed to be active for one month, then defoliation rated and plants clipped
- After two months, regrowth measured

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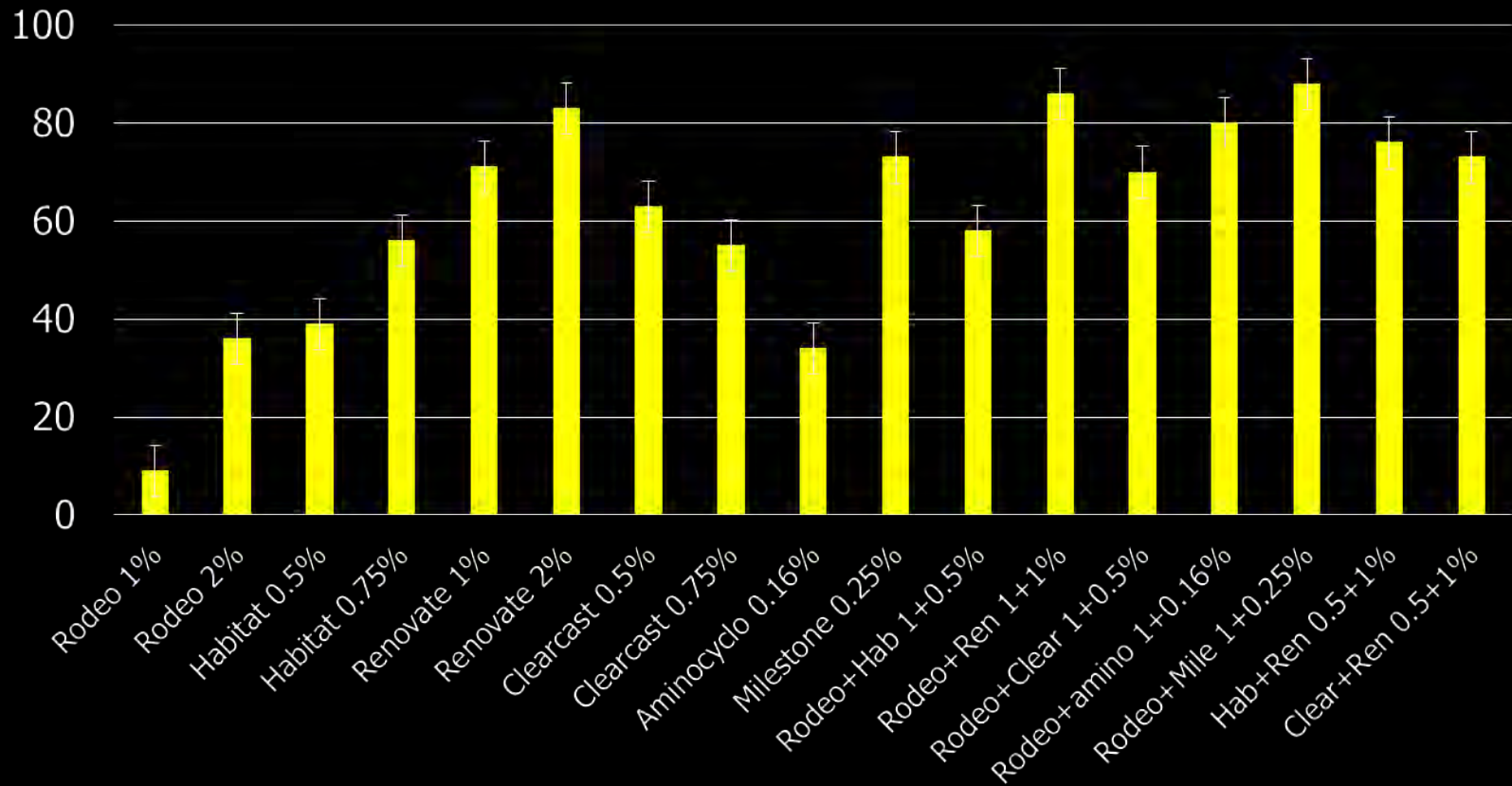




# Garden Loosestrife Injury

## 1 Month After Treatment

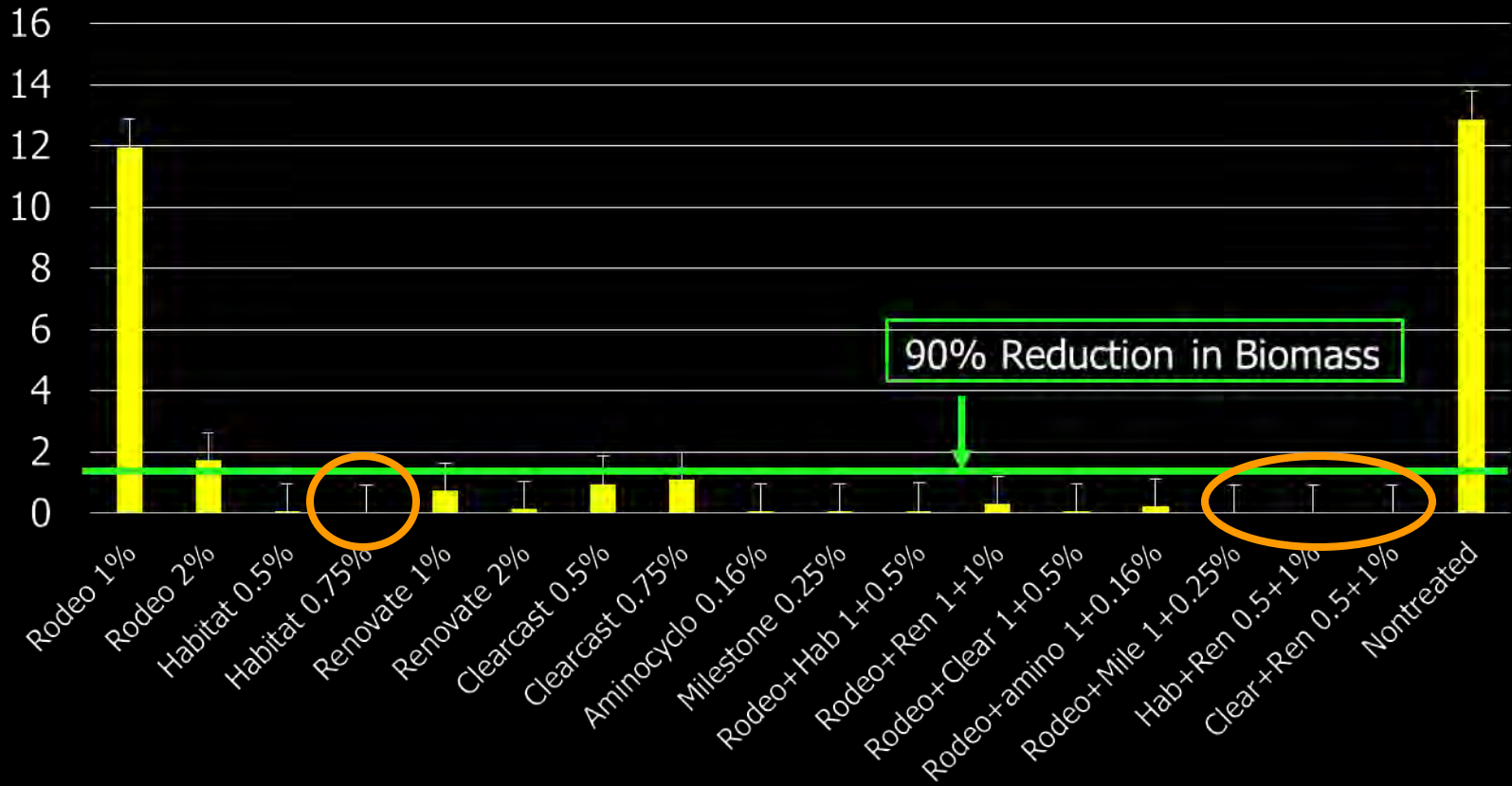
% injury





# Garden Loosestrife Regrowth 2 Months After Treatment

Biomass (g)





# A herbicide study is in process:

Mid-study suggestion\*:

- Imazapyr at 0.75%
- Imazapyr at 0.5% + Triclopyr at 1%
- Imazamox at 0.5% + Triclopyr at 1%
- Glyphosate at 1% + aminopyralid\*\* at 0.25%

\*more conclusive results coming next summer (we have to see what comes back!)

\*\*not aquatic-approved, don't exceed label rate





# Next step, a field study

- Installed August 2014 on the banks of the Sammamish River between Redmond and Woodinville
- Both banks of the river
- Five treatments:
  - Control (no spray)
  - 0.75% imazapyr
  - 0.5% imazapyr + 1% triclopyr
  - 0.5% imazamox + 1% triclopyr
  - 1% imazamox + 1% triclopyr
- 45 test plants total
- Plant locations recorded in GPS and air photo map
- Re-growth in 2015 will be monitored
- Fingers crossed!





A landscape photograph from August 2003 showing a slough with dense, tall vegetation and a forested hill in the background under a clear blue sky.

August 2003

Garden Loosestrife at  
Rutherford Slough  
(Fall City, WA)

- Herbicide treatment almost every year since 2003
  - Glyphosate or triclopyr 2003-2010
  - Imazapyr 2012 and 2013
  - Glyphosate + triclopyr 2014

A landscape photograph from August 2014 showing the same slough area, but with significantly reduced vegetation and a more open, grassy field in the foreground. A power line is visible in the upper right.

August 2014

*Eric Meador*



# Control – Biocontrol?

- Jennifer Andres at WSU Extension and her staff have started looking at what is eating *some* garden loosestrife plants
- Samples collected in June 2014
- Usually the plants still flower and set seed even if skeletonized
- Actual biocontrol development unlikely until the plant becomes a “problem” in more places

garden loosestrife





# Thank You

*Katie Messick*

*Tim Miller*

*Jennifer Andres*

*Denise Liguori*

*Avery Bowron*

King County Noxious Weed Control Program

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