

Chelan County PUD Rocky Reach Wildlife Area Biological Weed Control Project 2012-13

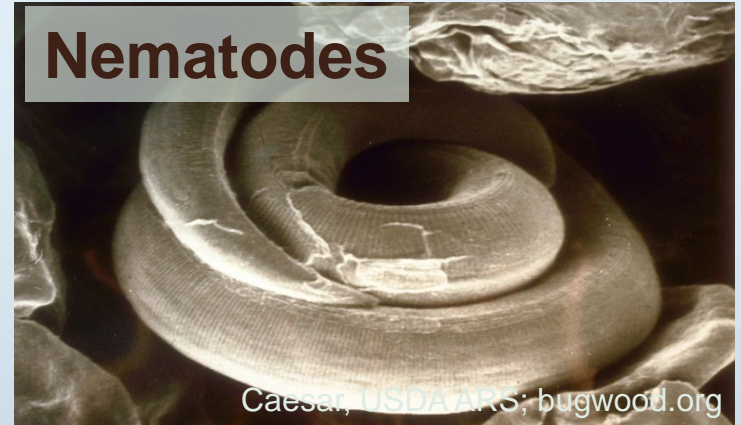


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Weed Biocontrol

The intentional use of one living organism to control/suppress another organism, such as WEEDS

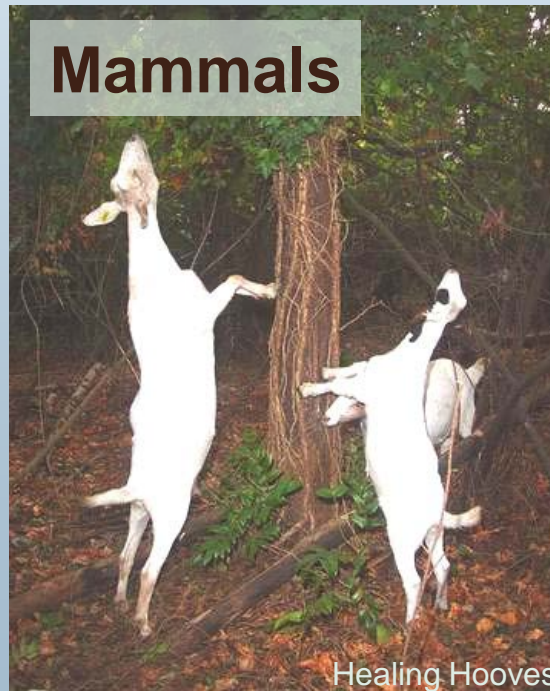
Nematodes



Insects



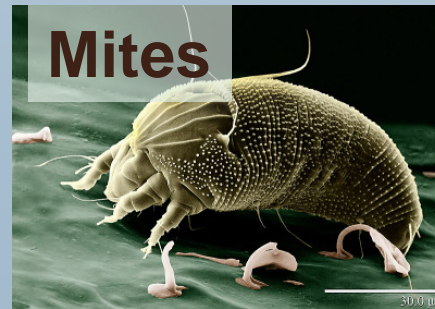
Mammals



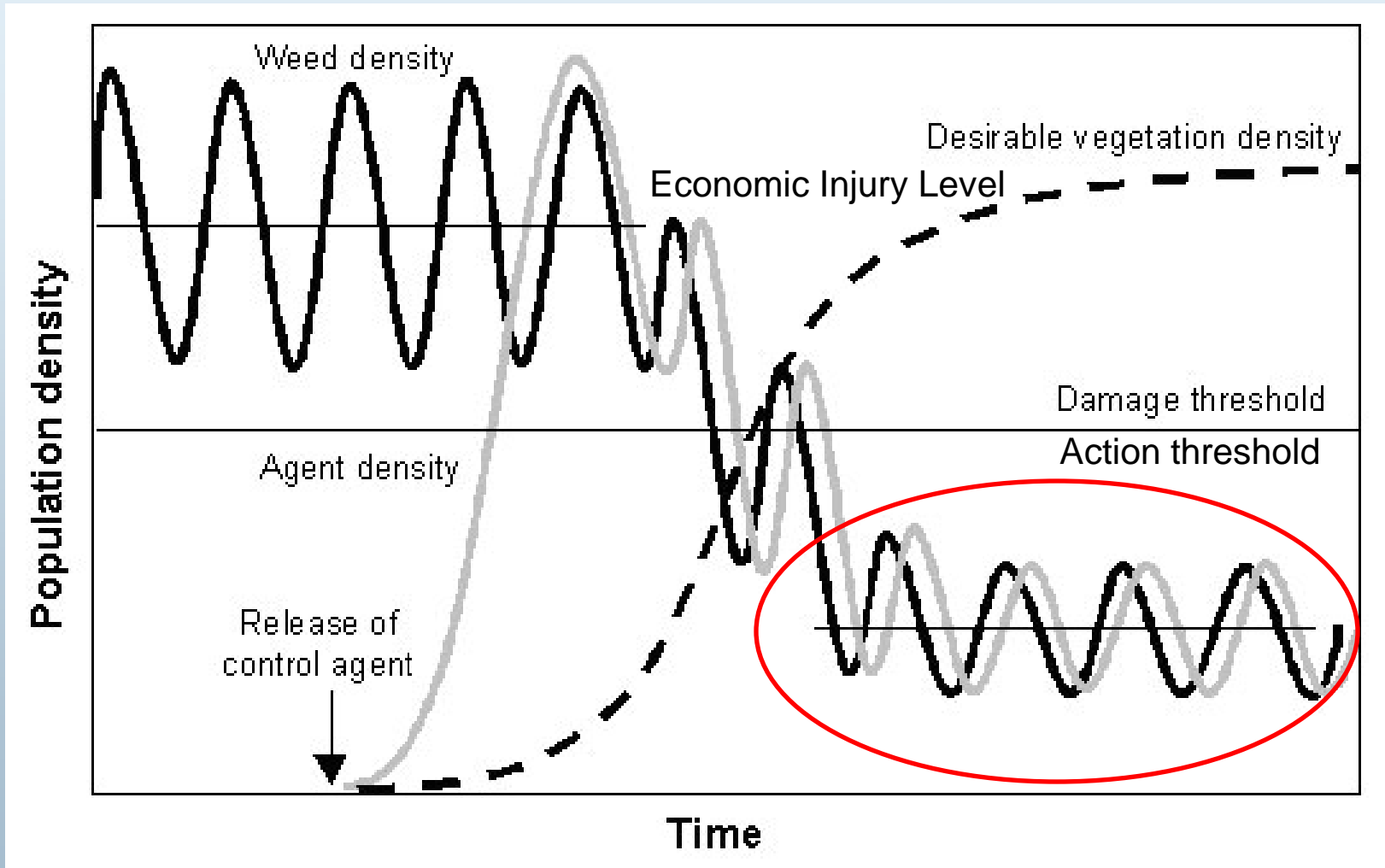
Pathogens



Mites



Ideal Biocontrol Results



Advantages

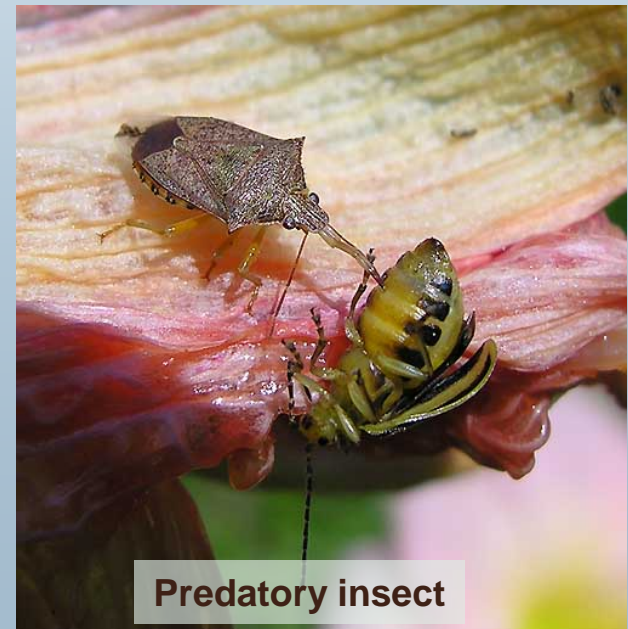
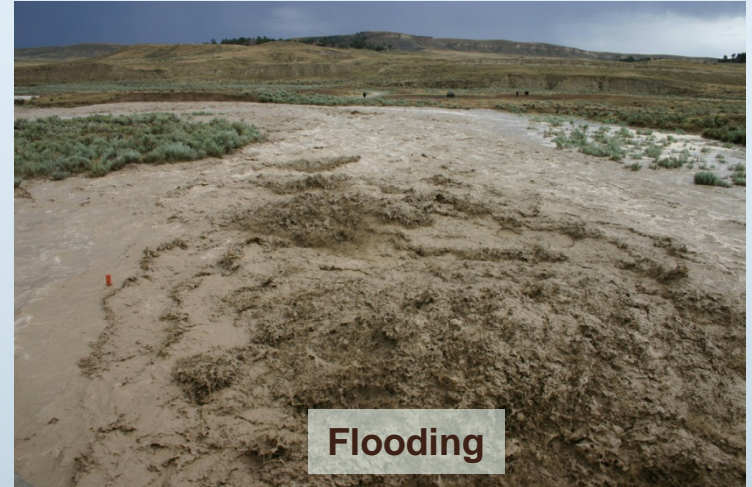
- Safe – USDA APHIS approves biological control agents before introduction into U.S.
- Ecologically desirable – herbicide alternative
- Insects are mobile
- Long-term solution
- Cost effective



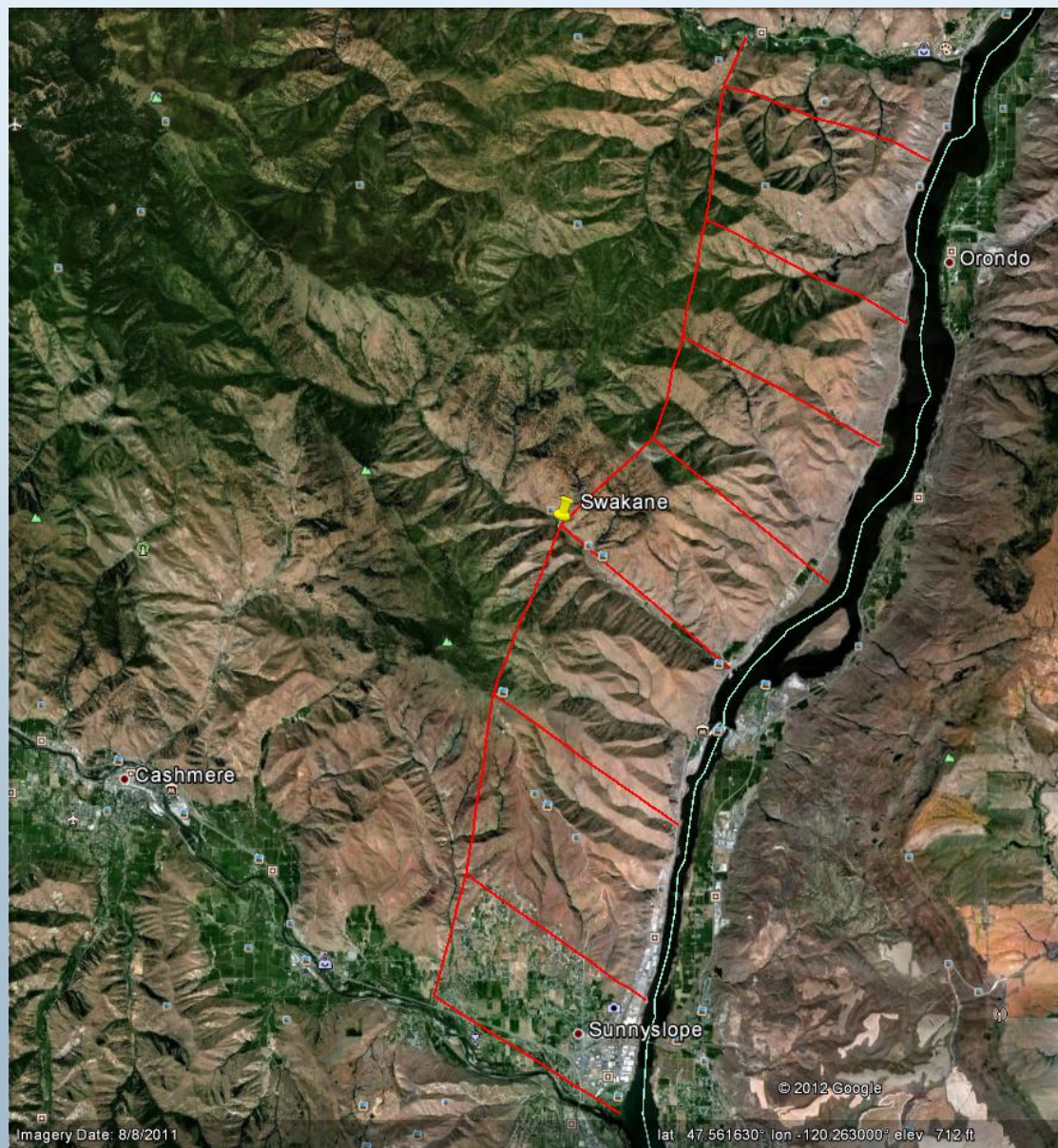
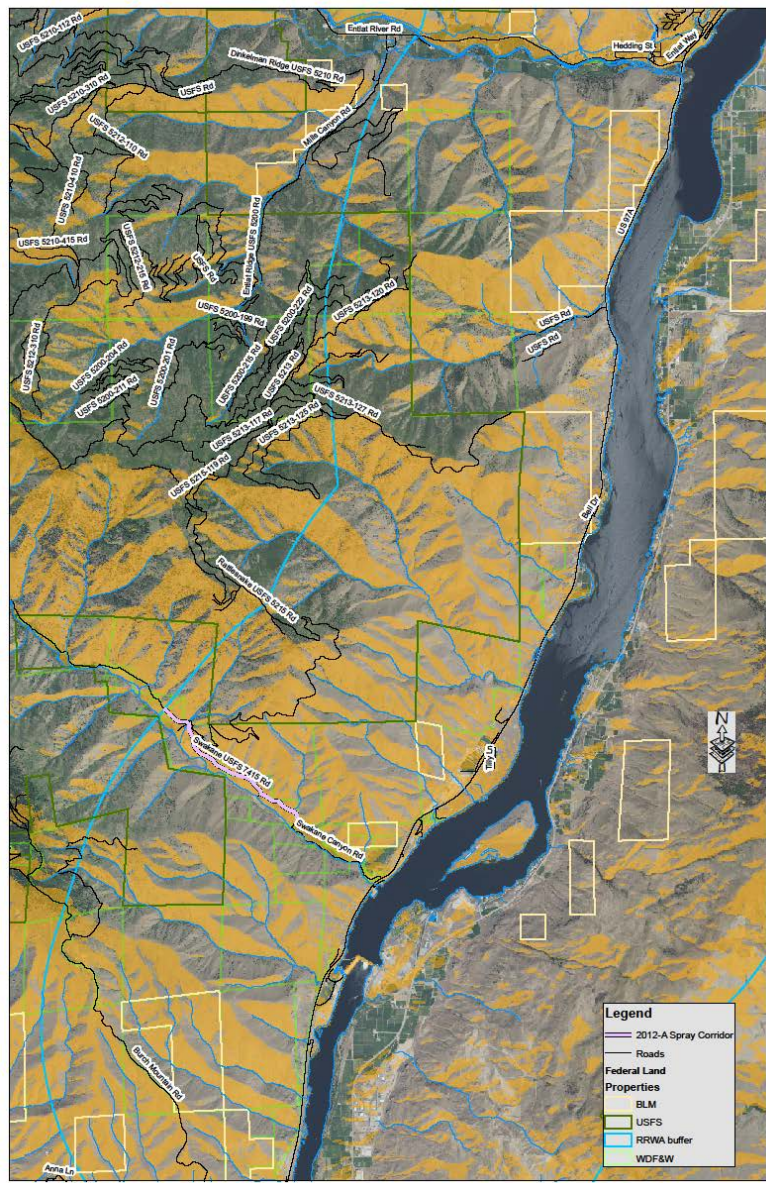
Leafy Spurge Biocontrol

Limitations

- Longer time to make impact
- Biotic factors; floods, extreme cold
- Subject to predators
- **No eradication**



Rocky Reach Wildlife Area Project – 1 (2012)



Dalmatian Toadflax



Dalmatian Toadflax Seed Production



1 Plant = 500,000 seeds

Diffuse Knapweed



Knapweed Infestation



Biological Control Insects

Dalmatian Toadflax

- *Mecinus janthinus* – Stem-mining weevil for Dalmatian and Yellow toadflax

Diffuse Knapweed

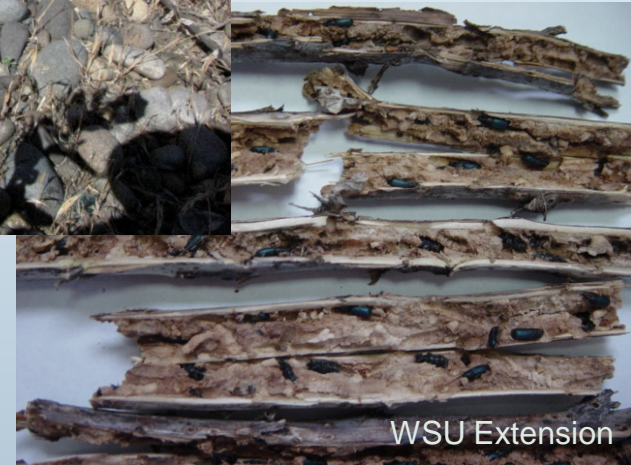
- *Larinus minutus* – Seed head weevil for Diffuse and Spotted knapweed
- *Cyphocleonus achates* – Large root-boring weevil for Diffuse and Spotted knapweed

Toadflax – Stem-mining Weevil

Mating adults



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Mecinus janthinus

- ~ stem-boring weevil
- ~ adult feeding causes severe damage
- ~ larval mining wilts shoots & ↓ flowering
- ~ highly effective

Mecinus janthinus Feeding Damage



Mecinus janthinus Feeding Damage



Mecinus janthinus Before and After



Knapweed – Seed head Weevil



Larinus minutus

- ~ seed head feeding weevil
- ~ attacks diffuse, spotted & meadow
- ~ adults can defoliate and kill plants
- ~ ↓ seed production
- ~ strong impact on diffuse in eastern WA



Larinus minutus Feeding Damage



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Larinus minutus Feeding Damage

Adults devouring
diffuse knapweed



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Larinus minutus Feeding Damage



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Larinus minutus Before and After



Larinus minutus Before and After



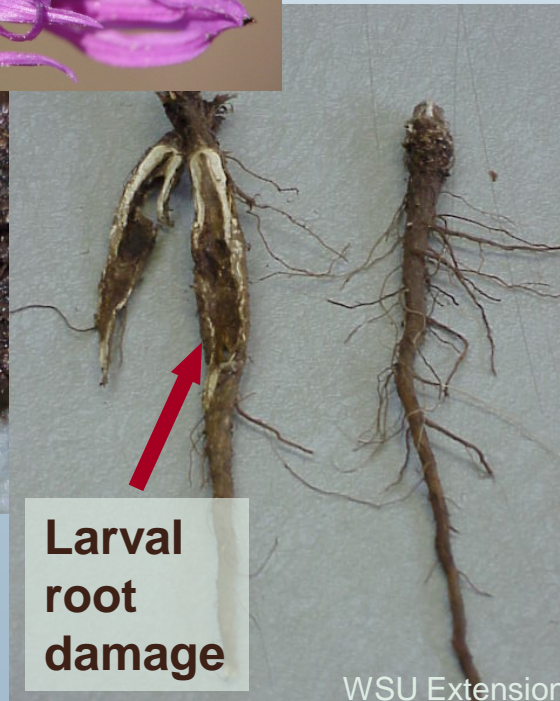
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Knapweed Complex



Cyphocleonus achates

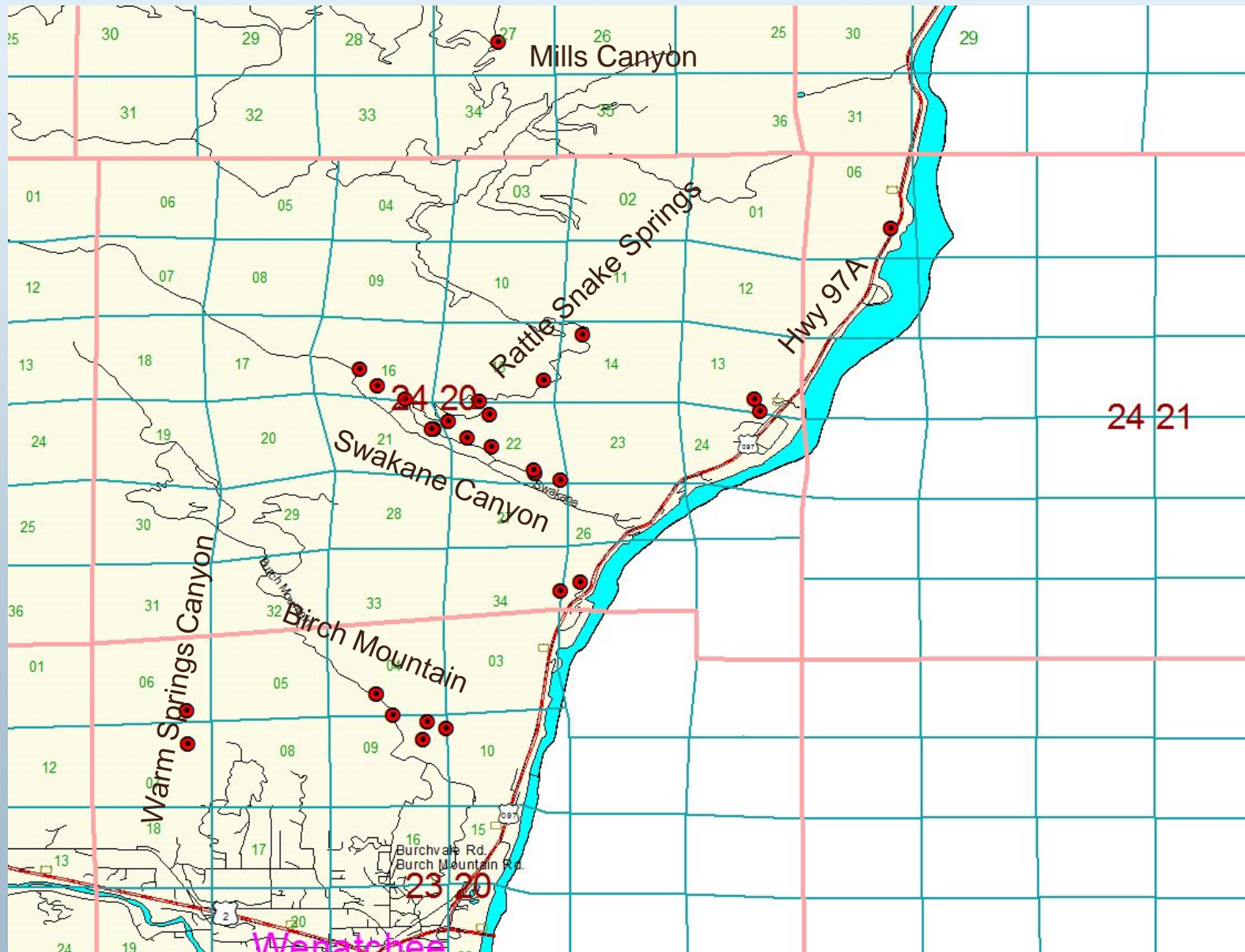
- ~ root-feeding weevil
- ~ attacks spotted & diffuse
- ~ ↓ biomass & density
- ~ can kill plants
- ~ good success in Montana with *L. minutus* & root weevil



2012 Rocky Reach Wildlife Area Project 1 - (Wenatchee to Entiat)

- Non-State Vehicle – (Insect collecting and redistributions: Chelan, Danville, Ellensburg, Entiat, Northport, Chelan)
- 16,910 *Mecinus janthinus* (Dalmatian toadflax stem-mining weevil). 19 releases (250 – 2,000)
- 4,070 *Larinus minutus* (Diffuse knapweed seed head weevil). 5 releases (250 – 1,000)
- 20 *Cyphocleonus achates* (Diffuse knapweed root-mining weevil)
- Photos and GPS coordinates

2012 Rocky Reach Wildlife Area Project 1 - (Wenatchee to Entiat)



RRWA Project 1 – Birch Mountain



RRWA Project 1 – Birch to Swakane



RRWA Project 1 – Swakane Canyon



RRWA Project 1 – Swakane Canyon



RRWA Project 1 – Swakane Canyon



RRWA Project 1 – Swakane Canyon



RRWA Project 1 – Rattle Snake Springs



NF-5215

Wood Stakes



RRWA Project 1 – Birch Mountain



RRWA Project 1 – Swakane Canyon



RRWA Project 1 – Swakane/Entiat



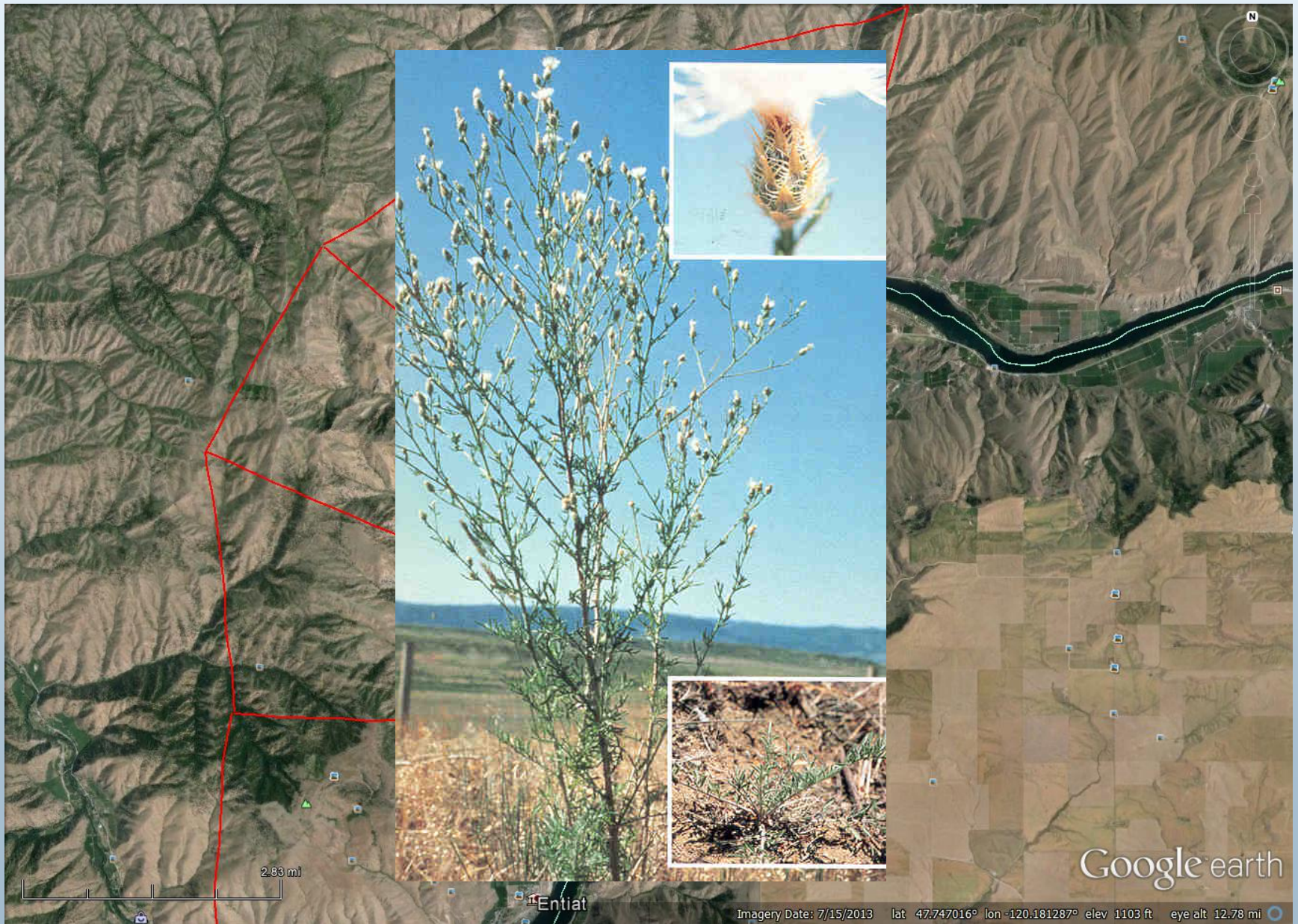
RRWA Project 1 – Mills Canyon



Rocky Reach Wildlife Area Project 2 (2013)



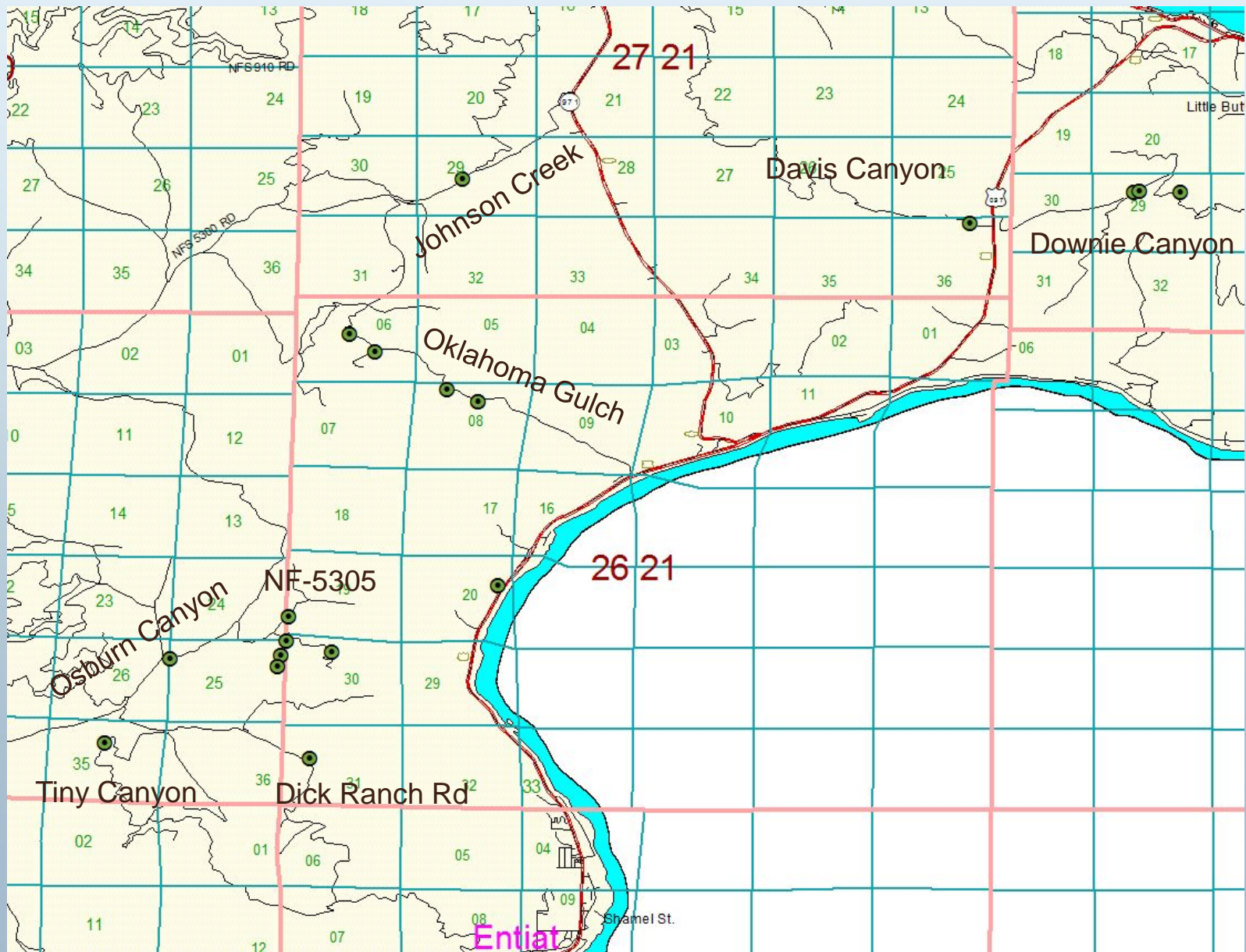
Rocky Reach Wildlife Area Project 2 (2013)



2013 Rocky Reach Wildlife Area Project 2 - (Entiat to Chelan)

- Non-State Vehicle – (Insect collecting and redistributions: Ellensburg, Entiat, Manson, Northport, Yakima)
- 12,000 *Larinus minutus* (Diffuse knapweed seed head weevil). 18 releases (250 – 1,000)
- 100 *Cyphocleonus achates* (Diffuse knapweed root-mining weevil)
- Photos and GPS coordinates

2013 Rocky Reach Wildlife Area Project 2 - (Entiat to Chelan)



RRWA Project 2 – Oklahoma Gulch



RRWA Project 2 – Oklahoma Gulch



RRWA Project 2 – Johnson Creek



RRWA Project 2 – Tiny Canyon



RRWA Project 2 – Crum Canyon



RRWA Project 2 – HWY 97A



Monitoring

- Before/after pictures
- Wood Stakes
- Monitoring
 - ~ insect population
 - ~ weed population
 - ~ plant community



Houndstongue: Osburne Canyon/Oklahoma Gulch

Photo by:
Richard Old
www.xidservices.com



Thank You

Helping Put Knowledge To Work

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