

**Water Quality Enhancement Activity – WQL02 – *Biological Suppression and Other Non-chemical Techniques to Manage Herbaceous Weeds and Invasive Species***



**Biological Suppression and Other Non-Chemical Techniques to Manage Herbaceous Weeds**

This enhancement is for the reduction of invasive species and/or herbaceous weed using physical and or biological control methods. Physical methods include pulling, hoeing, mowing, mulching or other similar methods. Biological methods include use of natural enemies either introduced or augmented. Use of chemicals is prohibited with this

enhancement.

**Land Use Applicability**

This enhancement is applicable on pasture, rangeland, and woodland in which an invasive plant and/or herbaceous weed problem exist.

**Benefits**

Environmental benefits will be site specific. Benefits may include but are not limited to improved water quality achieved through eliminating the use of synthetic pesticides resulting in no chemicals in surface runoff or leaching into the soil profile. Air quality will see similar impacts by eliminating chemical drift and volatilization. Controlling invasive species and/or herbaceous weeds will allow native plant communities to return and improve wildlife habitat.

**Criteria**

- 1) Develop a plan for managing invasive and/or herbaceous weeds that includes:
  - Assessment of existing conditions
  - Identify strategies for control
  - Control methods selected
  - Monitoring and evaluation process
  - Operation and maintenance follow up activities
- 2) Implementation of this enhancement requires the use of biological pest suppression techniques instead of pesticides. These techniques, used individually or in combination, can include activities such as:
  - Grazing animals (primarily through the use of goats) to target undesirable vegetation.
  - Introduction of beneficial insects to attack undesirable vegetation.
  - Introduction of beneficial micro-organisms to attack undesirable vegetation.
  - Hand removal or cultivation



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- Mowing or cutting
- 3) Biological suppression techniques should be based on techniques recommended by the local Land Grant University.
- 4) Biological suppression must be preceded by an analysis to ensure the proposed biological agent is compatible with the agronomic, ecological and social objectives of the operation.
- 5) Operation and maintenance activities must be followed to ensure regrowth is controlled. Additional treatment of individual plants or areas needing retreatment should be completed as required to effectively controlling the targeted species.

### **Documentation Requirements**

Written documentation for each treatment area and year of this enhancement including:

- a. A full description of all biological and/or physical suppression techniques utilized include:
  - Method (s) of control used
  - Area (s) on farm control methods were applied
  - Number of animals or insect colonies distributed and the planned time frame of the treatment.
  - Photograph (s) of treatment applied
- b. A map showing where the activities were applied including treatment acreage

WATER QUALITY ENHANCEMENT ACTIVITY

**WQL02 – OR Biological Suppression and Other Non-chemical Techniques to Manage Herbaceous Weeds**

**Criteria**

Beneficial Insects

- 1) Potential biological agents for suppression of herbaceous weeds are listed in the table below.
- 2) Use of any biological control agent will be coordinated with Oregon Department of Agriculture Plant Division, Noxious Weed Control and any local weed board. All requirements stated in permits will be followed.

<b>Current Status of Biological Weed Control Agents in Oregon</b>					
<b>Weed</b>	<b>Agent</b>	<b>Distribution<sup>1</sup></b> W = widespread status	<b>Attack Rate<sup>2</sup></b> H = heavy M = medium	<b>Control<sup>3</sup></b> E = excellent G = good F = fair P = poor	<b>Availability<sup>4</sup></b> M = mass collections
Knapweed, diffuse	<i>Bangasternus fausti</i>	W	H	G	M
	<i>Larinus minutus</i>	W	H	E	M
	<i>Sphenoptera jugoslavica</i>	W	H	G	M
	<i>Urophora affinis</i>	W	H	G	M
	<i>Urophora quadrifasciata</i>	W	H	G	M
Knapweed, meadow	<i>Larinus obtusus</i>	W	H	G	M

(more on next page...)

Weed	Agent	Distribution <sup>1</sup>	Attack Rate <sup>2</sup>	Control <sup>3</sup>	Availability <sup>4</sup>
Knapweed, spotted	<i>Larinus minutus</i>	W	H	E	M
	<i>Larinus obtusus</i>	W	H	E	M
	<i>Metzneria paucipunctella</i>	W	H	G	M
	<i>Sphenoptera jugoslavica</i>	W	H	G	M
	<i>Urophora affinis</i>	W	M	G	M
	<i>Urophora quadrifasciata</i>	W	H	G	M
Loosestrife, purple	<i>Galerucella californiensis</i>	W	H	E	M
	<i>Galerucella pusilla</i>	W	H	E	M
	<i>Nanophyes marmoratus</i>	W	M	F	M
	<i>Botanophila seneciella</i>	W	H	F	M
Ragwort, tansy	<i>Longitarsus jacobaeae</i>	W	H	E	M
	<i>Tyria jacobaeae</i>	W	H	E	M
	<i>Phrydiuchus tau</i>	W	H	G	M
St. Johnswort	<i>Agrilus hyperici</i>	L	H	E	M
	<i>Aplocera plagiata</i>	W	M	F	M
	<i>Chrysolina hyperici</i>	W	H	E	M
	<i>Chrysolina quadrigemina</i>	W	H	E	M
	<i>Cystiphora schmidtii</i>	W	H	G	M
Skeletonweed, rush	<i>Eriophyes chondrillae</i>	W	H	E	M
	<i>Puccinia chondrillina</i>	W	H	G	M
	<i>Aphthona lacertosa</i>	W	H	E	M
Spurge, leafy	<i>Aphthona nigriscutis</i>	W	H	E	M

	<i>Oberea erythrocephala</i>	W	H	G	M
Weed	Agent	Distribution <sup>1</sup>	Attack Rate <sup>2</sup>	Control <sup>3</sup>	Availability <sup>4</sup>
Starthistle, yellow	<i>Chaetorellia australis</i>	W	H	E	M
	<i>Eustenopus villosus</i>	W	H	E	M
	<i>Larinus curtus</i>	W	H	E	M
Thistle, bull	<i>Urophora stylata</i>	W	H	G	M
Thistle, Canada	<i>Rhinocyllus conicus</i>	W	H	F	M
	<i>Urophora cardui</i>	W	H	F	M
Thistle, Italian	<i>Rhinocyllus conicus</i>	W	H	G	M
Thistle, milk	<i>Rhinocyllus conicus</i>	W	H	G	M
Thistle, musk	<i>Rhinocyllus conicus</i>	W	H	G	M
Thistle, slenderflower	<i>Cheilosia corydon</i>	W	M	F	M
	<i>Rhinocyllus conicus</i>	W	H	G	M
Toadflax, Dalmatian	<i>Brachypterolus pulicarius</i>	W	M	P	M
	<i>Mecinus janthinus</i>	W	H	E	M

<sup>1</sup> Distribution within host range: W = widespread

<sup>2</sup> Attack rate host: H = heavy (> 70%); M = medium (> 30%)

<sup>3</sup> Control ability on seeds and/or plant density: E = excellent; G = good; F = fair; P = poor;

<sup>4</sup> Availability for redistribution: M = mass collections

#### Grazing Animals

- Use of grazing animals will be governed by a management plan indicating the targeted species, the appropriate livestock species, along with the timing, intensity, and duration of grazing

Extra care must be taken in mesic temperature regimes to avoid establishment and/or increase of annual grasses in the treated area

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#### References

Targeted Grazing: A natural approach to vegetation management and landscape enhancement. 2006.  
Edited by Karen Launchbaugh, Rangeland Ecology and Management Department, University of Idaho.  
<http://www.cnr.uidaho.edu/rx-grazing/Handbook.htm>

Pacific Northwest Weed Management Handbook 2008 [http://uspest.org/pnw/weeds?02W\\_BIOC02.dat](http://uspest.org/pnw/weeds?02W_BIOC02.dat)  
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