

**Water Quality Enhancement Activity – WQL01 – Biological suppression and other non-chemical techniques to manage brush, herbaceous weeds and invasive species**



**Enhancement Description**

This enhancement is for the reduction of woody brush, herbaceous weeds and invasive plants using non-chemical methods. Physical methods include pulling, hoeing, mowing, mulching or other similar techniques. Biological methods include use of natural enemies either introduced or augmented. Use of chemicals is prohibited with this enhancement.

**Land Use Applicability**

Pastureland, Rangeland, Forestland

**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, brush and weeds will allow native plant communities to return and improve wildlife habitat.

**Conditions Where Enhancement Applies**

This enhancement applies to all pasture, range or forest land use acres.

**Criteria**

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



- f. Mowing or cutting
- g. Use of heavy equipment in areas with well established, dense brush cover
- 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 or resprouting is controlled. Additional treatment of individual plants or areas needing retreatment should be completed as required to effectively controlling the targeted species.

### **Adoption Requirements**

This enhancement is considered adopted when invasives are being managed via biological or physical methods described above and no pesticides were used.

### **Documentation Requirements**

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

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

### **References**

- Bellows, T.S., and T.W. Fisher. 1999. Handbook of Biological Control. Academic Press.
- Bond, W. and A.C. Grundy. 2001. Non-chemical Weed Management in Organic Farming Systems. Weed Research 41: 383-405.
- DiTomaso, J.M., M.L. Brooks, E.B. Allen, R. Minnich, P.M. Rice, and G.B. Kyser. 2006. Control of Invasive Weeds with Prescribed Burning. Weed Technology 20(2):535-548.
- Peischel, A. and D.D. Henry, Jr. 2006. Targeted Grazing: a Natural Approach to Vegetation Management and Landscape Enhancement. American Sheep Industry.
- Popay, I., and R. Field, 1996. Grazing Animals as Weed Control Agents. Weed Technology 10(1):217-231.
- Upadhyaya, M.K., and R.E. Blackshaw. 2007. Non-Chemical Weed Management : Principals, Concepts and Technology. Cabi.
- USDA-NRCS. 2010. Conservation Practice Standards: Herbaceous Weed Control-Code 315, Integrated Pest Management-Code 595, and Prescribed Burning-Code338.
- USDA-NRCS. 2009. Conservation Practice Standard: Brush Management-Code 314.
- Valentine, J.R., 1989. Range Developments and Improvements, 3<sup>rd</sup> ed. Academic Press, MA.



United States Department of Agriculture  
Natural Resources Conservation Service

**IDAHO ADDENDUM 2013**  
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**Additional guidance for non-chemical suppression:**

**Biological Control Agents**

The producer should work through their local Cooperative Weed Management Area (CWMA) for assistance with biological control agents – release and monitoring.

**Currently, approved biological control agents for brush species are only available for saltcedar and scotch broom:**

Saltcedar (*Tamarix* sp.): *Diorhabda elongata*

Scotch Broom (*Cytisus scoparius*): *Bruchidius villosus*, *Exapion fuscirostre*, *Leucoptera spartifoliella*

**Approved biological control agents for the following noxious weeds are:**

Canada Thistle (*Cirsium arvense*): *Ceutorhynchus litura*, *Urophora cardui*

Dalmatian and Yellow Toadflax (*Linaria dalmatica*, *L. vulgaris*): *Brachypterolus pulicarius*, *Calophasia lunula*, *Eteobalea intermediella*, *Eteobalea serratella*, *Gymnetron antirrhini*, *Gymnetron linariae*, *Gymnetron netum*, *Mecinus janthinus*

Diffuse, Meadow, Spotted, and Squarrose Knapweeds (*Centaurea diffusa*, *C. nigrescens*, *C. stoebe* ssp. *micranthos*, *C. virgata* var. *squarrosa*): *Agapeta zoegana*, *Bangasternus fausti*, *Chaetorellia acrolophi*, *Cyphocleonus achates*, *Larinus minutus*, *Larinus obtusus*, *Metzneria paucipunctella*, *Pelochrista medullana*, *Pterolonche dispersa*, *Sphenoptera jugoslavica*, *Terellia virens*, *Urophora affinis*, *Urophora quadrifasciata*

Field Bindweed (*Convolvulus arvensis*): *Aceria malherbae*, *Tyta luctuosa*

Leafy Spurge (*Euphorbia esula*): *Aphthona abdominalis*, *Aphthona cyparissiae*, *Aphthona czwalinae*, *Aphthona flava*, *Aphthona lacertosa*, *Aphthona nigriscutis*, *Chamaesphacia empiformis*, *Chamaesphacia hungarica*, *Dasineura* sp. nr. *Capsulae*, *Hyles euphorbiae*, *Oberea erythrocephala*, *Spurgia esulae*

Mediterranean Sage (*Salvia aethiopsis*): *Phrydiuchus tau*

Puncturevine (*Tribulus terrestris*): *Microlarinus lareynii*, *Microlarinus lypriformis*

Purple Loosestrife (*Lythrum salicaria*): *Galerucella californiensis*, *Galerucella pusilla*,  
*Hylobius transversovittatus*, *Nanophyes brevis*, *Nanophyes marmoratus*

Rush Skeletonweed (*Chondrilla juncea*): *Bradyrrhoa gilveolella*, *Cystiphora schmidti*,  
*Eriophyes chondrillae*, *Puccinia chondrillina*

Tansy Ragwort (*Senecio jacobaea*): *Longitarsus jacobaeae*

Yellow starthistle (*Centaurea solstitialis*): *Bangasternus orientalis*, *Chaetorellia*  
*australis*, *Eustenopus villosus*, *Urophora sirunaseva*

For additional information on biological control for the noxious weeds above, refer to:  
[http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Documents/Bio\\_Control/2011/Idaho%20Agent%20Info%20with%20descriptions%202011.pdf](http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Documents/Bio_Control/2011/Idaho%20Agent%20Info%20with%20descriptions%202011.pdf). Additional information on the Noxious Weed Program at the Idaho Department of Agriculture, biocontrol releases, monitoring forms, etc., is available at:  
[http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Bio\\_Control.php](http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Bio_Control.php)

#### Targeted Grazing

Animal grazing can be effectively used to manage and manipulate plant communities – known as targeted grazing. Cattle, goats and sheep have been used to effectively control a variety of brushy and/or herbaceous noxious or invasive species. Effective techniques for targeted grazing applications can be found at: <http://www.cnr.uidaho.edu/rx-grazing/Handbook.htm>

#### Physical Suppression

Physical suppression includes pulling, hoeing, mowing, tilling and mulching. Selection of mechanical methods for brush control, such as chaining, shredding/chopping, and grubbing, should be based on site-specific conditions when heavy equipment is used.

### **Use of chemicals for control is prohibited.**

For additional information, refer to:

Idaho NRCS Practice Standard 314 (and specifications), *Brush Management*.  
<http://efotg.sc.egov.usda.gov/references/public/ID/314.pdf>

Idaho NRCS Practice Standard 595, *Integrated Pest Management*.  
[http://efotg.sc.egov.usda.gov/references/public/ID/595\\_0710\\_ID\\_Final\\_REV.pdf](http://efotg.sc.egov.usda.gov/references/public/ID/595_0710_ID_Final_REV.pdf)

Idaho NRCS Technical References, *Pest Management*.  
[http://www.id.nrcs.usda.gov/technical/pest\\_management.html](http://www.id.nrcs.usda.gov/technical/pest_management.html)

Idaho State Department of Agriculture, *Idaho's Strategic Plan for Managing Noxious and Invasive Weeds.*

<http://www.agri.state.id.us/Categories/PlantsInsects/NoxiousWeeds/Documents/general/StrategicPlan-10-11-05.pdf>

**This activity may NOT be used with the following enhancements:  
AIR04, AIR07**

**Potential Duplicate Practices:**

**314 – Brush Management , 528 – Prescribed Grazing, 595 – Integrated Pest Management , 315 – Herbaceous Weed Control**