

Noxious Weed Control

Applicability

This summary of recommended noxious weed management strategies has been developed to support the long-term sustainability of floodplain vegetation along the Musselshell River. The Best Management Practice (BMP) considers issues of noxious weed species adaptation, the role of disturbance, and environmental and regulatory restrictions.

This information is intended for producers in the river corridor where disturbance (flooding or human-caused) has altered channel vegetation or distributed fresh sediment in the floodplain. Canada thistle (*Cirsium arvense*), field bindweed (*Convolvulus arvensis*), leafy spurge (*Euphorbia esula*), spotted knapweed (*Centaurea spp.*), saltcedar (*Tamarix chinensis*) and Russian olive (*Elaeagnus angustifolia*) are noxious weeds commonly associated with disturbance in the floodplain. Producers affected by flooding are encouraged to develop a weed management plan.



Figure 1. Fresh sediment deposited by flooding provides an ideal setting for reestablishing riparian plants but unfortunately also for noxious weeds such as this stand of saltcedar (*Tamarix chinensis*). Photo credit: T. Pick.

A noxious weed is a plant that has been designated by state or local government as detrimental to agricultural crops, livestock, and/or ecological function. Typically, they are non-native, are prolific seed producers, and have aggressive and persistent growth habits. They usually have few, if any, natural enemies in the area of infestation.

Description

This *Noxious Weed Control* BMP addresses the following issues:

- I. **Early detection:** The need for a rapid response.
- II. **Species Identification:** The importance of targeting by species.
- III. **Chemical control:** A costly but effective means of control.
- IV. **Mechanical control:** Physical removal of plants.
- V. **Biological Control:** Targeting weeds with biological enemies.
- VI. **Integrated Pest Management:** Combining all appropriate control means as dictated by site and species.
- VII. **Long-Term Maintenance:** Adapting management and follow-up response to noxious weeds over time.

I. Early Detection

Quick action is necessary to effectively manage noxious weeds in the river corridor. Because of their unique dispersal traits and the floodplain setting, a large number of plants can become established in a relatively short time. Noxious weeds take advantage of the fertile and bare soil conditions to outcompete native plants which are typically slower to establish. Long seed viability permits these weeds to germinate over many years. Allowing the invasive plants to gain a long head start just makes control more difficult and expensive.

Early detection is even more important in headwaters areas as flowing water moves noxious weed seeds and plant parts downstream to uninfested areas. Downstream landowners will appreciate your vigilance and persistence in controlling noxious weeds in the river corridor.

Occasionally, severe infestations of common annual weeds may lead to competitive conditions that are detrimental to natural re-establishment of riparian vegetation. Control usually is not needed when density is light to moderate as these temporary species will usually only persist for a short period following the disturbance.

II. Species Identification

Some closely related noxious weeds have greatly different spreading mechanisms. Some are spread by plant parts rather than by seed so a key ingredient of control is being able to identify which plant you are targeting. This helps to select the appropriate control method(s). The easiest way to identify a plant is usually flower color and shape, but since flowers are not always present, other characteristics are sometimes used. Several excellent invasive species guides are available to help with identification. The Montana Department of Agriculture's Noxious Weed Program maintains the state [noxious weed list](#). Visit <http://www.mtweed.org/weed-identification/> for additional guides.

III. Chemical Control

Use of properly labeled and recommended herbicides offers safe and effective weed control, if relatively expensive. Some pesticides have restrictions on use in areas near surface water or high ground water. Always follow all manufacturer's label directions for the specific crop or use. Consult your county Weed District Coordinator for species specific chemical recommendations. Consider spot spraying when native riparian plants are present to minimize damage. A hood equipped, backpack sprayer or ATV mounted sprayer works best for sensitive and smaller areas. Larger areas may require a more aggressive, longer term approach.

IV. Mechanical Control

Clipping, grubbing, cultivation, burning, and grazing are forms of mechanical weed control. Mechanical practices are ideally suited for situations when the density of weeds is low enough to allow hand grubbing or pulling or large and accessible enough for cultivation with equipment and mechanical control suits the nature of the target species. For instance, weeds that primarily reproduce by seed are better suited for mechanical control than those that reproduce from root sprouts or plant parts. As an example, Canada thistle (*Cirsium arvense*), a



Figure 2. Common annual weeds occasionally are dense enough to threaten desired native plant survival unless treated. Here, Japanese brome, kochia, lambsquarters, and other annual or biannual weeds smother cottonwood seedlings. Photo credit: USDA-NRCS.



Figure 3. Lavender flowers and feather-like leaves help to identify saltcedar at a distance. Learn secondary ID keys, as well. Photo credit: T. Pick

perennial, noxious weed, is hard to control by pulling or cultivation because of its deep root system and the fact that root pieces will grow into new plants. Tilling will actually spread the plant further so it isn't a good candidate for cultivation, however repeated grazing or clipping is effective on Canada thistle.

Hand grubbing to kill the plant and remove the seed source is labor intensive so it is usually reserved for very small sites or low weed densities or projects with a ready supply of free labor such as a school project. For large areas, burning or grazing works best. Similar to clipping or harvesting, livestock grazing can be used to remove flowers that provide the seed source and to stress the plant through biomass removal. Prescribed grazing typically requires concentrating livestock and special stock handling skills such as training livestock to seek out and utilize the target species. Burning is usually only feasible on large fields or uplands that can be safely burned without harming adjacent areas and non-target plants, settings which do not occur frequently in riparian areas.

V. Biological Control

Biological control is using scientifically tested and released insects or plant pests to stress or kill noxious weeds. Biological agents attack target plants directly, either flowering parts, roots, or stems.

Biological control is usually the most cost-effective, long lasting, and environmentally friendly control and is ideally suited to flood plains when specifically targeted control agents are available. Biological agents keep working long after they are released. However, biological control of noxious weeds is rarely successful as a standalone eradication treatment, since the agent won't kill all the plants at once. To be effective, the proper biological agent must be released at the right time and place. Biological control is usually utilized once a plant population has become established or moved beyond the initial infestation stage. It is usually used as a component of an integrated pest management program.



Figure 4. Biological agents such as this flea beetle attack flowering parts, stems, and roots of the target species to weaken or kill it. Photo credit: USDA-ARS.

VI. Integrated Pest Management

Integrated pest management is the coordinated and planned use of a variety of methods to attack a pest or noxious weed from many angles. Inherent to the concept is careful planning and use of monitoring results to guide the application and timing of control methods. As such, IPM is probably best adapted to a long-term control approach for weeds that have become established and cannot be effectively eradicated. See <http://ipm.montana.edu/>. Some plants best respond to combination treatments. For instance, Russian olive is most effectively controlled by late summer or fall cutting and then immediate chemical treatment of the stump.

IPM may also include reseeding or replanting in conjunction with IPM to provide competition for noxious weeds as part of a control plan. Research has shown that noxious weeds such as spotted knapweed and leafy spurge are controlled most effectively when control efforts are combined with planting competitive grasses. Please contact the local USDA-NRCS office, Conservation District, or County Extension Service for recommendations on reseeding grasses in conjunction with noxious weed control efforts.

VII. Long-Term Maintenance

Because control of some noxious weeds that infest disturbed sites in floodplains may take multiple years, management needs to include long-term maintenance. If nothing else, treated sites should periodically be revisited to assess results and the need for follow-up treatment. By their nature, noxious weeds produce many, long-lived seeds along with other adaptations that make them hard to control using a single treatment approach. Always develop and utilize a monitoring technique to measure and track noxious weed treatment success and retreatment needs. Monitoring can be as simple as a photo point or as complex as a line transect or plot. Follow-up is perhaps more important when using bio or integrated control as the results are usually more gradual and less obvious over time. Follow-up may also include a livestock grazing plan or other allowances for periodic harvest of vegetation to prevent decadence.

VIII. Other Sources of Information

Biological weed control: <http://agr.mt.gov/agr/Programs/Weeds/PDF/Biocontrol.pdf>

Biological Weed Control Using Insects – A Field Guide for Montana (undated): http://mtwow.org/MT_bio-control_guide.pdf or available at most County Weed District Offices.

Biological weed control vendors: <http://www.bio-control.com/> and <http://www.integratedweedcontrol.com/>.

Center for Invasive Species Management at MSU contains an online weed identification program, an interactive mapping application, and many other useful tools: <http://www.weedcenter.org/>.

Invasive Species Technical Notes. USDA-Natural Resources Conservation Service (NRCS) in Montana has developed a series of technical guides for many of Montana's noxious weeds. These guides cover the ecology, management, and identification of each species in detail:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/mt/technical/?cid=nrcs144p2_056849.

Montana State University Extension Service, Preventing Noxious Weed Invasion:

<http://msuextension.org/publications/AgandNaturalResources/MT199517AG.pdf>.

Musselshell County Noxious Weed Management Plan (MSU 2012) describes 17 noxious weeds that occur there as well as the current management specifications. Other county plans can usually be found at the local library or through the respective County Weed Coordinator:

<http://www.msuextension.org/musselshell/PDF%20FILES/WEED%20MANAGEMENT%20PLAN%20DONE%20Revised%202012.pdf>

Weeds of the West. Color photographs of weeds common to the western U.S. Published by the U of WY Extension Service. Available at: <http://www.uwyo.edu/ces/wyoweed/profession/wedwest.htm>.