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Wildland Weed Management
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Conservation Reserve Enhancement Program (CREP)
Technical Assistance Series

Factsheet
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Weed Management in Riparian Forest Buffers

Riparian forest buffers (RFBs) provide improved water quality through two primary means: reducing sediment and nutrients that get into the stream; and creating in-stream conditions that foster the utilization and fixation of nutrients in a more complex food web, rather than those nutrients accumulating downstream to eutrophy rivers, bays, and estuaries.

RFBs also provide the foundation for diverse wildlife habitat. However, without effective weed control during establishment and early life of the planting, your RFB may never become a forest. It is not enough to plant the trees and 'let nature take its course'. The best habitat and ecological value comes from achieving canopy as soon as possible. To get to the forest, you need to 'farm' the trees.

This is especially true where RFBs are established in sites dominated by exotic plants species, such as existing cool-season grass pastures (the 'green death').

Effective weed control increases tree growth through reduced competition, reduces cover for pests such as meadow voles, and makes it easier to maintain the trees and tree shelters.

Control Weeds Before Planting

The best time to begin your weed control program is the season before the RFB is planted. Having weeds under control in the fall prior to a spring planting provides better control of perennial species, gives trees a faster start, and makes planting much easier (Figure 1).

Figure 1. Pre-plant weed control in the fall before a spring planting gives trees a weed-free start, makes planting much easier, and allows you to manage weeds on a maintenance basis rather than continually needing to bring an infestation under control.

Figure 2. Herbicide treatments that eliminate grass groundcover may 'release' problem species such as Canada thistle (Cirsium arvense, above). Effective weed control in riparian forest buffer plantings requires both maintenance applications to provide vegetation-free area around each tree, and ongoing spot treatments to prevent creeping perennial species from colonizing those bare areas.

Three basic approaches are to treat spots where the individual trees will be planted, establish weed free strips for the planted trees (Figure 1), or eliminate the existing vegetation entirely and seed a less competitive groundcover.

Site-prep method will be based on the species present and the ability/willingness of the land manager to stay after problem weeds after tree planting. It is a complicated decision, but boils down to finding the balance between reducing competition to the planted trees plus improving habitat value, versus using the existing vegetation to suppress weeds that may be worse if you remove it. Planting trees into former pastures provides a common scenario. Old pastures are often infested with Canada thistle. If you remove all the pasture grass, you release the thistle (Figure 2). However, the original pasture grass competes with the planted trees, has little habitat value, and nearly eliminates volunteer release of native trees and shrubs.

If you choose to establish weed-free spots or strips, make them 6-feet wide. The wider the weed-free strip, the better the opportunity for fast tree growth. Wider

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weed-free strips also reduce cover for meadow voles, and decrease the chance of mower damage if you mow the vegetation between the strips during the establishment phase.

Use a *glyphosate* herbicide in September or October. *Glyphosate* is a non-selective, systemic herbicide that does not have residual soil activity. It controls a wide range of species and does not pose a risk of injury to your trees. Woody weeds such as multiflora rose need to be treated prior to fall color and leaf drop.

An additional issue to consider is whether there are problem species on site prior to planting. Creeping perennial species such as Canada thistle, crownvetch, or reed canarygrass should be aggressively treated prior to planting (Table 1). Spot-treat these species *wherever* they occur in the buffer in the late spring of the season before planting. If you leave these species between the rows of trees, they will spread into the tree rows. For problem species, the fall *glyphosate* application should be the second application - the 'clean up' treatment after the initial late-spring or summer application.

Weed Control After Planting

To ensure rapid growth of your planted trees, maintain a weed-free zone around the shelters. The best way to maintain a weed-free condition is application of *glyphosate* plus a residual herbicide (Table 1) each spring for the first three seasons. The residual herbicide prevents establishment of weeds growing from seed. Residual herbicides obviously increase the cost of application, but they will save you time and hasten tree growth.

In addition to treating around the shelters, treat invasive and Noxious species throughout the planting. Spot-treating with *glyphosate* is a common approach. Add *triclopyr* (e.g. 'Garlon 3A') to create a mixture that will effectively control all woody and herbaceous targets. This mix has minimal soil activity, so you can use it as a clean-up treatment around the tree shelters later in the season. Maintaining bare ground around the shelters into winter provides an important weed control benefit, and reduces cover for voles to get at your young, tender trees.

Table 1. Effective weed control will provide faster canopy closure in your riparian forest buffer. Ongoing spot treatments with glyphosate will keep weeds suppressed, but regular use of residual herbicides will reduce your time input and reduce vegetative residue that provides vole cover. There are many suitable glyphosate products. 'Rodeo' is used as an example, not a recommendation.

timing/targets	product examples	application rate (product/acre)	comments
Spring pre-plant control persistent, creeping perennials the season before planting	'Streamline' or 'Milestone' or 'Rodeo'	2.5 oz/ac or 7 oz/ac or 3 quarts/ac	'Streamline' (*aminocyclopyrachlor plus metsulfuron*) or 'Milestone' (*aminopyralid*) can be used in the late spring to treat problem broadleaf species such as Canada thistle or crownvetch. A *glyphosate* product such as 'Rodeo' can be used on problem grasses such as reed canarygrass or quackgrass in May or June. Follow this treatment with a fall *glyphosate* treatment to create spots or strips for tree planting next spring.
Fall pre-plant control of existing vegetation with *glyphosate*	'Rodeo'	2 to 3 quarts/ac	'Rodeo' (or one of its many equivalent products) is an aquatic-labeled, concentrated form with 4 lb/gallon of *glyphosate* acid. 'Rodeo' does not contain surfactant so you must add one to the spray mixture. This treatment can be used to establish 6 ft-wide weed-free spots or strips, and to follow-up on late spring treatments to eliminate persistent species..
April-May, post-plant maintain weed-free strips or spots around tree shelters.	'Rodeo' plus either 'Pendulum AquaCap' or 'Proclipse' or 'Oust XP'	3 quarts/ac + 4 quarts/ac or 36 oz/ac or 1 oz/ac	A *glyphosate* application at this time will control established and seedling vegetation. The addition of *pendimethalin* or *prodiamine* will provide residual control of annual weeds with very little risk to the planted trees. The herbicide *sulfometuron* (Oust XP) has more foliar activity and is very active on reed canarygrass, but risk of injury to planted trees via root pick-up due to over-application is greater.
As Needed spot treatment of weeds around and between tree shelters	'Rodeo' + 'Garlon 3A'	3 qt/ac + 2 qt/ac	This tank-mix will control practically any woody (e.g. multiflora rose, autumn olive) and herbaceous weeds, has little soil activity, and both products have aquatic labeling. You can use this mix to control weeds throughout the planting, and to provide a clean-up treatment around tree shelters in the fall.

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