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# Stewards of our Streams

## Maintenance of Riparian Buffers

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**R**iparian buffers are effective at reducing non-point source pollution in streams. However, to maintain their effectiveness they must be managed and maintained. Regularly scheduled maintenance should begin immediately after the buffer has been planted. It is also important to carefully inspect your buffer annually or after major storm events for any damage or problems that may have occurred. Repairs should be completed as soon as possible to maintain proper buffer functions. There are four major maintenance procedures outlined in this brochure. These four procedures are energy intensive and should be done at specific times during the growing season.

### Weed Control

#### • *Mowing the Native Grass/Forb Zone*

Both the woody and native grass zones in a riparian buffer can benefit from mowing during the early years of establishment. Mowing native filter strips and riparian buffers is useful for areas that cannot be burned or sprayed and have large populations of competing annual weeds.

Native prairie grasses and forbs are often slow growing above ground during the first year or two after establishment because much of their energy is put into producing a root system. During this time annual weeds rapidly become established and provide competition to the establishing native plants. Mowing needs to occur before weeds get higher than 18" high. Another problem is weeds that produce large quantities of seeds and cultivate

themselves throughout the buffer. Because of these challenges, mowing a prairie filter during the first and second year is advised.

#### Some tips to consider when planning to mow:

- Mowing twice during the season is usually enough.
- Mow just before annual weeds produce seed to keep the seed from maturing.
- Mow high – 8-12 inches or more above the ground to minimize cutting the slow-growing native plants.
- Use a flail chopper or brush-hog to minimize windrows of cut material that can cover and choke out young prairie plants.
- Plan the last mowing to allow regrowth of enough plants to fuel a spring burn.

A cover of annual grass is considered a good practice for establishing native plants and should be mowed prior to seedhead production.



Even after the native grass/forb zone has been established it is useful to annually check the zones and mow any patches of weeds that may develop.

Mowing must be done carefully between tree and shrub rows in a newly established buffer.

#### • *Mowing the Woody Zone*

Mowing between tree and shrub rows helps reduce shading by large weeds and helps identify the rows of



woody plants. If weeds are kept out of the plant rows with herbicides, mowing between rows late in the season will reduce the cover for small rodents who may girdle woody plants over the winter. If, however, there is an extensive growth of weeds in the woody rows, mowing very short late in the season will concentrate the rodents along the woody plant corridors.

• **Spraying**

Spraying is an important part of riparian buffer maintenance. Tree and shrub seedlings are vulnerable to above and below ground competition during the first 3 to 5 years after establishment. During this time period water, nutrients, and light are crucial for seedling development and survival. Trees and shrubs do not grow as quickly as most weeds and can be shaded out for several years after planting. There also can be a lot of below-ground com-



Broadcast sprays are effective over large, weedy areas. Here an area to be planted into native prairie is being sprayed.

petition for water and nutrients in a newly established riparian buffer, so keeping weeds to a minimum is suggested.

There are two main options for

spraying large areas: backpack spraying or general broadcast spraying. Backpack sprayers are useful for small areas where precision is needed. Using backpack sprayers and a shielded spray wand, a post-emergent such as Glyphosate can be applied close to the base of woody plants without harm to the plant itself. Shielded spray wands are advised due to the close proximity of woody vegetation and potential damage that can take place. Pre-emergent herbicides can be applied to areas during the fall or early spring to help control weeds in the next growing season.

Broadcasting herbicides over a large area or in rows can be done quickly and easily with a tractor and spray mount. However, if weeds are spotty or if there are high-value plants close to weedy areas, using a backpack sprayer with a shield is preferred to a general broadcast spray.

All herbicides can easily damage trees and shrubs so equipment calibration and safety measures are important. As with fire, several precautions should be taken to keep woody seedlings and crops safe from drifting spray. Factors that should be taken into account include: wind direction and speed, strength of herbicide mix, soil properties, and size and broadcast area of spray droplets. For more specific information on the best herbicides to use locally, visit your DNR or NRCS office or get *Grass and Weed Control for Tree and Shrub Seedlings* available from your local DNR office.



**Replanting and Reseeding**

Replanting and reseeding are important maintenance practices during the first few years following establishment. An annual inspection should be made to identify areas in need of replanting/reseeding. Replanting can be done in the spring or fall. Woody plants should be

replanted within a row if more than 3-4 consecutive seedlings have died. Spot planting can be done quickly with just a bucket full of water and seedlings, and a shovel. Replanting in the native grass/forb zone may be a bit more involved depending on the density and quality of grass and establish-



Replanting trees and shrubs is an important part of buffer maintenance.

ment. If there is poor establishment, a herbicide like Glyphosate can be used, followed by redrilling. If there is some establishment, but not as dense as desired, the site can be directly redrilled. If the areas needing reseeding are small, hand-spreading the seed and raking it into the ground is acceptable.

During the life of a riparian buffer, trees will begin to compete with each other as they do in a natural forest, and without pruning and thinning they will not maintain an optimal growth rate. Fast-growing trees such as

cottonwoods and poplars will be competing with each other within 10 years of planting. After 8 to 9 years, every second or third tree may have to be harvested to increase water and growth space for remaining trees. Trees that are cut down or pruned can be chipped and used for mulch around other trees within the buffer.



## Pruning and Thinning

### • *When to Prune*

Trees should be pruned during late fall, winter, or early spring while the plants are dormant, regardless of your management goals. Pruning while the tree is dormant helps reduce problems with losing food production while actively growing and decreases the risk of infection. Whole trees can be harvested and removed at any time throughout the year.

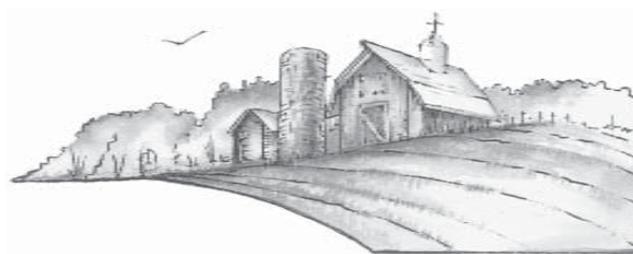
### • *How much to Prune*

How much to prune depends on your goal for the trees. If high-quality timber is desired, a straight log with few knots is important and branches should be pruned up to 16'. If the goal of pruning is to decrease competition between trees, then minimal pruning is required. The trees will self-prune as lower branches get shaded out. Trees grow most efficiently when there is enough canopy to provide plenty of food for the tree. By thinning too much, enough food production may be lost so trees become stunted and may take time to regain optimum growth rates.

### • *How To Prune*

Pruning must be done carefully so plants are not damaged. When pruning trees and shrubs, remember:

- Correct multiple leaders as soon as possible.
- Leave side branches on until they are 1 inches in diameter, but remove before they become 3 inches in diameter.
- Never cut out more than 25% of the crown of a tree.
- Retain at least 2/3 of the tree height in live branches to protect tree health.



### • *Thinning*

For most species, including those that resprout, late spring thinning is ideal. Thinning just after the leaves have fully expanded will find the tree with the least amount of stored food and with the smallest chance of resprouting. Thinning can be done systematically by removing every other row, or every other tree within rows. Thinning can also be done by selecting the trees to leave standing and removing any surrounding competing trees. Consult your local or district DNR professional to determine the best times to thin.



## Prescribed burning

Fire is a good maintenance tool for native grass and forb plantings in riparian buffers or filter strips. To reduce weed competition during the year, prescribed burns are usually performed early in the spring. During this time, many of the competing cool-season grasses, weeds, and woody plants begin growing while the native prairie plants are still dormant. Always develop a prescribed burn plan prior to burning. Assistance is available through NRCS and IDNR.



A drop torch is useful in lighting prescribed burns in riparian buffers. A mixture of kerosene and diesel fuel is used in the torch.

While different burning frequencies may be used, an annual spring-burn for the first three or four years is recommended. Following establishment of a good stand of desired grasses and forbs, a burning cycle of once every three to four years can be used. The burning cycle is usually defined by the accumulation of dead plant material on the ground, weed species invasion, and general vigor of the plant community. Fall burns also can be used to stimulate forb growth more than the grass growth. However, they may be problematic if adjacent crops are not harvested.

Burning the native prairie component of a riparian



buffer can be tricky due to the close proximity of shrubs and trees. Such a burn requires numerous people, careful planning, attention to fuel sources and amounts, and attention to wind. Using a small, slow backfire (a fire that burns into the wind) helps to keep the fire more controlled while it is close to neighboring shrubs and trees. A fire break is often mowed or raked between the shrubs and/or trees and the native prairie component. This fire break can be wetted if the fuel is dry. A good strategy is to burn when steady wind (10-15 mph) is blowing into the buffer toward the stream. This way, a backfire can be started with a drip torch along the mowed break and allowed to burn into the prairie filter. The fire moves slowly because it is burning into a prevailing wind. Once the backfire has burned a strip of 10 – 15 feet in width, a head fire (burning with the wind) can be lit along the crop field and allowed to burn rapidly with the wind. If there is heavy corn stover left along the crop edge care must be taken to keep the fire out of the field. This can be done by

raking or wetting the stover just before the fire is lit.

The crew, equipped with fire rakes, fire swatters, and backpack sprayers, should patrol the burn to keep it contained. Fires should be kept small and well controlled (start small to test the wind, moisture conditions, and train your crew). A water tank in a pickup truck fitted with a small pump and garden hose can be very useful for wetting down the fire break and corn stover. If you have not performed a controlled burn before, you should ask for assistance from a local natural resource professional with experience dealing with controlled burns.

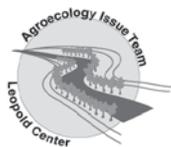
Consideration should be given to the influence of burning on nesting birds. Ideally, you should burn in sections; burn only one side of the creek or break a prairie stand into three or four sections and burn one each year. Fall burns eliminate winter cover and late spring burns can destroy nests. However, fire helps to maintain native plant health. Most native prairie plants will grow more vigorously, produce more flowers, and produce more seeds after a fire. The active growing points of most prairie plants are below the soil surface, and are therefore unaffected as the fire rapidly passes over. After the fire, these plants are stimulated by warmth of the blackened ground and the nutrients that were released from burned plant material.

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Agroecology Issue Team Riparian Management System website:

<http://www.buffer.forestry.iastate.edu>



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