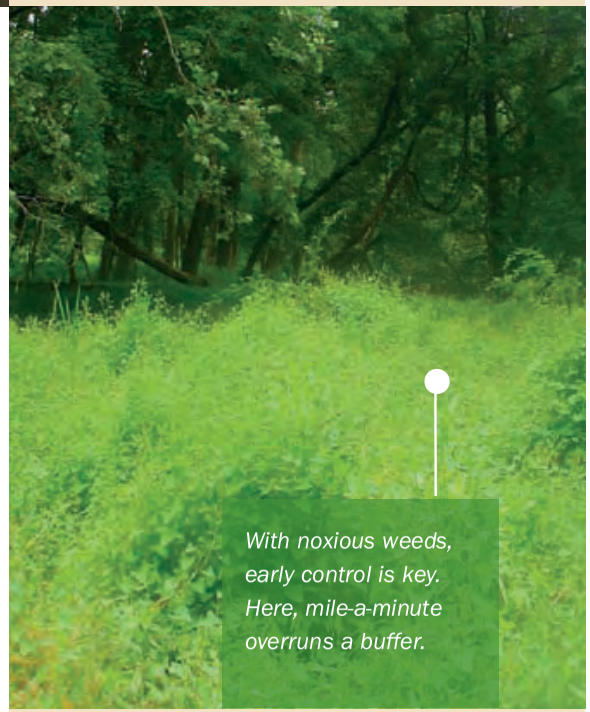
State-listed noxious weeds such as this Canada thistle must be controlled under state law.

State-listed Noxious Weeds Control required by law

- *Canada Thistle (Cirsium arvense)*
- *Multiflora Rose (Rosa multiflora)*
- *Johnson Grass (Sorghum halepense)*
- *Mile-a-minute (Polygonum perfoliatum)*
- *Kudzu-vine (Pueraria lobata)*
- *Bull or Spear Thistle (Cirsium vulgare)*
- *Musk or Nodding Thistle (Carduus nutans)*
- *Shattercane (Sorghum bicolor)*
- *Jimsonweed (Datura stramonium)*
- *Purple Loosestrife, including all cultivars (Lythrum salicaria)*
- *Giant Hogweed (Heracleum mantegazzianum)*
- *Goatsrue (Galega officinalis)*
- Marijuana *(Cannabis sativa)*

Other Invasive Plants – control highly recommended

- *Common Reed (Phragmites australis)*
- *Japanese Knotweed (Polygonum cuspidatum)*
- *Reed Canary Grass (Phalaris arundinacea)*
- *Japanese Honeysuckle (Lonicera japonica)*
- *Japanese Hops (Humulus japonicus)*
- *Oriental Bittersweet (Celastrus orbiculatus)*
- *Tree-of-Heaven (Ailanthus altissima)*



With noxious weeds, early control is key. Here, mile-a-minute overruns a buffer.

Mowing is allowed in the first 2-3 years and can be a useful tool in controlling weeds.

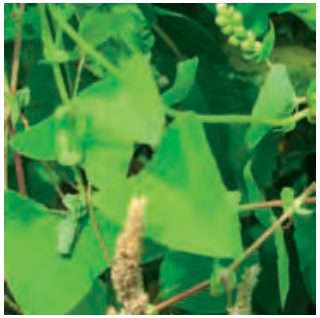
Best control strategies vary by species. Mile-a-minute begining to overtake a buffer.

Japanese Knotweed, an invasive plant, is common along waterways.

Identification of Common Noxious and Invasive Plants in Riparian Areas

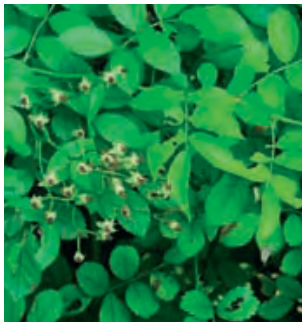
Canada Thistle

Japanese Knotweed

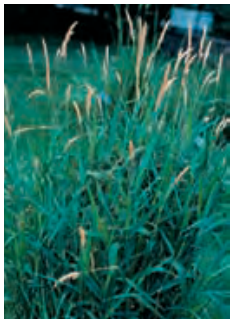


Mile-A-Minute

Tree-of-Heaven



Multiflora Rose



Reed Canary Grass

Japanese Hops

Common Reed

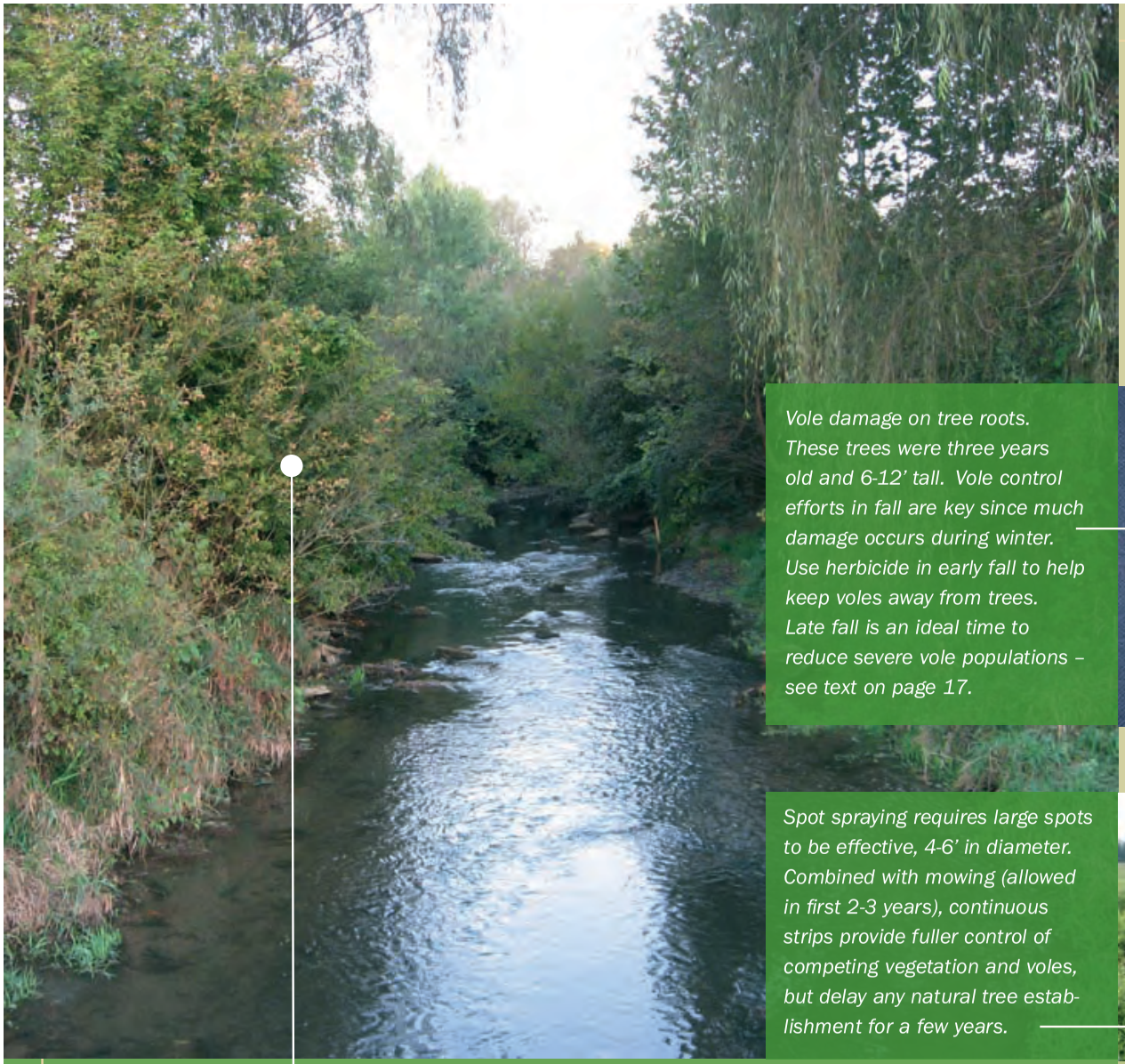
Oriental Bittersweet

For further help in identifying and controlling noxious and invasive plants, you can refer to Alliance for the Chesapeake Bay's **Pennsylvania Field Guide: Common Invasive Plants in Riparian Areas**, on line at **http://www.acb-online.org/pubs/projects/deliverables-145-1-2004.pdf** or purchase by calling **717-737-8622**.

Photos provided by Deborah Rudy, Alliance for the Chesapeake Bay, and from The University of Nebraska-Lincoln

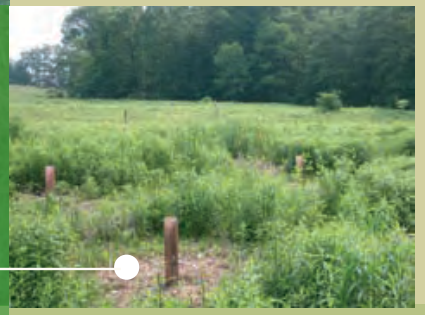
August-October

Make Another Herbicide Application Around Tree Shelters



Regular use of herbicides around shelters is key for highest possible survival and growth rates and faster canopy closure. Shade is a great deterrent to many of the worst noxious weeds and invasive plants since they prefer high light conditions. Here is a 12-year old buffer.

Vole damage on tree roots. These trees were three years old and 6-12' tall. Vole control efforts in fall are key since much damage occurs during winter. Use herbicide in early fall to help keep voles away from trees. Late fall is an ideal time to reduce severe vole populations – see text on page 17.



Spot spraying requires large spots to be effective, 4-6' in diameter. Combined with mowing (allowed in first 2-3 years), continuous strips provide fuller control of competing vegetation and voles, but delay any natural tree establishment for a few years.

Steps for Success

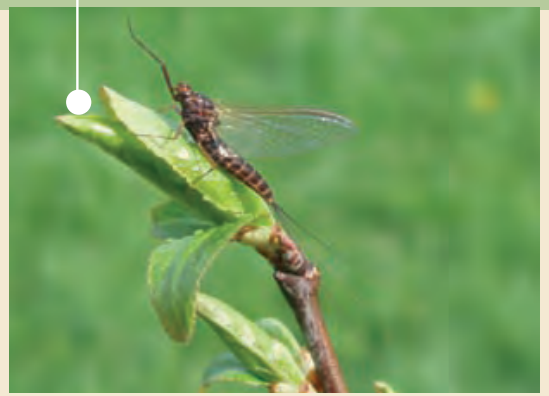
Fall

Right: Sprayed spots should be 4-6' in diameter. This site needs its next herbicide application.

Left: Spring peepers spend early lives in water as tadpoles.

Below: Mayflies spend most of their lives as nymphs in streams.

Follow all herbicide label instructions. The surfactant in Roundup Original™ is highly toxic to aquatic life! Formulations like Rodeo™ can reduce this risk.



Keys to Success in August-October

Make Another Application of Herbicide Around Shelters

Apply a broad-spectrum herbicide (like Roundup Pro™ or other glyphosate product) around sheltered seedlings. This application is like the one done in spring, but the pre-emergent can be omitted. Spraying can be done from mid-August through early October, depending on your region and site-specific conditions. This application will control competing vegetation and will create bare soil conditions around tree seedlings. This spraying is a key defense against voles during winter when a lack of other food often leads to damage on trees.

Fall is also the right time to consider additional steps to avoid vole damage over winter. A late fall mowing removes cover for voles and increases predation. Mowing is allowed in CREP projects during the first 2-3 years. Wide spread mowing beyond year 3 for control of voles or noxious weeds requires special permission. If not needed for vole control, omitting mowing may increase natural tree regeneration – particularly in northern PA where that potential is higher. Extreme vole problems may justify the use of an economical rodenticide containing zinc phosphide, applied by a professional. Consult your CREP project staff to discuss mowing or rodenticides. More information is available at right.

Tips: This spray is especially critical on sites where substantial regrowth in treated areas has occurred since spring. Competing vegetation can be an issue in late summer/early fall. Addressing regrowth of any grass is key, since voles prefer grass over broadleaf plants for food and cover. While working, pay attention to tree health, whether there are invasives regrowing and other details. Also mark any dead trees for replacement later.

Additional information on voles:

Penn State University site (good overview, no photos): http://pubs.cas.psu.edu/freepubs/pdfs/uh094.pdf

Cornell University site (good overview and photos): http://nysipm.cornell.edu/factsheets/treefruit/pests/vole/vole.asp

University of Maryland site (also tells how to assess vole levels) http://www.agnr.umd.edu/MCE/Publications/Publication.cfm?ID=146&cat=8

Right: These trails are tell-tale signs of vole activity. Herbicide, mowing, and rodenticide are all helpful tools to prevent vole damage to trees.

Right: Voles tunnel through snow and may gnaw on trees up to the height that snow accumulates.

Tasks To Be Completed As Needed

If replanting is needed: Replanting should only be done after addressing the cause of the initial failure (most commonly voles and/or competition from plants). Replanting can be done in fall using containerized seedlings or in spring using either containerized seedlings or bare root stock. Either should be successful if other recommendations are followed. Consult with CREP staff about cost-share prior to replanting.

Following floods: Within one week of any flood, any time of year, check tree shelters. Downed shelters will kill trees. Leaning tubes invite rodent damage. Also check for damage to any fences, crossings, etc.

If replanting where voles are a concern, consider using black walnut, tulip (yellow) poplar, and shagbark hickory, which are not preferred by voles.

Floods can easily knock down tubes but trees are typically still alive. Prompt action can avoid tree losses that would otherwise occur over time.

Work Records:

Work Done:	Date Done:	Notes:

Some links to riparian forest buffer information:

www.chesapeakebay.net/forestbuff.htm - EPA's Chesapeake Bay Program's info on buffers

www.chesapeakebay.net/pubs/subcommittee/nsc/forest/handbook.htm - EPA's Chesapeake Bay Program's extensive riparian area handbook that is quite valuable

www.chesapeakebay.net - the general website for EPA's Chesapeake Bay Program

www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/streamreleaf.htm - PA DEP site with basic buffer info and Pennsylvania specifics

www.riparianbuffers.umd.edu/home.html - University of Maryland site – regional perspective, lots of links to other resources – a good place to start

www.crjc.org/riparianbuffers.htm - riparian buffer fact sheets from Vermont/New Hampshire; still valuable information

or do a search on "riparian forest buffer"

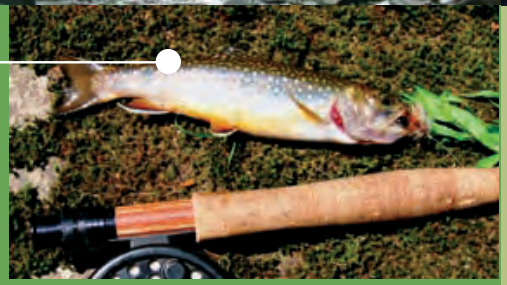
Forested buffers:

Read on to learn how forests work magic for Streams

Forested buffers are a stream's best friend.

Trees multiply stream habitat. The life of streams is tied to the bottom, literally. Most small organisms cling to rocks, roots and gravel to avoid being swept away. Trees vastly increase the amount and quality of bottom habitat. Compared to a bare soil bank in a meadow stream, a bank with fine tree roots commonly supports 1000 times more organisms in the same amount of space. Forested streams also have more bottom area. They are typically two to three times wider than a meadow stream of equal flow. With full sun, grasses encroach on the stream and channels narrow dramatically. Trees give streams more area, more habitat, more life.

Trout grow on trees. Trout eat stream insects that specialize in eating leaves of native trees that fall into streams. In very real ways trout grow on trees.



Trees Help Streams
Some ways that trees help streams are obvious: they shade streams and hold the banks in place. Other ways are less obvious but even more important.

Forested vs Grass Buffers

Summary of Research by Stroud Water Research Center (located in Chester Co., PA)

Study Variable:	Forest Buffer	Grass Buffer	Comments:
water temperature	+	-	forested areas cooler in summer, warmer in winter, both beneficial
streambed habitat quality	+	-	more usable streambed habitat, both amount and quality
removal of nitrogen pollution	+	-	forested areas removed 200% to 800% more nitrogen pollution
removal of phosphorus pollution	+/-	+/-	forested area tended to remove more phosphorus, but further sudy is needed
removal of pesticides	+/-	+/-	equal removal in forested areas was a surprise since sunlight is key
stream velocity	+	-	lower in forested areas, providing more contact time for clean up
stream width	+	-	forested streams 2-3x wider, providing 200-300% more habitat
large woody objects for habitat	+	-	large woody objects provide key habitat and benefits

+ means significantly better results than the other buffer option
- means significantly less helpful than the other buffer option
+/- means no significant difference

Trees help streams clean themselves
In a recent study, Stroud Water Research Center (with a staff of 30+ stream researchers) showed that forested conditions increase a stream's ability to cleanse itself. They studied 16 streams in eastern PA, comparing forested sections to grass buffered sections as the same streams flowed from woodlots to healthy meadows with no livestock and back again. Forested streams can remove 200% to 800% more nitrogen pollution than non-forested streams. The full results appear in the table on the left.

Added Benefits from Streamside Forests:
Beyond providing clean water, streamside trees also provide a long list of other benefits.

- Allowing rainfall to soak into the soil, turning floodwater into well water
- Reducing flooding and flood damage, guarding roads, bridges, houses, land
- Providing quality recreation and related income to local communities
- Providing key habitat for both aquatic and terrestrial wildlife
- Providing air quality benefits, especially when near animal production facilities

Complete Details:

A Seasonal Summary of Activites

Doing good things by planting **buffers**

Many landowners view buffers as a valued boost to fisheries.

Trees provide critical benefits to streams, providing benefits for both water quality and for quality of life. Restoring streamside forests provides a big boost to efforts to improve Pennsylvania's streams.

Details for Late Winter Activities (February-March):

Checking tree shelters and stakes

Timing: Best done when site is easily traveled, after most frost-heaving is finished, before spring flush of tree growth occurs and while wasps are less active. Most landowners will want to do this in February or March before the busy spring season.

Leaning or downed tree shelters: This happens mostly from either broken ties or broken, rotted or frost-heaved stakes. Frost action in the soil (especially in wetter soils) commonly lifts many stakes. A few taps from a 2 lb hammer can prevent toppling, pinning and killing trees. Rodents enter downed shelters and quickly damage any tree inside. Frost-heaved shelters (with a gap between soil and shelter) also allow rodents to enter easily (much less a worry if routine herbicide applications are done). You can place a small board over the tube, avoiding tree as needed, and give it a few taps to drive the tube back into the soil. Be careful not to snap the ties while hammering, which can bind on the stake and break. In wetter soils, stakes can rot off before the trees are able to support the weight of the shelter. Rotten or otherwise damaged stakes must be replaced.

Nets: Nets help prevent bird entrapment in tubes, but can ruin many trees. Rotting birds typically kill trees, so keeping them out keeps both birds and trees healthy.

Nets should be removed from trees that will reach the nets that year. For fast growing trees, this can be done when trees are 18” or more from the tops of the shelters. If not removed in time, nets typically cause growth deformities in tree tips. These deformities will reduce growth rate and may reduce future timber value. If you miss a net, clip off any deformed tips below the deformity. Later removal of one shoot may be desirable if a double leader results.

Wasps: Large wasp nests can prevent trees from emerging past the nest or may lead to rotting conditions. Damage to tubes by mammals may be related to wasp nests, which bears and other animals eat. At the very least, it is recommended to remove large wasp nests. Doing so in spring before wasps are active will reduce risk of stings.

Ties: Shelters are fastened to stakes with ties. Over time they can become brittle and break. Replacing as needed with UV resistant ties (or suitable wire) will keep shelters upright and functioning. To reduce the risk of frost-heave lifting shelters, leave a little slack in the ties so that a rising stake is less likely to pull the shelter up by the tie.

Note: Streamside forests provide valuable habitat for many types of wildlife. Bears, birds, voles, wasps, and deer are all valuable parts of a healthy environment. For a brief time in the early years, effort to limit their use and damage of young trees is key. Otherwise, the intended wildlife benefits of a successful reforestation will not occur.

Replanting: Mark dead or missing trees for replanting. Be sure to fix the cause of losses before replanting. Consult your CREP staff regarding potential cost-share before replanting.

A successful buffer after eight years of growth

Details for Late Winter Activities (February-March):

Balancing risks in removing or leaving shelters on trees:

If your tree shelters lack a vertical perforated line (designed to allow shelter to split as tree grows) it is necessary to remove shelters by cutting them top to bottom (use care to avoid damaging the tree) and pulling them off. Remove when trees reach 1 ½ to 2 inches in diameter at top of tube.

If your tree shelters have a vertical perforated line (through 2007, only Tubex™ shelters had this feature) they can be left in place unless specifically causing damage.

Agency staff in Maryland are trying a different approach to shelters that must be removed. They are splitting the shelters with a knife, and leaving them in place for additional time. If trying this unproven method, be sure to cut the full length including the portion in the soil which is least degraded by UV light and the first place constriction will occur.

Explanation: As trees grow, shelters can become a problem for trees. The worst problem occurs when the broad flare at the base of the tree approaches tube diameter. Moisture and debris can collect in the tube, leading to disease and damage. Forestry professionals in the mid-Atlantic suggest that shelters with a vertical perforated line can be left on trees indefinitely unless they are causing specific problems. This is not conclusive for other types of shelters, and thus removal, or at least splitting, is required. However, removing shelters exposes trees to increased risk from voles, buck rub, herbicide and mowers. Deer and voles will damage trees up to about 4-5" diameter.

Herbicide and mowers can damage even larger trees. For sites with tubes lacking perforated vertical lines, there may be helpful middle ground - splitting the tubes with a knife and leaving them in place for additional time. Be sure to split the bottom-most portion that will first constrict the tree. Periodic monitoring can help avoid damage due to shelters of any type.

Timing: If removal is needed, it can be done as part of early spring check of tree shelters or as separate step later in spring, using the shelters to protect trees for an additional herbicide application before removal. Shelters delay hardening-off of tree tissue. If removed in fall, tender tissue may be harmed by winter temperatures. Buck rub and vole damage may be reduced for another year by removal in spring rather than fall.

Size: Remove or split all shelters that lack a vertical line of perforations when trees are 1 ½ to 2 inches in diameter at the top of the shelter. Trees will reach 1 ½" to 2" diameter at varying rates, depending on species and site conditions.

Stakes: **Regardless of type of tree shelter, any non-biodegradable stakes must be removed before tree growth entraps them. This is for health of trees and safety of future users of the site such as its potential timber products.** If shelters are removed, wooden stakes can be left in place and provide some benefits. If trees become droopy (typically happens only after leaf-out), fasten tree to stake with twine that will rot. Stakes may also deter buck rub. If located upstream of tree, stakes may also help in the event of flood. Stakes give limited protection from large debris, but will help reduce the amount of grassy debris collecting on the tree (which could lead to rot).

Periodic monitoring can help avoid tube damage.

Details for Spring Activities (April-May):

Applying herbicide around sheltered plants:

Routine herbicide use is probably the single most important step for a successful project. **Do not apply herbicides directly to the trees.** Tree shelters are a big help when spraying herbicide by preventing accidental application to the trees. A broad-spectrum herbicide such as a glyphosate product (ex. Roundup Pro™) provides excellent control of grass and broadleaf vegetation, and has no soil residual activity that could harm trees. Eliminating vegetation near trees is highly effective in preventing rodents (mainly voles) from damaging trees. This method is standard practice in orchards, nurseries and tree farms. Voles are a serious threat, and have damaged plantings on hundreds of sites to date. For more information on voles, see references on page 17.

When using any herbicide, follow all label instructions. The surfactant (sticking agent) in Roundup Original™ and many generic products is highly toxic to aquatic life. To reduce risk, use Roundup Pro™ (or similar product) and avoid overspray or drift onto open water. Rodeo™ (and equivalents) can be even safer if the surfactant (which must be added) chosen by the landowner is safe for aquatic systems. Knowledgeable sales staff can assist with choosing a surfactant.

If you apply glyphosate only, you will need to apply it repeatedly during the growing season to maintain a weed-free (and vole-free) area. To extend the effectiveness of herbicide applications, landowners should consider adding a pre-emergence herbicide. Pre-emergence herbicides kill weed seedlings as they germinate or soon thereafter, thus extending the time between spray applications while boosting survival and growth rates.

Use of pre-emergence herbicides increases the complexity of applications. If you plan to use pre-emergence products, you will need to calibrate your sprayer to assure a proper dosage, or hire a professional to do the application (your CREP staff person can direct you to any number of such professionals). There are many publications to show you how to calibrate a sprayer, such as "calibrating a backpack sprayer" at **http://www.bae.ncsu.edu/programs/extension/agmachine/turf**. Be prepared to do math if you want the benefits of using pre-emergence herbicides.

The following list of options begins with simpler, lower risk methods and moves to methods with more risk to trees (if misapplied), but increased control of unwanted vegetation. In each case, trade names are only examples of the active ingredient. Several of the products below have equivalents.

Level 1: Roundup Pro at 2 to 4 quarts/acre (or equivalent)
Level 2: Roundup Pro at 2 qt/ac + Surflan at 2 qt/ac (or equivalent)
Level 2: Roundup Pro at 2 qt/ac + Pendulum AquaCap at 3.2 qt/ac (or equivalent)
Level 3: Roundup Pro at 2 qt/ac + Surflan at 2 qt/ac + SureGuard at 8 oz/ac (note: SureGuard is a dry product)
Level 3: Roundup Pro at 2 qt/ac + Surflan at 2 qt/ac + Goal 2XL at 1.5 qt/ac

Comments:
Level 1: No pre-emergence control. Will require repeat applications for full control.
Level 2: Extends control, especially for grasses (which are vole habitat).
Level 3: Extends control to delay regrowth of both grasses and broadleaf plants (including most noxious and invasive weeds). SureGuard and Goal can injure trees if they contact swollen buds or leaves.

Don't be overwhelmed by the options. Choose a plan that works for you and follow it. While not ideal for maximum growth, twice a year application of glyphosate alone (spring and late summer/early fall) should provide reasonable protection from voles on many sites. Clearly, any regrowth between applications can reduce tree growth rates and can harbor voles. For sites with serious vole problems and for anyone wanting maximum growth rates, additional applications of glyphosate alone (up to 1x/month) or use of glyphosate with pre-emergence herbicides can provide real benefits. If a pre-emergence herbicide will be used, calibrating your sprayer is required to assure safe and effective dosage. Calibration will also save you money when applying glyphosate by avoiding over-application typical when spraying without calibration. Hiring a professional is another option. A third application of glyphosate alone, applied June-July, is another option that avoids the need to calibrate a sprayer, yet helps assure strong survival and growth rates. Whatever option is chosen, the key is to follow the plan and get the herbicide applied to assure survival and growth.

You can easily apply herbicides with a backpack sprayer with a spray wand that has a single, off-center, flat fan spray tip. With properly maintained shelters to keep spray off the trees, you can spray each row of trees with a single pass. You can minimize the unsprayed "shadow" behind each shelter by doing a quick wiggle of the spray wand as you pass each shelter.

Best results come from applying spray to a continuous strip 4' wide, centered on the row of shelters. This is especially the case if mowing will be done. Bumping shelters and stakes with mowing equipment will lead to broken stakes, loose shelters and tree losses. The continuous sprayed strip eliminates the vegetation where the mower cannot easily reach. Mowing remaining areas provides complete vegetation management on the site. Good results also come from 4-6' diameter spots sprayed around each shelter. **Avoid applying herbicides to any part of desired plants – most herbicides will kill trees. Follow all label directions.**

Complete Details:

A Seasonal Summary of Activities

Details for Summer Activities (June-August):

Managing vegetation that was not sprayed in spring with broad-spectrum herbicide:

This means the vegetation in areas other than right around tree shelters. There are two common tools for this work—herbicide treatment or mowing.

Use of herbicides to control targeted species:

There are many different noxious and invasive weeds. The best control methods often vary by species. Help in identifying problem weeds can be found at **http://www.dep.state.pa.us/dep/deputate/watermgt/wc/subjects/streamreleaf/Docs/Invasive%20Plants.pdf**, or your local CREP staff can direct you to resources. In general, avoid using broad-spectrum sprays that also kill grasses and thus require repeat applications over time. (An exception is for the areas immediately next to trees as described above where repeated applications are planned.) Weeds prosper on bare soil. Grasses help suppress noxious and invasive weeds. Consult a conservation professional and/or the following reference. The Maryland Department of Natural Resources Forest Service *Riparian Forest Buffer Design and Maintenance (52 pages)* is the most comprehensive and recent (2005) publication on forest buffer maintenance for the mid-Atlantic region. It has specific herbicide recommendations for controlling noxious and invasive plants in appendices c and d. Access it at **http://www.dnr.state.md.us/forests/download/rfb_design&maintenance.pdf**. Or call **1-410-260-8509** to request a hard copy.

Mowing:

Mowing is permitted in CREP buffers during the first 2-3 years. Mowing helps control competing vegetation, invasive plants and rodent damage to trees. Unfortunately, mowing also delays natural tree regeneration. Regeneration varies by region and by site, with little potential on grassy sites that lack strong seed sources within a hundred yards. If mowing is not needed to control voles, omitting mowing may increase natural tree regeneration, which mowing would delay. Mowing should not be viewed as an alternative to broad-spectrum herbicide use around shelters, but as an effective companion. Mowing is especially helpful in the first two or three years. It should be done at least twice in the growing season, more often if needed to control competition or avoid seed formation by noxious invasive species. Mowing helps trees by exposing rodents to increased predation. A late season mowing will provide added control of rodents by reducing cover during the winter. Mowing may not be effective against Canada thistle. Mowing extensive areas of CREP buffers is not allowed beyond year three, unless approved by Farm Service Agency's county committee for specific reasons such as controlling vole populations or noxious weeds.

Details for Fall Activities (For Fall and "As Needed" in Any Season):

Details for Fall:

The above sections (April-May and June-August) have information that applies to late summer and fall as well. Please note that spring herbicide application around shelters would benefit from including a pre-emergent to prevent weed regrowth after spraying. In late summer or fall applications, the pre-emergent is less useful and can be omitted. It would provide control for winter annual weeds, but these are not typically a problem.

Fall is also the right time to consider additional steps to avoid vole damage over winter. A late fall mowing removes cover for voles and increases predation. Mowing is allowed in CREP projects during the first 2-3 years. Additional mowing up to year five may be approved if vole problems are severe. If not needed for vole control, omitting mowing may increase natural tree regeneration – particularly in northern PA where that potential is higher. Extreme vole problems may justify the use of an economical rodenticide containing zinc phosphide, applied by a professional. Consult your CREP project staff to discuss mowing or rodenticides.

Details for "As Needed" Activities:

Following Floods:

Trees trapped in shelters knocked down by floods will generally die even without rodent damage, which also increases in down tubes. It is unclear how long trees survive if pinned down, but getting tubes and trees upright sooner vs. later will help. Within a week of any flood, check that shelters and stakes are upright and sound. Also check for damage to any fences, crossings, etc. as applies to your project.

Survival check and possible replanting:

Late summer or fall is a good time to check plantings for overall health and success. Noting problems early will allow time to remedy them vs. expensive replanting. Your local CREP staff can help troubleshoot or you can consult the MD DNR maintenance guide noted above. Page 34 of the MD DNR guide offers help on identifying and solving problems. Shelters on apparently dead trees should be left in place. Trees that appear dead may resprout from the root. You may also want to drop a few seeds of native trees in the tube with some weed-free soil such as potting mix, or you may simply replant. Before replanting consult with your CREP staff about possible cost share. Also, before any replanting, be sure to fix the problem that caused the mortality the first time. Often, this is voles. Regular use of herbicides and mowing are key control methods. Rodenticides containing zinc phosphide may also be practical and economical in dealing with **extreme** cases of rodent damage where conscientious herbicide use around tree shelters has not kept voles from damaging plantings. Check label restrictions and always follow label directions.

Farmers with livestock appreciate CREP which pays for high quality fencing, stabilized stream crossings and watering systems (alternatives to the creek) as part of buffer projects. Here is a watering trough with stabilized apron

CREP partner organizations include:

USDA Farm Service Agency
USDA Natural Resources Conservation Service
PA Department of Environmental Protection
PA Game Commission
Chesapeake Bay Foundation
Western Pennsylvania Conservancy
Center for Rural Pennsylvania
Ducks Unlimited
PA Association of Conservation Districts
PA Department of Agriculture
PA Department of Conservation and Natural Resources
PA Fish and Boat Commission
Partners for Fish and Wildlife
State Conservation Commission

For more information on CREP, call 1.800.941.CREP
or visit www.creppa.org or www.cbf.org/CREP

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College of Agricultural Sciences
http://vm.cas.psu.edu

Conservation Reserve Enhancement Program (CREP)
Technical Assistance Series

Factsheet
5

Weed Management in Riparian Forest Buffers

Riparian forest buffers (RFBs) provide improved water quality by reducing stream temperatures and supplying the food source for aquatic macroinvertebrates; fostering wider, slower streams with more biologically active streambed surface area; and creating a more diverse plant and soil community that effectively intercepts and utilizes suspended soil and nutrients coming from upland surface flow. RFBs also provide the foundation for diverse wildlife habitat. However, without effective weed control during establishment and ongoing maintenance early in the 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 existing cool-season grass pastures or hay fields (the 'green death').

Effective weed control reduces competition (increases tree growth), reduces cover for pests such as meadow voles, and makes it easier to properly inspect 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 (two would be even better). Having weeds under control in the fall prior to a spring planting provides better control of perennial species, allows you to plant earlier in the spring, and makes planting much easier (Figure 1).

Figure 1. Preplant 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). Maintenance treatments to keep the tree rows clean will not eliminate creeping perennials. Effective weed control in riparian forest buffer plantings requires both maintenance applications to provide vegetation-free area around each tree, and ongoing spot treatments with glyphosate to prevent perennial species from colonizing those bare areas.

Two basic approaches are to eliminate the existing groundcover and replace it with a less competitive groundcover, or establish weed free strips for the planted trees in the existing groundcover.

Where the existing cover is cool-season, forage grasses such as tall fescue, timothy, orchardgrass, or reed canarygrass, long term success of the RFB may be easier to achieve if you remove the grasses entirely and replace them with a forage legume such as white clover.

If you choose to establish weed-free strips, establish 4- to 6-foot wide strips. The wider the weed-free strip, the better the opportunity for fast tree growth. Wider 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.

We recommend using a *glyphosate* herbicide (the active ingredient in 'Roundup' products) 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 species such as multiflora rose need to be treated

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This publications development and printing was supported in part by a grant from the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Harrisburg, PA. This work was sponsored by the Pennsylvania Association of Resource Conservation & Development (RC&D) Councils and U.S. Department of Agriculture, Farm Services Agency (USDA-FSA) Harrisburg, PA.
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prior to fall color and leaf drop. A later-season application improves control of perennial species and limits the opportunity for other weeds to germinate.

An additional issue to consider is whether there are problem species on site prior to planting. Creeping perennial species such as Canada thistle, crownvetch, Japanese knotweed, or Japanese honeysuckle should be aggressively treated prior to planting (Table 1). If you are going to establish strips, you should spot treat these species *wherever* they occur in the buffer. If you leave these species between the rows of trees, they will spread into the tree rows (Figure 2). For problem species, the fall *glyphosate* application should be the second application - the 'clean up' treatment after a late-spring or summer application.

Weed Control After Planting

To ensure rapid growth of your planted trees, maintain the weed-free strips in your tree rows. The best way to maintain a weed-free condition is application of *glyphosate* plus a residual herbicide (e.g. *pendimethalin*) to the tree rows in the spring and early fall, plus spot-treatment as needed in the summer (Table 1). The residual herbicide prevents establishment of weeds growing from seed. Sprayer calibration is necessary for any application, especially if you use residual herbicides. If you maintain weed-free spots instead of rows, it is easier to calibrate if you use a flat-fan spray tip and make your spots square instead of round. Residual herbicides obviously increase the cost of application, but they will reduce the total number of applications and save your most valuable resource - time.

Effective weed control early in the planting will shorten the time between establishment and 'forest', reduce maintenance later in the planting, and improve the habitat value and water quality benefits of your riparian forest buffer by allowing them to take effect sooner.

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.

no.	timing/targets	product examples	application rate (product/acre)	comments
1	**Summer pre-plant** control problem perennials the season before planting	'Stinger' or 'Milestone VM' or 'Rodeo'	8 oz/ac 7 oz/ac 3 quarts/ac	'Stinger' (*clopyralid*) or 'Milestone VM' (*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 Japanese knotweed or problem woody species in early July. Regrowth should be treated with *glyphosate* in the fall (see Treatment 2), as *clopyralid* or *aminopyralid* may persist until spring and injure some tree species.
2	**Fall pre-plant** control of existing vegetation with glyphosate	'Rodeo'	1.5 to 3 quarts/ac	'Rodeo' (or one of its *many* equivalent products) is a concentrated form with 4 lb/gallon of glyphosate acid (or 5.4 lb/gallon of the salt). 'Rodeo' does not contain surfactant so you must add one to the spray mixture. This treatment can be used to establish 4 to 6 ft-wide weed-free strips, or to remove perennial grasses from the entire site. This application should be a follow-up treatment for earlier-treated problem species such as Canada thistle, crownvetch, or Japanese knotweed (see Treatment 1).
3	**April-May** maintain weed-free strips or spots around tree shelters.	'Rodeo' + 'Pendulum AquaCap'	1 to 1.5 quarts/ac + 2 to 3 quarts/ac	A *glyphosate* application at this time will control cool-season grasses that are present, as well as winter annuals, biennials, and seedlings. The addition of 'Pendulum' (*pendimethalin*) will provide residual control of annual weeds. There are several pendimethalin products available. The herbicides *flumioxazin* (SureGuard) or *oryzalin* (Surflan AS) are alternatives to *pendimethalin.*
4	**As Needed** spot treatment of weeds	'Rodeo'	1 to 1.5 quarts/ac	If only *glyphosate* is used, you will probably need to do this 2 to 4 times per season to prevent weed canopies from forming. If weeds are allowed to grow large before treatment, the residue may be sufficient to provide cover to voles.
5	**September-October** maintain weed-free strips or spots around tree shelters.	Treatment 3	see above	A fall application with *glyphosate* plus a residual herbicide will suppress perennial weeds and prevent establishment of winter annuals and biennials. A spring-and-fall residual herbicide program will reduce the need to spot treat.

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The authors wish to thank Phil Pannill, Regional Watershed Forester, Maryland Dept. of Natural Resources-Forest Service for his technical input and critical review of this document.

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Managing Japanese Knotweed

Japanese knotweed (*Polygonum cuspidatum*) is an imposing herbaceous perennial that is commonly called 'bamboo'. It grows in dense patches to heights of 10 feet, on sites ranging from strip mine spoil to shaded streambanks. It is native to Asia, and was originally introduced to the U.S. as an ornamental in the late 1800's. In CREP plantings, knotweed will overrun riparian buffer tree plantings as well as grassland areas. Knotweed offers little habitat value other than cover, and greatly degrades the wildlife habitat value of your plantings.

Unique Among Weeds

There is no mistaking a well-established stand of Japanese knotweed for any other plant in PA except for its close kin, giant knotweed (*Polygonum sachalinense*). Both knotweeds grow in tall, dense stands that shade out other vegetation. Both have large, hand-sized, heart-shaped leaves, and jointed, hollow stems that look like bamboo. Knotweed is not a true bamboo (a woody, evergreen grass), but is a relative of plants such as buckwheat, smartweed, and the PA Noxious Weed mile-a-minute vine.

Figure 1. The root of the problem - the rhizomatous crown of Japanese knotweed. The primary rhizome is shown extending out of the bottom of the crown and is almost 2 inches in diameter. Several new rhizomes that will extend horizontally and form new crowns are visible. Swollen buds that will become this year's stems are emerging from the mat of fine roots at the base of last year's stems (clipped).

Figure 2. Knotweed will grow almost anywhere, but it is an acute problem in riparian settings. Knotweed prevents establishment of native trees and shrubs, reduces access to the water, and its coarse rhizomes do not stabilize the banks as well as the finer roots of trees or grasses.

Knotweed stems emerge in late-March to mid-April, depending on soil temperatures, and begin a burst of rapid growth. In a warm spring, knotweed can be 6 feet tall before May 1. Flowering usually occurs in July, and the seeds mature in August and September.

As frightening as the above ground growth of knotweed is, it is the rhizome system that is the real problem. A rhizome is an underground stem that gives rise to roots, aerial stems, and more rhizomes (Figure 1). Knotweed rhizomes spread vigorously, expanding the size of the knotweed stand. Rhizomes are also very durable. A very small piece of rhizome that is moved to another site will give rise to a new plant. Knotweed on streambanks spreads downstream as the bank erodes and pieces of rhizome break off and float downstream to take root elsewhere (Figure 2).

Knotweed Control Measures

To control knotweed, you have to control the rhizome system. To bring a knotweed infestation to a manageable level, you need to start with multiple treatments, and it will take at least two years.

The multiple treatment approach relies on depletion of the reserves stored in the rhizomes in the late spring, and

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injury through use of systemic herbicides in the late summer.

A late summer application of the herbicide *glyphosate* is one of the most effective treatments available. Late in the growing season is when the knotweed canopy is sending sugars from photosynthesis to the rhizomes for storage. *Glyphosate* moves through the plant into the rhizomes with these sugars. It also has the advantage of having no soil activity. This reduces the risk of injury to non-target plants through root absorption, particularly in riparian forest buffer plantings. If *glyphosate* contacts the foliage of non-target plants, they will be injured or killed.

There are many *glyphosate* products available. When working in riparian settings, a formulation labeled for aquatic applications is the best choice. The best-known example of this type of *glyphosate* product is 'Rodeo'. There are dozens of products equivalent to 'Rodeo'. There are two features that distinguish 'Rodeo' from products labeled only for terrestrial use, such as 'Roundup Pro'. 'Rodeo' has no surfactant, so you must add one; and 'Rodeo' is 1/3 more concentrated than 'Roundup Pro', so you use only 3/4 the product to achieve the same dose of *glyphosate*. To control knotweed, you would apply 128 oz/acre of 'Roundup Pro', or 96 oz/acre of 'Rodeo'.

By using a *glyphosate* product and surfactant labeled for aquatic settings, you reduce the risk of injury to aquatic organisms if you accidentally spray the water. *Glyphosate* is relatively non-toxic to most aquatic organisms, but the surfactant in the 'old' Roundup (now sold as 'Roundup Original') was highly toxic to aquatic organisms.

Using 'Rodeo' does not permit you to treat weeds in the water or allow you to directly spray the water. In Pennsylvania, an application directed to the water requires a permit from the PA Fish and Boat Commission. Using an aquatic-labeled product *close* to water simply reduces the risk to non-target aquatic organisms.

The late summer *glyphosate* application is much easier if you mow or cut the knotweed around June 1. The regrowth after cutting at this date is much shorter than the original growth - it's 3 to 4 feet tall rather than the 6 to 10 feet of growth that was there at cutting. This shorter canopy is much easier to treat using a backpack sprayer. It's less work, and you can be much more selective in the application if there is desirable vegetation among the knotweed.

If you don't cut the knotweed first, it should be treated with glyphosate in late July, and then spot treat any regrowth or missed stems in early September.

Follow-up treatment in the second year is *essential*. You will probably observe 90 to 95 percent reduction in the stand, but if you don't continue to treat it, it will come back and you will need to start over. Wait until July of the second year for the follow-up treatment. If you treat earlier, there is less translocation of the herbicide to the rhizomes.

Knotweed management is more complex if it's growing among planted trees (CP 3A and CP 22 practices). You will need to cut the knotweed earlier and more often to prevent it from canopying over your tree plantings. As with the single mowing approach, allow at least six weeks after the last mowing before you spot treat the knotweed with glyphosate in the late summer.

You may never eradicate knotweed from your property, but you can definitely keep it at a manageable level so it does not impact the habitat value of your plantings.

Table 1. Successful control of Japanese knotweed requires multiple applications the first season, and multiple seasons of control. A late summer application of glyphosate is the key to maximizing injury to the root system. This application is much easier if you mow or cut the knotweed around June 1 because the regrowth will be much shorter than the 6 to 10 foot canopy you started with.

treatment	product rate (oz/ac)	comments
Rodeo plus added surfactant	96 oz/100 gal	Rodeo is one of many *glyphosate* products that can be used for terrestrial, wetland, or aquatic applications. This mixture is for spot treating knotweed on a spray-to-wet basis. If you are following a June 1 mowing, wait at least six weeks before applying. If you are not going to cut the knotweed first, then plan on spraying twice. Make the first application between mid-July and early-August, then make a follow-up application by mid-September. Knotweed is frost-sensitive, so it is important to make the second application prior to frost. The advantage of mowing first (see below) is that the regrowth will be much shorter. You can easily treat this with a backpack sprayer. If you are treating uncut knotweed, it will be over your head, and require a spray-to-wet application. We don't recommend other herbicides because *glyphosate* is effective, has no soil activity, and is inexpensive. There will be some resprouting the following season. Wait until at least July 1, then spot-treat. After the second season plan on at least one annual application to any knotweed sprouts.
mowing/cutting	- -	Mowing by itself is not a useful control technique. However, mowing around June 1 will eliminate the top growth, deplete energy reserves in the rhizomes, and result in regrowth that is only 3 to 4 feet tall. This shorter regrowth is much easier to treat with herbicides than full-height knotweed. If knotweed is growing among planted trees, you will have to cut it more often, starting earlier in the season to prevent it from growing over the trees. Spot mowing may be necessary in grassland plantings.

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Factsheet
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Managing Purple Loosestrife

Purple loosestrife (*Lythrum salicaria*) was first brought to the U.S. from Eurasia by early settlers and grown for its medicinal uses, ornamental qualities, and pollen-bearing capabilities (beekeepers). A major route of entry into U.S. waterways was unintentional transport in ship ballast. Known for its striking and prolonged floral display, this plant is still popular with gardening enthusiasts. But don't let its beauty fool you! Purple loosestrife is listed as a Noxious Weed in PA, and for good reason. It threatens our wetlands and waterways with dense, monotypic stands that eliminate biodiversity, and have little value as wildlife habitat.

A Closer Look At Loosestrife

Loosestrife is an herbaceous perennial that thrives as an emergent plant along shorelines and in ditches, but also grows in sites that are not saturated (Figure 1). Typically this plant is found in full sun, but can tolerate some shade.

The most recognizable feature of loosestrife is the lavender flower spike that persists for weeks on top of the 2 to 7 foot tall stems. Loosestrife is characterized by a square stem; and opposite or whorled, narrow leaves with smooth margins that attach directly to the stem (no petiole, or leaf stalk) (Figure 2). It has a strongly developed taproot with major branching that becomes woody and effectively anchors the plant. The multiple flowering stems and abundance of flowers are responsible for the tremendous amount of seed this plant produces. Seed production estimates vary, but over 100,000 seeds per plant is realistic.

There are several desirable plants of wet areas that look similar to loosestrife. Fireweed (*Epilobium angustifolium*) has narrow leaves and a prominent spike-like flower head, but the leaves *alternate* on the stem. Blue vervain (*Verbena hastata*) and American germander (*Teucrium canadense*) have square stems and opposite leaves with purplish flower spikes, but their leaves are *stalked* and have *toothed margins*. The blazing stars (*Liatrus* spp.) have pink-to-magenta flower spikes and narrow, stalkless leaves, but the leaves *alternate* on the stem.

Figure 1: Purple loosestrife occupying drainage swales in a roadside setting. This plant likes 'wet feet' and takes advantage of sites that are occasionally flooded.

Figure 2. Purple loosestrife is characterized by a square stem and opposite or whorled, narrow leaves that attach directly to the stem without a petiole, or leaf stalk. The magenta flower spikes bloom for an extended period of time and ripen from the bottom-up.

Purple loosestrife spreads readily. The buoyant seeds can be distributed over great distances by water. Wind, animals, and people are also responsible for the movement of these tiny seeds. Seeds are highly viable and can lie dormant in submerged soil for years and develop during dry periods when water levels recede. The crown atop the branched taproot continues to expand, producing more stems each growing season.

Control Strategies

Although it's typically an aquatic or wetland plant, loosestrife will grow under a variety of soil conditions from wet to dry. Plants usually occur on terrestrial sites due to

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receding water levels or expansion of stands from nearby wet areas.

Purple loosestrife can be difficult to control because it usually occurs in or at the fringe of wetland or aquatic settings. While these are not insurmountable obstacles, they are beyond the 'comfort zone' of many applicators and land managers.

Small infestations can be dealt with by hand pulling. You would only want to attempt this in saturated soil, as loosestrife is well rooted. It is imperative to remove as much of the root system as possible, as large root pieces are capable of generating new shoots.

Mowing or cutting the above ground portions of the plant can prevent flowering and seed set. If you are going to cut once, wait until flowering begins and cut to the ground. This will not significantly injure the established plant, but if you can prevent additional seed, you can begin to limit the expansion of the infestation.

Biological control attempts have been undertaken by the PA Department of Agriculture and USDA-APHIS, who are releasing the *Galerucella* beetle in selected sites to control loosestrife. Biological control is an appropriate approach for larger scale infestations, but not practical at the individual landowner level. The beetles are expensive, the results are variable, and the potential effect is not as quick as more direct approaches.

Purple loosestrife can be effectively controlled with herbicides, but its proximity to water and the surrounding vegetation will determine your product choices.

To apply herbicides to loosestrife in standing water or saturated soil (these constitute 'waters of the Commonwealth') you must be a certified applicator in the aquatics category, and apply for a permit from the PA Fish and Boat Commission. If the site is not saturated at the time of application, no permit is required. Therefore, time your applications to drier periods.

The aquatic and near-aquatic sites also limit the herbicides available. Purple loosestrife can be controlled with the herbicides 'Accord Concentrate' or 'Renovate 3'. These herbicides can be used in wetland areas that are currently dry. Either must be applied to the foliage of plants. Ideally the treatment is performed at bud-to-early-bloom stage. This will prevent seed development. These treatments should be spot-applied, using a backpack sprayer or a hydraulic sprayer equipped with a handgun, mounted on a truck, tractor, or ATV.

Avoid spraying desirable plants. While not root absorbed, any errant spray contacting foliage of desirable plants can harm them. 'Accord Concentrate' is *glyphosate*, which is non-selective, and will injure all contacted plants. 'Renovate 3' is the 'broadleaf' herbicide *triclopyr*, which reduces risk of injury to grasses, sedges, and rushes.

It will be necessary to follow-up the initial treatment on an annual basis. In heavy infestations, it is likely you will miss some plants. Once loosestrife has infested a site, loosestrife seed will continue to germinate for several years after the last established plant was removed. Also, if loosestrife is on adjacent properties, there will always be a nearby source of a new infestation.

As troublesome as this plant can be, it is manageable if detected and dealt with early. It is important to realize that the best you can hope for is to transition from a control program to a maintenance program. You never get to say 'I won' and turn your back on purple loosestrife.

Table 1. Managing purple loosestrife is limited to hand pulling or postemergence herbicide application. Hand pulling can be useful for limited plant numbers in saturated soils, where pulling is easier. The herbicides 'Accord Concentrate' or 'Renovate 3' are labeled for aquatic or wetland sites. You may not apply herbicide directly to water without a pesticide applicator's license in the aquatics category and a permit from the PA Fish and Boat Commission. You may apply labeled herbicides to seasonally dry wetland or aquatic sites without a permit. We recommend using herbicides labeled for aquatic sites to minimize risk in case of inadvertent application to nearby surface waters.

treatment	application rate	comments
hand pulling	- -	This practice is useful for small infestations. Removal of the plants is easier in saturated soils. It is imperative to remove the entire root system or new stems will develop from root fragments.
Accord Concentrate	1.0 to 1.5% spot treatment	'Accord Concentrate' (equivalent to 'Rodeo') is one of many *glyphosate* products labeled for aquatic or wetland sites. This herbicide is non-selective with no soil activity. This treatment must be targeted to loosestrife only, as spray onto the foliage of desirable plants will injure or kill them. Apply as a 'spray-to-wet' treatment during bud-to-early-bloom stage to prevent seed production. Add a non-ionic surfactant according to label directions.
Renovate 3	1.0 to 1.5 % spot treatment	'Renovate 3' contains the active ingredient *triclopyr,* and is labeled for aquatic and wetland sites. *Triclopyr* is a 'broadleaf' herbicide and will cause minimal injury to adjacent grasses, sedges, and rushes. Spot treatments should thoroughly wet the foliage, just before the point of run-off. Apply during bud-to-early-bloom stage to prevent seed set. Add a non-ionic surfactant according to label directions.

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Managing Multiflora Rose

Multiflora rose (*Rosa multiflora*) is an invasive shrub that can develop into impenetrable, thorny thickets. It has the distinction of being among the first plants to be named to Pennsylvania's Noxious Weed List. This plant was introduced from Asia and widely promoted as a 'living fence' to provide erosion control and as a food and cover source for wildlife. Multiflora rose does provide cover and some food value with its fleshy fruit (called 'hips'), but its overall effect on habitat value is negative. Multiflora rose is very aggressive, and crowds planted grasses, forbs, and trees established on CREP acres to enhance wildlife habitat.

Telling Bad Rose from Good

There are least 13 species of rose that that grow 'wild' in Pennsylvania, and most of them are desirable in a wildlife habitat planting. Multiflora rose is readily distinguished from other roses by two features - its white-to-pinkish, five-petaled flowers occur in branched clusters, and the base of the leaf where it attaches to the thorny stem is fringed (Figure 1). Memorial rose (*Rosa wichuraiana*) is the only other species with a fringed leaf base, but its flowers are borne singly.

Individual plants can easily grow to more than 10 feet tall and 10 feet wide. When they grow singly, multiflora rose plants have a mounded form because of their arching stems (Figure 2). When the tips of the stems touch the ground, they can take root (called *layering*) and form a new crown. If near trees, the rose behaves almost like a vine, and can grow 20 feet into the tree.

Figure 1: Two features that distinguish multiflora rose from the other rose species that grow in Pennsylvania are the flowers that appear in branched clusters, and the fringed base of the compound leaf (inset).

Figure 2. Multiflora rose in whole-plant view, with its mounded form from arching stems, and cascades of showy, white-to-pinkish blooms.

Multiflora rose breaks bud early in the spring, quickly developing a full canopy of compound leaves that have seven to nine leaflets. Peak bloom is in early June. Birds and browsing animals eat the fleshy, bright red hips and the seeds pass through their digestive systems intact. These seeds can remain viable in the soil up to 20 years.

Multiflora Rose Control Measures

A single-method control approach will not eradicate a multiflora rose infestation. Like other invasive species, a combination of control tactics is necessary to manage this plant.

Finding multiflora rose early is the best way to simplify control. Controlling rose as small, scattered plants is much easier than trying to eliminate established thickets. Vigorous, competitive vegetation greatly aids control as well.

Brush mowers, or similar equipment can be used to cut and pulverize the top growth of established plants. Mowing alone will not control multiflora rose, but it is a great way to make it easier to treat the plant with herbicides. Top growth of smaller plants can be removed with conventional mowing equipment.

Herbicides can be applied to rose foliage or to the stems. Applications to foliage can be spot-applied with a hydraulic sprayer with a handgun, mounted on an ATV, tractor, or truck; or a backpack sprayer. In a grassland planting, treatments of the herbicide Cimmaron (*metsulfuron*) mixed at

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This publication's development and printing was supported in part by a grant from the U.S. Department of Agriculture, Natural Resources Conservation Service (USDA-NRCS) Harrisburg, PA. This work was sponsored by the Pennsylvania Association of Resource Conservation & Development (RC&D) Councils and U.S. Department of Agriculture, Farm Services Agency (USDA-FSA) Harrisburg, PA.
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1 oz per 100 gal of spray solution will be very effective. Apply this solution uniformly to the rose foliage, so that it is visibly wet but the solution is not running off the foliage. Avoid treating the surrounding vegetation. *Metsulfuron* is extremely effective against rose, but it will cause injury to adjacent grasses if you contact their foliage during the application.

In tree plantings, there is some risk of injury by *metsulfuron* through root absorption, so a *glyphosate* (Roundup Pro) treatment is a better choice. If either *metsulfuron* or *glyphosate* is accidentally applied to the foliage of the trees, severe injury will result. When treating multiflora rose, you should also target any other undesirable woody species in your CREP plantings. *Metsulfuron* in combination with *glyphosate* provides an effective treatment against a wide spectrum of woody and herbaceous species (Table 1).

A more selective, but more expensive treatment is a foliar application of the combination of *triclopyr + 2,4-D* (Crossbow). Apply Crossbow as a one percent mixture (one quart in 25 total gallons of spray solution) to multiflora rose in grassland plantings on a spray-to-wet basis. The ingredients in Crossbow will not injure adjacent grasses. This treatment is more likely to cause injury if used in tree plantings than a glyphosate treatment.

The herbicide *triclopyr* (Pathfinder II) can be applied to multiflora rose stems to kill the top growth, either after cutting, or to intact plants as a basal bark application. For either application, apply the ready-to-use Pathfinder II to wet the stems, but not to the point of run-off.

Stump treatment is a very effective way to enhance a mowing treatment. Pathfinder II is oil-based, and can be applied after a mowing to prevent regrowth. The oil solution penetrates the bark of the rose stems and kills the tissue underneath, preventing sprouts. You can apply this treatment with a squirt bottle, but if you have a lot of crowns to treat, it's much easier to use a backpack sprayer.

When it's acceptable to leave the top growth of the rose in place, and when you can actually access the base of the plant with a spray wand, you can control multiflora rose with a basal bark treatment. Apply Pathfinder II to the lower 12 inches of all the stems, completely wetting each stem, but avoiding run-off. Basal bark treatments are best applied from January up to the point of fall coloration.

After making your initial control applications, it is essential to follow-up. If you don't, multiflora rose will re-establish. Where rose was dense, it is unlikely you were able to thoroughly treat all the plants while trying not to get tangled in the thorny stems. When spot treating, it's easy to miss a few stems. When stump treating after mowing, it's almost impossible to find all the crowns that need to be treated. Don't get complacent. If you had a significant infestation, only ongoing maintenance will prevent it from returning.

Table 1. You can effectively treat multiflora rose with herbicides applied to the foliage or to the stems. Metsulfuron (Cimarron) or the combination of triclopyr + 2,4-D (Crossbow) are very useful in grassland plantings, but glyphosate (Roundup Pro) poses less risk of non-target injury through root absorption in tree plantings. Triclopyr (Pathfinder II) is effective for treating stumps (stubble) or the stems of intact plants.

method	treatment	application rate (herbicide/total mix)	comments
foliar	Cimarron	1 oz/100 gal	Cimarron (*metsulfuron*) is extremely active against multiflora rose. Thoroughly spray all the foliage to the point of being wet without running off. Add surfactant according to label directions. *Metsulfuron* is somewhat selective at this rate, but avoid treating adjacent grasses, and limit this treatment to grassland plantings.
foliar	Roundup Pro	128 oz/100 gal	Roundup Pro (*glyphosate*) is not as active against rose as *metsulfuron*, but is a safer option in tree plantings because it has no soil activity. If you have a lot of problem woody species, tank mix this treatment with Cimarron at 0.5 oz/100 gallons for broad spectrum brush control in grassland plantings.
foliar	Crossbow	1 gal/100 gal	Crossbow contains *triclopyr + 2,4-D*, and is safer to grasses than Cimarron, but more expensive. Avoid using this treatment in tree plantings. Crossbow can potentially injure trees through root absorption, or volatilization during high air temperatures.
mow and stump treat	Pathfinder II	ready-to-use	Use when mowing is practical. After cutting, apply Pathfinder II to the point of just wetting the remaining stubble. This treatment can be applied year-round.
basal bark	Pathfinder II	ready-to-use	This application is only feasible when you can access the base of the plant. Apply Pathfinder II to completely wet the lower 12 inches of the stems, without causing run-off. This is best applied from January up to fall color.

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Conservation Reserve Enhancement Program (CREP)
Technical Assistance Series

Factsheet
1

Managing Canada Thistle

Canada thistle (*Cirsium arvense*) is a perennial that has plagued farmers in America since European settlement, and is a Noxious Weed in Pennsylvania. It is adapted to a wide range of soil conditions, and spreads vigorously by wind-borne seeds and by way of its extensive, creeping root system.

Not Your Average Thistle

The key to Canada thistle's weediness is its root system. The roots of Canada thistle spread aggressively, and can increase the width of a thistle patch 6 to 10 feet in a season. As the root system spreads, it gives rise to new shoots. If left unchecked, a single Canada thistle plant eventually turns into a patch containing thousands of stems.

Although thistle may serve as a food source for some insects and provide seed to some bird species, it has a negative impact on wildlife habitat quality in your CREP planting. Canada thistle grows in dense patches and reduces the vigor and establishment of grassland plantings and riparian buffers that are planted to improve wildlife habitat.

The plants you are most likely to confuse Canada thistle with are other thistles. The common, weedy thistles in PA include bull thistle (*Cirsium vulgare*), musk thistle (*Carduus nutans*), and plumeless thistle (*Carduus acanthoides*). All these thistles grow erect, have spiny foliage, and bear prominent pink flowers that produce seed attached to downy 'umbrellas' that carry them on the wind, much like dandelion seed.

Figure 1. A flowering stem of Canada thistle showing flowers ranging from the pea-like bud stage to nearly ready to disperse ripened seed. The stems of Canada thistle are smooth, while the other common weedy thistles in Pennsylvania have spiny 'wings' on their stems.

Figure 2. A 'patch' of Canada thistle emerging in the spring. A patch is often one plant, with hundreds or thousands of stems arising from a shared root system.

Bull, musk, and plumeless thistles are biennials. They have a single, strongly-taprooted crown, and reproduce only by seed. You can distinguish Canada thistle from the biennial thistles because it has small flowers (less than 1 inch) and smooth stems between the leaves (Figure 1). The biennial thistles all have spiny 'wings' - tissue that looks like a continuation of the leaf - along their stems. Another distinguishing feature is that well-established Canada thistle grows in distinct patches (Figure 2) that are easily seen early in the spring as the thistle is emerging.

The typical growth pattern for Canada thistle begins with emergence of the new shoots in the first few weeks of spring. This first flush of growth enters the flower bud stage in late May to mid-June when the plants are 3 to 4 feet tall. The scaly flower heads are the size of a large pea. The heads open showing pink flowers up to 1 inch in diameter, then close after fertilization to shelter the ripening seed. When the seed is ripe, the flower opens again and releases the 'summer snow' that carries the seed away.

Canada Thistle Control Measures

To eliminate Canada thistle you must injure and exhaust its root system, and do it repeatedly. A successful control program requires multiple seasons, and multiple treatments within a season (Table 1).

A well-established groundcover, particularly a grassland

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planting, greatly aids your control efforts by competing with the thistle as you suppress it.

The most important opportunity for control is the fall when thistle is recharging its root system for the next growing season. Fall is the ideal time to maximize injury to the thistle's root system because systemic herbicides move through plants with the sugars being sent to the roots. As the thistle is stocking up its root reserves for the winter, it will send fall-applied herbicides to where they can do the most damage. Product selection is more important in the fall as only a few herbicides available for use in CREP plantings are truly effective Canada thistle control products (Table 1).

Late spring, when thistle is at the bud-to-early-bloom stage is the second important opportunity for control. Much of the energy to produce the spring flush of growth comes from stored reserves in the root system, causing a seasonal-low of stored energy at bloom stage. This is an ideal time to eliminate the top growth and force the plant to use its scarce reserves to regrow.

An herbicide application at bloom stage will serve as a 'chemical mowing'. The choice of herbicide treatment in the spring is not as critical as it will be in the fall. The spring application acts somewhat like a burndown treatment, eliminating the top-growth, but injury to the root system is limited. Well-established Canada thistle will eventually regrow after a spring application, regardless of the treatment. What is important is that the treatment effectively eliminates the existing top growth.

In grassland plantings, there are many inexpensive herbicide products that will selectively eliminate the aboveground thistle growth and leave grasses intact. In tree plantings, spot treatments using *glyphosate* reduce the risk of injuring the trees with broadleaf herbicides through root absorption.

An alternative to a late-spring herbicide treatment is a mowing timed for bud to early-bloom stage. This mowing should be as low to the ground as practical. After the grassland cover or riparian buffers are established, only spot mowing can be allowed by the FSA County Committee - and only approved on an annual basis.

After seed set, Canada thistle produces a second flush of growth. Some of it comes from buds on the spring stems, and a lot of it comes as new shoots from the root system. Instead of growing tall and flowering, the second flush of growth produces just enough foliage to 'recharge' the root system. This is the target of the critical fall herbicide application.

There is no 'silver bullet' for Canada thistle control. Once you accept that you need multiple treatments for multiple seasons, you will find it is a species you can successfully manage.

Table 1. Managing Canada thistle requires treatment in the spring to prevent seed set and eliminate the first flush of growth, ***and*** *in the fall to maximize injury to the root system. Choose one spring treatment and one fall treatment. The spring treatment is applied at bud to early-bloom stage. Herbicide choice is less critical in the spring because no treatment will prevent regrowth. The spring treatments listed below are just a few examples - any herbicide treatment that will kill the top growth is useful. The fall herbicide treatment maximizes injury to the root system, so only products known for their activity against Canada thistle are recommended.*

timing	treatment	product rate (oz/ac)	comments
late spring	Roundup Pro	64	Roundup Pro is just one of many *glyphosate* products. A spot treatment with *glyphosate* is the recommended herbicide alternative in tree plantings because there is no soil activity that could lead to herbicide injury through root absorption.
late spring	broadleaf herbicide	varies	In grassland plantings, there are many relatively inexpensive products that will provide burn-down of Canada thistle. Examples include 'Weedmaster' and 'KambaMaster' (*dicamba + 2,4-D*),
late spring	mowing	- -	If mowing once, mow at bud to early bloom stage to maximize root system depletion. Spot mowing may be necessary in grassland plantings.
fall	Milestone	6	Milestone (*aminopyralid*) is very active against thistles and legumes. This treatment will not injure established grasses, but should not be used in close proximity to desirable trees.
fall	Forefront R&P	32	Forefront is a mixture of *aminopyralid* plus *2,4-D*, and provides a broader spectrum of control if other broadleaf weeds are present. This treatment will not injure established grasses, but should not be used in close proximity to desirable trees.
fall	Telar	2	At lower rates, Telar XP (*chlorsulfuron*) is safe to grasses, but this rate will cause significant injury to most grasses.
fall	Roundup Pro	128	Roundup Pro (*glyphosate*) is non-selective, and this rate will severely injure all contacted vegetation. This is the best option - as a spot treatment - for use in hardwood plantings and riparian forest buffers because *glyphosate* has no soil activity.
fall	Vanquish	48	Vanquish is a less-volatile formulation of *dicamba*, the active ingredient in the 'Banvel' products. This treatment will not injure established grasses, but should not be used in close proximity to desirable trees.

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Structural Components

1 Fencing

A fencing recommendation for your riparian forest buffer is in your conservation plan. This conservation plan consider such factors as: the type of livestock, your current and future grazing plans (rotation system, existing fencing system, etc.), frequency and intensity of severe weather events (flooding, ice scour, etc.), and labor.

Fence installation costs and maintenance needs vary depending upon your site conditions and the type of fencing called for in your conservation plan. Below is a general discussion of fencing types commonly used in Pennsylvania. However, you should rely on your conservation plan when selecting fencing. If you have questions, please contact your local county NRCS office.

Option 1: 6-Strand High Tensile Fence

- Bottom, third, and top wires are electrified.
- High tensile fencing generally requires maintenance to keep weeds and other plants off the wires.
- Fencing must be routinely inspected to ensure it is in good working order and electrified.

Figure 1.Photo by Cornell Small Farms Program (2012), http://smallfarms.cornell.edu/2012/10/01/happy-cows-healthy-fish/

Option 2: Woven Wire Fence

- Woven wire fencing is typically more expensive to install than high tensile fencing.
- Woven wire fencing is generally less expensive to maintain than high tensile fencing.
- A single strand of electrified wire can be strung inside the fence to keep livestock off of it.

Figure 2. Photo by Bobby Whitescarver.

Option 3: Post and Rail or Board Fence

- Post and rail fencing is generally the most expensive option.
- Wood can be treated to preserve it longer.

Figure 3. Photo by Will Parson, Chesapeake Bay Program.

Option 4: Electrified Polytape Fence

- Electrified polytape fence is generally the least expensive option.
- Typically not covered by FSA CREP cost-share.

Figure 4. Photo by Bobby Whitescarver.

2 Watering Facility (wells, pipelines, tanks, troughs)

Your conservation plan was designed to develop dependable and strategically located water sources with CREP cost-share assistance. The alternate water can be an important farm asset, improving herd health, maximizing weight gain on pasture, increasing productivity by reducing livestock stress, and preventing injury by providing safe, reliable, accessible water. Costs will vary depending upon the design in your conservation plan.

Factors influencing water development include:

- Current and future livestock numbers and periods of use. Late fall use may require deeper buried pipelines.
- Your current and proposed grazing management plans.
- Location of existing wells, pipelines, springs, or etc.
- Dependability (e.g., volume, quality of existing water supplies, etc.)
- Location of power sources (e.g., can gravity flow be used?)
- Soils, geology and other natural features

CREP may provide cost-share assistance with spring development, wells, pipelines and hydrants, tanks or troughs, and fencing and gravel around the tanks or troughs for watering the livestock.

Figure 5. Livestock watering system. Photo by Bobby Whitescarver.

3 STREAM CROSSING

Your conservation plan may include one or more stream crossings. You can receive cost-share assistance for stream crossings. The actual cost to install the stream crossing will vary depending on what materials you use to build it, how the stream crossing is intended to be utilized, and how broad the stream is. Some of the costs to think about include, grading the stream banks and bottom, gravel and filter fabric, hog panels, stone, or other material to go in the bed of the stream, and fencing to lead the livestock to the crossing.

The stream crossing will provide a hard, stable place for cattle and equipment to cross the stream without damaging the streambed or banks. This provides important water quality benefits.

Figure 6. Photo by Pennsylvania Conservation Reserve Enhancement Program.

Pennsylvania Department of Environmental Protection (DEP) or county soil and water conservation district staff can help you obtain a free general permit for agricultural stream crossings.

You will want to install your stream crossing(s) in accordance with the specifics in your conservation plan, but generally speaking, you should:

- Install the stream crossing during the driest time of the year
- Install the stream crossing in a straight section of the stream where the grade is stable (not in a bend in the stream)
- Rock and fabric, hog slats or geoweb (plastic web filled with gravel) are common options for crossing construction. Rock and fabric is the simplest method, but cows don't like to walk over large rocks. Hog slats (used in hog pens) are easier for cows to walk on and can be laid over a bed of gravel and filter fabric.

What Benefits Do Forest Buffers Along Streams Provide?

Cleaner Streams with Better Water Quality

Forest buffers protect streams and local drinking water supplies by helping to intercept and process excess nutrients, sediments, and pathogens from entering them. Scientific studies show that 100 feet of streamside forest will adequately protect the physical, chemical, and biological characteristics of most streams[1] (Sweeney and Newbold 2014).

Healthier Stream Ecosystems Better Able to Process Pollution

Forest buffers restore natural conditions of temperature, oxygen, and food (algae, leaf litter) and stabilize and widen stream channels. This creates more ecosystem and healthier ecosystem per unit length of streambed. Studies have shown that streams bordered by forest are up to 2-8 times more effective than those with grass borders in processing important substances (like excess nitrogen)[2]; Sweeney et al. 2004).

Better Habitat for Aquatic Life

"Trout Grow on Trees™" because forest buffers help increase the diversity and abundance of fish food (aquatic macroinvertebrates or "macros") both directly [by shedding leaves into streams for macros to feed upon) and indirectly [by providing optimum light and temperature conditions for growing the preferred algae (diatoms) of macros]. Streamside forests also create cooler, clearer, wider, more stable streams favored by native species of fish like brook trout while providing important habitat for birds, like wood ducks. See http://troutgrowontrees.org/curriculum/

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[1] Sweeney, B. W. and J. D. Newbold. 2014. *Streamside Forest Buffer Width Needed To Protect Stream Water Quality, Habitat, And Organisms: A Literature Review.* Journal of the American Water Resources Association 50:560-584.

[2] Sweeney, B.W., T.L. Bott, J.K. Jackson, L.A. Kaplan, J.D. Newbold, L.J. Standley, W.C. Hession and R.J. Horwitz, 2004. *Riparian Deforestation, Stream Narrowing, and Loss of Stream Ecosystem Services*. Proceedings of the National Academy of Sciences of the United States of America 101:14132-14137.

Enhanced Property Values, Protection and Reduction of Flooding

Forest buffers can enhance property values, prevent erosion and property loss from sloughing banks, regulate base flow of water to streams, and provide woody debris and wider stream channels for reducing downstream flooding. One tree can reduce storm water runoff by 13,000 gallons a year.[3]

Improved Recreation and Human Health Benefits

Forest buffers enhance recreational opportunities, including fishing, bird watching, hunting, hiking, and exploration with children and grandchildren.

Numerous studies show significant human health benefits from recreating in forests or looking at trees[4], including:

- Increased immune system function,
- Lower blood pressure,
- Reduced stress (anxiety, depression, anger, fatigue),
- Improved mood,
- Increased ability to focus,
- Accelerated recovery from surgery or illness,
- Increased energy level,
- And improved sleep

Funding and technical assistance for riparian forest buffers

To learn more about forested streamside buffers and state and federal incentive programs, particularly the Conservation Reserve Enhancement Program, contact your county conservation district, USDA Natural Resources Conservation Service (NRCS) or USDA Farm Service agency office.

To learn more about the benefits of buffers, visit www.stroudcenter.org

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[3] Plumb, Mike. 2008. Sustainable Raindrops: Cleaning New York Harbor by Greening the Urban Landscape. Retrieved from Riverkeeper website: http://www.riverkeeper.org/wp-content/uploads/2009/06/Sustainable-Raindrops-Report-1-8-08.pdf

[4] "Immerse Yourself in a Forest for Better Health," New York Department of Environmental Conservation, http://www.dec.ny.gov/lands/90720.html#Reference

Frequently Asked Questions about Streamside Forest Buffers and Pennsylvania Conservation Reserve Enhancement Program (CREP)

This section provides some helpful general information in response to frequently asked questions. For more detailed information, please contact your local county conservation district, FSA county office or NRCS county office.

If I sign a CRP-2c form, can I change my mind? What happens next? What is the difference between the CRP-2c and the CRP-1 form?

Yes, you can change your mind. After signing the CRP-2c form (the basic application form), you will work with your forester or NRCS to develop a conservation plan for your streamside buffer. The conservation plan is part of your CREP contract. Then you finalize your enrollment in CREP by signing the CRP-1 (your contract with FSA). The contract becomes effective the first day of the month following the date the contract is signed by the FSA county committee.

In summary, your CRP-2c form is the basic application form that starts this process, but your CRP-1 is your signed CRP contract (including your conservation plan).

What are my obligations and FSA's obligations under the CRP-1 Contract?

Under the CRP-1 contract, you have one to two years to establish your streamside forest buffer in accordance with the conservation plan. You may hire a contractor or do the work yourself, but in order to receive state cost-share, a professional tree-planter must install the trees. After your buffer is installed, you provide the receipts to FSA to receive 50% cost-share reimbursement up to allowable limits and a practice incentive payment (equal to 40% of allowable cost-share). Depending upon the contract term you select, you will agree to keep and maintain the streamside forest buffer on your property for 10-15 years. In exchange, FSA agrees to provide you with 10 or 15 years of annual rental payments plus a one-time signing incentive payment of $100 per acre, which is issued by FSA within 30 days of contract approval.

What is a riparian forest buffer (CP22 Riparian Buffer) practice? Is this the only CREP buffer practice?

Pennsylvania FSA offers a variety of conservation practices and different buffer practices to choose from through CREP. Your conservation district and NRCS can help you think about how these different practices meet the needs of your farm and conservation goals. Often people choose to establish forest buffers alongside streams because the trees do the best job of holding soils on farms, stabilizing stream banks and reducing stream incision/down-cutting, restoring stream health and fish habitat by cooling stream temperatures, providing food for macroinvertebrates that fish feed on, increasing oxygen levels in the stream, and improving water quality by buffering streams and by enhancing the stream's natural capacity to process nutrients.

How big is a riparian forest buffer? Will I need to take much productive land out of production?

Speak with your local NRCS and Conservation District to find out the specific requirements in your locale. Generally speaking, riparian forest buffers in CREP require a minimum width of 35 feet. Maximum width is an average of 180 feet on either side of the stream. Your buffer does not have to be one uniform width. Your conservation plan may specify where to narrow or widen the buffer to meet cropping (e.g., squaring off fields) and conservation needs. Studies show that in many cases, the strip of land you enroll as a buffer is at the highest risk of crop loss and often one of the least productive sections of the cropped field.

How will fencing cattle out of the stream and restoring the forest buffer impact my livestock operation?

USDA provides substantial financial assistance for the costs of exclusionary fencing, alternate water, and stream crossings. These practices can directly increase farm productivity and profitability by, among other things, improving herd health and reducing vet bills, improving pasture management and nutrition, and providing a more convenient, safer, and reliable source of water for cattle/livestock.

Am I eligible to participate in this program?

To be eligible, you must have either owned the land for at least 12 months or acquired ownership of the land within the past year due to foreclosure, inheritance, or purchase. If purchased in the past year, you are not eligible if you purchased the property in order to enroll in the CREP.

Is this land eligible to enroll in CREP for a riparian forest buffer?

Your land is eligible to enroll in CREP if it meets cropping history or marginal pastureland eligibility requirements.

- Cropland eligibility: To meet cropping history requirements, the land must be cropped in a commodity for 4 out of the 6 years (consistent with the current farm bill) or be enrolled in a conservation program that preserves cropped status, and is legally and physically capable of being planted.
- Marginal pastureland eligibility: Marginal pastureland is not limited to land that is, or has been, used as pasture for livestock. Lands that are currently completely forested are not considered marginal pastureland and are not eligible for the program.

What are the financial incentives? When and how do I receive them?

In addition to the 50% cost-share payment, the 40% practice incentive payment, and the annual rental payments, CREP participants receive state incentives, such as enhanced cost-share, signing incentive payment, and/or payments for voluntary contract extensions or easements.

How does cost-share work?

After installation of your CREP streamside forest buffer, you may submit the receipts for your expenses for site preparation and planting to your local county FSA office. They will provide you with reimbursement for 50% of allowable cost-share (sometimes actual costs might exceed the allowable limits in your county) and a practice incentive payment equal to an additional 40% of allowable cost-share.

Are CREP payments taxable?

At least some CRP payments are taxable. Consult your accountant and/or the IRS – search Conservation Reserve Program Annual Rental Payments – for further information (www.irs.gov).

How do I get a conservation plan for my riparian forest buffer? Do I do the site preparation and plant the trees or do I hire someone? Are there other resources or partners I can consult with?

NRCS will prepare a conservation plan with you that specifies site preparation, species composition and planting requirements. Depending on your goals and interests, you can include species that maximize wildlife benefits or meet your aesthetic goals. Your county NRCS or conservation district may also have a list of local contractors you could hire. In addition, be sure to ask about any local non-profits that may provide assistance, such as volunteer help or additional financial assistance.

What kind of maintenance is required for my riparian forest buffer?

The conservation plan will specify the maintenance requirements you are responsible for regarding your buffer. Periodic maintenance is important for the success of the buffer. Generally, during the early years of the contract, weed control and maintaining tree tubes is very important to tree survival. This may entail multiple herbicide treatments during the year and visiting the site in early spring to ensure the tree tubes are functioning properly.

Can I hunt and fish on my streamside buffer?

Yes, in accordance with state and local law.

What happens if I change my mind or some unforeseen circumstance or hardship arises?

Backing out of a CREP contract should not be taken lightly. You, USDA and your State have made a significant investment in both time and money to install the streamside forest buffer that will provide important benefits on your farm and downstream for years to come. However, should unforeseen situations occur, it is best to consult with your local FSA office. You may have to pay refunds and penalties.

If I restore a riparian forest buffer on my property, must I keep it on my property forever?

Unless you signed a permanent conservation easement that requires you to keep the buffer in place or are bound by requirements of local or state law, you are not required to keep your riparian forest buffer after the CREP contract expires. However, many landowners chose to keep their streamside forest buffers because of the beauty and their economic and environmental value.

If I put a streamside forest buffer on my property through CREP, must I allow the public onto my land?

No, your land is private land and you retain your right to allow, or forbid, access to other people as you choose.

If I put a streamside forest buffer on my property through CREP, am I expected to put up a sign?

You are not required to post any signage indicating that the buffer is a CREP buffer. However, many property owners enjoy posting such signs and some states and/or CREP partners provide such signs free of charge.

Can I sell environmental credits for my CREP buffer?

Yes, CREP regulations allow the participant to retain credits, such as for carbon, nutrient reduction, forest mitigation, etc. However, your ability to sell such credits may be impacted by state or local laws and regulations.

When does my contract expire?

Your contract expires on September 30th of the final year agreed to in your contract. This is the last day of the annual federal fiscal year.

Can I reenroll my CREP riparian forest buffer?

Yes, if you meet reenrollment eligibility criteria. Your CREP riparian forest buffer must be in compliance with your contract (e.g., 70% tree survival after three years) and you must choose to reenroll during the final year of your contract. Since the buffer is forested, if you wait until after your CREP contract expires, your buffer will no longer be eligible to enroll in CRP/CREP under the language of the Farm Bill.

For more information: Contact your county conservation district and your USDA Farm Service Agency (FSA) and Natural Resources Conservation Service (NRCS) office (often these agencies are co-located in the same building).