

Schoharie Basin Stream Management Project

Carr Road Riparian Project

Landowner Guide to Vegetation Management

Project Goals and Objectives

The Carr Road Riparian Project was conducted to stabilize a section of the Schoharie Creek which had been lacking an adequate riparian buffer. The NYC Department of Environmental Protection (DEP) is working in conjunction with Greene County Soil and Water Conservation District (GCSWCD) to improve water quality throughout NYC's watershed. Through the protection and enhancement of the riparian corridor we are protecting water quality through natural biological means, protecting and increasing habitat diversity and offering some level of stabilization for streambanks.



Left bank downstream of Carr Road bridge – site for increased buffer width with shrubs and trees.

In the summer of 2006, an evaluation of stream channel stability and stream side vegetation was conducted as part of development of the Schoharie Stream Management Plan. This field evaluation determined that a ~ 1,952' section of the left stream bank up and downstream of Carr Road presented an excellent opportunity to improve the streamside buffer (Figure 1). In addition, ~ 262' of the right stream bank downstream on the Carr Road bridge could use riparian buffer enhancement with additional shrubs streamside (Figure 1). Keeping a buffer zone of trees and shrubs, especially in the first 50 to 100 feet, along streambanks helps prevent erosion and protects property, increases habitat value and filters pollutants. Plantings can include a great variety of flowering trees, shrubs, and sedges native to the Catskills. Native species are adapted to our regional climate and soil conditions and typically require less maintenance following planting and establishment.

In Fall 2007, the Participating streamside landowners will work with GCSWCD to develop planting designs for their property. This program will pay for conservation plantings such as stabilizing sedges and shrubs along the streambanks as well as trees and shrubs in the floodplain. Planting and maintaining a healthy buffer of trees and shrubs along the streambanks and floodplains is one of the most cost effective and self-sustaining methods for landowners to protect streamside property. Following the 2007 planting, the GCSWCD will work with the landowner to maintain a healthy riparian buffer.

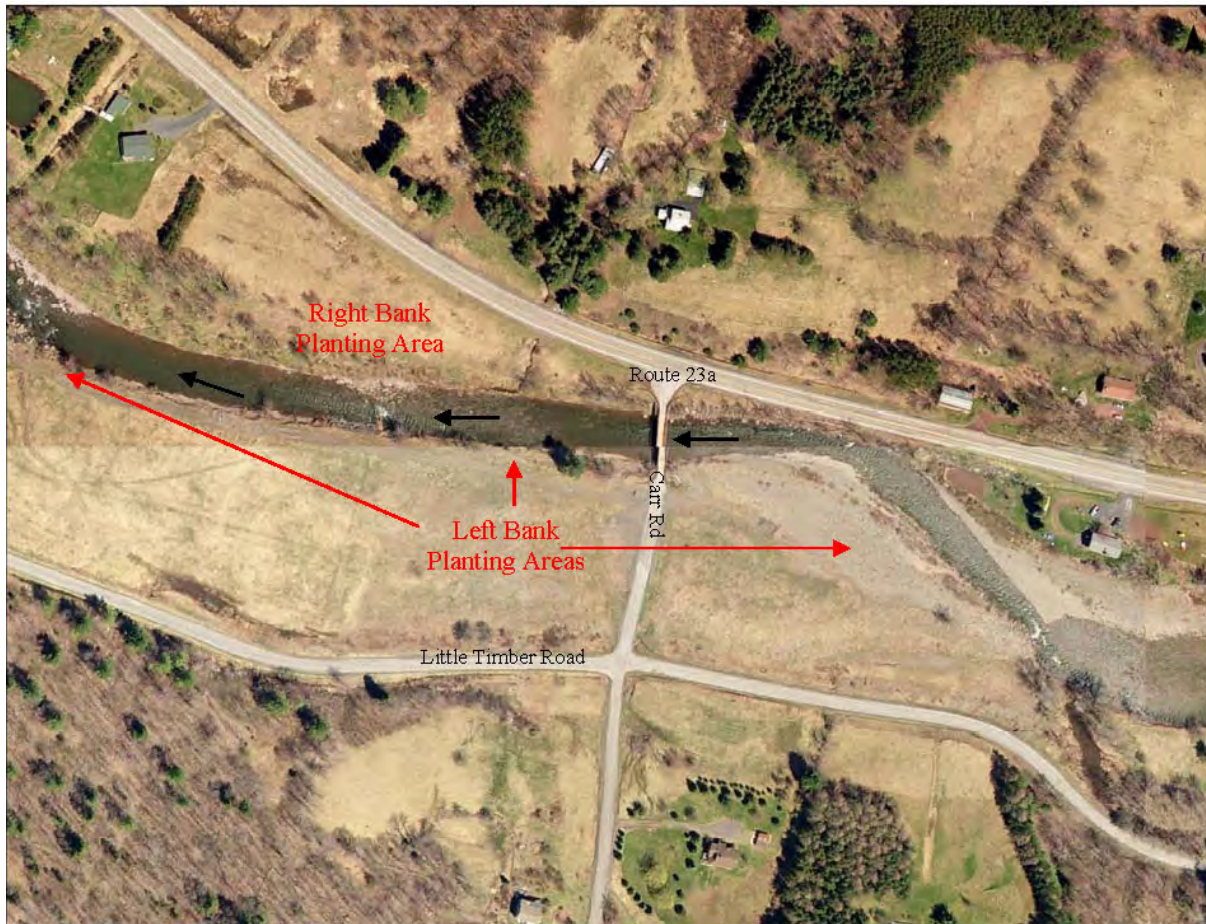


Figure 1. Carr road riparian restoration project area (2006).

Bioengineering and Balled-Burlaped Trees

Vegetation plays a crucial role in stream stabilization. Roots of the grass, trees, and shrubs protrude into the ground, creating the intricate framework that holds together the soil and provides resistance against runoff and flowing water. A mature vegetation community lasts



Willows being harvested at the PMC to be used for willow fascines.

much longer than rock structures. In restoration projects where rock structures are needed to address erosion, the rock structures have been strategically placed to guide the stream in a direction which will sustain itself and allow the vegetation to grow. Even after these structures shift and change over time, the vegetation will continue to help the stream remain stable.

One element of vegetation which has been used is bioengineering. Bioengineering uses dormant materials such as willows, and is a very effective way to quickly establish vegetation on the banks. Willow stakes are cut from living willow trees when the tree is dormant. The stakes, ranging from one to several feet long, are hammered or pushed into the stream bank. Willow fascines can also be planted along the stream bank. Willow fascines are made from long branches of willows and are also cut when the tree is dormant. The branches are bundled together, with the tops facing out of both ends. The fascines are planted in a ditch perpendicular to the stream, burying the mid section and keeping the ends above ground. In the spring they will sprout from these ends and will throw new shoots up through the ground along the mid sections. Placing them perpendicular to the stream provides for resistance against the streams flow and reduces erosion. Willow fascine and willow stake locations are typically close to the stream, because they grow quickly and provide necessary bank stabilization where it is most needed.

Balled-burlaped trees may also be planted throughout the project site. These trees are grown at GCSWCD's Plant Materials Center (PMC) in Maplecrest and dug with a tree spade shortly before transplanting. Balled-burlaped trees are an effective means to bring mature vegetation onto a site, providing shelter for wildlife as well as offering a more pleasing view of the site from homes and roadsides. The species of balled-burlaped trees that have been planted in the past include Poplar, Birch, and Green Ash.



Balled-burlaped trees being dug with a tree spade at the PMC.

Grass and Container Trees

Grass is essential to a restoration project. Its roots form the quickest and provide crucial immediate erosion control. The hydro-seeding method is typically used to spread grass seed immediately following project completion. This method uses a large tank which mixes water, seed, and mulch and sprays it through a hose. This provides for fast and even spreading, while the mulch protects and binds the grass seed to the soil until it can germinate. Native warm and cold season grasses are typically used to provide the best erosion protection for this environment.



Hydroseeder in action.

A total of 18 different species of container trees and shrubs were planted throughout the project site. These saplings were grown from bare-root stock in containers in the spring of 2007 and maintained at the PMC. Here they were allowed to grow until the time of planting. The diverse selection of trees provides for vegetation that has a multitude of favorable conditions and beneficial factors, ensuring the vegetation project's overall success. Native species were selected to reduce the amount of maintenance required. See appendix 1 for a list of the container tree species. This list includes the common name, scientific name, growing conditions, and the total number planted (in red) of each species.



Volunteers helping with container trees at the PMC.

Many species were planted and will begin competing with each other over time. Species like Black Cherry were planted because they thrive quickly in wide open disturbed spaces. Their trade-off for this trait is that they do not grow as tall as some other species and they are intolerant of shade. As taller, slower growing species like Green Ash begin to create a canopy over certain parts of the land, species like Black Cherry may be out competed in those areas. For this reason it is important to introduce a well selected group of species.

Upon planting, specific species were selected for locations where they would most likely succeed. American Elderberry, American Sycamore, Silky Dogwood, and Speckled Alder are

among those planted in wet areas. These trees live and prosper in conditions where the roots are often wet. These “wet footed” species were planted heavily throughout the wetlands, in depressed wet areas, and close to the stream where water will often reach their roots. They will help to maintain these important structures over time. Once they mature they will provide shade and shelter for local wildlife. Species such as White Pine, White Spruce, and Hemlock were heavily planted in upland areas. These species prefer the dry soil conditions which occur a bit further from the stream.

Care was also taken to spread different species throughout the project. This takes into account that if, for example, one species can't survive in a given area due to inevitable small habitat changes, that there are other species that have a chance to take its place and thrive in that area. As time goes by, soil conditions will begin to diversify, creating microhabitats. A diverse placement of species helps to further ensure the project's overall success.

In a riparian planting project one goal is to create healthy habitats for all types of wildlife. As one of the first creatures to respond to a new habitat, birds are often an important indicator of a restoration projects success. They play an important role in the natural processes which foster life. Plants like Black Cherry and Pin Cherry provide fruit which attracts birds to these areas. Species such as White Spruce grow into large, broad specimens, providing unique habitats for certain types of birds. Each tree species was selected for characteristics such as these. For more information on each individual species, see Appendix 1.

Invasive Species: Japanese Knotweed

Invasive species can threaten the ecology of a native plant community. This impact may extend to an alteration of landscape or bank stabilization. Japanese Knotweed is an exotic, invasive species and in recent years has been a serious issue in the Schoharie Basin. As the name implies it comes from Asia and was originally brought here as an ornamental plant. In an attempt to beautify their homes, residents unknowingly introduced a threatening element to the environment. Knotweed is very good at out-competing native plants. Eventually, it can take over entire stretches of stream banks. It grows much faster than most native species, thereby towering over them and cutting off their light supply. This is especially dangerous, because knotweed does not hold stream banks together as well as native species. Furthermore, it is a very resilient plant. Simply cutting it down without the proper knowledge can potentially make the problem worse.

Identification

As a landowner you can help stop the spread of this invasive. The first step is identification. Japanese Knotweed is fairly easy to identify; it has bamboo stalks and large heart-shaped leaves. In late summer, the shrub sprouts long lacy white flowers. It generally grows anywhere from a tiny sprout up to around 10 ft tall. It is often



seen in large patches where the tall stalks droop outward around the edges. Identification can be difficult in early spring. Often, what gives it away at this time of year are the young sprouts amongst last years dead stalks, which appear as clusters of brown, jointed, hollow wooden poles. See pg 7-8 for more information on the control of Japanese Knotweed.

Surveyors and Field Crews

In coming years you may notice GCSWCD and DEP survey crews entering the project site. This is part of an ongoing process to study and document the progress of the project. Survey crews will be surveying designated cross sections along the stream. Measurements such as the shape, depth, and width of the stream channel will be taken in order to track the natural changes which occur from year to year.



Annual and high flows will be measured to ensure the stream is performing as desired.

Vegetation monitoring crews will also be collecting data in order to follow the progress of the planted vegetation. Such factors as height, plant vigor, and survival will annually be documented in order to maintain the site and improve other future plantings. Monitoring of the invasive species Japanese Knotweed will also take place. This will include observations as well as removal at various locations. Crews may also enter the project site to replant in the future if it is deemed necessary. In the spring, small sedge plugs may also be planted throughout the project in the stream corridor.

You may see crews with GPS (Global Positioning System) units as well. A GPS is a device which uses satellites to determine and record the user's position on the ground. They are often used to collect the location of various features along with information on the condition of the particular feature. These groups will collect a wide array of information about various attributes to the stream. The location and condition of such structures as culverts, bridges and utility lines are collected as GPS points. These points can then be placed on maps using GIS (Geographic Information System) software and displayed along with features like roads, soils, and vegetation. The maps and the information collected are used to assess existing or potential problems. The use of GPS data along with GIS software provides an intuitive, convenient way of comparing various data with respects to many different management concerns, such as minimizing threats to private and public property and protection of water quality and fish habitat.

Vegetation Maintenance

The landowner plays an extremely important role in the success of this project. It is crucial that certain measures are taken by you, the landowner, in order to assure the success of the project. Below is a list of important guidelines to follow with regards to the project area. See the attached project map to view your property in relation to the project boundaries. To ensure the project's success, it is important that you observe the following guidelines unless otherwise instructed by the GCSWCD. If you have any questions, or see any problems you wish to report, please contact GCSWCD at the number listed on the bottom of page 8.

Important Rules to Follow:

- **Never cut, remove, mow, or otherwise disturb the vegetation. This includes all trees, shrubs and any other vegetation, whether it has been planted or occurs naturally.**
- **Never remove, excavate, or grade the soil.**
- **Never construct roads, bridges, or permanent structures of any kind without appropriate permits.**
- **Always check with GCSWCD before conducting any work within the project area.**

Want to do More?

If you would like to do more to help the success of this project, there are several things you can do:

1. Mulch can be placed around the trees that have been planted to help them grow. This helps keep weeds from suffocating the tree and helps hold moisture in the soil. Mulch should be spread around the tree, making sure to leave a space of an inch or two around the base of the trunk. If the mulch is piled against the trunk it could damage the tree. If the plants seem to be in drought conditions, you may also choose to water them.
2. The addition of supplemental native vegetation could help to keep invasive species away from areas where they might otherwise take over. If you see an area that lacks vegetation, you may wish to plant something. In the case that you should plant anything on or near the restoration site, it is important that you don't introduce any invasive species. What you plant should be healthy for and native to the habitat and free of any unknown materials. Appendix one shows a list of the sapling tree species that have been planted on the job site and can therefore be used as a general guide of what trees are best to plant. In the case of grasses, a conservation or native reclamation mix would work well. Check with your local seed supplier and make sure what you are buying is native to and suited for local habitats.
3. GCSWCD holds an annual plant sale in the spring. Items for sale include bare-root trees and shrubs, wildflower seed mixes, ground cover seed mixes, fertilizer tablets, and bird boxes/feeders. More information as well as order forms can be found on their website, <http://www.gcswcd.com/conservation/>, or you can call the Cairo office at 518-622-3620 to have an order form mailed to you. Seedlings can also be purchased through the New York State Department of Environmental Conservation (DEC). DEC operates the State Tree Nursery in Saratoga Springs which produces tree and shrub seedlings for conservation on private and public lands. Orders for seedlings can be placed from January 2 through mid-May by calling 518-587-1120. For all other inquiries the nursery office can be reached Monday through Friday, 8 a.m to 4 p.m. at 518-581-1439. More information can also be obtained at the GCSWCD office in Cairo.

Japanese Knotweed Management

When dealing with knotweed the most important thing to understand is its diligent ability to spread by vegetative means. This means that it spreads through its root system, as opposed to by seed (which it also does, but not as prominently). One of the best things a landowner can do is to monitor the spread of knotweed on his or her section of the project. Never alter the environment in any way that would destabilize the stream banks or disrupt the natural riparian vegetation and allow the spread of knotweed. Any fill material introduced to the area should be tested for the presence of knotweed. Knotweed has a history of spreading through contaminated fill material.

Mowing

Depending on the characteristics of your landscape, it may be beneficial to employ a regular lawn mowing schedule at a minimum frequency of every other week. This would help to suppress knotweed colonies by continually oppressing them before they have the ability to grow. This is much more time efficient than manual removal. Keep in mind that mowing too close to the stream and removing native grasses can decrease bank stability and cause erosion problems. Also be careful to avoid mowing over planted trees as well as native trees that occur naturally.

It is important when removing knotweed from areas that will be naturally re-vegetated to make sure you collect all of the root and stalk pieces. The knotweed must then be disposed of in a manner where it will not have the potential to spread and root anywhere else. Even a small piece, if left behind or dumped somewhere, has the potential to root and start a new colony. Be especially careful not to allow debris to fall in the stream, as this will only spread the problem further downstream.



Japanese Knotweed sprouting from a tiny plant fragment.

Removal

The application of herbicide is governed by NYS Department of Environmental Conservation (DEC) and must be administered by a licensed professional. Therefore, cutting and removal may be the only means by which to eradicate Japanese Knotweed. In small patches it may even be beneficial to pull each plant up by the roots. It is important to note that no matter

how you remove it, Japanese Knotweed will most likely return due to the fact that any part of the root left underground can re-sprout. Therefore, an effective removal strategy will most likely involve several cuttings per season, perhaps over the course of several years. One method that is suggested for small patches is to employ a combination of cutting and covering. This method involves cutting the knotweed as close to the ground as possible, then covering the area with a tarp or old rug in the winter. This way, when spring comes and the knotweed tries to sprout, it is covered and has no light supply.

The following website, although discussing knotweed in the northwest, contains information useful to the landowner pertaining to the removal of knotweed throughout the U.S.: http://www.skamaniacounty.org/Noxious_Weeds/TNCreport.htm. It has a wealth of information and links for those who wish to learn more about this troubling invasive species. NYC DEP and GCSWCD are working with Hudsonia, Inc. to review the state of the knowledge on Japanese Knotweed and conduct basic research into its growth habits as part of an effort to develop management recommendations for its future control. As mentioned, you may see knotweed monitoring crews entering the project site in the future to monitor this problem.

GCSWCD will be the main caretakers of this project for the years to come. As a landowner, you may have the unique ability to observe your particular stretch of the project on a regular basis. We appreciate and welcome calls to report potential problems seen on the project site. Problems could include things like flood issues, deer browse damage or anything that seems threatening to the success of the project. If you have any questions regarding your own use of the land, what trees you should plant, to what extent you may mow lawn which borders the project, or anything else call GCSWCD at the number listed below.

Contact

Greene County Soil & Water
Conservation District
907 County Office Building
Cairo, NY 12413
Phone (518) 622-3620
Fax (518) 622-0344
www.gcswcd.com/stream/



Carr Road Vegetation Guidance

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Page 10 of 10

Appendix 1. Container Tree Species

	<p><i>Sambucus canadensis</i></p> <p>Grows well in swamps and other wet soils. Matures to a large shrub or small tree, up to 15ft tall. Produces clusters of black/dark purple berries used in jam, pie, and wine making.</p>		<p><i>Prunus virginiana</i></p> <p>A pioneer species. Can withstand very cold temperatures and drought conditions. The root suckers quickly spread and provide good water erosion control. Grows to a shrub or small tree, up to 25ft tall.</p>
<p>American Elderberry</p>		<p>Chokecherry</p>	
	<p><i>Platanus occidentalis</i></p> <p>Grows well along streams and in wetlands. Can become quite tall and produces large leaves, which makes it an excellent shade tree. Often grows to over 100ft tall. The root system hold stream banks together well.</p>		<p><i>Fraxinus Pennsylvanica</i></p> <p>All around tolerant species which grows into a tall shade tree, up to 70 ft. Extensive root system provides for erosion control. Easily transplanted and established.</p>
<p>American Sycamore</p>		<p>Green Ash</p>	
	<p><i>Viburnum dentatum</i></p> <p>A very durable species that grows well in wetlands. Adapts well to varying soil types and sunlight conditions. Mature specimens reach 15ft tall. Berries provide food for wildlife.</p>		<p><i>Populus sp.</i></p> <p>Fast growing hardy tree which grows well in and around wet areas. Long history of successful environmental use. Good for wind and water erosion control.</p>
<p>Arrowwood</p>		<p>Hybrid Poplar</p>	
	<p><i>Prunus serotina</i></p> <p>Takes advantage of open spaces by growing quickly in direct sunlight. Tolerates varying soil conditions. Supports bird life with its fruit. This type of cherry is the tallest in NY, reaching 50-100ft tall.</p>		<p><i>Betula papyrifera</i></p> <p>A pioneer species. Takes advantage of open spaces quickly and tolerates many types of soil and slope conditions. Mature specimens can reach 70-80ft tall.</p>
<p>Black Cherry</p>		<p>Paper Birch</p>	
	<p><i>Tsuga canadensis</i></p> <p>Shade tolerant; grows well in the under story. Prefers acidic, moist, well drained soils. Mature specimens reach from 30-50ft tall. The wide nature and full foliage of this evergreen makes it a good wind screen.</p>		<p><i>Prunus pennsylvanica</i></p> <p>Fast growing pioneer of disturbed soils. Grows to a Shrub or small tree, reaching 30ft tall. Displays vegetative reproduction through root suckers. Seeds can live dormant for as long as 100 years underground.</p>
<p>Canadian Hemlock</p>		<p>Pin Cherry</p>	
	<p><i>Rosa carolina</i></p> <p>This hardy shrub/vine grows 1-3ft on its own, with dense root systems. Vegetative reproduction through the roots (suckering) allows this shrub to survive trauma. Does well in dry, rocky, and sandy soils.</p>		<p><i>Populus tremuloides</i></p> <p>Fast growing pioneer of disturbed soil. Tolerates cold conditions. Reproduces almost entirely via root suckers. For this reason, stands of aspens are often seen in clusters.</p>
<p>Carolina Rose</p>		<p>Quaking Aspen</p>	

Container Tree Species



Red Maple

Acer rubrum

Tolerates varying pH, moisture, and pollutant conditions. Prefers moist, well drained soils on river banks and swamps. Shallow, wide root system stabilizes stream banks. Can reach 100ft tall.



Speckled Alder

Alnus hybrid

A pioneer species. Requires moist soil and direct sunlight, but otherwise very tolerant. "Nitrogen fixing"- maintains healthy nitrogen levels in the soil. Shrub or small tree; can reach up to 60ft in height. Can reproduce via root suckers.



Red Oak

Quercus borealis

Grows well in well drained rocky areas, where it can grow a deep tap root. Lateral roots spread wide, creating good erosion control. Wildlife feeds on the acorns. Fastest and tallest growing oak in NY, reaching 70-90ft in height.



Staghorn Sumac

Rhus typhina

A hardy tree. Seeds spread and establish quickly. Grows well in dry conditions. Produces white flowers and red berries. Branches are covered in velvet, like the horns of a stag.



River Birch

Betula nigra

Grows well in a wide variety of conditions, growing best in flood plains and swamps. Takes advantage of disturbed areas. Mature specimens can reach 70ft tall.



Sugar Maple

Acer saccharum

The official NY tree. Does well in rich, moist, well drained soils along river valleys and upland areas. Very shade tolerant. Can grow from 70-100ft tall. Hydraulic lift brings water from moist soil layers to dry upper soil layers.



Shadblow Serviceberry

Amelanchier arborea

Grows well in a wide range of soils and slopes. Grows to a bush or small tree, reaching 20-25ft tall. Berries provide food for wildlife. Can reproduce through root suckers.



White Oak

Quercus alba

Fire resistant. Grows well in dry soils, and supports a variety of wildlife with its acorns. Can grow up to 80 ft tall with a 5ft trunk diameter. Makes a good shade trees. Specimens have been known to live for over 500 years.



Silky Dogwood

Cornus amomum

Shade tolerant shrub thrives under the canopy of larger trees in moist soils. Can reproduce via root suckering. Branches can even bend toward the ground and take root. Grows up to 10ft tall.



White Pine

Pinus strobus

Widely distributed. Grows fast in moist, well drained soils. High rate of generational survival due to its continuous regeneration through offspring. Specimens can live for 200-400 years.



Silver Maple

Acer saccharinum

Often called "water maple," this highly adaptable tree grows well along streams and wetlands. Can reach 70-100ft tall. Seeds provide food for wildlife. Major requirement is direct sunlight.



White Spruce

Picea glauca

Grows well in semi-dry upland regions. Provides cover for birds. Tolerates many extreme conditions, growing slowly under the canopy of other species. Can grow over 100ft tall. Specimens have been known to live for over 500 years.