

**Schoharie Creek and East Kill
Riparian Planting Pilot Guidelines**

Background

The Schoharie Creek and East Kill Riparian Planting Pilot Project was developed by the Greene County Soil and Water Conservation District (GCSWCD) and New York City Department of Environmental Protection (NYCDEP) as part of the Schoharie and East Kill Watershed Planning Project. Initiated in 2006, Schoharie and East Kill project participants have fostered the development of a project advisory committee, conducted a stream



Healthy Riparian Buffer in the East Kill's Headwaters

feature assessment on both streams, and authored comprehensive stream management plans for the two streams. As part of the stream management planning process the project team developed comprehensive recommendations designed to protect, and possibly improve, water quality and ecological health. These recommendations complement, and are similar in scope, to the recommendations presented in the Batavia and West Kill Management Plans. Protecting and enhancing riparian buffers encompass numerous recommendations in the Schoharie Basin's Stream Management Plans (Table 1).

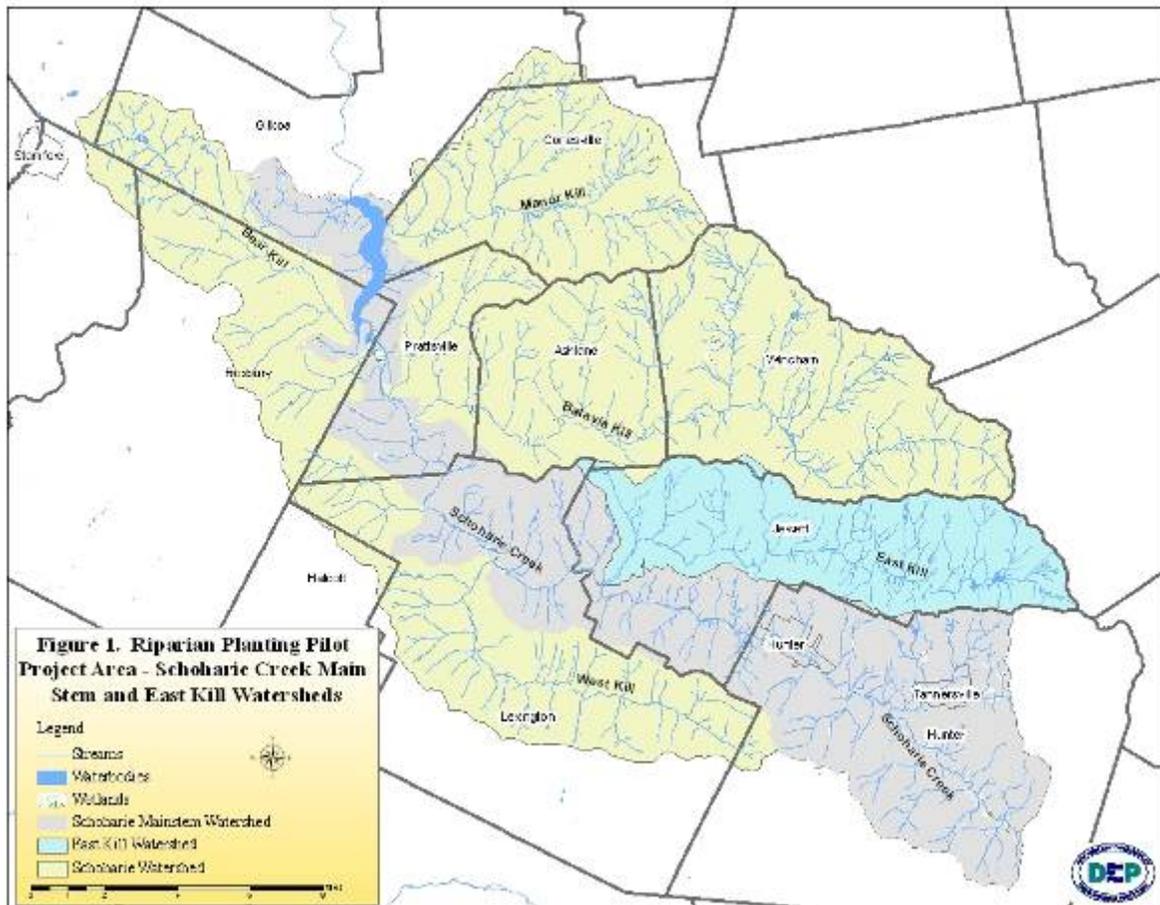
Table 1. Management Planning Basin and recommendations in support of Riparian Buffers.		
Schoharie Creek/East Kill (GCSWCD, 2007, GCSWCD 2007a)	Batavia Kill (GCSWCD, 2003)	West Kill (GCSWCD, 2005)
Riparian Zone Management (RZM) - 6.7.1, RZM-6.7.3, RZM-6.7.7, RZM 6.7.8, RZM-6.7.9, RZM-6.7.10, RZM-6.7.11, RZM-6.7.12, RZM-6.7.13	Riparian Buffer (RB)-03 (Very High, 3.46)	RZM-6.7, RZM-6.7.1, RZM-6.7.3, RZM-6.7.4, RZM-6.7.6, RZM-6.7.7, RZM-6.7.8, RZM-6.7.9, RZM-6.7.10
General Stream Management Activities (GSMA)-6.8.2	RB-07 (Very High, 3.08)	Education/Outreach (EO)-6.4
	RB-11 (High, 2.69)	Water Quality (WQ)-6.3.6,
		GSMA-6.8.2

Responding to the fact that riparian buffer enhancement is documented as a priority in basin management plans, the Schoharie Watershed Project Team proposed to demonstrate the restoration of a riparian buffer on one or two residential properties. Residential properties often encompass a large percentage of the riparian corridor, but lack the programs which fund riparian buffer restoration/plantings, available to agricultural properties through the United States Department of Agriculture (e.g. Conservation Reserve Enhancement Program). In 2007, the New York City Department of Environmental Protection (NYCDEP) funded the Riparian Planting Pilot Project through the Greene County Soil and Water Conservation District (GCSWCD). The following guidelines provide the structure for the riparian buffer pilot project which supports the following project goals:

- Develop a protocol that utilizes the information gathered during the stream feature inventory and riparian vegetation characterization analyses that were completed as a part of the development of Stream Management Plans. A component of both analyses was to identify potential planting sites where improvement of the riparian vegetation is likely to be both effective and successful. The selected planting sites should provide the potential for improvements to water quality, habitat and/or stream stability, and be located where existing channel conditions do not pose a high risk of losing the investment in plantings to bank erosion;
- Develop treatment designs for these sites using native plants that address landowner aesthetics, ecological enhancement and water quality improvement or protection. When necessary, minor engineered solutions (armored toe, single rock vane, root wads, etc.) can be used to protect new vegetation until it becomes established;
- Planting designs and maintenance and monitoring plans should be developed, and both the planting process and results should be documented for program replication and general education/outreach;
- Local landowners should be engaged, sign a ten-year maintenance agreement with the GCSWCD and possibly cost-share either directly with a financial contribution, or indirectly by providing planting assistance and/or maintenance activities (e.g. watering, etc.).

Identification of Priority Planting Sites

The primary focus of this project is to revegetate the riparian corridor on non-agricultural properties within the Schoharie Creek Main Stem and/or East Kill watersheds (Figure 1). Secondly, in-channel areas will be considered separately and definitely within the confines of the riparian corridor plantings (e.g. in-channel side or point bars may be planted with sedges to provide some boundary conditions for the stream).



Riparian Areas

In the simplest sense, riparian buffers are vegetated areas bordering a water resource. Riparian buffers typically include trees, shrubs and herbaceous vegetation, which exists or is established to protect a stream, lake, wetland, or vernal pool. Riparian buffers restore and maintain the chemical, physical and biological integrity of the water resource and can often reduce the impacts of adjacent land uses.

There are multiple objectives for managing vegetation in the riparian corridor, and trees typically provide the greatest number of benefits (Table 2). Rooting depth and root density are important elements in determining the boundary conditions of a stream channel. Deep and dense tree roots can influence rates of lateral channel migration and widening, and therefore sediment loading. Whereas the rooting depth of grass tends to be minimal, providing much less soil cohesion. Therefore, enhancement of the riparian zone adjacent to the stream channel and extending 100' from the top of the stream bank with trees and shrubs should be a priority for management in order to promote bank stability and potentially reduce sediment loading. A high quality buffer may also limit the inputs of pollutants from upland sources into the stream through filtration and uptake from overland flow, interflow and/or shallow groundwater; and may trap and store pollutants from overbank flows.

Table 2. Relative effectiveness of different vegetation types for specific benefits (Tjaden and Weber, 1998).			
Benefits	Vegetation Type		
	Grass	Shrub	Tree
Stabilize bank erosion	Low/Medium	Medium/High	High
Filter sediment	High	Low/Medium	High
Filter nutrients, pesticides, microbes: sediment bound	High	Low/Medium	High
Filter nutrients, pesticides, microbes: soluble	Medium	Low	Medium
Aquatic habitat (food, cooler water temps and cover)	Low	Medium	High
Wildlife habitat: forest wildlife	Low	Medium	High
Economic products	Medium	Low/Medium	High
Visual diversity	Low	Medium	High
Flood protection	Low	Medium	High

Riparian Site Selection

Priority sites for riparian plantings include all areas within a 300' buffer of the stream currently dominated by herbaceous vegetation or non-vegetated, where the stream bank was not identified as a Bank Erosion Monitoring Site (BEMS) during the 2006 stream feature inventory or is severely actively eroding. This 300' buffer coincides with the area of riparian vegetation mapped as part of the Stream Management Planning Project, but the first priority will be the 100' buffer closest to the stream. Planting sites may also include plantings within rip-rap revetments. The site selection process will be as follows:

1. Utilize the existing GIS layer of proposed riparian buffer planting sites, identified and GPSed during the 2006 stream feature inventory, to map potential planting sites (Figure 2).



Figure 2. Proposed riparian planting sites that were mapped as part of the 2006 stream feature inventory and overlaid on 2001 digital orthophotography. This particular stretch of stream is flowing through the Hamlet of Lexington and includes the Schoharie's confluence with the West Kill.

2. Using the riparian vegetation mapping completed for the Stream Management Plans (GCSWCD, 2007; GCSWCD, 2007a) create a GIS layer identifying sites dominated by herbaceous vegetation and/or bare soil (Figure 3). These two vegetation classifications were chosen as top priorities because they provide the least streambank stabilization benefit, and because the goal is to promote buffers with the characteristics of the native climax terrestrial vegetation community found in reference riparian sites, which in most riparian locations will not be herbaceous (one exception may be wetland areas). The

vegetation mapping was completed with 2001 imagery, therefore field verification will be necessary for these potential project sites.

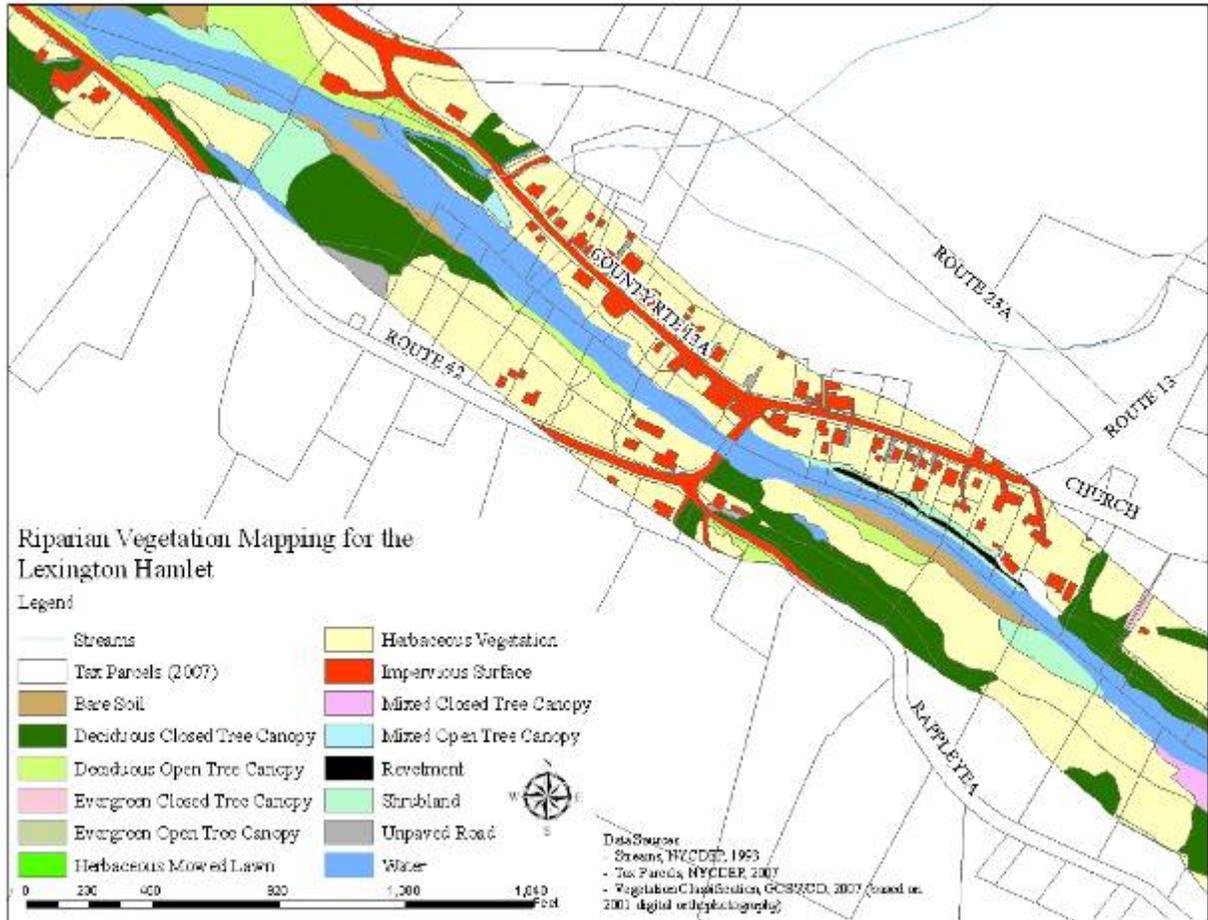


Figure 3. Riparian vegetation mapping of the 300-foot riparian buffer area around the Lexington Hamlet. Mapping was based on 2001 digital-orthoquads and completed for the Schoharie Creek (GCSWCD, 2007) and East Kill (GCSWCD, 2007a).

3. Creation of a GIS layer depicting revetment, large gravel bars and over wide sections of stream may be analyzed to determine other potential sites for plantings. Revetment enhancement utilizing vegetation (e.g. interplanting of rip rap) involves placing of live stakes in the joints of previously installed rock rip-rap. This is intended to increase the effectiveness of the rock system by forming a living root mat underneath the rock, while improving the habitat and aesthetic value of the rip-rap. Sites will also be identified where sedges may be planted in an attempt to convert what are currently over wide bars

into a vegetated low bench and, eventually, floodplain. These plantings may reduce over time the width-to-depth ratio of the bankfull channel (to increase sediment transport effectiveness at bankfull discharge), increase bank cohesiveness, slow avulsion or toe scour adjustments and/or improve aquatic habitat value by providing thermal shading and habitat complexity. These sites will be considered a lower priority.

4. Compare the three GIS layers developed in steps 1 to 3 depicting potential riparian buffer planting sites with the erosion and BEMS layers in the Schoharie and East Kill geodatabases to determine areas adjacent to severe active bank failures. These sites will not be candidates for vegetative restoration since they are experiencing severe erosion and will most likely need channel geometry adjustments before vegetation can be successfully established.
5. Utilize 2006 aerial photography and field visits to further verify that the proposed sites are good candidates for riparian buffer enhancement.
6. Create a contact list of landowners for the priority riparian planting areas by cross-referencing selected planting site locations with the 2006 Greene County tax parcel data.

Steps after Prioritization

1. Conduct an outreach mailing to landowners who own priority planting areas, including information describing the Riparian Planting Pilot Project, briefly describing how priority planting areas were selected, how planting vegetation could benefit their property and a response form to indicate their interest in participation. These materials will include a discussion of expectations regarding the maintenance responsibilities of the landowners.
2. On the basis of landowner response from this mailing, select a subset of high priority sites on which to pilot plantings.
3. Conduct site visits with landowners to collect additional information and prepare development of a planting design for the selected site(s).
4. Negotiate designs with designer and landowners and get maintenance agreements signed.
5. Develop plant materials list and order plant materials.

6. If not installing in-house, develop bid document for bidding out installation, announce bid competition, arrange and conduct site showings, conduct bid opening, and award contract. Develop contract.
7. Coordinate with designer and landowner to install plantings.
8. Follow maintenance schedule and monitor plantings for survival. If necessary, negotiate replantings with planting contractors and replant.
9. Publicize the project for ongoing outreach to increase future landowner participation.

References

- GCSWCD, 2003. Batavia Kill Stream Management Plan. Greene County Soil and Water Conservation District, Cairo, NY.
- GCSWCD, 2005. West Kill Stream Management Plan. Greene County Soil and Water Conservation District, Cairo, NY.
- GCSWCD. 2007. Schoharie Creek Management Plan. Greene County Soil and Water Conservation District, Cairo, NY. Available on web:
<http://www.gcswcd.com/stream/schoharie-eastkill/SchoharieCreekSMP/>.
- GCSWCD. 2007a. Schoharie Creek Management Plan. Greene County Soil and Water Conservation District, Cairo, NY. Available on web:
<http://www.gcswcd.com/stream/eastkill/EastKillSMP/>.
- Tjaden, B. and Weber, G.M. 1998. Riparian Buffer Management Riparian Buffer Systems (FS733). University of Maryland Cooperative Extension. Available online:
<http://www.riparianbuffers.umd.edu/fact/FS733.html>.