Riparian Corridor Management Plan
East Kill

Bardfield Property – Jewett, NY

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Catskill Streams Buffer Initiative

Introduction

A riparian buffer is the vegetated area adjacent to a stream that plays a key role in protecting water quality and providing various environmental benefits. A healthy riparian buffer usually consists of a diverse assemblage of tree and shrub species. Deeply rooted riparian buffers stabilize stream banks by anchoring sediment particles in place, and therefore play an essential role in the prevention of erosion. These buffers also intercept surface runoff from upland sources which may contain contaminants such as sediment, pesticides, and nutrients. Many of the unique wildlife species seen in the Catskill region rely on riparian areas for critical habitat.

Maintaining healthy and intact riparian areas and improving the condition of degraded riparian buffers are high priorities of the Catskill Streams Buffer Initiative (CSBI) program. Stream feature inventories have been conducted on numerous streams in the Catskills, which include detailed mapping of vegetation within the riparian corridors, existing stream conditions, presence of invasive species, and identification of the need for supplemental planting of vegetation in the riparian zone. While 75% of the West of Hudson Watershed is forested, it is apparent that some riparian areas lack this protective cover.

The overall goal of the Catskill Streams Buffer Initiative is to inform and assist landowners in better stewardship of their riparian (streamside) area through protection, enhancement, management, or restoration. In addition, CSBI seeks to maintain ecological integrity of streamside property by conducting restoration projects which include the use of plant materials that are native to the Catskill region. The New York City Department of Environmental Protection (NYCDEP) and its partners (County Soil & Water Conservation Districts and Cornell Cooperative Extension) will assist riparian landowners throughout the West of Hudson Watershed by providing:

1) Riparian Corridor Management Plans to create awareness about riparian management issues specific to individual properties
2) Best management practice design and/or prescriptive measures and installation to encourage positive riparian stewardship and
3) Educational materials and activities as needed by landowners to understand the critical role of their buffer and how to maintain it in optimal functioning condition.

Aerial view of Bardfield property on Shadow Mtn. Road, Jewett, NY

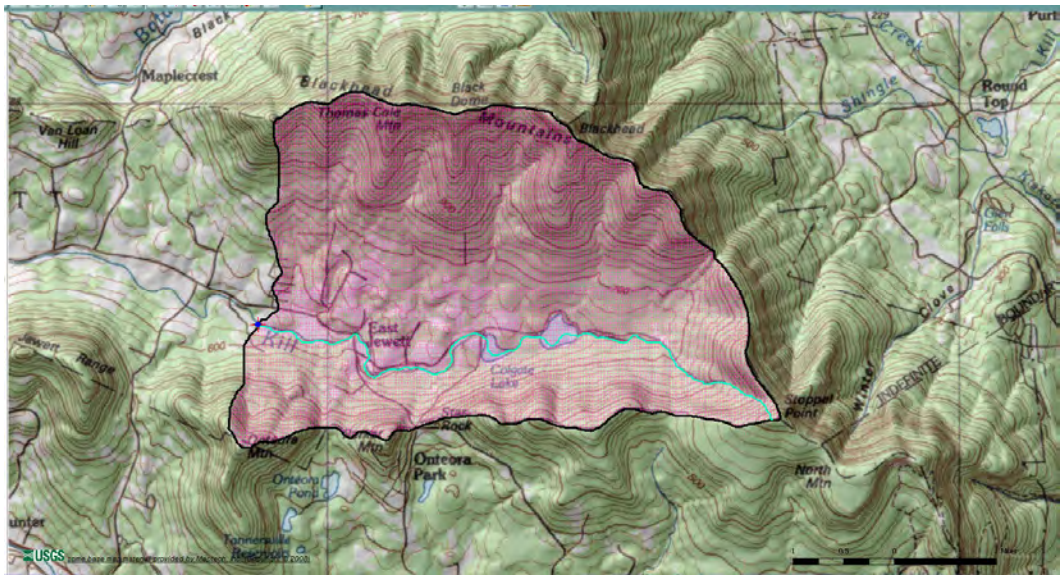
Any streamside landowner with property within the mapped buffer area can receive technical assistance and a Riparian Corridor Management Plan.

Riparian planting site as shown in 2007 SMP

Site Visit Description / Existing Conditions

The Bardfield property is located on Shadow Mountain Road off of Route 23C in East Jewett, NY. The northern property boundary is the East Kill, which is a C (TS) stream suitable for trout spawning.[1] During a site visit conducted by GCSWCD staff in November of 2010, erosion was evident in the form of 500 feet of undercut bank along the left bank (looking downstream). Although the stream had migrated through a 20 year old pine and spruce buffer, there were no immediate threats to structures on the property. Other than a few mature trees present at the top of the bank, deep-rooted vegetation was sparse along the property line. The low elevation, flood prone left terrace is currently a field of mowed herbaceous vegetation, and was identified as such in the East Kill Stream Management Plan which was conducted in 2007 by the GCSWCD.

The drainage area for this location is 13.4 mi^2 including runoff from portions of the Blackhead Mountains to the North, Stoppel Point to the East, and Onteora Mountain to the South. Approximately 96.9% of the drainage area is covered by forest.



USGS StreamStats map showing Drainage Area for Bardfield property

[1] All waters of New York State are provided a class and standard designation based on existing or expected best usage of each water or waterway segment. Classification C is for waters supporting fisheries and is suitable for non - contact activities. Classification TS designates trout spawning waters.

After the November site visit, Mr. Bardfield applied for a stream bank disturbance permit to reinforce the banks with rip-rap, and completed much of this work prior to the CSBI site visit in December. He has indicated that plans for the spring of 2011 include a continuation of rip-rap placement near the upstream end of his property. Although the banks were covered with snow at the time of the site visit in December 2010, much of the existing rock armoring was visible and appeared to be in fairly good functional condition. The photo below taken in November 2010 shows the view looking downstream from Stephen's property prior to rip-rap installation, and highlights the severity of historic bank erosion at this site.

Eroding streambank looking upstream at Joshua Bardfield's parcel 12/22/10

The soil type within the project area is identified as Barbour loam (Ba) which consists of very deep, well drained soils formed in alluvial deposits derived from acid, reddish sandstone, siltstone and shale. Mean annual air temperature is 45 to 50 °F., and mean annual precipitation is 47.6 inches. Depth to high water table is 3 to 6 feet with occasional flooding. Native trees found in this floodplain soil type are maple,

oak, and white pine. [2] According to the current floodplain maps, this project area is located within the 100-year floodplain, and is at a relatively high risk of frequent inundation. Recent studies indicate that air temperature, precipitation, and runoff are all showing a trend of increase in the Catskill region (Burns et al. 2006). These trends suggest that flood events may become more frequent and severe, and every attempt should be made to naturally mitigate flood risks to stream side property.

Historic Conditions

In the development of the East Kill Stream Management Plan by the Greene County Soil and Water Conservation District (GCSWCD), it was determined that the Bardfield parcels are located in Management Unit 4. Within the mapped 300 foot wide riparian buffer zone for this management unit, the predominant vegetation type is forest cover (64% of mapped area). Other land cover types include shrubland (12%), herbaceous vegetation (22%), and impervious surface (2%).

As seen from the historical stream channel alignments (below), the planform of the channel alignment has changed significantly over the years along this management unit. In each of the three locations, the channel has experienced lateral migration, the movement of a channel across its floodplain over time. Channel migration can occur through natural processes of erosion and deposition over time, but is often expedited by human induced changes to the stream. Historically, through the section of stream that runs through the Bardfield parcels, there has been a split channel, the locations and lengths of the secondary channel has changed over time as the outside banks of the meandering channel moved laterally across the valley floor and down the valley. Currently, the flow along this property is confined to a single channel. However, channel alignment is subject to relatively frequent change due to various factors.

Historic stream channel alignments with 2006 aerial photograph

The East Kill Stream Management Plan recommends that management efforts in this unit should focus on establishing a riparian buffer in appropriate locations by planting native trees and shrubs along the streambank and the upland area. Buffer width should be increased by the greatest amount agreeable to

[2] National Cooperative Soil Survey
Official Series Description – 1999

the landowners. Increasing the buffer width to at least 100 feet will increase the buffer's functionality and protect the stream from nearby land uses.

Landowner Issues / Concerns

Mr. Bardfield has owned the property for 35 years and is concerned about recent erosion occurring on his property. As a result of the two major floods that occurred in the fall of 2010, he estimates that an area of 450 feet in length and 20 feet in width has washed away. Mr. Bardfield states that his upstream neighbor created a berm within the last two years, which may be contributing to the increased frequency and magnitude of flooding along this property.

Landowner Goals

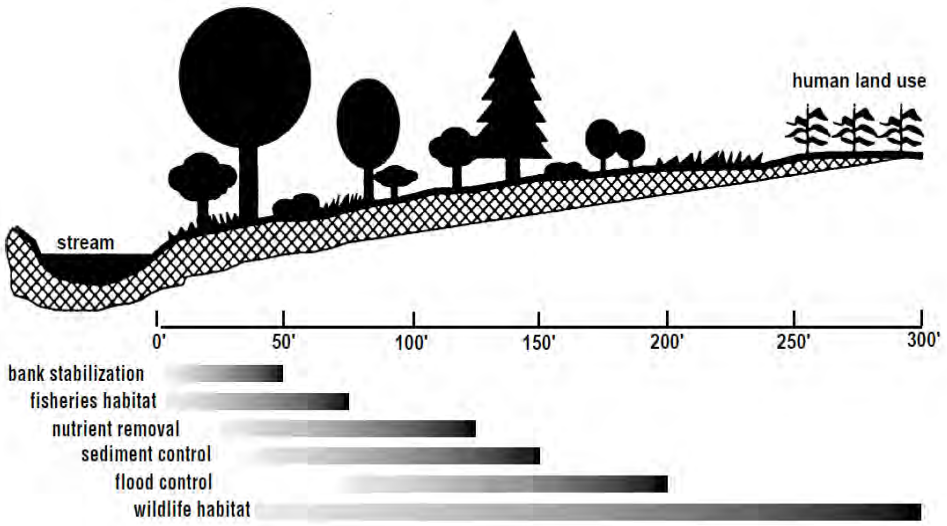
1) Reduce erosion and stabilize streambanks
2) Protect existing trees and plant additional vegetation to enhance buffer
3) Maintain property for preservation

Mr. Bardfield does not participate in any other watershed programs at this time. He has completed a CSBI application form and indicated that his preferred buffer width is 35 - 100 feet, while estimating the buffer length to be 500 ft. He has indicated a willingness to assist with project installation and recruitment of volunteers for project installation.

Recommendations – Best Management Practices (BMPs)

1) Apply to CSBI for funding support to install one or more of the practices below.

2) Establish a riparian buffer as deep rooted woody vegetation is critical to maintaining bank stability**.** This site could benefit from enhanced buffer width and establishment of more woody vegetation. Planting and maintaining a healthy buffer of native trees and shrubs along streambanks and floodplains is one of the most cost effective and self-sustaining methods for landowners to protect streamside property**.** Planting additional native species such as willow can help restore the riparian buffer to stabilize the streambanks. Native species are recommended due to their adaptation to our regional climate and soil conditions and because they typically require less maintenance than exotic species following planting and establishment.



3) Use vegetative treatments such as dormant posts and stakes to address minor localized erosion. Bioengineering, the use of live vegetation to stabilize soils associated with streambanks, can be used at this location. Dormant cuttings from appropriate species, such as willows and dogwoods, quickly establish vegetation on the banks. Live posts and stakes are cut from living willow shrubs when the shrub is dormant (usually during the fall or early spring). The stakes, ranging from one to several feet long, are hammered or pushed into the stream bank where they will grow quickly and provide necessary bank stabilization where it is needed most. A dormant post detail drawing is attached.

4) Maintain root systems that hold soil in place by not mowing right to the stream edge. Degrading buffer zones can be improved by not mowing in the buffer zone. Keeping a buffer zone of trees and shrubs, especially in the first 50 to 100 feet, along streambanks helps to minimize erosion and protect property, filter pollutants, and increase habitat value.

5) Interplant native shrub and sedge species through the rip-rap. This planting will help to strengthen the revetment, while enhancing aquatic habitat.

6) Be on the lookout for invasive species such as Japanese knotweed. Invasive, non-native species can threaten the ecology of a native plant community. This impact may extend to an alteration of landscape or bank stabilization. Japanese knotweed out-competes native plants by growing much faster than its native counterparts. Knotweed can tower over native plants, cut off their light supply and eventually, take over the entire length of a stream. This is especially dangerous, because knotweed does not stabilize stream banks as well as native species. Furthermore, it is a very resilient plant, and simply cutting it down without proper disposal can potentially make the problem worse. See the link below (in the Appendix) for tips on controlling Japanese knotweed.

7) Continue to monitor reach stability through normal observations. Take photographs from the same location each year to photo document erosion.

Project Proposal

The scope of the proposed project includes riparian buffer plantings of trees and shrubs on two adjacent parcels owned by Stephen and Joshua Bardfield. This riparian buffer planting of native vegetation is intended to enhance the overall ecological function of the riparian corridor.

In order to proceed with a riparian buffer enhancement project, the landowner must sign a written agreement which specifies the terms of the work being conducted on the property. GCSWCD offers multiple options for these agreements to ensure that each landowner has the opportunity to agree to the terms that best suit their goals. The landowner agreement options range from a basic license agreement to conduct the specified work, to easements which ensure the conservation of the planted buffer over a longer period of time. CSBI coordinators are happy to provide landowners with detailed descriptions of the terms associated with each agreement option.

The Greene County Soil and Water Conservation District will provide:

1. A Riparian Corridor Management Plan
2. Project Design for the Riparian Buffer Plantings
3. Native Trees and Shrubs
4. Installation of Plant Materials
5. A Landowner's Guide to Vegetation Management

Resources and References

East Kill Stream Management Plan
http://www.catskillstreams.org/East_Kill_Stream_Management_Plan.html

East Kill Management Unit 4
http://catskillstreams.org/pdfs/EKSMP/24_MU4.pdf

Catskill Streams Buffer Initiative
http://catskillstreams.org/CSBI/

Riparian Buffers
http://www.catskillstreams.org/stewardship_streamside_rb.html

Introduction to Riparian Buffers Fact Sheet
http://northjerseyrcd.org/upload/uploads/Intro.pdf

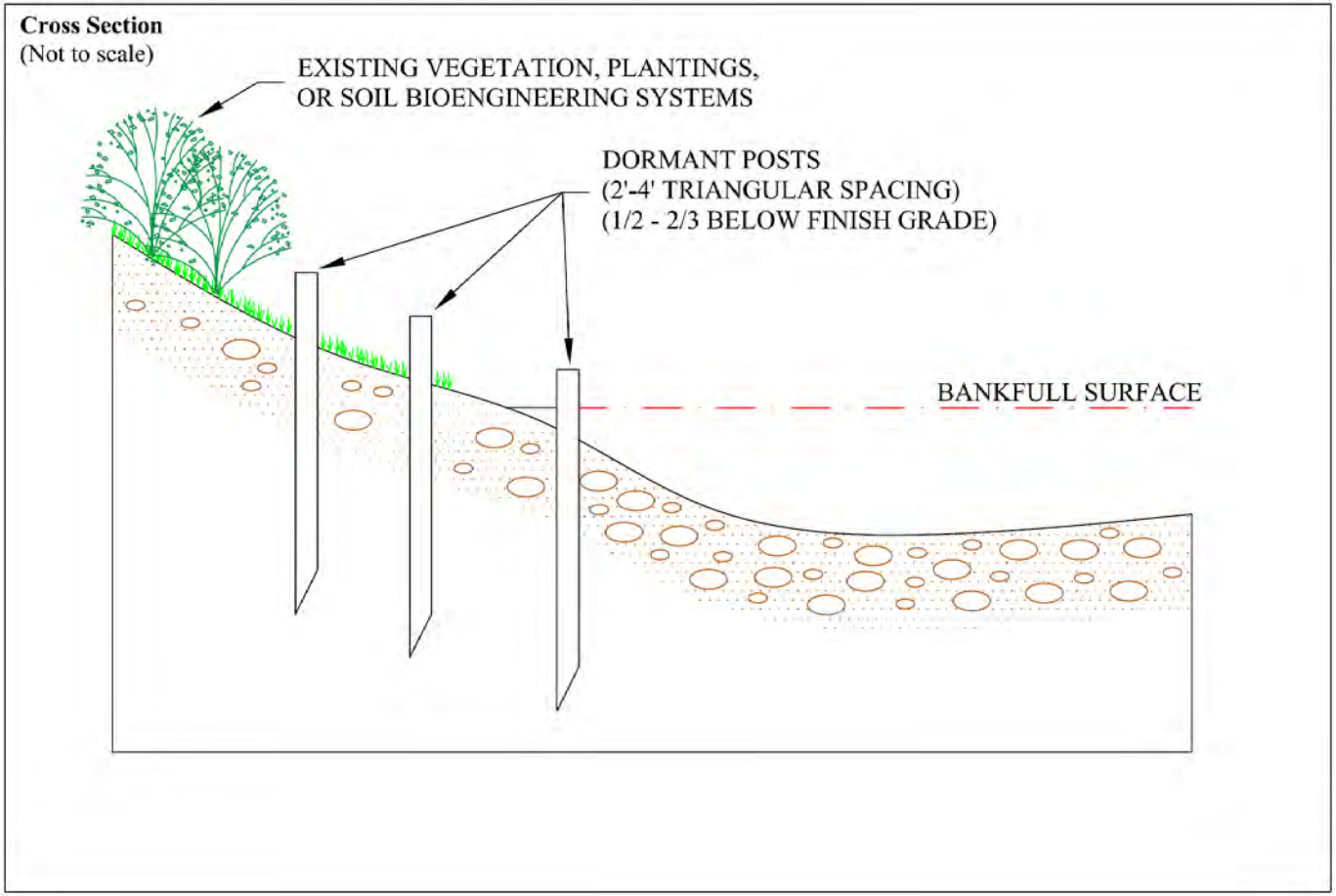
DEC Environmental Resource Mapper
http://www.dec.ny.gov/animals/38801.html

Japanese Knotweed Information
http://www.catskillstreams.org/pdfs/Knotweed%20webpage%20text%20&%20links.pdf

Soils
National Cooperative Soil Survey
Official Series Description Series, 1999
http://soils.usda.gov/technical/classification/osd/index.html

Burns, D.A., Klaus J., and McHale M.R. (2006). Recent Climate Trends and Implications for Water Resources in the Catskill Mountain Region, New York, USA. Journal of Hydrology.

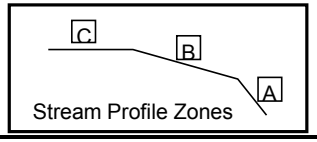
DORMANT POST DETAIL (VS-03a)



Bardfield Riparian Planting Plan
East Kill

Site Details

700 ft x 35 ft (24,500 sq ft)
.56 acre
432 trees and shrubs with 8 x 8 spacing
willow stakes



	Latin Name	Wetland Indicator	Native	Location	Spacing (ft)	Total #	*Notes*
Evergreen transplants							
White pine	Pinus strobus	**FACU**	**Y**	C	8	50	
Eastern hemlock	Tsuga canadensis	**FACU**	**Y**	C	8	30	
White spruce	Picea glauca	**FACU**	**Y**	C	8	25	
						105	
Hardwoods							
Paper birch	Betula papyrifera	**FACU**	**Y**	C	8	17	
Gray birch	Betula populifolia	**FAC**	**Y**	C	8	12	
Sugar maple	Acer saccharum	**FACU**	**Y**	C	8	12	
Red maple	Acer rubrum	**FAC**	**Y**	C	8	40	
Red oak	Quercus rubra	**FACU**	**Y**	C	8	35	*acorns - food for wildlife*
White ash	Fraxinus americana	**FACU**	**Y**	C	8	3	
Black ash	Fraxinus nigra	**FACW**	**Y**	B	8	3	
Choke cherry	Prunus virginiana	**FACU**	**Y**	C	8	10	*plant in sun - fast growing*
						132	
Shrubs							
Speckled alder	Alnus rugosa	**FACW**	**Y**	B	8	10	
Black willow	Salix nigra	**FACW**	**Y**	B	8	10	*plant downstream by water*
Meadowsweet	Spirea alba	**FACW**	**Y**	B	8	20	*plant downstream by water in full sun*
Elderberry	Sambucus canadensis	**FACW**	**Y**	B	8	20	*berries eaten by 48 species of birds*
Shadblow serviceberry	Amelanchier canadensis	**FAC**	**Y**	C	8	20	
Gray dogwood	Cornus racemosa	**FAC**	**Y**	C	8	15	*berries are food for many songbirds*
Redosier dogwood	Cornus sericea	**FACW+**	**Y**	A-B-C	8	38	
Silky dogwood	Cornus amomum	**FACW**	**Y**	A-B	8	35	*high wildlife value*
Arrowwood	Viburnum dentatum	**FAC**	**Y**	C	8	27	
						195	
				TOTAL PLANTS		432	

Wetland Indicator = Wetland Indicator Status

OBL: Obligate Wetland: Occurs almost always (estimated probability 99%) under natural conditions in wetlands.

FACW: Facultative Wetland: Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.

FAC: Facultative: Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).

FACU: Facultative Upland: Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).