

Schoharie Watershed Stream Management Program 2016 – 2018 Action Plan



Photo of Apple Hill Stream Restoration in Jewett (East Kill) looking upstream courtesy of Chris Langworthy



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To: David Burns, Project Manager, NYCDEP

From: Jeff Flack, Executive Director, GCSWCD

Date: May 19, 2016

Re: Schoharie Watershed Stream Management Program 2016-2018 Action Plan

The Greene County Soil and Water Conservation District (GCSWCD) and the NYC Department of Environmental Protection (DEP) have collaborated with the Schoharie Watershed Advisory Committee (SWAC) to develop the 2016 – 2018 Action Plan. The Action Plan provides the Schoharie Watershed Stream Management Program’s activities, projects and programs that are planned for 2016-2018 as well as program accomplishments.

The Action Plan is divided into key programmatic areas:

- A. Protecting and Enhancing Stream Stability and Water Quality
- B. Floodplain Management and Planning
- C. Highway and Infrastructure Management in Conjunction with Streams
- D. Assisting Streamside Landowners (Public and Private)
- E. Protecting and Enhancing Aquatic and Riparian Habitat
- F. Enhancing Public Access to Streams

The Action Plan is updated and revised annually. This plan will be implemented from May 2016 – May 2018.

Schoharie Watershed Stream Management Program 2016-2018 Action Plan

Purpose

This Action Plan identifies stream management goals, presents a subset of stream management plan recommendations and identifies current implementation initiatives by the Schoharie Watershed Stream Management Program for the period 2016-2018. The Action Plan also provides the current status or progress of each action item.

How to read this document: The Action Plan is organized around key programmatic areas. For each topic area, a list of recommendations, derived from Stream Management Plans and program staff, are provided in *italicized text*. Following the recommendations, the ongoing projects, programs and activities, including those that are funded through the Stream Management Implementation Program (SMIP), are listed.

Background

The Schoharie Watershed Stream Management Program (SWSMP) was established in a partnership between the Greene County Soil & Water Conservation District (GCSWCD) and NYC Department of Environmental Protection (DEP) in 1997 as part of the Filtration Avoidance Determination (FAD) issued to DEP by the Environmental Protection Agency. Stream Management Plans have been completed for each major river corridor in the Schoharie Watershed and each plan includes a set of general recommendations, and project specific recommendations, which provide a “road map” for improved stream and floodplain management. In addition to supporting the FAD, many SWSMP projects also target reductions to in-stream sources of suspended sediments as part of DEP’s Shandaken Tunnel State Pollution Discharge Elimination System (SPEDES) permit established in September 2006. The SWSMP seeks to advance state-of-the-art watershed management projects, policies and programs to improve and protect the Schoharie’s water resources. Initiatives include the Stream Management Implementation Program (SMIP), the Catskill Streams Buffer Initiative (CSBI), stream and floodplain restoration projects, stream and watershed assessments, flood hazard analysis and mitigation, and education and outreach programs.

The following Action Plan summarizes the programs and projects that GCSWCD will be leading within the Schoharie Basin between May 2016 and May 2018, and includes action plan updates through May 1, 2016. The GCSWCD will lead the efforts for each action item, and work cooperatively with watershed partners including, but not limited to, the Schoharie Watershed Advisory Committee (SWAC), NYCDEP, NYSDEC, CWC and watershed municipalities. Funding sources for our action items include, Stream Management Implementation Program (SMIP), Catskill Streams Buffer Initiative (CSBI), Watershed Assistance Program (WAP), Water Resources Development Act (WRDA), Catskill Watershed Corporation (CWC), DEP/GCSWCD Schoharie Watershed Stream Management Program (Contract), Federal Emergency Management Agency (FEMA), and Natural Resource Conservation Service Emergency Watershed Protection Program (EWP).

Program Administration

The Schoharie Watershed Stream Management Program requires on-going administrative and organizational support to implement stream management efforts. Many of the program administration action items began in 2007 and will continue through the duration of the stream management program. Additional action items may be added as the program evolves and as program goals are refined.

PROGRAM ADMINISTRATION				
Action Item	Partners	Description	Funding	Status
Program Administration and Implementation	NYCDEP, GCSWCD, MSMA, SWAC	The GCSWCD has developed an effective and efficient process for implementation of the stream management plans for Schoharie Creek and its associated tributaries. These efforts help to fulfill the NYCDEP FAD obligations. Development and implementation of the program is an on-going process.	NYCDEP, GCSWCD	On-going
Inter-Agency Coordination	GCSWCD, NYCDEP, NYSDEC, USACOE	Facilitate coordination between the agencies with stream management responsibilities. This is a key component of SMP implementation.	NYCDEP, GCSWCD	On-going
Schoharie Watershed Advisory Committee (SWAC)	Schoharie Basin Municipalities, Technical Advisors, GCSWCD, NYCDEP	The organizational structure of the Schoharie Watershed Advisory Committee (SWAC) was developed in early 2008. After the kick off meeting in May 2008, the SWAC has met regularly throughout the years, developed program materials to initiate a stream management plan implementation process, and identified projects for implementation. Administrative support for the SWAC remains an on-going activity, with SWAC member reappointments, town re-adoption of SMPs, signing of MOUs to collaborate on stream issues, regular municipal updates and SWAC meetings.	NYCDEP, GCSWCD	Organized May 2008, meet 2-3x per year
Catskill Streams Website	NYCDEP, GCSWCD Schoharie SMP Contract	The GCSWCD will continue to provide logistical support in the development and maintenance of the Catskill Streams Website as a valuable tool for sharing information with watershed stakeholders. The GCSWCD will also continue to maintain and update the district's website.	NYCDEP, GCSWCD	On-going
Plant Materials Program	NYCDEP, GCSWCD	GCSWCD will continue to produce quality native plant materials for its stream restoration projects and riparian buffer plantings.	NYCDEP, GCSWCD	On-going
Operation and Maintenance	NYCDEP, GCSWCD, Landowners	The GCSWCD, NYCDEP and project partners will work to maintain project sites throughout the Schoharie Creek watershed. This may include, but is not limited to, supplemental planting, bioengineering, minor repairs, general maintenance and assessments as needed.	NYCDEP/ GCSWCD Schoharie SMP Contract	On-going, maintenance plan developed annually in Spring

A. Protecting and Enhancing Stream Stability and Water Quality

Protecting and enhancing stream stability and water quality may include: stream corridor assessments; stream stabilization/restoration projects with a goal to restore stream stability and reduce targeted pollutant; monitoring and maintenance of stream projects; and outreach, education and technical assistance to encourage stream stewardship.

STREAM CORRIDOR ASSESSMENT AND MONITORING RECOMMENDATIONS

1. *Complete a watershed assessment of tributaries within the Schoharie Creek Watershed that have yet to be assessed. These tributaries should be studied to identify and prioritize sediment sources, erosion hazards, and potential water quality impairments and associated treatment opportunities.*
2. *Review existing water quality data and identify, to the extent possible, the most significant water quality impairments.*
3. *Identify locations of potential water quality impairments including; sources of pollution from upland areas and within the stream channel such as significant glacial lake clay exposures, and sources of contaminants from road runoff and households, and make prioritized recommendations for their mitigation.*
4. *Identify, monument and survey selected sites of bank erosion, assess their relative stability, and make prioritized recommendations for their treatment.*
5. *Monitor constructed stream restoration sites to document the projects' status and performance. Monitoring will include measurements and analysis of geomorphic form, rock structures, and vegetation. Monitoring will be performed in accordance with Army Corps of Engineers permit requirements as well as GCSWCD/NYCDEP annual assessments of the need for additional monitoring. Data will be collected to monitor project stability and vegetation establishment.*

STREAM ASSESSMENTS AND MONITORING				
Action Item	Partners	Description	Funding	Status
Tributary Stream Inventory and Assessment	NYCDEP, GCSWCD	While existing SMPs cover the main stems of most major stream systems within the Schoharie Watershed, they do not address any tributaries to these systems. Therefore, less than 10% of total stream miles have been inventoried, assessed and planned. Stream Feature Inventories (SFI) of tributaries is an on-going priority to assess baseline conditions and identify potential projects. The Huntersfield Creek and Little West Kill SFIs will be conducted in 2016. Tributaries to assess in 2017 will be determined in winter, 2016.	NYCDEP/ GCSWCD Schoharie SMP Contract	Active
Monitoring of Restored Stream Reaches	NYCDEP, GCSWCD	Annual monitoring of restored stream reaches provides valuable information on the effectiveness of restoration practices in addition to fulfilling the permit requirements associated with these projects. Monitoring includes a visual inspection of the reach, photo documentation, pebble counts, and a survey of monumented cross sections and the longitudinal profile.	NYCDEP/ GCSWCD Schoharie SMP Contract	Years 1, 2, 3 and 5 post-construction

Vegetation Monitoring	NYCDEP, GCSWCD	Annually, the GCSWCD and project partners monitor the native riparian vegetation that has been installed along streambanks within the Schoharie watershed. Riparian plantings are completed in conjunction with the installation of natural channel designed (NCD) stream restoration projects and CSBI projects. Vegetation provides for increased stability as trees and shrubs continue to mature, and it is a critical component to the long-term success of these types of projects. Annual vegetation monitoring provides valuable information on the effectiveness of restoration practices in addition to fulfilling the permit requirements associated with these projects.	NYCDEP/ GCSWCD Schoharie SMP Contract	Annually Schedule updated in January
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STREAM RESTORATION AND STABILIZATION RECOMMENDATIONS

1. *Identify locations where roads, bridges, or culverts and water quality may be threatened by SMP prioritized bank erosion, or are otherwise unstable or threatened, and make prioritized recommendations for their treatment.*
2. *Identify locations where improved or residential areas and water quality may be threatened by bank erosion, and make prioritized recommendations for their treatment.*
3. *Identify locations of stream instabilities contributing to water quality impairment and make prioritized recommendations for their mitigation or treatment.*
4. *Implement stream stability restoration projects that have been identified through field assessments or prioritized in management plans.*
5. *Governmental landowners in the Schoharie Creek watershed should manage their lands using natural channel stability concepts, and should serve as a model for other watershed landowners.*

STREAM RESTORATION AND STABILIZATION				
Action Item	Partners	Description	Funding	Status
Schoharie Creek Stabilization and Riparian Restoration at Kozak	GCSWCD, NYCDEP	Located along the Schoharie Creek, this project involves restoring 750 linear feet of erosion with clay exposures by grading the bank and stabilizing the toe with rock and bioengineering treatments. A 50-100 feet wide riparian buffer will be established by planting native tree and shrub species along 2,000 feet of streambank. Planning, assessment, permitting and design are complete. Project construction is planned for August 2016.	SMIP, GCSWCD, NYCDEP	Active
Batavia Kill Restoration at Big Hollow Project Repairs	GCSWCD, NYCDEP, FEMA	Repair of damages sustained on the Big Hollow Stream Restoration project on the Batavia Kill are planned for 2016. Design, permitting and bidding were complete in 2013; construction has been postponed until landowner approval was recently obtained.	FEMA, NYCDEP/ GCSWCD Schoharie Contract	Active

Batavia Kill Restoration at Red Falls	GCSWCD, NYCDEP	A full-channel restoration project located on the Batavia Kill at the border of Ashland and Prattsville is in the assessment and design phase. This project will develop a plan to stabilize eroding streambanks and to protect water quality by reducing fine sediment sources along this high-turbidity producing reach of stream. The design will address over a mile of severely degraded stream. The assessment, design, permitting and implementation are in progress, and construction is planned for summer of 2017.	GCSWCD/ NYCDEP Schoharie SMP Contract	Active
West Kill Restoration at Shoemaker	GCSWCD, NYCDEP	General construction of this project was completed in 2015, but will have bioengineering installed in 2016.	GCSWCD/ NYCDEP Schoharie SMP Contract/ SEMO, FEMA	Active

STREAM STEWARDSHIP EDUCATION AND OUTREACH RECOMMENDATIONS

1. *Collaborate with local and regional partners to enhance education and outreach efforts related to stream and floodplain management, sediment and erosion control, and other topics critical to sound watershed management.*
2. *Maintain a watershed website to provide information to watershed stakeholders.*
3. *Develop publications focused on stream management which can be provided to watershed stakeholders and/or used in training workshops.*
4. *Host a Schoharie Watershed Month with various events planned for watershed residents and visitors to promote awareness and stewardship.*
5. *Increase public and technical awareness about the importance of the Schoharie Creek watershed and ecosystem by providing educational workshops for a variety of stakeholders including, riparian landowners, municipal leaders, planning boards, code enforcement personnel, highway departments, local businesses, contractors, developers and educators.*
6. *Increase technical awareness about stream science, water quality protection and best management practices by providing educational workshops for a variety of stakeholders including, riparian landowners, municipal leaders, planning boards, code enforcement personnel, highway departments, local businesses, contractors, developers and educators.*
7. *Develop detailed, science based guidelines to stream management which are readily available to those entities responsible for stream activities in the Schoharie Creek watershed. Guidelines must emphasize natural channel stability.*

STREAM STEWARDSHIP EDUCATION AND OUTREACH				
Action Item	Partners	Description	Funding	Status
Annual Education and Outreach Plan	NYCDEP, GCSWCD, SWAC	The GCSWCD continues to work with NYCDEP and others to develop and implement a comprehensive education and outreach strategy with goals submitted annually in January. The GCSWCD will help identify training needs and plan training activities for a wide range of audiences; training activities may be basin-wide or specific to individual sub-basins.	GCSWCD/ NYCDEP SMP Contract, WAP, CWC	Annually
Schoharie Watershed Month	GCSWCD, NYCDEP, local schools, TU, CWC, WAC, GCCCE, DEC, SWAC	Community involvement and awareness is important for promoting the protection of streams and their watersheds. Hosting a watershed-wide educational and recreational event (SWM) provides an opportunity for watershed residents, students, community groups, tourists, officials and others to get to know their stream and the resources available to help provide watershed protection.	SMIP	Annually
Schoharie Watershed Summit	NYCDEP, GCSWCD, SWAC	The annual conference, which began in 2007, is organized for local municipal officials, county and non-profit agencies, highway departments, regulatory agencies and engineering firms active in the Schoharie Basin, and offers training in relevant water resources management, regulations, land use, and stormwater management. Credits for planning board members are provided.	GCSWCD NYCDEP SMP Contract	Annually
Schoharie Watershed Tour	NYCDEP, GCSWCD, SWAC	The annual watershed tours are organized to provide public officials, watershed managers and landowners an opportunity to view project sites to see the range and diversity of completed and potential watershed projects. The tours offer training in relevant water resource issues and management. The next tour will be held in 2017.	GCSWCD NYCDEP SMP Contract	Biennial
Community Outreach	NYCDEP, GCSWCD	Success of SMP implementation requires community awareness and involvement. In order to keep watershed communities and interested stakeholders informed of SMP implementation progress and activities, the GCSWCD and its partners may use a variety of outreach media including newspaper articles, an "e"-newsletter, program print newsletter, brochures, facts sheets, project announcements, media contacts, press releases and kiosks.	GCSWCD NYCDEP SMP Contract, CWC, GCSWCD-WAP	On-going

B. Floodplain Management and Planning

Floodplain management and planning may include: floodplain assessments; coordination of floodplain management efforts in the watershed; and outreach, education and technical assistance for floodplain management in the Schoharie Watershed.

LOCAL FLOOD ANALYSIS AND FLOODPLAIN ASSESSMENT RECOMMENDATIONS

1. *Identify locations where roads, bridges, or culverts may be threatened by flooding, and make prioritized recommendations for their treatment.*
2. *Identify locations where improved or residential areas may be threatened by flooding, and make prioritized recommendations for their treatment.*
3. *Support flood hazard mitigation efforts to reduce the impacts from flooding such as impacts to public safety, homes and businesses, infrastructure and the natural environment.*
4. *Through LFA provide resources to help WOH municipalities: confirm that there is a significant flood hazard in the target area through engineering analysis; use engineering analysis to develop a range of hazard mitigation alternatives; the primary focus of the analysis is to identify the potential for reducing flood elevations through channel and floodplain restoration, as the first alternative to other hazard mitigation solutions; evaluate both the technical effectiveness and the benefit/cost effectiveness of each solution, and compare different solutions to each other for the most practical, sustainable outcome.*

LOCAL FLOOD ANALYSIS AND FLOODPLAIN ASSESSMENT				
Action Item	Partners	Description	Funding	Status
Lexington Local Flood Analysis	GCSWCD, NYCDEP, Town of Lexington	In 2014, the Town of Lexington began a Local Flood Analysis (LFA) to determine the causes of flooding, investigate and analyze the overall potential of specific projects, and projects in combination, in an attempt to mitigate flood damages and hazards. The analysis is complete and the LFA report is complete and pending final approval of the Town of Lexington in spring 2016.	SMIP	Active
Conesville Local Flood Analysis	GCSWCD, NYCDEP, Town of Conesville, SCSWCD, SC Planning	The Town of Conesville has formed a Flood Advisory Committee (FAC) and will work with consultants in 2016 - 2017 on a Local Flood Analysis (LFA). The LFA will help to determine the causes of flooding, investigate and analyze the overall potential of specific projects, and projects in combination, in an attempt to mitigate flood damages and hazards.	SMIP	Active
Ashland Local Flood Analysis	GCSWCD, NYCDEP, Town of Ashland	The Town of Ashland has begun to form a Flood Advisory Committee (FAC) that will work with consultants in 2016 - 2017 on a Local Flood Analysis (LFA). The LFA will help to determine the causes of flooding, investigate and analyze the overall potential of specific projects, and projects in combination, in an attempt to mitigate flood damages and hazards	SMIP	Active

Windham LFA Implementation	GCSWCD, NYCDEP, Town of Windham	The GCSWCD will continue to support the LFA recommended project of relocating GNH Lumber to a site outside the floodplain in Windham. Their LFA was completed and adopted in 2015.	CWC	Active
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FLOODPLAIN MANAGEMENT COORDINATION, EDUCATION AND OUTREACH RECOMMENDATIONS

1. *The GCSWCD should support local municipalities in the use of FIRM maps.*
2. *Municipalities in the watershed should conduct a review of current floodplain ordinances and adopt revisions as appropriate. Revisions should reflect current building trends, new technologies, compliance and integrated broader community plans as appropriate.*
3. *Schoharie Watershed municipalities should evaluate participation in the FEMA Community Rating System.*
4. *Access to flood prevention/protection information should be established and supported throughout the Schoharie Creek Watershed.*
5. *Watershed municipalities, working with local and state agencies, should support periodic training sessions on flood related issues. Audiences should include municipal leaders, code enforcement staff, planning boards, landowners, realtors, lending institutions and others.*
6. *Watershed municipalities should facilitate development of a flood damage reporting system to track types of flooding, their location and the costs associated with flood damage.*
7. *Stream and floodplain management guidelines, which integrate stream form and function, should be developed for use during post flood response.*

FLOODPLAIN MANAGEMENT COORDINATION, EDUCATION AND OUTREACH				
Action Item	Partners	Description	Funding	Status
Hazard Mitigation Grant Program Flood Buyout Program	NYCDEP, GCSWCD, SEMO, FEMA, Watershed Municipalities, GC Economic Development, Tourism & Planning,	The GCSWCD is facilitating a FEMA flood buyout program for 23 eligible landowners in 8 Greene County towns following Hurricane Irene in 2011. NYCDEP is participating in the program by covering the 25% non-federal match for watershed properties that are not eligible for state assistance. Deed restriction and conservation easement for watershed properties are issued to maintain the property in perpetuity as open floodplain space, therefore eliminating future flood damage to the parcel. Demolition is complete on all but one property. The program will be fully complete in summer 2016 following demolition of the final property located in Prattsville. Once the DEP-funded buyout program starts, the District will facilitate four stream project related and erosion hazard buyouts.	FEMA, SEMO, NYCDEP	Active

C. Highway and Infrastructure Management in Conjunction with Streams

Highway and infrastructure management in conjunction with streams may include: best management practices (BMPs) to improve infrastructure and stream intersections; stormwater management; and outreach, training and financial assistance to infrastructure managers to demonstrate BMPs.

HIGHWAY, INFRASTRUCTURE AND STORMWATER MANAGEMENT RECOMMENDATIONS

1. *Local municipalities, Greene County Highway Department and NYSDOT should place a priority on vegetation management on critical areas such as roadside ditches and steep slopes.*
2. *Watershed municipalities should evaluate winter road abrasive procedures to address abrasive quality, application methods and spring sweeping.*
3. *The Town and County Highway Departments and NYSDOT should integrate geomorphology principles in all new projects and routine maintenance activities related to the Schoharie Watershed.*
4. *Work with local highway departments to minimize the negative effects of bank armor through the use of vegetation within and above the armor. Replant existing rip rap. This will both increase the effectiveness and strength of the rip rap and cool water temperatures through shading and reducing the thermal effects of heated rock.*
5. *Work with the SWAC Highway Committee to identify opportunities to address infrastructure that is leading to stream instability and water quality degradation.*

HIGHWAY, INFRASTRUCTURE AND STORMWATER MANAGEMENT				
Action Item	Partners	Description	Funding	Status
Critical Area Seeding and Slope Stabilization Program	GCSWCD, NYCDEP, County & Municipal Highway Departments	All of the SMPs and the SWAC Highway and Infrastructure subcommittee recommend that local municipalities, county highway departments and NYSDOT should place priority on vegetation management on critical areas such as roadside ditches and steep slopes. GCSWCD continues to partner with all highway departments to provide critical area seeding for roadside ditches and slopes using the district’s hydroseeder and power mulcher. In 2016, the program launched a slope stabilization fund through SMIP to address prioritized slopes with reinforced vegetative treatments for highway departments that attended a mandatory training in April, 2016.	SMIP, NYCDEP/ GCSWCD Schoharie SMP Contract	On-going
Kaaterskill United Methodist Church Stormwater/Rain Harvesting Project	NYCDEP, GCSWCD, Kaaterskill United Methodist Church	Several stormwater management practices are proposed to treat the water from the roof drainage and provide storm water infiltration. These include rooftop rain harvesting (gutter system), and above ground cistern to capture the runoff and serve as a water source for the community garden, and four rain gardens to provide stormwater filtration and infiltration. A detailed design is in progress and construction is planned for spring of 2017.	SMIP	Active

Glen Avenue Culvert Upgrade	Village of Hunter Highway Department, GCSWCD, NYCDEP	The GCSWCD worked with the Village of Hunter Highway Department to design and properly size the culvert under Glen Avenue near the entrance of Camp Loyaltown. Installation was completed in 2015 with a buried bottom for improved habitat. Supplemental plantings are planned for the spring of 2016.	SMIP, ESD, FEMA	Active
Cranberry Road Culvert Upgrade	Town of Hunter Highway Department, GCSWCD, NYCDEP	The GCSWCD worked with the Town of Hunter Highway Department to design, properly size and oversee the installation of this culvert. The existing culvert is undersized, contributing to flooding of the roadway during high flows. It is also substantially perched, which presents a barrier for fish passage. Survey, design and permitting are complete; construction is planned for 2016.	SMIP, ESD, FEMA	Active
Schoharie Watershed Stream Crossing/ Culvert Design	Highway Superintendents Subcommittee, NYCDEP, GCSWCD	To support local highway departments two SMIP grants have been awarded (\$50,000 & \$30,000) to fund engineering design services to ensure prioritized culverts/embankments are designed properly. Cranberry Road (Hunter), Glen Avenue (Village of Hunter), South Gilboa Road (Gilboa), Beech Ridge Road (Lexington) projects are being, or have been, designed using these monies. The culverts are being upgraded to reduce stream instability and associated pollutants, allow for proper conveyance and passage of aquatic organisms.	SMIP	Active
Mitchell Hollow Road (CR 21) Stormwater Sewer Upgrade	GCHD, GCSWCD, NYCDEP, Town of Windham	Install water quality treatment components associated with 370' of stormwater sewer with catch basins along Mitchell Hollow Road. Project will mitigate stormwater flooding in area along NYS Route 23.	SMIP, NYCDEP/ GCSWCD Schoharie SMP Contract	Active
Street Sweeper with Vacuum	Highway Superintendents Subcommittee, NYCDEP, GCSWCD	After the winter season, highway crews sweep road abrasives using different machines. Greene County owns a sweeper with a vacuum that is effective at collecting leftover sand material and cleaning out stormwater structures. Given its limited availability, purchasing another one for the mountaintop communities will allow more road miles to be cleaned and maintained across the mountaintop, thereby reducing the amount of abrasives washing into ditches and waterways.	CWC, SMIP	Active
South Gilboa Road Stormwater Mitigation Project	SC Department of Public Works, SCSWCD, GCSWCD, NYCDEP	This project will replace a culvert that conveys stream flow from an unnamed tributary to the Schoharie Reservoir under South Gilboa Road. In 2016, the SCSWCD will work with the Schoharie County Department of Public Works, NYCDEP and Milone and MacBroom to design and install a culvert that will provide for the appropriate alignment and structure to convey flow and reduce turbid discharges directly to reservoir.	SMIP, SCDPW, NYCDEP/ GCSWCD Schoharie Contract	Active

RECOMMENDATIONS FOR OUTREACH AND TECHNICAL SUPPORT TO HIGHWAY DEPARTMENTS, STORMWATER MANAGERS, AND CONTRACTORS

- 1. Provide municipal highway departments and local contractors with hands-on training in various stream management activities. Conduct field days, workshops and demonstration projects to meet this goal.*
- 2. Educate and train municipal highway departments in stream process, and provide them with information about how maintenance of road systems and other public infrastructure may impact local waterways.*

3. Provide education and outreach to municipal highway departments, stormwater managers and contractors to improve their ability to recognize changes in stream stability and impacts to water quality that may be associated with infrastructure management activities and to understand the impact of any management action they may take.

OUTREACH & TECHNICAL SUPPORT TO HIGHWAY DEPARTMENTS, STORMWATER MANAGERS & CONTRACTORS				
Action Item	Partners	Description	Funding	Status
Schoharie Watershed Stream Crossing Workshop	GCSWCD, GCHD, NYCDEP, NYSDOT, Local Highway Departments	Develop, design and implement a culvert workshop for local highway departments that highlights the importance of proper design and installation of culverts for sediment transport, fish passage, and incorporates principles using natural channel design for long-term stability, protection of water quality and health of streams.	SMIP	Active
NYS DEC endorsed Erosion and Sediment Control Required Construction Activity Training	NYSDEC, NYCDEP, GCSWCD	This training targets contractors, engineers, local government and watershed residents and provides knowledge about why stormwater is a concern and information on the new GP-0-15-002 permit. The training also informs participants about the requirements of stormwater pollution prevention plans (SWPPP). Participants learn about erosion and sediment control practices and how to perform site inspections, and how to obtain technical assistance on erosion and sediment control problems. GCSWCD will host another training in 2017.	NYCDEP, GCSWCD	Active
Highway Ditch Stabilization Workshop	NYCDEP, GCSWCD, SWAC, EJ Prescott	Develop, design, and implement a highway ditch stabilization workshop for local highway departments. Attendance will be mandatory for those interested in applying for funding through the Mountaintop Highway Ditch Stabilization Project (awarded by SMIP). This workshop occurred on April 18th, 2016 with presenters coordinated through EJ Prescott, and a field component to follow later in the year.	GCSWCD NYCDEP SMP Contract	Active

D. Assisting Streamside Landowners (Public and Private)

Assisting public and private streamside landowners may include: providing access to training and technical information to increase water resource knowledge, skills and capabilities of landowners; and providing technical assistance and programmatic support for stream issues and riparian restorations.

CATSKILL STREAMS BUFFER INITIATIVE

1. *Preserve and protect existing riparian buffers and provide for improved stewardship.*
2. *Efforts should be made to protect/enhance the stream corridor through the establishment of effective forested buffers. Stream buffers will offer some measure of protection against encroaching land uses and act to protect public and private property.*
3. *Assist landowners with their efforts to protect and maintain healthy riparian buffers, address invasive species, and improve the condition of unstable or degraded riparian areas.*
4. *Provide assistance with managing and preventing the spread of Japanese knotweed and other invasive species.*
5. *Provide assistance for streamside landowners to maintain diverse and healthy riparian buffers of at least 35-100 feet using native shrubs, trees and other woody vegetation.*

CATSKILL STREAMS BUFFER INITIATIVE				
Action Item	Partners	Description	Funding	Status
Manor Kill Colangelo Riparian Planting	SCSWCD, GCSWCD, NYCDEP	Riparian planting project on the Manor Kill in Conesville. Landowner has signed agreement and SCSWCD completed a Riparian Corridor Management Plan for this property. In 2009, 354 trees were planted, 150 willow stakes and 500 sedge plugs were installed along 546 feet of stream. In 2010, 340 additional trees and 200 stakes were installed. In 2012, potted stock was planted along 900 feet of the left streambank. An additional 319 feet of willow clump plantings are planned for installation.	CSBI	Active
Tompkins Riparian Project	GCSWCD, NYCDEP, Ashland	Replant a large section of Batavia Kill streambank adjacent to Tompkins Quarry. Project was on hold due to a change in ownership from Tompkins Quarry to the Town of Ashland. A planting plan has been developed and GCSWCD will obtain landowner agreement with the Town of Ashland to proceed with planting in 2016 and 2017.	CSBI	Active
Benjamin Property Planting	GCSWCD, NYCDEP	Riparian planting project to restore approximately 300 linear feet of streamside vegetation along the East Kill. GCSWCD has a 5 year landowner agreement for this property. The Greene County Highway Department restored the stream channel. GCSWCD installed willow stakes along 300 feet of streambank. Additional trees and shrubs will be planted on the site. Project site will be evaluated to determine vegetation needs in 2016.	CSBI	Active
Prattsville Ball Field	GCSWCD, NYCDEP, Town of Prattsville	Riparian planting project to restore approximately 200 linear feet of streamside vegetation along the Batavia Kill just upstream of the confluence with the Schoharie Creek in Prattsville at the Everett Conine Memorial Field. Plant an additional 550 linear feet of streamside vegetation along the Schoharie Creek at the same property. Project is on hold due to park and trail construction.	CSBI	Active

Chase Property Planting	GCSWCD, NYCDEP	Riparian planting to restore approximately 200 linear feet of streamside vegetation along a Batavia Kill tributary in Hensonville in Fall 2016.	CSBI	Active
Grossman Property Planting	GCSWCD, NYCDEP	Riparian planting to restore approximately 300 linear feet of streamside vegetation along a Schoharie Creek tributary in Hunter. GCSWCD has surveyed the property and will design bioengineering and bank treatments prior to planting 180 native trees and shrubs in 2016.	CSBI	Active
Posch Riparian Planting	GCSWCD, NYCDEP	Restore approximately 300 linear feet of streamside vegetation along the East Kill. GCSWCD has a 5 year landowner agreement for this property. GCSWCD will install willow stakes along 300 ft. of streambank to reestablish vegetation that washed out in Irene flooding. A riparian planting of 300 native trees and shrubs will be installed in spring 2016.	CSBI	Active
South Street Riparian Planting	GCSWCD, NYCDEP	Riparian plantings will be installed to a length totaling approximately 1,000 feet, with buffer widths varying from 45 feet to 100 feet, covering an area of 1.15 acre, along the Batavia Kill in Windham. This volunteer planting project will be included as a 2016 Riverkeeper Sweep event on May 7. Staff and volunteers will install 750 native trees and shrubs. To allow establishment of native trees, Japanese knotweed in the planting area will be treated.	CSBI	Active
Sawicki Property Grading and Planting	GCSWCD, NYCDEP	Restore approximately 4,500 square feet of streamside vegetation along a portion of the Schoharie Creek in Hunter. GCSWCD has conducted multiple site visits to develop planting recommendations. GCSWCD will obtain a permit from DEC to grade less than 300 ft. of eroding bank. Riparian trees and shrubs will then be planted along with willow stakes and fascines to establish riparian vegetation along the left bank of the Schoharie Creek.	CSBI	Active

OUTREACH, EDUCATION AND TECHNICAL ASSISTANCE TO STREAMSIDE LANDOWNERS

1. *Provide streamside landowners detailed technical information on the establishment and maintenance of riparian buffers.*
2. *Provide stakeholders technical assistance that will guide restoration of stream system stability and help to maintain ecological integrity. Technical assistance can range from a landowner consultation to activities that will help meet the priorities of protecting water quality and establishing riparian buffers.*
3. *Provide long-term access to technical assistance to landowners and municipalities for assessment of their stream-related problems, and development of effective management strategies and to supervise stream project implementation.*
4. *Educate streamside landowners by providing a basic understanding of fluvial process, factors impacting streambank stability and water quality, and management decisions for the promotion of a healthy stream.*
5. *Characterize current riparian vegetation management in the watershed and make prioritized recommendations for changes that can improve ecosystem integrity.*
6. *Educate municipal leaders by providing a basic understanding of fluvial process, with an emphasis on how local decision makers can support stream health through their leadership and provide information on the multiple benefits which can be realized by protecting stream and watershed health.*

OUTREACH, EDUCATION AND TECHNICAL ASSISTANCE TO STREAMSIDE LANDOWNERS				
Action Item	Partners	Description	Funding	Status
Local Technical Assistance	GCSWCD, NYCDEP	The GCSWCD and NYCDEP have worked cooperatively to develop program resources and policies to provide technical assistance for municipalities, planning boards, highway departments, developers, landowners and other interested parties. Technical assistance may include, but is not limited to, stormwater planning and retrofit, stream management activities, project permitting, and land use planning.	NYCDEP/ GCSWCD Schoharie SMP Contract, WAP	On-going

E. Protecting and Enhancing Aquatic and Riparian Habitat and Ecosystems

Protecting and enhancing aquatic and riparian habitat and ecosystems may include: support for research and education programs that encourage protection of aquatic and riparian ecosystems; and support for comprehensive and community planning efforts that incorporate watershed protection.

STREAM AND RIPARIAN ECOSYSTEM ASSESSMENT RECOMMENDATIONS

1. *Conduct a study to monitor summer season stream temperatures along the Schoharie Creek and associated impacts on fisheries. Study will assess if cold water fish communities are thermally limited, and locate areas where habitat improvements might mitigate these impacts, and areas of thermal refuge that may need protection.*
2. *Complete watershed assessments of tributaries within the Schoharie Creek watershed. During the studies, identify sediment sources, erosion hazards, and potential water quality impairments and associated treatment opportunities.*
3. *Review existing water quality data and identify, to the extent possible, the most significant water quality impairments.*
4. *Identify locations of potential water quality impairments including; sources of pollution from upland areas and within the stream channel, such as significant glacial lake clay exposures, and sources of contaminants from road runoff and households, and make prioritized recommendations for their mitigation.*
5. *Characterize the status of stream ecosystem health utilizing existing fish and insect population data, and outlining the general threats to ecosystem health and integrity.*
6. *Conduct a watershed aquatic habitat study including; mapping habitats and associated characteristics throughout Schoharie Creek, characterization of fish species presence or absence in those habitats, establish target fish community structure based on regional and historic fish community data, and make recommendations for improvement of habitat for target community.*
7. *A habitat assessment should be conducted in the Schoharie Creek and major tributaries, with particular attention paid to thermal refuge for cold water fish.*

STREAM AND RIPARIAN ECOSYSTEM ASSESSMENT				
Action Item	Partners	Description	Funding	Status
Fisheries Assessment & Improvements Strategy	NYCDEP, NYSDEC, GCSWCD, TU, SWAC	During development of SMPs for the various sub-basins, the GCSWCD and NYCDEP identified the need for further evaluation of fisheries and the importance of developing a comprehensive strategy to improve fish habitat. Working through the SWAC Habitat and Recreation Subcommittee the GCSWCD will prioritize recommendations for fisheries improvements in 2016.	TBD	Active

WATERSHED PROTECTION AND COMMUNITY PLANNING RECOMMENDATIONS

1. *Establish and maintain a comprehensive program that supports localized efforts and mobilization of the public for stream stewardship and the coordination of agencies, interest groups, municipalities, and stakeholders in community planning and watershed protection.*
2. *Watershed municipalities should evaluate their existing land use regulations, and adopt provisions which will protect stream corridor resources including wetlands, floodplains and floodways and provide additional local review for proposed development in these special areas.*
3. *A watershed-wide evaluation of regulations, including ordinances and zoning laws, should be undertaken. The evaluation should seek to identify regulatory gaps and determine if the current laws and ordinances adequately protect the watershed and encourage municipalities to update their regulations as needed.*
4. *Establish and support a Project Advisory Committee consisting of representatives of all significant stakeholder groups to coordinate the implementation of stream management plans.*
5. *Watershed municipalities should evaluate local ordinances such as comprehensive plans, zoning regulations, site plan review laws, subdivision laws and floodplain ordinances to determine if adequate consideration is given to riparian buffer impacts.*
6. *Watershed communities should integrate the evaluation of stormwater impacts on stream systems as they develop and implement comprehensive stormwater management plans which will protect water quality and reduce impacts on stream morphology.*

WATERSHED PROTECTION AND COMMUNITY PLANNING				
Action Item	Partners	Description	Funding	Status
Town of Hunter Land Use Regulation Review & Development Guidelines	Town of Hunter, GCSWCD, NYCDEP	Conduct detailed review of Hunter's current land use regulations with intent of adopting revisions, new regulations &/or guidelines promoting low impact design, climate smart and smart growth principles. A land use committee was formed to guide the process. They made recommendations for local code improvements and expect to complete the project in 2016.	SMIP	Active
Hunter Wetlands Leachate Treatment System Remediation Design Study	Mountaintop Towns, GCSWCD, NYCDEP	Complete assessment and make recommendations to improve the treatment of landfill effluent. This landfill was previously used by most towns on the Mountaintop, but it is in Hunter.	SMIP	Active

F. Enhancing Public Access to Streams

Enhancing public access to streams may include: support for projects that improve the quantity and quality of public stream access and enhance stream-based recreational opportunities; and support for projects that provide water resource educational materials at public access points. These recommendations incorporate community development efforts into stream management.

ENHANCING PUBLIC ACCESS TO STREAMS RECOMMENDATIONS

1. *Public access for fishing should be enhanced along the Schoharie Creek stream corridor. Additional public access, as well as improvements to parking and access trails, is representative of the type of activities that may be possible.*
2. *Investigate opportunities to develop multi-use, low impact trail systems along the stream corridor.*

ENHANCING PUBLIC ACCESS TO STREAMS				
Action Item	Partners	Description	Funding	Status
Lexington Riverfront Access Park	NYCDEP, GCSWCD, Town of Lexington, SWAC, FEMA, NYDOS	The Town of Lexington plans to expand the Schoharie Creek Park (Lexington Pocket Park) by purchasing two additional parcels, along County Route 13a, through the FEMA Property Acquisition Program. The project aims to enhance public outdoor recreation and education along the Schoharie Creek. Components of the project may include a low impact path, a shade structure, and signage/informational kiosk. The Schoharie Watershed Advisory Committee approved funding the riverfront access park contingent upon FEMA, and other regulatory, approvals for development of park-like amenities on the buyout parcels. Pending permitting, this project may proceed in 2017.	SMIP	Active
Conine Fishing Access	NYCDEP, GCSWCD, Town of Prattsville, SWAC	The project is a sub-component of the overall redevelopment and expansion of Conine Field Recreation Complex in Prattsville. This part of the project will focus on repairing and improving the fishing area and canoe launch at Conine Field.	SMIP	Active
Ashland Town Park	Ashland, GCSWCD, NYCDEP	The project entails signage, seeding/riparian planting, and to support efforts to provide public access to the Batavia Kill.	SMIP	Active

STREAM ACCESS EDUCATION AND OUTREACH RECOMMENDATIONS

1. *Develop an interesting, hands-on display and accompanying presentation that could travel with staff or volunteers to public places. Include the definition of a watershed, how people affect the watershed in their daily lives, the importance of a healthy watershed and what they can do to help improve water quality.*
2. *At public stream access sites, provide educational materials, such as signage, that may lead to an increased stewardship ethic for the stream.*

STREAM ACCESS EDUCATION AND OUTREACH				
Action Item	Partners	Description	Funding	Status
Riparian Walk	Windham Path	As part of Schoharie Watershed Month, a guided riparian buffer walk and discussion will be held at the Windham Path.	GCSWCD, NYCDEP	Active

Appendix A: Summary of Completed Projects May 2007 – May 2016

PROGRAM ADMINISTRATION

Action Item	Partners	Description	Funding	Status
Restoration Project Permits	GCSWCD, NYCDEP, NYSDEC	The GCSWCD and NYCDEP worked with NYSDEC to evaluate alternatives and to offer training to address the complexity of achieving turbidity control during construction. Two staff members have been trained as Certified Professional Erosion and Sediment Control Specialists, one has been trained as a Certified Professional in Stormwater Quality and the majority of staff were trained as part of the NYSDEC 4-hour erosion and sediment control certification. GCSWCD is also qualified to teach the 4-hour E/S control certification. GCSWCD purchased dewatering equipment for stream projects and routinely prepares stormwater pollution prevention plans for all size projects.	NYCDEP/ GCSWCD	Completed 2007
Program Administration Staffing Plan	GCSWCD, NYCDEP	To manage the many projects and priorities in the action plan, the GCSWCD needs staffing and resources to provide overall project administration. In 2007, a staffing plan was developed along with a new intergovernmental agreement between GCSWCD and NYCDEP that began in January 2009 and will fund watershed activities through January 2014.	NYCDEP/ GCSWCD	Completed 2007
Program Office	GCSWCD, GCWAP, NYCDEP	The GCSWCD and NYCDEP collaborated to establish a project office within the Schoharie Watershed. The GCSWCD and WAP identified and secured a Mountaintop project office in Tannersville. The office is used by various local, regional, and state committees working on watershed protection (e.g. Schoharie Watershed Advisory Committee, subcommittees of the SWAC, Mountaintop Supervisory & Mayors Association, WOH Education & Outreach committee, etc.).	NYCDEP/ GCSWCD	Completed 2008
Riparian Buffer General Permit	GCSWCD, NYCDEP, NYSDEC, USACOE	To successfully implement a multi-year riparian buffer program it was necessary to work with NYSDEC, USACOE, and NYCDEP to develop a general permit to allow for rapid planning and installation of riparian buffers. The general permit applies to minor (less than 300 ft.), short-term impacts such as, bank preparation and planting.	NYCDEP/ GCSWCD	Completed 2009
General Contracting Specification	GCSWCD, NYCDEP	Completed an RFP process to develop a list of "pre-qualified" contractors for work including but not limited to, installing stormwater management practices, drainage improvements, and stream projects.	NYCDEP/ GCSWCD	Completed 2009
Local Adoption of SMPs	Schoharie Basin Municipalities, Conesville, GCSWCD, SCSWCD, NYCDEP	All Greene County municipalities within the Schoharie Basin and sub-basins (Batavia Kill, East Kill and West Kill watersheds) and the Town of Conesville (Manor Kill) have adopted the relevant SMPs and signed Memoranda of Understanding (MOU) with GCSWCD and SCSWCD, respectively. Annual reviews occur with the municipalities per the MOU and provide an update on current action items within the municipality, while also seeking input from municipal officials in identifying potential future projects based on local needs.	NYCDEP/ GCSWCD	Completed 2009, renewed as needed

Schoharie Watershed Advisory Committee (SWAC)	Schoharie Basin Municipalities, Technical Advisors, GCSWCD, NYCDEP	The organizational structure of the Schoharie Watershed Advisory Committee (SWAC) was developed in early 2008. After the kick off meeting in May 2008, the SWAC has met regularly throughout the year, developed program materials to initiate a stream management plan implementation funding application process, and identified initial projects for implementation. Although administrative support for the SWAC remains an on-going activity, the effort to establish local representation and implementation of the SMP, coupled with technical agency support, has been accomplished.	NYCDEP/ GCSWCD	Organized May 2008, meet 2-3x per year
Plant Materials Program: Greenbelt Plant Material	NYCDEP, GCSWCD	In 2014, there were 20,401 Greenbelt plants delivered to the GCSWCD Plant Materials Center; 14,571 of the plants were repotted. In 2015, approximately 5,830 plants were repotted.	NYCDEP/ GCSWCD	Completed 2015

STREAM ASSESSMENTS AND MONITORING

Action Item	Partners	Description	Funding	Status
Batavia Kill Stream Walkover	NYCDEP/ GCSWCD	Collected erosion data along the Batavia Kill in the Towns of Windham, Ashland and Prattsville.	NYCDEP/ GCSWCD	Completed 1997
West Kill Stream Walkover	NYCDEP/ GCSWCD	Collected stream feature data along the West Kill in the Town of Lexington.	NYCDEP/ GCSWCD	Completed 2004 & 2005
Schoharie Creek SFI	NYCDEP/ GCSWCD	Stream Feature Inventory (SFI) along the Schoharie Creek in the Towns of Hunter, Jewett, Lexington, and Prattsville.	NYCDEP/ GCSWCD	Completed 2006
East Kill SFI	NYCDEP/ GCSWCD	Stream Feature Inventory (SFI) along the East Kill in the Town of Jewett.	NYCDEP/ GCSWCD	Completed 2006
Manor Kill SFI	NYCDEP/ GCSWCD	Stream Feature Inventory (SFI) along the Manor Kill in the Town of Conesville.	NYCDEP/ GCSWCD	Completed 2008
Monitoring of Restored Reaches	NYCDEP/ GCSWCD	2008: 5 sites; 2009: Conine, Ashland Connector Reach, Brandywine, Farber Farm; 2010: Conine, Ashland Connector Reach, Shoemaker, Lanesville, Sugar Maples, Long Road; 2011: Long Road, Sugar Maples; 2012: Ashland Connector Reach, Conine, Sugar Maples, Schoharie Street, Long Road; 2013: Vista Ridge; 2014: Ashland Well Head, Maier, Conine, Sugar Maples, Holden, CR 6, SR 42, Apple Hill; 2015: Ashland Well Head, Brandywine/Ashland Connector Reach, Maier Farm, Conine, Holden, Long Road, CR 6, SR 42, Lanesville, Vista Ridge, Apple Hill	NYCDEP/ GCSWCD	Completed Annually 2008-2015
Vegetation Monitoring	NYCDEP/ GCSWCD	2009: Shoemaker, RAH Stables, Long Road, Ashland, Conine, Sugar Maples, Lanesville, Farber Farms, Carr Road; 2010: Shoemaker, RAH Stables, Long Road, ACR, Conine, Sugar Maples, Kastanis, Lanesville, Farber Farm, Carr Road; 2011: Dodson, ACR, Conine, Kastanis, Long Road; 2012: Dodson, Hensonville, North Settlement, Slutzky, Valenti; 2013: Kastanis, Hensonville, Slutzky, Cervini, Torsiello/Hegner, Valenti, Cole, Mayo; 2014: Conine, Holden, Vista Ridge, Apple Hill, Hensonville, Cervini, Torsiello/Hegner, Slutzky, Cole; 2015: Ashland Wells, Brandywine/ACR, Maier, Conine, Holden, Vista Ridge, Apple Hill, Long Road, Lanesville, Kastanis, Kane, McRoberts, Avella, Brunsdan, Valenti, Mayo, Hensonville, Benjamin Cole.	NYCDEP/ GCSWCD	Completed Annually 2009-2015

Manor Kill Stream Management Plan	NYCDEP/ GCSWCD, SCSWCD, SCPD	In 2008, a stream feature inventory, riparian vegetation mapping, and a significant portion of the stream management plan were completed. The Manor Kill Management Plan was completed in 2009, and the Town of Conesville adopted it and signed an MOU for implementation with the Schoharie County SWCD. This project offered an opportunity to expand our partnership and planning area, to include the Schoharie County Planning Dept. and SWCD.	NYCDEP/ GCSWCD	Completed 2009
Survey of potential SPDES stream restoration site	NYCDEP/ GCSWCD	A site on the East Kill was selected as a potential SPDES stream restoration site due to its high contribution of fine sediments. One landowner was unwilling to grant GCSWCD permission for the required pre-design survey work. Survey is no longer planned for this site.	NYCDEP/ GCSWCD	Completed 2009
Dale Lane Survey and Hydraulic Analysis	NYCDEP/ GCSWCD	Site survey was completed in 2009 and hydraulic analysis using HEC RAS was completed in spring 2010.	NYCDEP/ GCSWCD	Completed 2010
Mauro Residence Bank Stability	NYCDEP/ GCSWCD	Geotechnical assessment of a failing streambank in relation to a private residence. Engineer concluded that the residential structure was not currently threatened by the slope condition. Report provided to the homeowner and the bank was seeded and mulched.	SMIP	Completed 2010
Lexington Sill (Schoharie Creek)	NYCDEP/ GCSWCD	Upon assessment, it was determined that the removal of the sill would have little impact on the stream. No further action is expected.	NYCDEP/ GCSWCD	Completed 2010
Tributary Assessment and Planning Projects	NYCDEP/ GCSWCD	Historical alignments, riparian vegetation mapping, watershed analysis, stream feature inventory, and Geodatabases have been completed for Batavia Kill Tributaries North Settlement Creek, Furnace/Red Falls Creek and Mad Brook.	NYCDEP/ GCSWCD	Completed 2010

STREAM RESTORATION AND STABILIZATION				
Action Item	Partners	Description	Funding	Status
Holden Stream Restoration	NYCDEP, GCSWCD NYSDOT	Windham- Batavia Kill: a NYS DOT Article 15 stream disturbance permit was flagged by DEC Region 4 for potential inclusion of a natural channel design approach. The project, designed and implemented by GCSWCD, established a geomorphically appropriate channel and floodplain bench and included riparian plantings which restored floodplain function.	NYCDEP/ GCSWCD, NYSDOT	Completed 2007
Conine Farm Stream Restoration	NYCDEP, GCSWCD	Town of Prattsville- Batavia Kill: GCSWCD/NYCDEP completed a full geomorphic based restoration of a +/- 1800 foot reach on the lower Batavia Kill. The project addressed severe slope instability, reduced sediment loading and protected private property.	NYCDEP/ GCSWCD	Completed 2008
Lanesville Stream Restoration Project Repairs	NYCDEP, GCSWCD	Town of Hunter- Esopus Basin: repairs were made on the Lanesville Demonstration Stream Restoration Project. Most adjustments were associated with gullyng on a high slope failure caused by poor drainage on the terrace above the slope, which had not been addressed as part of the restoration project. Other adjustments were made in rock vane elevations and additional bioengineering was added to mitigate gullyng.	NYCDEP/ GCSWCD	Completed 2008

Broadstreet Hollow Stream (BSH) Restoration Project Repairs	NYCDEP, GCSWCD	Repairs to a restoration project GCSWCD implemented in 2000. The April 2005 flood damaged two dewatering wells which then failed to relieve artesian conditions and a mud boil returned, causing chronic turbidity. GCSWCD modified the damaged rock structures and hired a well drilling subcontractor to attempt to rehabilitate the dewater wells. The subcontractor found the well heads had broken and couldn't be rehabilitated. After reviewing all options, a decision was made to abandon the wells and monitor the projects stability.	NYCDEP/ GCSWCD	Completed 2008
Faber Farm Stream Restoration	NYCDEP, GCSWCD	Town of Jewett- East Kill: excessive erosion, following 2005 and 2006 floods, caused damage to project grading and rock structures, including 4 rock vanes and 2 cross vanes. The site was originally vegetated by Conservation Reserve Enhancement Program (CREP), but the seedlings never became established, limiting project success. This restoration included: removal or modification of damaged rock and cross vanes, treatment of the back channel area to reduce frequency of flows in the back channel and promote use of primary channel, bank grading, vegetative stabilization to reduce erosion, and establishment of riparian buffer along restored reach. Also, a bankfull bench was added, 1,179 larger trees were planted, willow stakes and approximately 1,000 feet of willow fascines were installed, along with many shrubs, sedges, and herbaceous seed.	NYCDEP/ GCSWCD, ACOE	Completed 2008
Ashland Connector Reach	NYCDEP, GCSWCD	Town of Ashland- Batavia Kill: GCSWCD completed planting on the streambanks and floodplains at the lower end of the project reach. Also, compensatory wetland areas were planted with appropriate species. Limited site cleanup work on access/staging areas was completed, and the project was surveyed as part of routine project monitoring schedule.	NYCDEP/ GCSWCD	Completed 2008
Schoharie Street Stabilization	NYCDEP, GCSWCD	Village of Hunter: stabilization of approximately 120 feet of high stream bank to protect infrastructure and private property. Project includes stacked and pinned riprap and vegetated beds. The GCSWCD and NYCDEP also added additional riparian buffer plantings on the opposite bank. Additional plantings including balled and burlapped river birch trees, were added fall 2009.	NYCDEP/ GCSWCD	Completed 2009
West Kill Restoration Project, Long Road	NYCDEP, GCSWCD	Town of Lexington: completed a full geomorphic restoration of approximately 2,400 linear feet of stream on the West Kill in Spruceton Valley. The site had significant bank failure and clay exposures in bank and stream bed. Wetland delineation, archaeological investigation and final survey of site conducted.	NYCDEP/ GCSWCD	Completed 2009
Oakwood Pistol Club	NYCDEP, GCSWCD, CWC	Town of Prattsville: GCSWCD led the CWC Stream Program streambank projection project. Engineering services were contracted for this project; design plans and specifications have been submitted for permit, and construction completed.	CWC Stream Corridor Protection Grant	Completed 2009
Windham Golf Course Streambank Project	NYCDEP, GCSWCD, CWC	Primarily a CWC project with GCSWCD assistance. The project provided for the removal of failed sheet piling, armoring of the toe and sloping of the bank, and planting of approximately 155 feet of streambank.	CWC, NYCDEP/ GCSWCD	Completed 2009

Sugar Maples Stream Restoration	NYCDEP, GCSWCD	Town of Windham- Batavia Kill Tributary: removed mortared stone walls that confined a tributary and restored the stream to a natural shape and meander pattern. Floodplain grading was performed and the site was seeded with wetland and riparian seed mixes. GCSWCD hosted a student planting with three schools to install 1,584 herbaceous plugs, 340 willow stakes, 250 trees and shrubs, and 7 willow fascines. The project was designed to restore wetland functions and approximately 700 feet of stream that was historically channelized and confined by mortared stone walls.	NYCDEP/ GCSWCD, ACOE	Completed 2010
Wright Stream Bank Stabilization/ Riparian Project	NYCDEP, GCSWCD, SCA	A bankfull bench of approximately 1,200 feet was constructed and 3,127 feet of the streambank were re-vegetated. A rock installation was completed by the project contractor, while plantings were installed by GCSWCD staff and SCA service project hosted by GCSWCD.	NYCDEP/ GCSWCD, CWC, ACOE	Completed 2010
Wright Stream Bank Stabilization/ Riparian Project Enhancement	NYCDEP, GCSWCD	The previously constructed project was modified and enhanced with additional vegetative treatments in 2011 and monitoring initiated in 2012.	NYCDEP/ GCSWCD	Completed 2011
Vista Ridge Floodplain Restoration	NYCDEP, GCSWCD	This project improved the immediate project area and the aggraded reach upstream, by reducing a backwater condition at the Vista Ridge bridge. The project also enhanced the riparian buffer, reduced the risk of failure of Vista Ridge and Colgate Lake Roads, reduced erosion of silts and clays, and provides for improvement of the habitat value of the reach.	NYCDEP/ GCSWCD, ACOE	Completed 2011
Holden Stream Restoration Project	NYCDEP, GCSWCD	Phase 1 of the project was completed in 2011; continued construction was postponed due to Hurricane Irene. Project construction completed in 2012. The project included streambank and channel excavation to achieve stable geometry, installation of in-stream stabilization structures and a variety of bioengineering techniques along 3,500 feet of stream channel. Over 6,000 trees were planted along the restored stream channel.	NYCDEP/ GCSWCD	Completed 2011-2013
Windham Country Club Repairs	NYCDEP, GCSWCD	Windham- Batavia Kill: There were significant damages sustained at the Windham Country Club. Topographic data was collected to support cost, material and labor estimates for implementation of the repair work. GCSWCD provided technical support to the project due to the extensive damage that occurred along the stream corridor.	NYCDEP/ GCSWCD	Completed 2012
East Kill Restoration at Apple Hill	NYCDEP, GCSWCD	Project components included the realignment and resizing of 3,500 feet of channel, the installation of 23 rock structures, and installation of extensive bioengineering treatments and riparian plantings over the 11 acre site. These efforts will improve water quality, reduce risk to humans and property, reduce erosion and excessive sediment loading, restore floodplain function, and improve aquatic and terrestrial habitat.	NYCDEP/ GCSWCD, SMIP, ACOE, EWP	Completed 2012
NYS Route 42 West Kill Slope Failure	GCSWCD NYCDEP NRCS	Town of Lexington: The project addressed a large slope failure along a 1,400 foot reach of the West Kill, just downstream of the Pushman Bridge on NYS 42. The project included stream bank and channel excavation, and the installation of in-stream stabilization structures to achieve stable geometry. Practices include rock riffles, random boulder clusters, log boulder revetment and dry rock riprap with willow stakes to establish an armored flood plain bench at the toe of the slope, upper portions of the slope were hydroseeded and staked, and an as-built survey and plans have been prepared.	NYCDEP/ GCSWCD, EWP	Completed 2013

Conine Project Repairs	NYCDEP, GCSWCD	Town of Prattsville: The purpose of this work was to repair a project that was damaged during Irene in 2011. The repair project measured approximately 2,200 linear feet in length, with a disturbance area of 11 acres. Extensive earthwork required to restore original grades, and included excavation and placement of over 52K cubic yards of material. The project included the repair and reconstruction of 5 j-hook vane structures, two cross vanes, and a constructed riffle. Biotechnical measures taken included live staking and fascines, seeding native riparian and wetland seed mixes, and developing a 7.1 acre riparian zone.	FEMA NYCDEP/ GCSWCD	Completed 2013
Maier Farm Project Repairs	NYCDEP, GCSWCD	Town of Ashland- Batavia Kill: The purpose of the project was to repair a portion of a project constructed in 1999 that sustained damage during Irene in 2011. Damages included streambank erosion, structural damage to rock structures, channel migration and land loss, and excess sedimentation. Earthwork was completed to restore original grades. The reconstruction of two j-hooks and repair of one cross vane provided channel grade control, stream bank stabilization, and habitat enhancement. Bioengineering, including live staking and fascines, along with the establishment of a one acre riparian zone was completed.	FEMA NYCDEP/ GCSWCD	Completed 2013
Brandywine Project Repairs	NYCDEP, GCSWCD	Town of Ashland- Batavia Kill: The project addressed damages sustained to the Brandywine restoration site during Irene in 2011.	FEMA NYCDEP/ GCSWCD	Completed 2014
Ashland Connector Reach Project Repairs	NYCDEP, GCSWCD	Town of Ashland- Batavia Kill: The project addressed damages sustained to the Ashland Connector Reach during Irene in 2011.	FEMA NYCDEP/ GCSWCD	Completed 2014
Long Road Project Repairs	NYCDEP, GCSWCD	Town of Lexington- West Kill: The project addressed damages sustained to the Long Road restoration site during Irene in 2011.	FEMA NYCDEP/ GCSWCD	Completed 2014
Lanesville Project Repairs	NYCDEP, GCSWCD	Village of Hunter- Stony Clove: The project addressed damages sustained to the Lanesville restoration site during Irene in 2011.	FEMA NYCDEP/ GCSWCD	Completed 2014
Ashland Well Heads Protection Project	NYCDEP, GCSWCD	Town of Ashland- Batavia Kill: The project addressed damages sustained to the Ashland Wells Head restoration site during Irene in 2011.	NYCDEP/ GCSWCD, EWP, ESD	Completed 2014
Shoemaker Project Repairs	NYCDEP, GCSWCD	Damages sustained on the Shoemaker Stream Restoration project on the West Kill were repaired in 2014 and 2015.	FEMA, NYCDEP/ GCSWCD	Completed 2015
Manor Kill Stream Restoration	SCSWCD, GCSWCD, NYCDEP, Conesville	A full-channel restoration project was installed adjacent to the Conesville Town Park in order to stabilize eroding streambanks and protect water quality by reducing fine sediment sources along this reach of stream.	SMIP, NYCDEP/ GCSWCD,	Completed 2015

STREAM STEWARDSHIP EDUCATION AND OUTREACH				
Action Item	Partners	Description	Funding	Status
What is turbidity and why is it important?	GCSWCD/ NYCDEP	Workshop held that provided an overview of what turbidity is, and the impact it has on the Schoharie Basin.	NYCDEP/ GCSWCD	Completed 2007
Watershed Tours	GCSWCD/ NYCDEP	Watershed tours provide an opportunity for local officials and interested basin residents to observe best management practices used in stream stewardship and management throughout the watershed. The tours foster and improved understanding of stream protection efforts and implementation projects.	NYCDEP/ GCSWCD	Completed Annually 2007-2010
Batavia Kill Stream Celebration	GCSWCD/ NYCDEP	Annual event promoting the wise use of our natural resources as they relate to water quality and ecosystem functions. Interactive exhibits, educational displays, and activities promoting understanding of the environment engage those of all ages.	NYCDEP/ GCSWCD, Ashland, CWC	Completed Annually 2007-2011
Educational Workshops	GCSWCD/ NYCDEP	Education, built into Summits and Tours, target elected and appointed officials, planning boards, code enforcement officers, highway department staff, and streamside property owners.	NYCDEP/ GCSWCD	Completed Annually 2007-2016
Watershed Summits	GCSWCD/ NYCDEP	Watershed conferences held to provide local decision makers and officials educational classes and networking opportunities around watershed protection. All eleven communities within the basin are represented by the vast and diverse number of attendees.	NYCDEP/ GCSWCD	Completed Annually 2007-2016
Websites	GCSWCD/ NYCDEP	Although websites require continuous updating, the www.catskillstreams.org and www.gcswcd.com are established sites that are used to promote project updates and share information on watershed protection issues.	NYCDEP/ GCSWCD	Completed 2007, 2010, 2014
Program Office	GCSWCD NYCDEP	GCSWCD and WAP secured a Mountaintop project office in Tannersville which is used by various local, regional, and state committees working on watershed protection.	NYCDEP/ GCSWCD	Completed 2008
Schoharie Watershed Advisory Committee	GCSWCD/ NYCDEP/ Watershed Municipalities	SWAC meets regularly throughout the year, developed program materials to initiate a stream management plan implementation funding application process, and identified initial projects for implementation. Establishment of local representation and implementation of the SMP, with technical agency support, has been accomplished.	NYCDEP/ GCSWCD	Completed 2008
ESC Workshop	GCSWCD NYCDEP	GCSWCD sponsored three Construction Erosion and Sediment Control Training Courses that were attended by approximately 230 people from the Schoharie basin. Participants included watershed developers, planners, code enforcement officers, regulators and contractors. This course focused on the review of new state construction permit, the requirements of stormwater pollution prevention plans, and the proper installation of erosion and sediment control practices.	NYCDEP/ GCSWCD	Completed Annually 2008-2010
Manor Kill Environmental Study Team, Stream Management Implementation	Schoharie River Center	Experimental, hands on environmental education and stream monitoring program for youth ages of 13 - 18. Youth members learn specific skills, develop and master abilities in environmental assessments, field research projects and community education activities. Members also participated in a riparian planting along Manor Kill in 2011.	SMIP	Completed Annually 2009-2011

Schoharie Watershed Week	GCSWCD/ NYCDEP/ Watershed Municipalities	A number of events scheduled to educate and engage local community members in watershed programs and stewardship activities. Intended to be an annual event, but replaced with Schoharie Watershed Month in 2011.	SMIP	Completed 2010
Rain Barrel Workshop	CCE, GCSWCD, NYCDEP	Workshop took place during Schoharie Watershed Week in May 2010 and Schoharie Watershed Months in 2011 & 2012. Watershed landowners took part in building their own rain barrels.	SMIP	Completed 2010-2012
Mountain Top Arboretum Wet Meadow- Interpretive Kiosk, Brochures, & Historic Pump House Repair	Mountain Top Arboretum	A kiosk was installed and brochures were developed to describe the wet meadow including the historical background of the historic pump house, an explanation of the site's hydrology, and other information about wetland plants and wildlife.	SMIP	Completed 2010
SWAC and Schoharie Watershed Week Logos	GCSWCD/ NYCDEP/ SWAC	Logos were developed for the Schoharie Advisory Committee and Watershed Week.	SMIP	Completed 2010
Schoharie Watershed Months	GCSWCD, NYCDEP, SWAC	Schoharie Watershed Month engages watershed communities and organizations in hands-on activities to learn about the watershed and its resources. Various activities, workshops and family events are organized each May by host communities and organizations that promote awareness and protection of streams and their watersheds.	SMIP	Completed Annually 2011-2016
CD Lane Family Day	GCSWCD, NYCDEP, Community of Windham Foundation	Activities included Trout Unlimited fly fishing demonstrations, water quality testing activities with the Schoharie River Center, nature hikes, kayak demonstrations, and a water-focused craft activity. These activities encourage responsible use of water and nearby land areas. There were approximately 60 participants.	Community of Windham Foundation (COWF)	Completed 2011
Identify Existing Resources	GCSWCD, NYCDEP	GCSWCD identified and cataloged existing resources that are currently available. The website was revamped in 2011, to provide web-based documentation of existing resources and links to additional resources.	NYCDEP/ GCSWCD	Completed 2011
Mountain Top Arboretum Outdoor Classroom Design	GCSWCD, NYCDEP, Mountain Top Arboretum	An outdoor classroom was designed and constructed at the arboretum. It accommodates approximately 45 people for year-round outdoor programming on a range of ecological and natural history topics relating to the watershed.	SMIP	Completed 2011
Water Quality at Home Workshop	GCSWCD, NYCDEP, CCE	Two action-based educational workshops held during Schoharie Watershed Month to raise awareness about stewardship of water quality. The Holistic Pond Management Workshop provided tools and strategies to address pond problems without the use of chemical treatments. The rain barrel workshop discussed the impacts of stormwater runoff on water quality and taught participants how to build a rain barrel.	SMIP	Completed 2011
Environmental Film Series	GCSWCD, NYCDEP, SWAC	The film series was held at the Doctorow Center in Hunter during the Schoharie Watershed Month and highlighted watershed issues, pollution mitigation, and watershed, foodshed, and viewshed topics.	SMIP	Completed 2011 & 2012

Septic Workshop for Homeowners	CWC, GCSWCD, NYCDEP	As part of Schoharie Watershed Month, the Catskill Watershed Corporation provided an educational septic workshop for watershed homeowners held at the Windham Waste Water Treatment Plant. A tour of the state of the art treatment plant followed the workshop.	SMIP, CWC	Completed 2013
Earth, Wind & Water: The Seasons Student/Amateur Watershed Art Exhibit	SWM Committee, GCSWCD, NYCDEP	The artwork of local students and amateur artists was on display at the Kaaterskill Fine Arts Gallery in Hunter, NY. The artwork theme was Earth, Wind & Water: The Seasons. An opening reception was held and the exhibit was on display for the month of May.	SMIP	Completed 2013
Windham Path Stream Clean Up	Windham, GCSWCD, NYCDEP, WARF	The Windham Area Recreation Foundation (WARF), in coordination with NYCDEP and GCSWCD, held a Grand Opening of the Windham Path in May 2014. Volunteers who attended also participated in a stream clean-up along the property.	SMIP, WARF	Completed 2013
Greene Infrastructure at Work & Home	CGCCE, GCSWCD	As part of Schoharie Watershed Month, The Columbia-Greene Cornell Cooperative Extension and GCSWCD presented a workshop about green infrastructure. Topics included stormwater impacts, small scale treatment practices and a tour of the Mountain Top Library, and green infrastructure project supported by SMIP.	SMIP, GCSWCD, WAP	Completed 2013
Earth, Wind & Water: The Seasons Student/Amateur Watershed Art Exhibit	SWM Committee, GCSWCD, NYCDEP	The artwork of local students and amateur artists was on display at the Kaaterskill Fine Arts Gallery in Hunter, NY. The artwork theme was Earth, Wind & Water: The Seasons. An opening reception was held and the exhibit was on display for the month of May.	SMIP	Completed 2014
Invasive Species Workshop for Landowners	Catskill Center, SWM Committee, GCSWCD, NYCDEP	The Catskill Center for Conservation and Development provided a workshop about invasive species. This workshop was for small and large landowners in the watershed and was held in Prattsville, NY during Schoharie Watershed Month.	SMIP, Catskill Center	Completed 2014
The City that Drinks the Mountain Sky	SWM Committee, GCSWCD, NYCDEP	The Arm-of-the-Sea Theater, presented <i>The City that Drinks the Mountain Sky</i> , an educational puppet show for the entire family, held in Prattsville, NY as part of Schoharie Watershed Month.	SMIP	Completed 2014
Rain Garden Workshop	CCE, SWM Committee, GCSWCD, NYCDEP	Liz LoGiudice of Cornell Cooperative Extension provided the Rain Garden Workshop and site visit as part of Schoharie Watershed Month. The workshop was provided in Tannersville, NY and taught landowners about stormwater landscaping that will beautify your property.	SMIP	Completed 2014
Gilboa Dam Tour	GCSWCD, NYCDEP	GCSWCD partnered with NYCDEP to provide a tour of the Gilboa Dam as part of Schoharie Watershed Month.	SMIP, NYCDEP	Completed 2014
Water Workshop	Mrs. Puddle Duck's, GCSWCD, Catskill Center, Hunter Foundation, NYCDEP	As part of Schoharie Watershed Month, the Catskill Center for Conservation & Development and the Hunter Foundation supported a water workshop targeting preschoolers and their families. To workshop provided an opportunity for participants to discover what is in our stream and why it is important to protect them.	SMIP, Catskill Center, Hunter Foundation	Completed 2014

Windham Day of the Batavia Kill	SWM Committee, GCSWCD, NYCDEP	As part of Schoharie Watershed Month, Windham Day on the Batavia Kill was held at the Windham Path property. Attendees had the opportunity to participate in the COWF Pat Meehan Memorial Scholarship Walk, plant identification walks, and learned about local organizations that promote outdoor and community resources.	SMIP, COWF	Completed 2014
The Gilboa Ancient Forest	SWM Committee, GCSWCD, NYCDEP	During Schoharie Watershed Month, the Gilboa Ancient Forest lecture was presented by Kristen Wyckoff of the Gilboa Historical Society (GHS). Participants learned about the oldest known forest on earth and saw fossilized tree trunks.	SMIP	Completed 2014
Guided Bus Tour of the Schoharie Reservoir	SWM Committee, GCSWCD, NYCDEP	As part of Schoharie Watershed Month, Gerry Stoner and Diane Galusha, area historians, presented a Guided Bus Tour of the Schoharie Reservoir. Participants took a scenic tour around the reservoir and explored this history of the former valley and the creation of the Gilboa Dam.	SMIP	Completed 2014
The Stream of Life Student/Amateur Watershed Art Exhibit	SWM Committee, GCSWCD, NYCDEP	The artwork of local students and amateur artists was on display at the Kaaterskill Fine Arts Gallery in Hunter, NY. The artwork theme was The Stream of Life. An opening reception was held and the exhibit was on display for the month of May.	SMIP	Completed 2015
Trout Release	SWM Committee, GCSWCD, NYCDEP	During Schoharie Watershed Month, a trout release and macroinvertebrate study were held at Dolan's Park in Hunter, NY. Participants also have the opportunity to learn about flycasting and tying.	SMIP	Completed 2015
Changing Trout Habitat in the Upper Schoharie Creek	TU, SWM Committee, GCSWCD, NYCDEP, Platte Clove Community	As part of Schoharie Watershed Month, Trout Unlimited supported the workshop, <i>Changing Trout Habitat in the Upper Schoharie Creek</i> . Walt Keller, a fisheries biologist, and a panel of speakers explored the factors that influence stream health and fish populations. The workshop was held at the Platte Clove Neighborhood Center in Hunter, NY.	SMIP/CSBI	Completed 2015
Guided Paddle on the Schoharie Reservoir	SWM Committee, GCSWCD, NYCDEP, Catskill Outback Adventures	Catskill Outback Adventures led a guided paddle on the Schoharie Reservoir beginning at Snyder's Cove. This trip was part of Schoharie Watershed Month.	SMIP	Completed 2015
Aquatic Invertebrates Workshop for Children	SWM Committee, GCSWCD, NYCDEP	As part of Schoharie Watershed Month, an Aquatic Invertebrates workshop was held in the Village of Hunter, NY. This after school program taught students about dragonflies, damselflies, and other aquatic insects and animals that play important roles in the watershed.	SMIP	Completed 2015
Interpretive Watershed Hike, Bearpen Mountain	SWM Committee, GCSWCD, NYCDEP	Peter Manning led a 7-mile interpretive watershed hike of Bearpen Mountain as part of Schoharie Watershed Month.	SMIP	Completed 2015
The Schoharie Basin and It's Ice Age History	SWM Committee, GCSWCD, NYCDEP	<i>The Schoharie Basin and It's Ice Age History</i> was presented by Bob and Johanna Titus. They told the story of how glaciers shaped the Schoharie Basin and created its most scenic views. This lecture was held at the Mountaintop Historical Society in Haines Falls, NY as part of Schoharie Watershed Month.	SMIP	Completed 2015

Town of Lexington Watershed Awareness Workshops	Town of Lexington	A series of four educational workshops for children in the Town of Lexington. The proposed workshops will teach local children, using hands-on experiences, about the insects and animals that play important roles in the watershed, and the role that streams play in the environment.	SMIP	Completed 2015
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LOCAL FLOOD ANALYSIS AND FLOODPLAIN ASSESSMENT

Action Item	Partners	Description	Funding	Status
Prattsville Local Flood Analysis	Town of Prattsville, GCSWCD, NYCDEP, NYSDOT	The primary focus of the analysis was to identify the potential for reducing flood elevations through channel and floodplain restoration, as the first alternative to other hazard mitigation solutions and to evaluate both the technical effectiveness and the benefit/cost effectiveness of each solution, and compare different solutions to each other for the most practical, sustainable outcome.	NYCDEP/ GCSWCD	Completed 2013
Windham Local Flood Analysis	Town of Windham, GCSWCD, NYRCRP, NYCDEP	The Flood Mitigation Analysis provided baseline hydraulic modeling, evaluated the mitigation alternatives, and a Flood Engineering Analysis Report. The work completed through the local flood analysis supported the efforts that were underway through the NY Rising Community Reconstruction Program.	SMIP, NYRCRP	Completed 2015

FLOODPLAIN MANAGEMENT COORDINATION, EDUCATION AND OUTREACH

Action Item	Partners	Description	Funding	Status
2008 FEMA Flood Maps: What Every Planner Needs To Know	GCSWCD, NYCDEP, FEMA	Information regarding FEMA's Flood Maps, geared towards planners.	NYCDEP/ GCSWCD	Completed 2008
Greene County All Hazards Mitigation Plan	GCSWCD, NYCDEP, GCPD	The Greene County Planning Department, GCSWCD, and NYCDEP interviewed potential subcontractors and awarded the development of the hazard mitigation plan to Tetra Tech, Inc. Tetra Tech worked with various municipalities and partners to gather input for the plan, which was completed in 2009.	NYCDEP/ GCSWCD	Completed 2009
National Flood Insurance Program: Intermediate Course	GCSWCD, NYCDEP, NYSDEC	NYSDEC, course focused on flood insurance maps and elevation certificates; DOS accredited course.	NYCDEP/ GCSWCD	Completed 2009
National Flood Insurance Program	GCSWCD, NYCDEP, NYSDEC	Introductory course on floodplain management NYSDEC.	NYCDEP/ GCSWCD	Completed 2009 & 2010
What to do After the Flood	GCSWCD, NYCDEP, NYSDEC	Floodplain administrators' and community officials' guide to surviving a flood, NYSDEC.	SMIP	Completed 2011
Post Flood Emergency Stream Work Training	GCSWCD, NYCDEP, UCSWCD, UCCCE, TU, Shandaken Highway Dept.	Flooding and damage caused by Tropical Storms Irene and Lee led to emergency stream work training. Training content developed by contributors from DEP, UCSWCD, GCSWCD, CCE Ulster, Trout Unlimited, and Shandaken Highway Dept. One session was presented by Ulster County and two sessions were presented in Greene County. Over 200 attendees were trained in basic consideration that should be addressed when planning an emergency intervention in a stream system.	NYCDEP/ GCSWCD, UCSWCD	Completed 2012

Post Flood Stream Intervention Training	GCSWCD, UCCCE, NRCS, NYCDEP, UCSWCD, TU	The training, held in Ulster, Greene, and Dutchess counties, was tailored to local highway departments, excavation contractors, and others involved in stabilizing streams following flood events. The training focused on the basics of stream process and the limits of what should be targeted for repair in the immediate days follow destructive flooding.	NYCDEP, GCSWCD, UCSWCD, UCCCE	Completed 2012 & 2013
Manor Kill Acquisition (Town of Conesville)	GCSWCD, NYCDEP, SCSWCD	The Town of Conesville assisted a landowner by acquiring a floodplain parcel approved for FEMA Pre-Disaster Mitigation funding (75%) and demolishing and removing the home. The SMIP grant was used to assist the Town in meeting the required 25% match. The project, which involved demolition and site restoration, was completed with demolition and site restoration occurring in June, 2013.	NYCDEP/ GCSWCD, FEMA	Completed 2013
All Hazards Mitigation Plan Updates	GCSWCD, NYCDEP, GCPD	The Greene County Planning Department, GCSWCD, and NYCDEP and other stakeholder organizations updated the existing All Hazards Mitigation Plan.	NYCDEP/ GCSWCD	Completed 2015

HIGHWAY, INFRASTRUCTURE AND STORMWATER MANAGEMENT				
Action Item	Partners	Description	Funding	Status
Critical Area Seeding	GCSWCD, NYCDEP, Schoharie Basin Municipalities	GCSWCD provided seeding assistance in the Towns of Hunter, Ashland, Tannersville, Jewett, and Lexington in 2007; the Towns of Windham, Ashland, Jewett, and Hunter in 2008; the Towns of Windham, Hunter, Ashland, Hunter, and Lexington in 2009; the Towns of Lexington, Windham, Tannersville and Hunter in 2010.	NYCDEP/ GCSWCD	Completed Annually 2007-2015
County Route 13A Culvert Upgrade	GCSWCD, NYCDEP, Lexington	Town of Lexington: GCSWCD/NYCDEP worked with Greene County Highway Department to upgrade a significantly undersized culvert that was the source of repetitive flooding in the Hamlet of Lexington. The project had excellent community and landowner support and demonstrated floodplain drainage concepts, proper conveyance sizing to allow fish migration and a riparian buffer component.	NYCDEP/ GCSWCD	Completed 2007
Hunter Highway	GCSWCD, NYCDEP, Hunter Highway Department	Provided Operation and Maintenance Plan and implemented stormwater maintenance and cleaning of the stormwater controls at the Hunter Highway Garage. Annual maintenance in 2008 captured 6.3 tons (3.6 cubic yards) of sand and salt from entering the downstream Schoharie Creek.	NYCDEP/ GCSWCD, CWC	Completed 2008
Hydraulic Analysis	GCSWCD, NYCDEP, GCHD	Provided technical assistance including hydrology and hydraulic assessment to better size culvert for Greene County Highway Department.	NYCDEP/ GCSWCD	Completed 2008
Driveway/Curb Cut Specifications	GCSWCD, NYCDEP, GCHD	Permit specifications were obtained from the Greene County Highway Department and given to the Highway Subcommittee in December 2009 in order to provide watershed communities with a model to consider when issuing permits. Each community will follow up based on their level of comfort. Some communities do not use driveway regulations, preferring to assess on sight and guide landowners.	NYCDEP/ GCSWCD	Completed 2009
Road Abrasives Program	GCSWCD	Upon further review with local and county highway departments, cost sharing for road abrasive was determined to be unfeasible due to limited funding available to support offsetting costs over time.		Completed 2009

Community Stormwater Planning	GCSWCD, NYCDEP, Schoharie Basin Municipalities	GCSWCD has initiated a series of projects to help develop Community Stormwater Management Plans for town and villages in the Schoharie Basin. GCSWCD has detailed information on stormwater structures, for the towns of Ashland and Prattsville, in GIS format. Community Stormwater Management Plans for Tannersville, Hunter, and Windham have been obtained.	NYCDEP/ GCSWCD	Completed 2009
Hunter Mountain: Village of Hunter	GCSWCD, NYCDEP, Hunter, CWC	Following discussions between GCSWCD and Hunter Mountain, it was determined that Hunter Mountain had already received funding through the CWC Stormwater Program and completed stormwater retrofits for their parking areas.	CWC	Completed 2009
Sugar Maples Stormwater Project	GCSWCD, NYCDEP	GCSWCD installed stormwater treatments to serve approximately 4.7 acres of relatively high density commercial buildings and residential homes in the hamlet of Maplecrest, in the town of Windham. The components were initiated with an upgraded conveyance system and demolition of a single building to reduce impervious surfaces and allow for pervious grass parking area. Rain gardens (7), wetland (treats 4.7 acres of runoff), porous walkways and riparian planting beds were installed.	NYCDEP/ GCSWCD, ACOE, CWC	Completed 2010
Mountain Top Library & Learning Center	GCSWCD, NYCDEP, Mountain Top Library	GCSWCD worked with Mountain Top Library Capital Campaign on a stormwater retrofit project. This project was initiated in conjunction with the rehabilitation of a building that will be used as the Mountain Top Library and Learning Center. Innovative methods were used to meet water quality treatment standards for runoff from roofs and parking.	SMIP, ACOE, CWC	Completed 2011
Windham Mountain	GCSWCD CWC ACOE- WRDA	GCSWCD worked with Windham Mountain Ski Center to evaluate, assess, design and install stormwater management practices. An on-site pond was converted to a stormwater facility; the pond was expanded and improvements were installed in order to route 27 acres of drainage area into the pond.	GCSWCD CWC ACOE- WRDA	Completed 2011
Village of Tannersville Highway Dept. Technical Assistance	GCSWCD, NYCDEP, Village of Tannersville Highway Department	The Village of Tannersville requested assistance on sizing a culvert under Spring Street. GCSWCD inspected the existing culverts under the road and provided the village with a variety of culvert sizing options which would increase the flow capacity of the culvert system. The information was forwarded to the Village of Hunter Highway Department in March 2011.	NYCDEP/ GCSWCD	Completed 2011
Partridge Road Culvert Replacement	GCSWCD, NYCDEP, Ashland Highway Department	The culvert under B.G. Partridge Road, in the Town of Ashland, was undersized which contributed to roadway flooding during high flows. The culvert was also perched, which presented a barrier for fish passage. GCSWCD worked with the Town of Ashland Highway Department to design a properly sized culvert and oversee the installation of this culvert. A grant was approved by SWAC/SMIP to offset the costs of upgrading the culvert to a larger size. Design, permitting and construction were completed in the summer of 2011.	NYCDEP/ GCSWCD, SMIP	Completed
Flood Response	GCSWCD, NYCDEP, Jewett	A site visit at an East Kill tributary that is frequently dredged under Griffin Road in the Town of Jewett was conducted. Hurricane Irene destroyed the crossing and GCSWCD assisted the Town in constructing a temporary crossing. The new three sided structure is durable, made of concrete, will pass flows above the 100 year runoff event, and will have limited impact on upstream and downstream reaches and aquatic habitat.	NYCDEP/ GCSWCD	Completed 2012

Griffin Road Culvert Replacement	GCSWCD, NYCDEP, Jewett	The existing culvert under Griffin Road in the Town of Jewett was undersized and washed out during the flooding caused by Hurricane Irene. GCSWCD and Delaware Engineering provided design plans, permits, specifications and contract documents for bidding, funding, construction management and administration for the culvert replacement. The new culvert was designed to withstand the 100-year runoff event and included a habitat friendly three sided precast concrete structure with wing walls at the inlet and outlet. Road improvements and stream enhancements, including an upstream cross vane, were installed.	FEMA NYCDEP/ GCSWCD	Completed 2012
County Route 6 Slope Failure	GCSWCD GC Highway Dept. NYCDEP NRCS EWP	This project included stabilization of the slope failure along County Route 6 and the West Kill in Lexington. Practices installed included the use of rock riffles and sheet piling to elevate stream profile adjacent to the slope failure, to help buttress the failing slope and to provide grade control. The installation of rock revetment to protect the toe of the slope from erosion and stormwater drainage in the area of the failure to help maintain moisture levels in the soil profile was completed.	GCSWCD GC Highway Dept. NYCDEP NRCS EWP, ESD	Completed 2014
Hunter Foundation	GCSWCD, NYCDEP, Hunter Foundation	The GCSWCD worked with the Hunter Foundation to design and implement a demonstration project integrating stormwater management in an area with limited space. Innovative methods including, porous gravel parking, bioswales and rain gardens, were used to meet water quality treatment standards for runoff from roofs and parking.	SMIP	Completed 2014

OUTREACH AND TECHNICAL SUPPORT TO HIGHWAY DEPARTMENTS, STORMWATER MANAGERS, AND CONTRACTORS

Action Item	Partners	Description	Funding	Status
Impacts from Road Ditch Erosion	GCSWCD/ NYCDEP	Results of a field study on the impact of road ditch instability on erosion and sedimentation.	NYCDEP/ GCSWCD	Completed 2007
DEP and DEC Stormwater Regulations and Updates	GCSWCD/ NYSDEC/ NYCDEP	Presentation of NYSDEC and NYCDEP stormwater regulations.	NYCDEP/ GCSWCD, CWC	Completed Annually 2008-2010
Roadside Ditch Maintenance Workshop	GCSWCD, NYCDEP	NYSDOT, Greene County Highway and most Greene County municipalities in the Schoharie Watershed attended the workshop which covered 1) Impacts from roadside ditches on water quality and municipal budgets, 2) General ditch maintenance and importance of proper erosion control, 3) Distinctions with topography, soils, slopes, and drainage, 4) Cost factors, different applications and lifespan, and 5) Selective ditching, how to prioritize to save money and minimize water quality impacts.	SMIP	Completed 2011
Mountain Top Highway Ditch Re-vegetation Program	GCSWCD	Program to encourage greater use of critical area seeding equipment that the GCSWCD has available for highway departments by offsetting the cost of seed and mulch. In 2011, GCSWCD worked with highway departments, seeding 3 miles of roadway ditches.	SMIP	Completed Annually 2011-2015

NYS DEC endorsed Erosion and Sediment Control Required Construction Activity Training	NYSDEC, NYCDEP, GCSWCD	This training targeted contractors, engineers, local government and watershed residents and provided knowledge about why stormwater is a concern and information on the new GP-0-15-002 permit. The training also informed participants about the requirements of stormwater pollution prevention plans (SWPPP). Participants learned about erosion and sediment control practices and how to perform site inspections, and how to obtain technical assistance on erosion and sediment control problems.	NYCDEP, GCSWCD	Completed 2015
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CATSKILL STREAMS BUFFER INITIATIVE				
Project Title	Partners	Description	Funding	Status
Shadow Mountain	GCSWCD, NYCDEP	Town of Jewett- East Kill: planted 124 trees and shrubs, hydroseeded and interplanted the riprap at the Greene County Highway Dept. bridge replacement in Jewett over the East Kill.	GCSWCD, NYCDEP	Completed 2007
Riparian Buffer Implementation pilot	GCSWCD, NYCDEP	A protocol for identifying potential planting sites based upon stream management planning researched was evaluated. Also, GCSWCD approached five of the identified parcel owners and moved forward with the Carr Road riparian restoration project.	GCSWCD, NYCDEP	Completed 2007
Carr Road Project	GCSWCD, NYCDEP	Town of Jewett- Schoharie Creek: The project had three components including, stem injection treatment of Japanese knotweed to prepare location for re-vegetation with native species, planting of a 100 foot wide buffer along the streambank, and enhancing the existing buffer on the immediate streambank by tapering the bank and planting willow tublings and stakes.	GCSWCD, NYCDEP, ACOE	Completed 2007-2009
Riparian Program Development	GCSWCD, NYCDEP	In 2007-2008, the Catskill Streams Buffer Initiative (CSBI) was developed to educate and assist streamside landowners in order to provide for improved stewardship of riparian areas. GCSWCD & NYCDEP established guidelines, policies and protocols for the implementation of the program.	GCSWCD, NYCDEP	Completed 2008
Plant Materials Program	GCSWCD, NYCDEP	This program supported enhancement and utilization of GCSWCD's own nursery at the Plant Materials Center, to supply plant material for various planting and seeding projects. The native seed program was initiated in 2008; A relationship with Greenbelt Center, in Staten Island, was established.	GCSWCD, NYCDEP	Completed 2007-2016
Sugar Maples Riparian Buffer Project	GCSWCD, NYCDEP	Town of Windham- Batavia Kill: Treated invasive Japanese knotweed and then planted approximately 800 feet of riparian vegetation.	ACOE (WRDA)	Completed 2008
Vegetation Enhancements	GCSWCD, NYCDEP	Batavia Kill, West Kill, Schoharie Creek, and Manor Kill: Root Production Method (RPM) trees were planted at Big Hollow, Brandywine, and Ashland Connector Reach project sites. A certified herbicide applicator treated Japanese knotweed at Big Hollow, Carr Rd., Schoharie Ave. and Long Rd. project sites. DEP conducted monitoring of vegetative techniques on a majority of these projects. Vegetation enhanced projects in the developed with Greene County Highway, FEMA, at the County Route 13 culvert project, and a volunteer planting in Manor Kill behind the Conesville town hall.	GCSWCD, NYCDEP	Completed 2008

County Route 6	GCSWCD Greene County Highway Dept.	Town of Lexington- West Kill: Implemented vegetation stabilization methodologies at a site on the West Kill that was previously scheduled for all riprap. Along this site, a short section of Vegetation Reinforced Slope Stabilization (VRSS) was installed, and trees and shrubs were planted on the upper bank; willows were interplanted with the riprap.	GCSWCD, NYCDEP	Completed 2008
Deming Road Riparian Project	GCSWCD, NYCDEP	On this project, 723 trees and shrubs, along with 120 willow stakes, were installed on three contiguous parcels.	GCSWCD	Completed 2009
McRoberts Property Planting	GCSWCD, NYCDEP	GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. During this project, 50 trees and shrubs and 125 willow stakes were installed.	CSBI	Completed 2009
Manor Kill Grogan Property Planting	GCSWCD, NYCDEP	SCSWCD has a 5 year agreement for this property. Riparian Corridor Management Plan is complete. During this project, 54 trees and 500 sedge plugs were installed.	CSBI	Completed 2009
Kane Property Planting	GCSWCD, NYCDEP	GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. During this project, 116 trees and 250 willow stakes were installed.	CSBI	Completed 2009
Kastanis Property Planting	GCSWCD, NYCDEP	Catskill Streams Buffer Initiative Pilot: Obtained 5- year landowner agreement, completed a riparian corridor management plan and restored approximately 7.1 acres of streamside vegetation along the Batavia Kill, including hosting school groups in the effort and planting about 1,500 trees and shrubs.	CSBI	Completed 2009
Evergreen Planting	GCSWCD, NYCDEP	GCSWCD/NYCDEP worked with the landowner to develop a planting plan and to obtain a landowner agreement for the property. Project is located in the town of Hunter.	CSBI	Completed 2009
Silver Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. GCSWCD removed fence, graded 60 feet of streambank, planted 25 trees and shrubs, and installed 30 willow stakes in May 2010.	CSBI	Completed 2010
Grossman Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Installed a 50 foot riparian buffer and 198 trees and shrubs were plant along 300 feet in May 2010.	CSBI	Completed 2010
Brunsdan Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Installed 54 herbaceous plugs, 22 willow stakes, 5 shrubs, and 2 trees in August 2010.	CSBI	Completed 2010
Avella Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Installed 26 trees and shrubs in June 2010.	CSBI	Completed 2010
Rappleyea Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 150 trees and shrubs were installed in June 2010.	CSBI	Completed 2010
Dodson/McCloskey Property Planting	GCSWCD, NYCDEP	GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 300 trees, shrubs, and weed mats were installed in June 2010 to create a 100 foot wide riparian buffer along 300 feet of the East Kill. GCSWCD contracted Bevan Forestry to control a patch of Japanese knotweed; Aqua Master was used to inject 25 JKW stems.	CSBI	Completed 2010
Manor Kill Quinn Property Planting	SCSWCD, GCSWCD, NYCDEP	SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 100 trees, 80 willow stakes/tubes, and 100 sedge plugs were installed in spring 2010. Also, approximately 50-100 JKW plants were removed from the site.	CSBI	Completed 2010

Manor Kill Brandow Property Planting	SCSWCD, GCSWCD, NYCDEP	SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 50 trees, 100 willow stakes/tubes, and sedge plugs were installed in spring 2010.	CSBI	Completed 2010
Manor Kill Gentile Property Planting	SCSWCD, GCSWCD, NYCDEP	SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 292 trees, 50 willow stakes, and 500 sedge plugs were installed in November 2009. 100 additional willow stakes were installed spring 2010.	CSBI	Completed 2010
Hegner Property Planting	GCSWCD, NYCDEP	This property is adjacent to Torsiello, where stream channel was repaired by the town highway department. GCSWCD has a 5 year landowner agreement for this property.	CSBI	Completed 2011
Torsiello Property Planting	GCSWCD, NYCDEP	Flooding, due to Tropical Storm Irene, caused woody debris jam on property. Stream channel was repaired by town highway department. GCSWCD has a 5 year landowner agreement for this property. CSBI installed 275 trees and shrubs.	CSBI	Completed 2011
Cervini Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 275 trees and shrubs were installed.	CSBI	Completed 2011
Kelly Property Planting	GCSWCD, NYCDEP	GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Project involved installation of 94 trees and shrubs along 250 feet to create a 25 foot riparian buffer in the spring of 2011.	CSBI	Completed 2011
Slutzky Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Project involved installation of 793 trees and shrubs with 15 high school students from Gilboa-Conesville CSD. Planting area was 950 feet long and 50 feet wide.	CSBI	Completed 2011
Rivera Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. GCSWCD installed 506 trees and shrubs, 500 willow stakes, and 50 lbs in two areas along the East Kill. Most trees were lost to post-flood management activities in the fall of 2011.	CSBI	Completed 2011
Bardfield Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Installed 432 trees and shrubs with 20 BYC students in a planting area of 700 feet long and 35 feet wide. Many of the trees were lost to post-flood management activities in fall of 2011.	CSBI	Completed 2011
Cole Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. The Riparian Corridor Management Plan is complete. A subcontractor was hired to grade 300 feet of streambank along the West Kill prior to the planting and then 225 trees and shrubs, 200 willow stakes and 300 feet of fascines were installed along 350 feet of the right streambank.	CSBI	Completed 2012
Higgins Property Planting	GCSWCD, NYCDEP	GCSWCD has completed a Riparian Corridor Management Plan for this property and obtained a 10 year landowner agreement. Also, 60 willow stakes and 49 trees and shrubs were installed in the fall of 2013.	CSBI	Completed 2013
Mayo Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete and 300 willow stakes were installed along 200 feet of streambank, 94 native trees and shrubs were installed, and 0.23 acres of streamside habitat was seeded.	CSBI	Completed 2013
Enochty Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. GCSWCD installed 30 willow stakes and 25 native trees and shrubs along 100 feet of stream in the fall of 2013.	CSBI	Completed 2013

Donnelly Riparian Project	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. GCSWCD installed 125 willow stakes and 117 native trees and shrubs along 250 feet of stream in the fall of 2013.	CSBI	Completed 2013
Wilkie Riparian Project	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property. GCSWCD installed 75 willow stakes and 15 native trees and shrubs along 150 feet of stream in the fall of 2013.	CSBI	Completed 2013
Dodson/McCloskey Property Planting Phase 2	GCSWCD, NYCDEP	GCSWCD re-installed a 100 foot wide riparian buffer along 300 feet of stream including, 250 native trees and shrubs and 250 willow stakes in the fall of 2013.	CSBI	Completed 2013
Manor Kill Dahlberg Property Planting	GCSWCD, NYCDEP	GCSWCD has a 5 year landowner agreement for this property and installed 50 native trees and shrubs and willow stakes along 150 feet of stream in 2014.	CSBI	Completed 2014
Police Anchor Camp (Windham Path) Riparian Project	GCSWCD, NYCDEP	Riparian planting project at multiple locations along tributaries of the Batavia Kill and the Windham Path. GCSWCD completed a Riparian Corridor Management Plan and has obtained a landowner agreement for this property. GCSWCD hosted a volunteer planting in 2013, installing 1,028 native trees and shrubs along 1,375 feet of stream. 2.41 acres were restored at three planting locations. GCSWCD removed a gravel berm 223 ft. long x 10 ft. wide x 4.5 ft. high and relocated 371 cubic yards of berm material outside 100 yr. floodplain prior to installing 350 trees to create a riparian buffer. Project area was graded and seeded with riparian mix. With an additional planting along a tributary that bisects the parcel, 460 native trees and shrubs were installed along 820 ft. of stream. 1.23 acres were restored in 2015. Project is complete.	CSBI	Completed 2015
Former Kastanis Property Planting Phase 2	GCSWCD, NYCDEP	Riparian planting project to reestablish a forested riparian buffer 100 feet wide along 1,200 feet of the Batavia Kill was planted in 2009, as a pilot project to restore approximately 7.1 acres of streamside vegetation. In 2015, GCSWCD obtained a land use and herbicide permit to reestablish a forested riparian buffer and treat Japanese knotweed. GCSWCD hosted a volunteer planting and installed 1,100 native trees and shrubs along 1,650 feet of stream, a total of 3.8 acres were restored. Japanese knotweed will require monitoring and follow-up treatment.	CSBI	Completed 2015
Saenger Property Planting	GCSWCD, NYCDEP	A riparian planting to restore approximately 4,500 square feet of streamside vegetation along a Schoharie Creek Tributary in Hunter. In 2015, a volunteer planting was hosted at the site; 120 native trees and shrubs and 20 willow stakes were installed along 137 feet of stream, 0.1 acre was restored.	CSBI	Completed 2015

OUTREACH, EDUCATION AND TECHNICAL ASSISTANCE TO STREAMSIDE LANDOWNERS				
Action Item	Partners	Description	Funding	Status
Riparian Program Development	GCSWCD, NYCDEP	CSBI developed to educate and assist streamside landowners in order to provide for improved stewardship in riparian areas. Program guidelines, policies, protocols, and other items required to offer a riparian buffer program to watershed landowners were developed. A protocol was developed that utilizes stream feature inventory and vegetation mapping to identify potential riparian planting sites.	NYCDEP/ GCSWCD	Completed 2008
Where Infrastructure & Streams Collide: How to Manage Both Responsibly	GCSWCD, NYCDEP	How infrastructure and streams are influenced by each and what potential strategies exist for prevention and mitigation of problems where stream instability has impacted infrastructure and vice-versa.	NYCDEP/ GCSWCD	Completed 2008

Catskill Streams Buffer Initiative Education Materials	GCSWCD, NYCDEP	CRSR, Inc. conducted a needs assessment, developed a marketing strategy, and developed initial program roll-out with above mentioned educational materials. Streamside Assistance Program was renamed the Catskill Streams Buffer Initiative (CSBI) based on the assessment. The marketing strategy, program slogan, logo, introduction language, program brochure, and application for funding have all been developed.	CSBI	Completed 2009
Conduct Watershed Survey	GCSWCD/ NYCDEP/ SWAC	It was decided by the SWAC E/O subcommittee to focus on surveys on events; that enough watershed surveys have already been done. No larger survey is expected.		Completed 2009
Dream Homes & Ditch Nightmares	GCSWCD	A skit involving landowners learning about permit requirements when building their dream home- volunteer role playing by audience NYSDEC, DOS approved course.	NYCDEP/ GCSWCD	Completed 2009
Japanese Knotweed Mailing	GCSWCD/ NYCDEP	GCSWCD printed 1,000 copies of a revised JKW prevention brochure for distribution to landowners in knotweed prevention areas identified by stream feature inventories. The brochures were mailed to 286 streamside landowners and distributed to 11 municipal town halls (15 copies each).	NYCDEP/ GCSWCD	Completed 2010
Riparian Buffer Workshop	GCSWCD/ NYCDEP	GCSWCD CSBI sponsored Healthy Buffers, Healthy Streams: A Landowner Workshop in July 2010. The interactive workshop was held at the Spruceton Community Center in West Kill and showed participants the characteristics of healthy vs. degraded buffers and different management practices to maintain healthy buffers.	CSBI	Completed 2010
Mountaintop Mapping	GCSWCD	Workshop participants learned how environmental mapping software can assist local communities in site planning and subdivision reviews.	SMIP	Completed 2011
Riparian Buffer Workshop	GCSWCD, NYCDEP, TU	A workshop was held for streamside landowners to highlight the importance of riparian buffers. The workshop included a demonstration of management practices used to maintain healthy stream buffers.	CSBI	Completed 2015

STREAM AND RIPARIAN ECOSYSTEM ASSESSMENT

Action Item	Partners	Description	Funding	Status
Catskill Riparian Reference Study	GCSWCD, NYCDEP, NYNHP	NY Natural Heritage Program completed a final report "Inventory, Classification, and Description of Riparian Natural Community Reference Types for West Kill Watershed, New York" and appendix "West Kill Restoration Guide to Planting."	NYCDEP/ GCSWCD	Completed 2009
Restoration Project Wetland Mapping	GCSWCD, NYCDEP	C.T. Male Associates was hired to remap the wetlands on the Ashland and Conine restoration sites to assure ACOE's wetland mitigation requirements were being met. Wetland mapping and reporting was completed by C.T. Male Associates.	NYCDEP/ GCSWCD	Completed 2009
Japanese Knotweed Management Project	GCSWCD, NYCDEP, Hudsonia	Hudsonia sampled Japanese knotweed management plots for several years. The results of their research are shown in the final report "Experimental Management of Japanese Knotweed on the Batavia Kill, Greene County, New York", which was submitted to GCSWCD in December 2009.	NYCDEP/ GCSWCD	Completed 2009

Organize Repository of Stream Ecosystem Data	GCSWCD, NYCDEP, Habitat & Recreation Subcommittee	SMPs included a recommendation to characterize the current health of stream ecosystems using food web dynamics, the presence or absence of indicator species and primary producers, and the status of fish populations, among others. Under guidance of Habitat/Recreation Subcommittee, GCSWCD has organized a master repository which integrates existing data and published documents and may help determine where additional field studies are warranted.	NYCDEP/ GCSWCD	Completed 2013
Water Temperature Impacts on Fisheries Study	GCSWCD, NYCDEP, Habitat & Recreation Subcommittee, USGS	GCSWCD and NYCDEP worked with USGS and RIT to determine the location of thermal refugia, which are important to cold water fish communities during the summer months. The study was conducted to inform and guide entities whose activities may impact cold water inputs. In 2012, RIT conducted imagery collection flight and submitted report, in 2013, USGS analyzed and summarized the data, and in 2014, USGS submitted report.	NYCDEP/ GCSWCD, USGS	Completed 2014

WATERSHED PROTECTION AND COMMUNITY PLANNING				
Project Title	Partners	Description	Funding	Status
Implementing SEQRA, basics & determinations	GCSWCD, NYCDEP	Participants were provided a basic understanding of the SEQRA process.	NYCDEP/ GCSWCD	Completed Annually 2008-2010
Federal & NYS Wetland Protection & Regulation	GCSWCD, NYCDEP	Presentation of regulations.	NYCDEP/ GCSWCD	Completed 2008
Schoharie Watershed Strategy	GCSWCD, NYCDEP	Engaged multiple watershed partners and agencies, municipal officials, and departments (highway, planning, and code enforcement) in the strategy's development which focused on landscape sources that contribute to water quality impairments. Some recommendations were identified as implementation activities in 2009-11 action plan and Schoharie Watershed Advisory Committee reviewed proposals to allocate funding in 2009.	NYCDEP/ GCSWCD	Completed 2008
Low-Impact Development	NYCDEP, GCSWCD	An overview of an alternative approach to site planning, design, and building that minimizes landscape impacts and preserves the natural hydrological cycle.	NYCDEP/ GCSWCD	Completed 2009
Mountaintop Recreation Master Plan	NYCDEP, GCSWCD, WAP, Schoharie Basin Municipalities	GCSWCD WAP worked with numerous public and private sector partners to develop a comprehensive master plan that focuses on recreation, and also includes open space, scenic quality and cultural resources. Two implementation subcommittees are working on marketing and coordinating projects and outdoor resource improvements that promote access to, and appreciation of, the mountaintop's natural environment including stream systems.	NYCDEP/ GCSWCD	Completed 2009
Low Impact Development Made Local	NYCDEP, GCSWCD, WAP	How improved site planning can achieve multi-objectives for Schoharie basin communities.	NYCDEP/ GCSWCD	Completed 2010
Town of Hunter Corridor Regional Planning Study	NYCDEP, GCSWCD, WAP	GCSWCD worked with the Town of Hunter and the Villages of Tannersville and Hunter to undertake a Corridor Study that entailed comprehensive assessment of potential future development along the State Route 23A corridor. The study was in effort to evaluate foreseeable development and environmental mitigation associated with future development.	NYCDEP/ GCSWCD	Completed 2010

State and City Stormwater Regulations	GCSWCD, NYCDEP, NYSDEC	Workshop participants were informed about the permit requirements of NYSDEC, NYCDEP and what triggers a permit.	NYCDEP/GCSWCD	Completed 2011
Mountaintop Better Site Design Plan Workshops	GCSWCD	GCSWCD's WAP, Kendall Stormwater Services, and Morris Associates worked with Ashland, Jewett, Lexington, Windham, Hunter, and Tannersville. For each community, there was a comprehensive code review against model development principles, helped identify which principles to address for local government, developed LID manual for communities to use in site planning, and to share with landowners and developers. Also, an education packet, for easier reference, was developed.	SMIP, LTAP	Completed 2011-2012

ENHANCING PUBLIC ACCESS TO STREAMS				
Action Item	Partners	Description	Funding	Status
Prattsville Conine Park	GCSWCD, NYCDEP, Prattsville	GCSWCD worked with the Town of Prattsville on a master plan for redevelopment of Conine Field. Key conservation issues included fishing access point, knotweed management, a riparian buffer planting and a conservation easement on sections of the property adjoining the Batavia Kill and Schoharie Creek and a stormwater pollution prevention plan retrofitting the site to meet current standards for new construction.	NYCDEP/GCSWCD	Completed 2008
Windham Creamery Pond	GCSWCD, NYCDEP, Windham	GCSWCD assisted the Town of Windham with the development of a public access area on a NYCDEP owned parcel in the hamlet of Windham. The GCSWCD completed a site design, Stormwater Pollution Prevention Plan and other documents. The design included the construction of parking area and athletic fields and was left to the town to complete.	NYCDEP/GCSWCD, Windham	Completed 2008
Town of Windham (Police Anchor Camp)	GCSWCD, NYCDEP, Windham	GCSWCD provided conceptual plans to the Town of Windham to assist with assessment and planning for public use of a 65 acre parcel located in the Batavia Kill watershed.	NYCDEP/GCSWCD, Windham	Completed 2010
Ashland Fishing Access Enhancements	GCSWCD, NYCDEP, Ashland	GCSWCD and NYCDEP completed a parking area and access to an existing public fishing area on the Batavia Kill at the Ashland Connector Reach Restoration Project. The access includes an information kiosk.	NYCDEP/GCSWCD	Completed 2010
Promote Increased Recreational Use of Watershed Streams	GCSWCD, NYCDEP, Recreation & Habitat Subcommittee	All stream management plans recommend enhancing public access of the streams for fishing. Along many of the streams within the Schoharie Watershed, there are public fishing access points; existing access locations have been mapped. Through the Recreation and Habitat category, multiple stream access parks have been and will continue to be supported by SWAC.	NYCDEP/GCSWCD	Completed 2010
Prattsville Stream Access Parking	GCSWCD, NYCDEP, Prattsville, SWAC	The Town of Prattsville was approved for SMIP funding October 2009; this grant was closed in August 2012, due to site constraints and significant flood damage throughout Prattsville during Hurricane Irene in 2011.		Completed 2012
Windham Path	GCSWCD, NYCDEP, WARF, Windham	GCSWCD and NYCDEP assisted Town of Windham and the Windham Area Recreation Foundation with installation of a public, non-motorized, multi-use trail along a 65 acre parcel located along the Batavia Kill. SWAC/SMIP funds were used to cover the cost of materials for a boardwalk and footbridges. The path is used almost daily by local residents and visitors of Windham.	NYCDEP/GCSWCD, WARF	Completed 2013

Schoharie Creek Park (Town of Lexington)	NYCDEP, GCSWCD, Town of Lexington	The GCSWCD assisted the Town of Lexington with the development of a small “pocket park” located on the Schoharie Creek. The project included the removal of a derelict house (completed 2007), cleaning up weedy growth, enhancement of riparian vegetation and installation of low impact improvements such as demonstrative plantings, informational signage and stream access. Plantings were installed in 2010 and repaired in 2012 following flood damages. In 2012, split rail fencing was installed. In 2015, signage was installed.	SMIP	Completed 2015
Windham Path Phase 2	NYCDEP, GCSWCD, WAP, WARF, SWAC	The Windham Area Recreation Foundation is working on expanding the Windham Path, a 1.3 mile non-motorized, multi-use recreational trail in the Town of Windham near the Batavia Kill. Phase 2 extends the trail over the Batavia Kill on a pedestrian bridge to the Route 296/South Street business district. A second SMIP grant was awarded in 2014 for two small wooden footbridges that cross wet areas along the path's phase 2 extension, and a trailhead sign and kiosk on Route 296.	SMIP, Windham, NYCDEP/ GCSWCD, WARF	Completed 2015
Conesville Town Park Walking Path	NYCDEP, GCSWCD, SCSWCD	The SCSWCD, GCSWCD, NYCDEP and the Town of Conesville worked together to rehabilitate the existing walking path in the Conesville Town Park. A SMIP grant was awarded in 2014; the design, permitting and construction of the path were combined with the Manor Kill Stream Restoration Project.	SMIP	Completed 2015

STREAM ACCESS EDUCATION AND OUTREACH				
Action Item	Partners	Description	Funding	Status
Manor Kill Information Kiosk	GCSWCD, NYCDEP, Conesville, SCSWCD	A Kiosk for Conesville was provided by GCSWCD, and a general Schoharie Watershed/Schoharie SWCD educational panel was produced in conjunction with GCSWCD's kiosk series.	NYCDEP/ GCSWCD, SCSWCD	Completed 2011