

SCHOHARIE BASIN STREAM MANAGEMENT PLAN IMPLEMENTATION ACTION PLAN 2009 – 2011

Updated – May 1, 2010

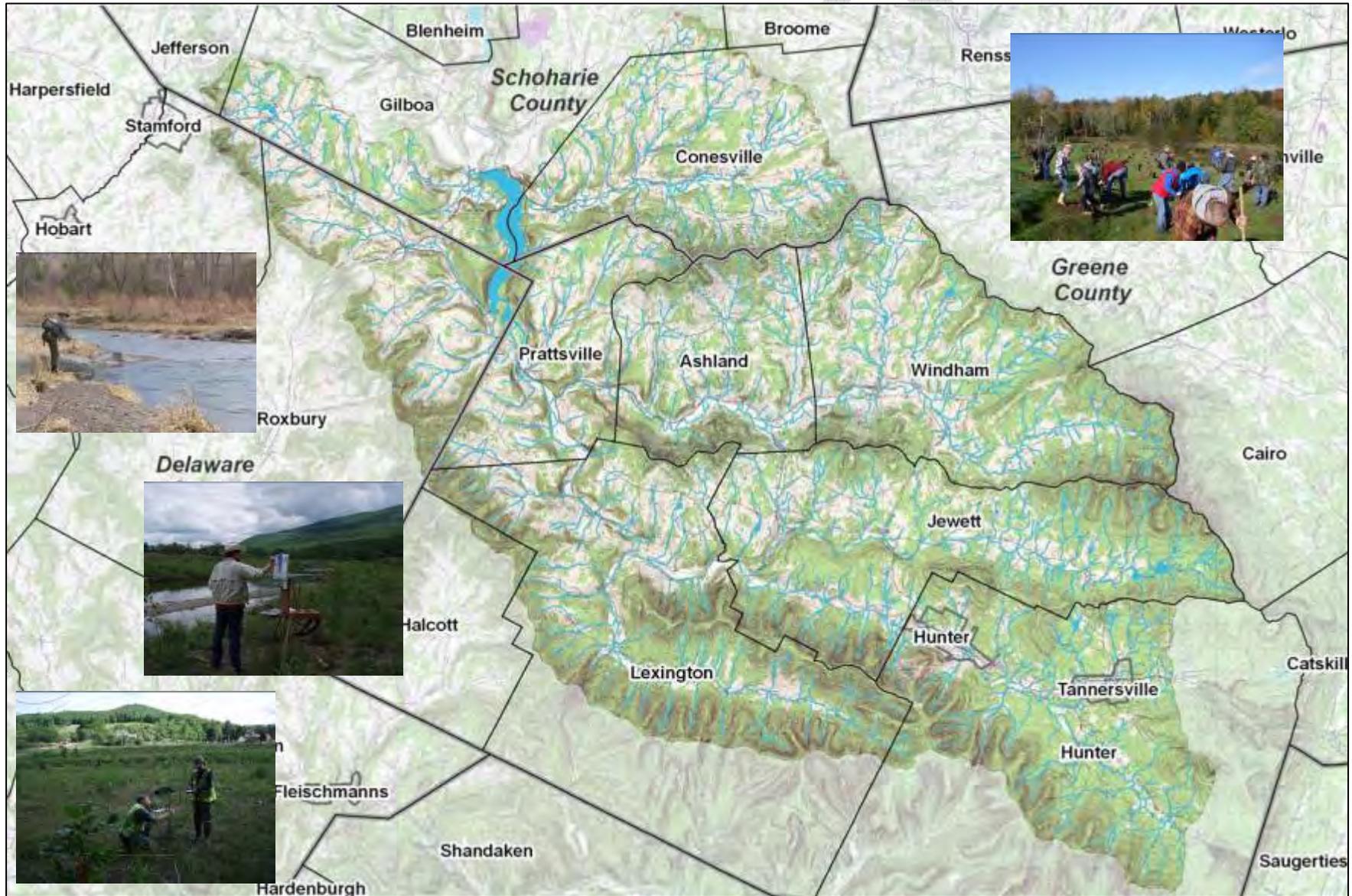


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**Schoharie Basin Stream Management Plan Implementation
Action Plan 2009 – 2011
Update May 1, 2010**

The following Action Plan summarizes the programs and projects that GCSWCD will be leading within the Schoharie Basin between May 2009 and May 2011. The GCSWCD will lead the efforts for each action item, and work cooperatively with watershed partners including, but not limited to, the SWAC, NYCDEP, NYSDEC, CWC, and watershed municipalities. Implementation categories include, Program Administration and Implementation, Education on Watershed Protection, Landowner Stream Assistance, Creative Stormwater Practices and Critical Area Seeding, Highway and Infrastructure Improvements, Planning and Assessment, Recreation and Stream Habitat Improvements, and On-going Activities. This is a dynamic document and will be modified annually to include additional action items or to update existing items. Action items may be site specific, community-wide, or basin-wide, and are targeted for the watersheds in which the GCSWCD and NYCDEP have completed Stream Management Plans (SMP). The Action Plan is one piece of a three-part package that includes: this action plan, completed projects synopsis and a progress tracking sheet; all of these documents were updated in May, 2010. Task items that have a funding source identified as “SMIP” were funded through the Schoharie Basin Stream Management Implementation Funding Program. Similarly, task items with a funding source of CSBI were funded through the Catskill Streams Buffer Initiative. The following items have been identified by GCSWCD, NYCDEP and the Schoharie Watershed Advisory Committee (SWAC) as being consistent with SMP recommendations and will be completed by the Schoharie Watershed Team.

I. Education on Watershed Protection:

The GCSWCD will continue to work with a wide network of partners to enhance its education and outreach efforts related to stream and floodplain management, sediment and erosion control, and other topics critical to sound watershed management. A priority goal of this action plan is to increase education and outreach activities. Many of the following E/O initiatives were developed by the SWAC E/O Subcommittee. Education and Outreach action items include, but are not limited to:

A. WOH Education & Outreach Strategy: The GCSWCD will continue to work with NYCDEP and others to refine and finalize a detailed education and outreach strategy for the West of Hudson (WOH) watershed area. 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 Staff:	Gorman, Yost
Project Partners:	NYCDEP
Project Funding:	NYCDEP SMP Contracts, WAP, CWC
Project Schedule:	Complete by 2009
SMP Recommendation:	Batavia Kill – EO-01 (Medium, 1.66); Schoharie/East Kill – EO-6.4.1; West Kill – EO 6.4
Date Added to Action Plan:	2007

Progress: As a sub-set of the WOH Education & Outreach Strategy, the Schoharie Basin’s education and outreach programs continue to be guided and funded by the Schoharie Watershed Advisory Committee (SWAC) and the Watershed Assistance Program’s Schoharie Watershed Strategy (SWS). E & O action items listed below offer watershed communities and stakeholders (local decision-makers, agency regulators, county government, property owners) opportunities to come together in small focus groups and in large forums to network and learn about current practices, programs, and regulations governing watershed protection. The Schoharie Watershed Strategy includes E & O activities and topics specific to particular audiences (e.g., highway personnel, planning boards, code enforcement officials, property owners) and are supported by inter-basin and inter-county agencies (SWCD’s, Cornell Cooperative Extension, Planning Departments). The GCSWCD also participates on the WOH E & O Committee sharing information and suggestions on educational programs, and networking with other watersheds on educational forums (e.g., Ashokan Conference, May 2010).

B. Educational Workshops: While the detailed E&O plan will determine long term training needs, the GCSWCD has identified a number of workshops that are proposed for 2009 – 2010. Potential work shops include:

1. Riparian Buffer workshop for private landowners.
2. Sediment & Erosion control for contractors.
3. Floodplain management for municipalities (CEO, Highway, Planning Board).
4. Floodplain Management for private sector (realtors, lending institutions, developers).

GCSWCD Staff: Gorman, Yost
Project Partners: NYCDEP
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract, CWC, GCSWCD-WAP, others
Project Schedule: Completed by August 1, 2010, updates as appropriate –
1. Continue to organize training workshops with targeted groups.
2. Identify additional target groups and develop appropriate training workshops.
3. Develop a training calendar and identify funding needs.

SMP Recommendation: Batavia Kill – RB-01 (Very High, 3.33), SC-06 (Very High, 3.46); Schoharie/East Kill – EO-6.4.8; West Kill – EO 6.4
Date Added to Action Plan: 2007

Progress: In addition to public trainings and informational programs offered throughout the year, such as the annual Water Quality Summits, watershed tours, and Batavia Kill Stream Celebrations (activities noted below), specific workshops for targeted audiences have occurred during the year including:

Sediment and Erosion Control

GCSWCD held a NYS DEC Erosion and Sediment Control training on December 17, 2008 and January 15, 2009. Both trainings were well attended and the District is committed to offering these trainings on a regular basis. GCSWCD organized a NYSDEC Erosion and Sediment Control training for March 15, 2010. The training provides local contractors and community officials detailed information on state standards and regulations, as well as updates to DEC's storm water requirements.

Floodplain Management for Municipal Officials

Workshops at the 2009 and 2010 Watershed Summits focus on proper Floodplain Management. NYS DEC staff presented to municipal, planning and code enforcement officials on the National Flood Insurance Program and the importance of proper administration of floodplain regulations.

Emergency Critical Response Training for Highway Supervisors

GCSWCD is working with the Highway Subcommittee to start the development of Critical Response Planning for local highway departments. On 12/15/09, GCSWCD staff presented key information to the subcommittee on the benefits of preparing response plans and offered each community the opportunity to identify six "hot spots" which would undergo stream and culvert modeling to address inadequate water conveyance. The District will work with local highway superintendents that responded to identify areas in need of response plans.

Riparian Buffer Workshop

A Riparian Buffer workshop is being planned for July 2010. The training will focus on the Catskill Streams Buffer Initiative program goals and resources. Landowners will also learn about the negative effects of invasive species.

C. Conduct Watershed Survey: In order to achieve successful implementation of SMPs, it is important to determine the educational needs and interests of various stakeholders and watershed residents. It is also important to know the types of educational resources that already exist. Surveys should be developed and distributed to targeted audiences within the watershed including, but not limited to, Highway Departments, Municipal Officers, members of planning boards, and watershed or streamside landowners.

GCSWCD Staff: Gorman, Yost
Project Partners: Regional Science Teachers, Greene County CCE, CWC, CCCD, others
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract, CWC, GCSWCD-WAP, others
Project Schedule: Fall/Winter, 2009

1. Determine the audience(s) that will be targeted for survey.
2. Develop appropriate survey(s) for targeted audience(s) with input from educators and relevant agencies.
3. Distribute survey(s).
4. Compile and analyze the results of the survey(s).
5. Identify workshop and curriculum needs and investigate the feasibility and funding availability to conduct identified workshops.

SMP Recommendation: Schoharie/East Kill – EO 6.4.7 and 6.4.8; Manor Kill- EO 5.4.7 and 5.4.8
Date Added to Action Plan: 2009
Progress: Draft surveys for the various workshops were developed. The education and outreach committee decided to use these surveys at existing trainings to assess the community's knowledge and interest in specific topics. These surveys will be given to participants to gauge the level of knowledge and training needs of each stakeholder group.

D. Identify Existing Resources: In order to know where gaps exist and to target educational efforts, GCSWCD will identify and catalog existing resources that are currently available.

GCSWCD Staff: Gorman, Yost
Project Partners: Agencies that provide watershed programming (CWC, GCCCE, CCCD, WAC, basin schools, DEC)
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract, CWC, GCSWCD-WAP, others
Project Schedule: Fall/Winter, 2009
SMP Recommendation: Schoharie/East Kill – EO 6.4.8
Date Added to Action Plan: 2009
Progress: The Watershed Surveys will help GCSWCD identify the gaps in the existing resources that are currently available. The surveys will be compiled and cataloged to identify the education resource needs throughout the Schoharie Watershed.

E. Organize a Schoharie Watershed Week: Community involvement and awareness is important for promoting the protection of streams and their watersheds. Hosting a watershed-wide educational and recreational event (Schoharie Watershed Week) will provide an opportunity for watershed residents, students, community groups, tourists, officials, etc. to get to know their stream and the resources available to help provide watershed protection.

GCSWCD Staff: Gorman, Yost
Project Partners: Local schools and colleges, community organizations, CWC (Youth Summit Committee), CCCD, WAC, GCCCE, DEC, NYCDEP
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract, CWC, GCSWCD-WAP, local sponsors, chambers of commerce
Project Schedule: Winter, 2010
1. Organize Schoharie Watershed educational events, starting with one or two days (Fall, 2010) and building up to a solid week of activities involving schools, community groups, and agencies (2012).
SMP Recommendation: Schoharie/East Kill – EO 6.4.8; Manor Kill- EO 5.4.8
Date Added to Action Plan: 2009
Progress: In the fall of 2009, GCSWCD held an initial Schoharie Watershed Week scoping meeting. A large group of community organizations and municipal officials attended. The group began to develop ideas for the Week, and out of this a steering committee was formed to assist in organizing Schoharie Watershed Week. The date for the First Annual Schoharie Watershed Week will be May 17-23rd, 2010. A number of events are scheduled to take place to educate and engage local community members (full time and seasonal residents, and tourists) in watershed programs and stewardship activities. For more information: http://www.gcswcd.com/wap/index_files/Page2020.htm

F. Complete Kiosk Series: Kiosks will be based upon categories of water resource-related best management practices.

GCSWCD Staff: Gorman, Hellinga
Project Partners: Organizations, property owners where kiosks will be located
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract
Project Schedule: Complete installation 2010.
SMP Recommendation: Batavia Kill – EO-08 (High, 2.27), EO-09 (Medium, 1.54), EO-06 (Medium, 1.15), EO-10 (Medium, 0)
Schoharie/East Kill – EO-6.4.2, EO 6.4.3, EO 6.4.4, EO 6.4.5, EO, 6.4.6, EO 6.4.7, EO 6.4.8, FP-6.1.7
West Kill – EO 6.4.3, 6.4.4, 6.4.5
Date Added to Action Plan: 2009
Progress: Three kiosks were constructed in 2009 and one of the three was installed at the Sugar Maples site. The kiosk series will highlight the various restoration projects throughout the Schoharie watershed. GCSWCD entered into a contract with a graphic design company to develop the initial drafts, finalize the layout and produce the kiosk displays. The remaining two kiosks and signage will be installed in summer 2010

G. Japanese Knotweed Mailing: As discussed in SWAC meetings, Japanese knotweed is a basin-wide concern. Managing Japanese knotweed requires active treatment of existing knotweed occurrences and a proactive approach to prevent its spread. In order to inform streamside landowners about Japanese knotweed, its prevention and available treatment methods, an informational brochure will be mailed to landowners with Japanese knotweed free areas.

GCSWCD Staff: Weyeneth, Gorman
Project Partners: GCCCE, CCCD, Mountaintop Arboretum, The Nature Conservancy, Catskill Region Invasive Species Partnership
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract
Project Schedule: 1. Identify properties and landowner addresses that did not have Japanese knotweed at the time of the stream assessments, 2009.
2. Create or update Japanese knotweed informational brochure, 2009
3. Mail brochure to landowners, 2009.
SMP Recommendation: Schoharie/East Kill 6.7.13; Manor Kill 5.7.13
Date Added to Action Plan: 2009
Progress: GCSWCD developed several initial drafts of a brochure for distribution to landowners. The brochures will be finalized by a design firm and sent to landowners in the knotweed prevention areas identified by the streamside surveys. The mailing will go out in the spring of 2010.

H. Batavia Kill Stream Celebration: The annual Batavia Kill Stream Celebration is held in August, in the Town of Ashland. The family-oriented event has music, displays and educational activities and events that celebrate the Batavia Kill and water resources. For more information: <http://www.gcswcd.com/wap/calendar/>

GCSWCD Staff: Yost, Gorman
Project Partners: NYCDEP, GCSWCD, Ashland, CWC, SWAC
Project Funding: NYCDEP, GCSWCD, Ashland, CWC, many local business sponsors
Project Schedule: Organize from February through August with event in August, 2009.
SMP Recommendation: Schoharie 6.4
Date Added to Action Plan: 2009
Progress: The 2009 Batavia Kill Stream Celebration was held on August 1 at the Country Suites Bed & Breakfast in Ashland. Tracked for the first time using car and hand-held clickers, attendance at the 2009 event registered a conservative 750 (some people entered at different points) The Stream Celebration continues to grow in popularity with numerous attendees remarking what a wonderful event it is. The 2009 event expanded the agency and non-profit organizations involvement by highlighting the various organizations working throughout the watershed (state, city, county level, not-for-profits) and promoting collaboration in the process. The event showcased the talents of Molly Mason and Jay Ungar (Ashokan Center), Arm of the Sea Theater, and provided dozens of children and adult activities geared toward stewardship and protection of local natural resources. The 4th Annual Batavia Kill Stream Celebration is planned for August 7, 2010.

I. Schoharie Watershed Summit: The third and fourth annual Watershed Summits were held in Hunter on January 24, 2009 and January 23, 2010, respectively. The yearly conference targets appointed and elected municipal officials with decision-making capacity and regulatory and engineering firms active in the basin, and offers training in relevant water resources management, regulations, and land use, and offers credits to planning board members.

GCSWCD Staff: Yost, Gorman
Project Partners: NYCDEP, GCSWCD, SWAC
Project Funding: NYCDEP, GCSWCD
Project Schedule: Organize from September through January; event held in annually in January.
SMP Recommendation: Schoharie 6.4
Date Added to Action Plan: 2009

Progress: January 23, 2010 was the Fourth Annual Schoharie Watershed Summit. The Summit is another event that continues to grow from year to year. This year's event brought in close to 140 people; mostly local municipal officials, watershed agency managers, county departments, and contractors and engineers. Building on past years and comments provided by attendees, training workshops focused on storm water management, floodplain management, low impact development, available funding resources, and the State Environmental Quality Review Act.

J. Schoharie Watershed Bus Tour: The third annual Watershed bus tour was held at C.D Lane Park in Windham. Recommended from the first Watershed Summit, the bus tour is organized to provide public officials and landowners an opportunity to view project sites, in order to see the range and diversity of potential watershed projects. Similar to the Summits, the Watershed Tours target landowners and municipal officials, and offer training in relevant water resource issues. For more information: <http://www.gcswcd.com/wap/calendar/>

GCSWCD Staff: Yost, Gorman
Project Partners: NYCDEP, GCSWCD, SWAC
Project Funding: NYCDEP, GCSWCD
Project Schedule: Organize from February through June; event held in June, 2009.
SMP Recommendation: Schoharie 6.4
Date Added to Action Plan: 2009

Progress: The 2009 Schoharie Watershed Bus Tour was held on June 20, 2009, with approximately 50 people attending. The tour offered an opportunity for community residents, officials and county support staff to see first hand stream and riparian restoration work that is being done throughout the watershed. The tour showcased a low-impact development storm water project at the Sugar Maples Arts Center in Maplecrest, and a stream restoration site on a Watershed Agricultural Council-supported farm in Jewett. The 2010 Schoharie Watershed Bus Tour is being planned for June 19th.

K. Mountaintop Arboretum Wet Meadow – Interpretive Kiosk, Brochures, & Historic Pump House Repair: This project involves installing a kiosk which will display a map, a description of the site including the historical background of the historic pump house in the East Meadow, an explanation of the site's hydrology, and other information about wetland plants and wildlife. The brochures will be available at the kiosk, and trails will be marked with numbered posts that relate to the featured information in the brochure.

GCSWCD Staff: Gorman, Yost
Project Partners: Mountain Top Arboretum, SWAC
Project Funding: SMIP Round 1
Project Schedule: Contract period - 2010-2012
SMP Recommendation: Schoharie 6.4
Date Added to Action Plan: 2010
Progress: Awarded SWAC SMIP funding in October, 2009 and completed agreements with GCSWCD in early 2010 – cleared to begin work – have 2 years to complete project.

L. SWAC and Schoharie Watershed Week Logos: This project will develop logos for the Schoharie Watershed Advisory Committee and Schoharie Watershed Week. Schoharie Watershed Week is a new initiative the Education and Outreach subcommittee is working on which will entail outdoor, arts, and cultural activities focusing on education & watershed awareness.

GCSWCD Staff: Yost, Gorman
Project Partners: SWAC
Project Funding: SMIP Round 1
Project Schedule: Completed in early 2010
SMP Recommendation: Schoharie 6.4.8
Date Added to Action Plan: 2010
Progress: Awarded design work in October 2009, draft designs submitted in March, 2010 for SWAC consideration.

M. Manor Kill Environmental Study Team/Stream Management Implementation: Conduct on-going implementation of Manor Kill Stream Management Plan by involving youth, and their families, in water quality monitoring and testing, taxonomy, riparian zone restoration, invasive species identification, and public outreach presentation skill building.

GCSWCD Staff: Gorman, Yost
Project Partners: Schoharie River Center, SWAC
Project Funding: SMIP Round 1
Project Schedule: Contract period - 2010-2012
SMP Recommendation: Manor Kill 5.4
Date Added to Action Plan: 2010
Progress: Awarded SWAC SMIP funding in October, 2009 and completed agreements with GCSWCD in early 2010 – cleared to begin work – have 2 years to complete project.

N. Mountain Top Arboretum Outdoor Classroom: Create design plans for an accessible outdoor classroom that would accommodate approx. 45 people for year-round outdoor programming on a range of ecological and natural history topics relating to the watershed (wetland plants, insects & wildlife along riparian area, leaf pack workshops to learn about geology, birding and stream health.

GCSWCD Staff: Gorman, Yost
Project Partners: Mountain Top Arboretum
Project Funding: SMIP Round 2
Project Schedule: Contract period - 2010-2012
SMP Recommendation: Schoharie 6.4
Date Added to Action Plan: 2010
Progress: Awarded SWAC SMIP funding in March, 2010 and completing agreements with GCSWCD in spring/summer 2010 – have 2 years to complete project once agreements are signed.

O. Rain Barrel Workshop: Conduct a hands-on educational workshop on building rain barrels as part of the Schoharie Watershed Week program (raising awareness about water quality stewardship). The Workshop will provide materials, instruction for approx. 10 families, the goal of which is to introduce participants to methods of stormwater control, non-point source pollution prevention and conservation of water resources in a residential setting. Primary objectives include helping at least 10 families successfully construct a rain barrel for home use and helping them understand the importance of stormwater control in a residential setting.

GCSWCD Staff: Gorman, Yost
Project Partners: Greene County Cornell Cooperative Extension
Project Funding: SMIP Round 2
Project Schedule: May 2010
SMP Recommendation: Schoharie/East Kill – EO 6.4.8; Manor Kill- EO 5.4.8
Date Added to Action Plan: 2010
Progress: Awarded SWAC SMIP funding in March, 2010 and completing agreements with GCSWCD in spring 2010 with workshop planned for May, 2010.

P. Manor Kill Information Kiosk: Create a kiosk highlighting the Manor Kill, watershed protection efforts, and agencies and programs serving the area. Location would be in a popular public park, near a riparian planting project that took place in October 2008. Information will be changed and updated as warranted.

GCSWCD Staff: Nichols, Gorman
Project Partners: SCSWCD, NYCDEP
Project Funding: SMIP Round 2
Project Schedule: Contract period - 2010-2012
SMP Recommendation: Manor Kill 5.4
Date Added to Action Plan: 2010
Progress: Awarded SWAC SMIP funding in March, 2010 and completing agreements with GCSWCD in spring/summer 2010 – have 2 years to complete project once agreements are signed.

II. Landowner Stream Assistance

The GCSWCD and NYCDEP recognize the importance of providing assistance to local landowners. The NYCDEP, GCSWCD and SCSWCD have provided the necessary training for project staff to be able to provide state-of-the-art technical assistance throughout the watershed. Technical assistance from staff members will guide the restoration of stream system stability and help to maintain ecological integrity. The technical assistance can range from a landowner consultation to activities that will help to meet the priorities of protecting water quality and establishing riparian buffers. Protection and enhancement of water quality can benefit both the City of New York's water supply and the residents of the Schoharie basin. Landowner Stream Assistance action items include, but are not limited to:

A. Catskill Streams Buffer Initiative: An effective riparian buffer program can 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. In 2009, the Catskill Streams Buffer Initiative was developed to educate and assist streamside landowners in order to provide for improved stewardship of riparian areas. The GCSWCD and NYCDEP will work with landowners to protect, enhance, manage and restore riparian buffers within the WOH watershed. To help guide implementation of this program, the GCSWCD will continue to work with NYCDEP, other Soil and Water Conservation Districts, the Riparian Buffers Working Group, and the CSBI Communications, Program Guidelines and Plant Materials subcommittees. GCSWCD staff will conduct site visits to determine eligibility for funding through the CSBI. Site visits will lead to the recruitment of at least 5 new CSBI projects each year. In addition to site visits, recruitment may also include outreach mechanisms such as press releases, targeted mailings, presentations to organizations, and Riparian Corridor Management Plan development.

Catskill Streams Buffer Initiative Projects:

Site 1. Manor Kill Colangelo Riparian Planting:

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Community Volunteers
Project Funding: NYCDEP, GCSWCD, SCSWCD, CSBI
Project Schedule: Fall, 2009
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan: 2009

Progress): Landowner has signed landowner agreement and applied for Floodplain Easement Program (NRCS). SCSWCD wrote a Riparian Corridor Management Plan for this property. In November 2009, 354 trees were planted and 150 willow stakes and 500 sedge plugs were installed along 546 feet of stream. 340 additional trees and 200 stakes will be installed this spring (2010).

Site 2. Manor Kill Gentile Property Planting: Catskill Streams Buffer Initiative Pilot - Obtain landowner agreement, create property management plan and restore approximately 550 feet of streamside vegetation along the Manor Kill.

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Landowner
Project Funding: NYCDEP, GCSWCD, SCSWCD, CSBI
Project Schedule: Build in 2009
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan: 2010

Progress: 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. Additional willow stakes will be installed this spring (2010).

Site 3. Manor Kill Grogan Property Planting: Catskill Streams Buffer Initiative Pilot - Obtain landowner agreement, create property management plan and restore approximately .28 acre of streamside vegetation along the Manor Kill.

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Landowner
Project Funding: NYCDEP, GCSWCD, SCSWCD, CSBI
Project Schedule: Build in 2009
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan 2010
Progress: SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 52 trees and 500 sedge plugs were installed in November 2009.

Site 4. Manor Kill Brandow Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement, create property management plan and restore approximately 3,520 square feet of streamside vegetation along the Manor Kill.

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan 2010
Progress: SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 40 trees, 300 willow stakes/tubes, and 100 sedge plugs will be installed this spring (2010).

Site 5. Manor Kill Quinn Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement, create property management plan and restore approximately 12,500 square feet of streamside vegetation along the Manor Kill.

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan 2010
Progress: SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 100 trees, 80 willow stakes/tubes, and 100 sedge plugs will be installed this spring (2010).

Site 6. Manor Kill Dahlberg Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement, create property management plan and restore approximately 3,750 square feet of streamside vegetation along the Manor Kill.

SCSWCD/GCSWCD Staff: Nichols, Weyeneth
Project Partners: NYCDEP, GCSWCD, SCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Manor Kill- 5.7.1, 5.7.2, 5.7.4, 5.7.7
Date Added to Action Plan: 2010

Progress: Riparian Corridor Management Plan is complete. 40 trees, 80 willow stakes/tubes, and 150 sedge plugs will be installed this spring (2010).

Site 7. Dodson/McCloskey Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 25,000 square feet of streamside vegetation along the East Kill.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – RZM-6.7.1, RZM-6.7.2, RZM-6.7.4,
Date Added to Action Plan: 2010

Progress: GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Install a 100 ft. riparian buffer. 250 trees and shrubs will be installed this spring (2010).

Site 8. Rappleyea Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 15,000 square feet of streamside vegetation along the East Kill.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – RZM-6.7.1, RZM-6.7.2, RZM-6.7.4,
Date Added to Action Plan: 2010

Progress: GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 150 trees and shrubs will be installed this spring (2010).

Site 9. Avella Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 2,500 square feet of streamside vegetation along a Batavia Kill tributary.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Batavia Kill – RB-03 (Very High, 3.46), RB-07 (Very High, 3.08), RB-11 (High, 2.69)
Date Added to Action Plan: 2010
Progress: GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 25 trees and shrubs will be installed this spring (2010).

Site 10. Brunsdon Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 1,000 square feet of streamside vegetation along a Batavia Kill tributary.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Batavia Kill – RB-03 (Very High, 3.46), RB-07 (Very High, 3.08), RB-11 (High, 2.69)
Date Added to Action Plan: 2010
Progress: GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Install 10 trees and 60 willow stakes this spring (2010).

Site 11. Grossman Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 15,000 square feet of streamside vegetation along a Schoharie Creek tributary.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – RZM-6.7.1, RZM-6.7.2, RZM-6.7.4
Date Added to Action Plan: 2010
Progress: Riparian Corridor Management Plan is complete. Install a 50 ft. riparian buffer. Plant 200 trees and shrubs this spring (2010).

Site 12. Silver Property Planting: Catskill Streams Buffer Initiative - Obtain landowner agreement and restore approximately 1,500 square feet of streamside vegetation along a Schoharie Creek tributary.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: NYCDEP, GCSWCD, Landowner
Project Funding: CSBI
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – RZM-6.7.1, RZM-6.7.2, RZM-6.7.4
Date Added to Action Plan: 2010
Progress: GCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. Grade 60 ft. of streambank, remove fence, and plant 15 trees and shrubs this summer (2010).

B. Stream Restoration Projects and Repair: In 2009 and 2010, the GCSWCD and NYCDEP will complete the following stream restoration projects. The GCSWCD and NYCDEP will also work cooperatively with the Schoharie Watershed Advisory Committee (SWAC) and others to identify additional sites. Projects are contingent on available funding, proper design, landowner cooperation and appropriate environmental and weather conditions. Implementation of these projects includes assessment, design, permitting, contracting, and construction oversight.

Stream Restoration Projects:

Site1. Wright Stream Bank Stabilization/Riparian Project: Construct a bankfull bench (~500') and re-vegetate approximately 2,100 feet of streambank.

GCSWCD Staff: DuBois, Mellot
Project Partners: NYCDEP, GCSWCD, CWC, Delaware Engineering, Landowner
Project Funding: NYCDEP, GCSWCD, CWC, NRCS
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – FP-6.1.10, FP-6.1.11, RZM-6.7.1, RZM-6.7.2, RZM-6.7.4, RZM-6.7.9, RZM-6.7.13, GSMA-6.8.2, GSMA-6.8.3, GSMA-6.8.6, GSMA-6.8.7, GSMA-6.8.8
Date Added to Action Plan: 2009
Progress: CWC Stream Corridor Protection Grant and other NYCDEP and ACOEs funding has been secured for this project. The landowner has decided against moving forward with the whole farm plan due to their reluctance to commit to the time period (10-15 yrs) that the farm practices would need to be maintained. Negotiations are complete and the project will be constructed in 2010.

Site 2. Prattsville Riparian Project

GCSWCD Staff: DuBois, Mellot, Hellinga
Project Partners: NYCDEP, GCSWCD,
Project Funding: NYCDEP, GCSWCD
Project Schedule: Build in 2010
SMP Recommendation: Schoharie/East Kill – FP-6.1.10, FP-6.1.11, RZM-6.7.1, RZM-6.7.2, RZM-6.7.4, RZM-6.7.9, RZM-6.7.13, GSMA-6.8.2, GSMA-6.8.3, GSMA-6.8.6, GSMA-6.8.7, GSMA-6.8.8
Date Added to Action Plan: 2010
Progress: Taper bank, remove farm dump and restore riparian vegetation to ~ 1,000 feet of the Schoharie Creek on the next property upstream of the Wright project (Site 1).

Site 3. Tompkins Riparian Project: Replant a large section of Batavia Kill adjacent to Tompkins Quarry as part of their restoration/compliance efforts.

GCSWCD Staff: Weyeneth, Mellot
Project Partners: GCSWCD, NYCDEP, Landowner
Project Funding: NYCDEP, GCSWCD, Landowner
Project Schedule: Construct in 2009
SMP Recommendation: Batavia Kill – RB-03 (Very High, 3.46), RB-07 (Very High, 3.08), RB-11 (High, 2.69)
Date Added to Action Plan 2009

Progress: A planting plan has been developed and has been submitted to NYSDEC for review and approval. GCSWCD Obtained a 10 year landowner agreement for this property. A scheduled volunteer planting date set for October 2009 was cancelled due to the landowner's desire to treat Japanese knotweed on site prior to installing the riparian buffer. GCSWCD is currently working with the landowner to decide upon a path for completing this project.

Site 4. Vista Ridge Floodplain Restoration: The proposed mitigation strategy is expected to improve not only the immediate project area, but also the aggraded reach upstream. Reduction of the backwater condition, enhancement of the riparian buffer, reduction of the risk of failure of the Vista Ridge Road Bridge, and improvement of the overall habitat value of the reach are all anticipated outcomes of the project.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: GCSWCD, NYCDEP, Landowner
Project Funding: NYCDEP, SMIP Round 1
Project Schedule: Survey 2009, Design 2010, Construct 2011
SMP Recommendation: East Kill 6.1.11, 6.1.12
Date Added to Action Plan 2010
Progress: Survey was completed and the design was started in 2009.

Site 5. Holden Stream Restoration Project Phase 2: Based on the GCSWCD's assessment of the monitoring cross sections and the historical aerial photos, it is evident that the project reach should be characterized as being highly unstable, a condition which has been ongoing for many years. Instability is likely a combination of several factors including past management practices, poor riparian conditions, valley morphology, and road impacts. The restoration strategy recommended for this site consists of a geomorphically based full channel restoration of the entire reach. The proposal includes stream bank and channel excavation to achieve stable geometry, installation of in stream stabilization structures such as rock vanes and cross vanes. The proposal also includes various vegetative treatments such as live willow fascines, live willow stakes, seeding and mulching with a specially designed riparian seed mix, and planting of a mix of tree and shrub species that are adapted to stream-side conditions.

GCSWCD Staff: DuBois
Project Partners: GCSWCD, NYCDEP, Landowner
Project Funding: NYCDEP, SMIP Round 1
Project Schedule: Survey and Design 2009-2010, Construct 2010
SMP Recommendation: Batavia Kill SC-02; Schoharie 6.1.11, 6.1.12, 6.3.11
Date Added to Action Plan 2010
Progress: Survey was completed, design is in-progress and wetland and archeological assessments have been completed.

Site 6. Sugar Maples Stream Restoration: (Batavia Kill Tributary, Town of Windham) This project was designed to restore wetland functions and approximately 700 feet of stream that was historically channelized and confined by mortared stone walls. This area has also flooded several times due to rock walls along this reach collapsing and blocking storm flow. Project goals include: reducing channel erosion, improving water quality, upgrading the farm's infrastructure (new culverts sized to properly convey storm runoff), developing and improving wetlands, improving public access to the site, providing public education on natural channel design and wetlands, improving habitat and protecting the adjacent farm fields.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: NYCDEP, ACOE
Project Funding: NYCDEP, ACOE
Project Schedule: Supplemental plantings in 2010.
SMP Recommendation: Schoharie RZM 6.7.4, GSM 6.8.7
Date Added to Action Plan: 2009

Progress: Mortared stone walls were removed and the stream was restored to a natural shape and meander pattern. Floodplain grading was performed and the entire site was seeded with wetland and riparian seed mixes. Riparian plantings and bioengineering will be completed in spring 2010. Additionally, minor grading will be performed in summer 2010.

Repair & Modifications of Existing Projects: The GCSWCD/NYCDEP will repair previously constructed stream restoration projects. Repairs and modifications will be undertaken to correct problem areas, to replace vegetation, control invasive species or to make adjustments to stream structures based on monitoring data. Project sites include: Brandywine, Lanesville and Farber Farm.

GCSWCD Staff: Dubois, Mellot
Project Partners: NYCDEP, ACOE
Project Funding: NYCDEP, ACOE
Project Schedule: Repairs in 2010 and 2011
SMP Recommendation: Schoharie RZM 6.7.4, GSM 6.8.7
Date Added to Action Plan: 2010

Progress: Survey has been completed at Brandywine; Farber will be resurveyed in early 2010.

III. Creative Stormwater Practices and Critical Area Seeding

In order to reduce runoff and protect groundwater resources in the basin, the GCSWCD and NYCDEP support promoting the infiltration of stormwater through erosion and sediment control techniques such as hydroseeding of open ditches, stormwater techniques to infiltrate water into the ground, wetland enhancement, filter strips, and creation of rain gardens and bioswales to manage stormwater. The GCSWCD will work with multiple partners to implement stormwater projects within the Schoharie Watershed. Creative Stormwater Practices and Critical Area Seeding action items include, but are not limited to:

A. Windham Mountain: (Town of Windham) The GCSWCD has been working with Windham Mountain ski center to evaluate stormwater impacts at the ski slope and adjacent high density development areas. A detailed assessment of impacts has been completed and a strategy for long term implementation of a series of stormwater retrofit activities has been developed. The GCSWCD is working with Windham Mountain and others to design and implement stormwater management practices that will be installed.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: NYCDEP, Windham Mountain, CWC, ACOE, NYSDEC
Project Funding: CWC, ACOE-WRDA, NYCDEP
Project Schedule: First set of storm water management practices to be installed in 2010, additional implementation 2011.
SMP Recommendation: Batavia Kill WQ-08 (Very High, 4.23)
Schoharie – WQ-6.3.7
Date Added to Action Plan: 2007

Progress: A design for the stormwater retrofit of the site has been completed. This design has been permitted by the NYS DEC and the US ACOE. Funding which is in place from the CWC and ACOE (through WRDA) will be used to implement this stormwater retrofit in two phases. In phase one the pond will be expanded and material used to terrace the existing parking area, stormwater conveyance improvements will be installed in order to route 27 acres of drainage area into the pond. In phase two the maintenance facility will be equipped with gutters and an underground sand filter will be installed to treat runoff from this area. Phase one will be performed during 2010 and phase two during 2011.

B. Hunter Foundation: (Village of Tannersville) The GCSWCD is working with the Hunter Foundation on a stormwater retrofit project that will be completed in conjunction with the Foundation's rehabilitation of a block of buildings in the Village of Tannersville. The Project will use innovative methods to meet water quality treatment standards for runoff from roofs and parking. The site presents space challenges and will be an excellent demonstration project for integrating stormwater management in an area with limited space. In addition, the project will include the design and construction of a "Creek walk" along a small tributary stream that will link with main street commercial businesses.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: NYCDEP, Hunter Foundation, CWC, ACOE,
Project Funding: CWC, ACOE-WRDA, NYCDEP
Project Schedule: Completion of project construction, 2010.
SMP Recommendation: Batavia Kill WQ-08 (Very High, 4.23); Schoharie – WQ-6.3.7, PR-6.2.3
Date Added to Action Plan: 2007

Progress: The porous gravel parking area and bioswale were installed in 2009. Raingardens and the creekwalk will be installed in 2010.

C. Sugar Maples Stormwater Project: Town of Windham (Batavia Kill)

GCSWCD Staff: Buchanan, Hellinga
Project Partners: NYCDEP, GCSWCD-WAP, Catskill Mountain Foundation, CCE Agroforestry Center, MT Arboretum.
Project Funding: GCSWCD-WAP (WRDA), Catskill Mountain Foundation, CWC (SWR Program)
Project Schedule: Supplemental planting, 2010
SMP Recommendation: Batavia Kill – RB-09 (High, 1.81); Schoharie/East Kill – WQ-6.3.7, RZM-6.7.2, RZM-6.7.4, RZM-6.7.13, GSMA-6.8.2
Date Added to Action Plan: 2007
Progress: The permeable parking area, stormwater wetland, and rain gardens have been installed. Supplemental plantings will be performed in the raingardens and wetland in spring 2010.

D. Mountain Top Library & Learning Center: (Town of Hunter, Village of Tannersville) The GCSWCD is working with the Mountain Top Library Capital Campaign on a stormwater retrofit project. Located in the Village of Tannersville, this project will be completed in conjunction with the rehabilitation of a building that will be used as a Mountain Top Library and Learning Center. The Project will use innovative methods to meet water quality treatment standards for runoff from roofs and parking. The site presents space challenges and will be an excellent demonstration project for integrating stormwater management in an area with limited space. In addition, the project will offer substantial educational opportunities on stormwater impact and integrating stormwater management practices during the redevelopment project.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: NYCDEP (TA), CWC, Mountain Top Library Capital Campaign
Project Funding: CWC (SR Program), NYCDEP, SMIP Round 1, ACOES WRDA
Project Schedule:
1. Complete site investigation, 2009.
2. Develop a conceptual plan summer 2009.
3. Seek funding through CWC Stormwater Retrofit Program and others TBD.
4. Complete design and permitting during winter 2009.
5. Project implementation spring 2010.
SMP Recommendation: Schoharie/East Kill – WQ 6.3.7
Date Added to Action Plan: 2009
Progress: The GCSWCD has worked with the Mountain Top Library and project engineers to develop a plan for the stormwater retrofit for the site. Funding has been secured from the CWC, ACOEs and SWAC SMIP for this project and project design has been completed, with construction scheduled for 2010.

IV. Highway and Infrastructure Improvements

During development of SMPs for the various sub-basins, the GCSWCD, NYCDEP, and the SWAC Highway and Infrastructure Subcommittee identified a number of recommended actions that would provide water quality protection. Maintaining high water quality in the Schoharie Creek and its associated tributaries will provide multiple benefits including, improved recreational use, supplying quality drinking water, and enhancing the ecological health of the stream systems. Water quality protection activities may be site-specific, community-wide, or basin-wide. Highway and Infrastructure Improvements action items include, but are not limited to:

A. Road Abrasives Program: Winter road abrasive materials, containing a high silt/clay content, can have a direct impact on water quality. The use of high quality washed sand materials may help to minimize the negative impacts of road abrasives. All of the SMPs and the SWAC Highway and Infrastructure Subcommittee recommend a road abrasives program.

GCSWCD Staff: Flack, Yost
Project Partners: County and Municipal Highway Departments, GCSWCD, NYCDEP
Project Funding: Proposed cost share with highway departments and NYCDEP/GCSWCD Schoharie SMP Contract
Project Schedule: 1. Investigate the feasibility of purchasing higher quality road abrasives in bulk, 2009.
2. Investigate the feasibility of establishing a cost-share program for purchasing quality road abrasive material, 2009.
3. Implement a road abrasives program, 2010.

SMP Recommendation: Batavia Kill – WQ-06; West Kill- WQ-6.3.5; Schoharie/East Kill- WQ- 6.3.5; Manor Kill- WQ- 5.3.5
Date Added to Action Plan: 2009
Progress: Upon further review with local and county highway departments, cost sharing for road abrasives is on hold due to limited funding available to support offsetting costs over time. Initial estimates have been obtained from highway departments in terms of sand and salt usage/municipality. As an alternative, purchasing road de-icing equipment that would give drivers control over how much material to spread is a possibility. The Town of Hunter installed such a device for the '09-'10 season (through a CWC grant). Discussion with the superintendent will occur in spring, 2010 to determine if it is worth exploring for other departments.

B. Street Sweeper with Vacuum: After the winter season, highway crews sweep road abrasives (sand) using different machines. Some communities have their own outdated sweepers (Villages of Hunter and Tannersville), others brush the material aside with a broom. Greene County owns a sweeper with a vacuum that is effective at collecting leftover sand material. Given its limited availability during certain times of the year, purchasing another one for the mountaintop communities would allow more municipalities to effectively collect and store the sand material left on the roads from winter.

GCSWCD Staff: Flack, Yost
Project Partners: Highway departments, Cornell Local Roads Program,
Project Funding: CWC, SMIP Round 1
Project Schedule: 1. Research the cost of purchasing a street sweeper with a vacuum.
2. Investigate the feasibility of providing, storing and coordinating shared access to the street sweeper.

SMP Recommendation:
Date added to Action Plan: 2009
Progress: Application will be submitted to CWC stormwater retrofit program in 2010 for majority of the cost, with SWAC funds covering the required match. Greene County Highway will oversee and operate the unit, and store it at either the Ashland or Hunter facility (allowing the other unit to be shared with fewer municipalities).

C. Partridge Road Culvert Replacement: The existing culvert under B.G. Partridge Road in the Town of Ashland is undersized which causes flooding during high flows. The culvert is also perched, which presents a barrier for fish passage. The GCSWCD will work with the Town of Ashland Highway Department to design a properly sized culvert and oversee the installation of this culvert.

GCSWCD Staff: Buchanan, Hellinga
Project Partners: Town of Ashland Highway Department, Cornell Local Roads Program,
Project Funding: FEMA, SMIP Round 1
Project Schedule: 1. Design culvert replacement project, winter 2010.
2. Install culvert, summer 2010.

SMP Recommendation: Schoharie – FP-6.1.11
Date added to Action Plan: 2010

Progress: A grant was approved by the SWAC to offset the costs of upgrading the culvert to a larger size. A topographic survey of the site was completed in fall 2009 with construction scheduled for 2010.

D. Flood Response: A Critical Response Plan is being developed for a culvert replacement along Griffin Road in the Town of Jewett.

GCSWCD Staff: DuBois, Gorman
Project Partners: Town of Jewett Highway Department
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract
Project Schedule: Develop plan in late 2010 with outreach in late 2010/early 2011
SMP Recommendation: Schoharie – FP-6.1.11
Date added to Action Plan: 2010

Progress: Site visit conducted in April 2010 to an East Kill tributary that is frequently dredged under Griffin Road in the Town of Jewett. Critical Response Plan that will provide the Highway Department with guidance on proper width-to-depth ratios for emergency work is in progress.

V. Planning and Assessment

During development of SMPs for the various sub-basins, the GCSWCD and NYCDEP identified a number of recommended actions that would require additional planning and assessment at various scales. Planning may be site-specific, community-wide, basin-wide or on the county level. Assessments may range from remote assessment of streams and their watersheds to site-specific streambank assessments, and will include survey and monitoring of various locations and project sites. Planning and Assessment action items include, but are not limited to:

A. Tributary Stream Inventory and Assessment: While existing SMPs cover the main stem 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. Inventory and assessment of tributaries is an on-going priority, although assessment of the tributaries and the subsequent planning efforts may not be at the same level as those efforts conducted along the main stems. In 2009-2010, the GCSWCD/NYCDEP should work to develop a condensed SMP planning process to include assessment of baseline conditions and an abbreviated SMP. This methodology should be applied to prioritized tributaries.

GCSWCD Staff: Martin, Miles
Project Partners: NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Develop protocol for inventory & assessment by spring 2009
2. 2009 – North Settlement, Furnace Creek, Mitchell Hollow Brook (Mad Brook)
3. 2010 – Two small tributaries TBD

SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007

Progress: The GCSWCD and NYCDEP have identified four tributaries that were assessed during the 2009 field season; these include North Settlement Creek, Red Falls Creek and Furnace Creek (along Dent Road) and Mad Brook (Mitchell Hollow Brook). In 2010, management plans are being written for the various tributaries.

Tributary Assessment and Planning Projects:

1. Historical Alignments: Using the historical aerials, create a centerline for each tributary, North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook.

GCSWCD Staff: Miles, Martin
Project Partners: NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Order historical aerial imagery- completed, April 2009.
2. Georeference aerial imagery, 2009.
3. Create historical alignments, 2009.

SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007

Progress: Aerial imagery for Batavia Kill tributaries was received in April, 2009. Georeferencing of images complete. Historical alignments in progress.

2. Riparian Vegetation Mapping: Using the 2006 pictometry, classify the vegetation and impervious surfaces within a 300 ft. buffer of each tributary, North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook.

GCSWCD Staff: Miles, Burton
Project Partners; NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Vegetation classification for Brainerd Brook, Red Falls Creek and Furnace Creek and Madd Brook, 2009.
SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007
Progress: Furnace Creek, Red Falls Creek and Mad Brook complete. North Settlement Creek in progress.

3. Watershed Analysis: Using a Geographic Information System analyze each tributary, North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook.

GCSWCD Staff: Miles, Martin
Project Partners; NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Watershed boundaries for North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook, 2009.
SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007
Progress: Additional aerial photography has been purchased. Delineating watershed boundaries complete.

4. Stream Feature Inventory: Using a Global Positioning System (GPS), record the location and associated attribute information of various stream features, such as erosion, invasive species, bedrock and proposed planting sites for each tributary, North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook.

GCSWCD Staff: Martin, Miles
Project Partners; NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Inventory North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook, 2009.
SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007
Progress: Letters to obtain access have been sent. Inventories complete September, 2009.

5. Create Tributary Geodatabase: Create a geodatabase to store GPS data and photographs from the stream feature inventories.

GCSWCD Staff: Miles, Martin
Project Partners; NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Create and update geodatabase, 2009 and 2010.
SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007
Progress: Furnace Creek and Red Falls Creek complete. North Settlement Creek and Mad Brook in progress.

6. Tributary Management Plans: Develop stream management plans for each tributary, North Settlement Creek, Red Falls Creek and Furnace Creek and Mad Brook.

GCSWCD Staff: Martin, Miles
Project Partners: NYCDEP, Delaware & Schoharie County agencies, others
Project Funding: NYCDEP(TA)
Project Schedule: 1. Analyze stream feature inventory data- Winter 2009-2010.
2. Develop tributary SMPs- Winter, 2009 -2010.
3. Create maps for tributary SMPs- Winter, 2009-2010.

SMP Recommendation: Schoharie – WQ-6.3.8, WQ-6.3.11; WK – WQ 6.3.8
Date Added to Action Plan: 2007
Progress: In progress.

B. Lexington Creek Sill (Schoharie Creek): There is a concrete sill that runs completely across the Schoharie Creek in the hamlet of Lexington. In the Schoharie SMP this sill has been identified as having a potential impact on stream morphology along this reach of the stream. The sill remains from past days when flashboards would be installed in the summer creating a popular swimming area. The sill appeared to cause localized aggradation of the channel and decreased channel capacity. The GCSWCD and NYCDEP propose to conduct further field surveys and analysis of the sill to determine if its removal would benefit stream function in this reach.

GCSWCD Staff: DuBois, Buchanan
Project Partners: NYCDEP, Town of Lexington, others
Project Funding: NYCDEP (TA)
Project Schedule: 1. Collect field survey on stream profile through the reach (by winter 2009)
2. Conduct assessment of sill impact, develop recommendations (by spring 2010)
SMP Recommendation: Schoharie – FP-6.1.12, PR-6.2.1, WQ-6.3.11, FH-6.6.5, GSMA-6.8.2, GSMA-6.8.7
Date Added to Action Plan: 2007
Progress: None

C. Town of Hunter Corridor Regional Planning Study (formerly called Generic Environmental Impact Statement): The GCSWCD is working with the Town of Hunter and the Villages of Tannersville and Hunter to undertake a Corridor Study that entails a comprehensive assessment of potential future development along the state route 23A corridor. The Corridor Study is a cooperative, multi-municipality effort to evaluate foreseeable development and environmental mitigation associated with future development. The GCSWCD WAP is responsible for overall project coordination and is using a number of consultants to complete various components of the project.

GCSWCD Staff: Yost, Flack
 Project Partners: CWC, NYCDEP, Town of Hunter, Villages of Hunter/Tannersville, others
 Project Funding: CWC from Shandaken Tunnel SPDES funds
 Project Schedule: 1. Complete application, receive funding confirmation by August 2007,
 2. Complete GEIS by 12/31/08
 SMP Recommendation: Schoharie – PA-6.5.3
 West Kill – Section 7 – Implementation
 Date Added to Action Plan; 2007
Progress: The Corridor Study is more than half complete, three consultants have been hired and the first three deliverables are done – data gathering, development analysis, and inventory and local land use regulation analysis. The project advisory team is moving into drafting the report and beginning public outreach. The project should be completed by September/October 2010.

D. Fisheries Assessment & Improvements Strategy: 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. Improvements to fisheries would also provide economic and water quality benefits. In order to effectively evaluate basin fisheries, the GCSWCD and NYCDEP recognize the need for additional funding, increased coordination with potential project partners, and an understanding of the appropriate field methodologies.

GCSWCD Staff: Martin, Miles
 Project Partners: NYCDEP, NYSDEC, Greene County Promotions, municipalities, Trout Unlimited, others
 Project Funding: TBD, TA from NYCDEP via GCSWCD contract
 Project Schedule: 1. Research potential funding sources, 2010.
 2. Identify appropriate field methodologies, 2010.
 3. Coordinate fisheries assessment, 2011.
 SMP Recommendation: Batavia Kill – PE-04 (Medium, 0.38), FH-03 (High, 2.31); Schoharie – PR-6.2.1, PR-6.2.2, PR-6.2.4, FH-6.6.1, FH-6.6.2, FH-6.6.3, FH-6.6.4, FH-6.6.5, GSMA-6.8.8; West Kill – 6.6, 6.6.1, 6.6.2
 Date Added to Action Plan: 2007
Progress: None

E. Project Monitoring: The GCSWCD will continue to monitor previously 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 ACOE 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.

1. Monitoring of Restored Stream Reaches (2010): 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. The Conine, Ashland Connector, Shoemaker, Lanesville, and Schoharie Street stream restoration projects are priority monitoring sites for 2010.

GCSWCD Staff: Hellinga, Miles
Project Partners: NYCDEP, GCSWCD
Project Funding: NYCDEP, GCSWCD
Project Schedule: Monitor in 2009
SMP Recommendation: Schoharie – WQ-6.3.11, RZM-6.7.2; West Kill – MUR 4.10, 4.11
Date Added to Action Plan: 2009
Progress: Monitoring Plan Completed - The Conine, Ashland Connector, Shoemaker, Lanesville, and Schoharie Street stream restoration projects are priority monitoring sites for 2010. In addition, groundwater monitoring wells will be installed at Conine, Ashland and Sugar Maples to meet wetland restoration requirements.

2. Dale Lane Survey and Hydraulic Analysis:

GCSWCD Staff: Hellinga, DuBois
Project Partners: NYCDEP, GCSWCD, Town of Hunter
Project Funding: NYCDEP, GCSWCD
Project Schedule: Complete hydraulic analysis in 2010.
SMP Recommendation: Schoharie WQ 6.3.11
Date Added to Action Plan: 2009
Progress: The site survey was completed in 2009. Hydraulic analysis will be performed by spring 2010. It is anticipated that additional survey work may need to be completed in spring 2010 in order to ensure an accurate hydraulic model.

3. Survey of potential SPDES stream restoration site:

GCSWCD Staff: Hellinga, DuBois
Project Partners: NYCDEP, GCSWCD
Project Funding: NYCDEP, GCSWCD
Project Schedule: Complete in 2009
SMP Recommendation: Schoharie WQ 6.3.11
Date Added to Action Plan: 2009
Progress: A site on the East Kill was selected as a potential SPDES stream restoration site due to its high contribution of fine sediments. The GCSWCD is working with landowners to secure permission for the required pre-design survey work. In early 2010, six landowners have signed on to the project, but the seventh necessary landowner has been unwilling to participate.

F. Mauro Residence Bank Stabilization: This project involves a geotechnical assessment of their failing streambank and development of a conceptual stabilization strategy. This application is also being submitted to obtain funding for temporary seeding and mulching of the damaged streambank.

GCSWCD Staff: Martin, DuBois
Project Partners: Landowner, Engineer
Project Funding: SMIP Round 1
Project Schedule: Hire engineer to conduct geotechnical assessment, spring/summer 2010.
SMP Recommendation: Schoharie 6.1.12, 6.3.11
Date Added to Action Plan: 2009
Progress: Site visit with engineer completed April 27, 2010.

G. Town of Hunter Land Use Regulation Review & Development Guidelines: Conduct detailed review of current land use regulations with intent of adopting revisions, new regulations &/or guidelines promoting low impact design, climate smart and smart growth principles. In the absence of zoning, the town is seeking to investigate, and adopt as appropriate, innovative land use practices which will be an incentive to achieve desirable future growth. The town is participating in proactive planning efforts (Climate Smart Action Plan, Hunter Regional Corridor Study, expansion of designated hamlets, Scenic Byways, Stream Management Plans), and this project would integrate the planning principles amongst the individual plans (low impact development, climate smart, & smart growth) and position the town to adopt changes to current regulations, propose new local rules and regulations as relevant and create detailed guidance resources for planning board and developers.

GCSWCD Staff: Martin, Yost
Project Partners: Greene County IDA, Town of Hunter
Project Funding: SMIP Round 2
Project Schedule: Approved for SMIP funding in March, 2010; applicant will have 2 years to complete the project.
SMP Recommendation: Schoharie 6.5.3
Date Added to Action Plan: 2010
Progress: Approved in March 2010, contract and scope of work are being developed

H. Mountaintop Better Site Design Plan Workshops: Guide each community through a comparison of the local codes against model development principles using a consensus building approach. Model principles will be compiled into a General Guide for Mountaintop Communities to facilitate development of recommendations specific to each community. Facilitated meetings involving municipal officials, local board members and consulting firms will form the basis of the consensus building approach. Each community will receive a report that identifies suggested code language to update local ordinances.

GCSWCD Staff: Martin, Yost
Project Partners: GCSWCD WAP, Towns of Ashland, Jewett, Lexington, Windham, Villages of Hunter and Tannersville
Project Funding: SMIP Round 2, CWC LTAP
Project Schedule: Approved for SMIP funding in March, 2010; applicant will have 2 years to complete the project.
SMP Recommendation: Schoharie 6.5.3
Date Added to Action Plan: 2010
Progress: Approved in March 2010, contract and scope of work are being developed.

VI. Recreation and Stream Habitat Improvements

In the general recommendations of all SMPs, enhanced public access to streams for recreational purposes was identified as a priority. The GCSWCD already has a number of these projects underway, and in 2009-2011 will continue to move forward with these projects. Upon completion of the Mountaintop Recreation Master Plan, the GCSWCD and its partners will identify additional opportunities for enhanced recreation access. Assessing, protecting and improving fish habitat have also been recommended in the SMPs, and many of the following action items were developed by the SWAC Recreation and Habitat Improvement subcommittee. Recreation and Stream Habitat Improvements action items include, but are not limited to:

A. Ashland Fishing Access Enhancements: GCSWCD is working with NYCDEP and Trout Unlimited to create a new parking area and access to existing public fishing areas on the Batavia Kill at the Ashland Connector Reach.

GCSWCD Staff: Buchanan
Project Partners: NYCDEP, Trout Unlimited
Project Funding: NYCDEP
Project Schedule: Build in 2010
SMP Recommendation: Batavia Kill – PE-01 (Very High, 3.08); Schoharie – PR-6.2.2
Date Added to Action Plan: 2007
Progress: A site plan and budget for the new parking area and access was completed, and a NYSDOT road access permit was applied for. The project should be constructed in 2010.

B. Town of Windham (Police Anchor Camp) The GCSWCD will continue to assist the Town of Windham with assessment and planning for public use of a 65 acre parcel located in the Batavia Kill watershed. The final project is expected to provide recreational access to the creek and enhance the riparian buffer. Establishing long-term protective easements between the Town and GCSWCD or its partners is under consideration. The goal in the 2009-2011 action plan is to continue to provide assistance as plans are developed and implemented.

GCSWCD Staff: Yost, Miles
Project Partners: Town, NYCDEP, GCSWCD-WAP, Greene Land Trust, others
Project Funding: Town, GCSWCD-WAP, others TBD
Project Schedule: Completed site inventory & assessment fall 2007
Completed a conceptual Plan spring 2008
SMP Recommendation: Schoharie – PR-6.2.2, PR-6.2.3, RZM-6.7.4, RZM-6.7.7
Date Added to Action Plan: 2007
Progress: Conceptual plans were completed and provided to the Town. A trail committee has been working on a proposed multi-use path along the Batavia Kill (under Recreation Master Plan guidance). Long-term plans for the parcel have not been established yet. See Windham Path project for more details.

C. Schoharie Creek Park (Town of Lexington): The GCSWCD has been assisting the Town of Lexington with the development of a small “pocket park” to be located on the Schoharie Creek in the Lexington hamlet. Components of the project will include the permanent removal of a derelict house right on the streambank, cleaning up weedy growth, enhancement of riparian vegetation and installation of low impact improvements such as a kiosk, trail, flower beds and picnic tables/benches.

GCSWCD Staff: Mellot, Yost
Project Partners: NYCDEP (TA), Town of Lexington, Greene County, Trout Unlimited, others
Project Funding: NYCDEP-(TA), Town of Lexington, ACOE-(WRDA) others TBD
Project Schedule: 1. Complete site development plans, 2009.
2. Implement plans, 2010.
SMP Recommendation: Batavia Kill – RB-09 (High, 1.81), EO-11 (Medium, 0.91); Schoharie – PR-6.2.2, PR-6.2.3, RZM-6.7.4, RZM-6.7.7
Date Added to Action Plan: 2007
Progress: Clean up and tree removal were completed during the summer of 2007. The house was removed, the local highway department has been re-grading and mowing the property to smooth it out. A local committee would like to organize park plantings in the spring 2010 and create a naturalized walkway to the stream and a butterfly host garden, using native plants. Plans may also include an extension of the park onto an adjacent property.

D. Water Temperature Impacts on Fisheries Study: All of the stream management plans recommend conducting a study to determine the impact of water temperature on fisheries. In order to determine the location of thermal refugia, which are important to coldwater fish communities during the summer months, the SWAC Habitat and Recreation subcommittee recommends a thermal imaging study. This may be coupled with a new thermograph study (DEC has data from 2008). The studies will help to identify areas that may need to be protected. The information obtained will be helpful to highway departments, streamside property owners and any entity whose activities may impact cold water inputs such as seeps.

GCSWCD Staff: Martin, Carrie
Project Partners: NYCDEP, NYSDEC, USGS, Trout Unlimited, Rod and Gun Clubs
Project Funding: NYCDEP, SMIP Round 1, USGS
Project Schedule: 1. Thermal remote sensing, fall 2010.
2. Data analysis, thermal mapping and report, fall 2012.
SMP Recommendation: Batavia Kill – FH-03; West Kill- PR 6.2.1; Schoharie Creek– PR 6.2.1; East Kill- PR 6.2.1; Manor Kill- PR 5.2.1
Date Added to Action Plan: 2009
Progress: In October 2009, the SWAC allocated funds from the Planning and Assessment category to conduct a baseline thermal imaging study of the Schoharie Creek and West Kill. GCSWCD plans to partner with the Rochester Institute of Technology (RIT) to conduct the thermal remote sensing and the United States Geological Survey (USGS) to conduct thermal mapping, data analysis and to produce a report identifying potential thermal refugia in both streams. Thermal remote sensing is expected to occur in fall 2010, with data analysis and report completion by October 2012.

E. Organize Repository of Stream Ecosystem Data: Some of the stream management plans recommend that effort is put forth to characterize the current health of stream ecosystems. In order to determine the health of streams, a variety of data may be useful including food web dynamics, the presence or absence of indicator species and primary producers, and the status of fish populations, among others. Various studies have been conducted by different agencies and colleges over the years (e.g., USGS, NYSDEC, NYCDEP, ESF, Stroud Resource Center, GCSWCD), and organizing a master repository will help integrate existing data and determine where additional field studies are warranted. Monitoring fisheries habitat conditions at restoration sites is also important for determining the impact that these projects have on the localized fish populations.

GCSWCD Staff: Martin, Miles
 Project Partners: NYCDEP, NYSDEC, USGS, Trout Unlimited, Rod and Gun Clubs
 Project Funding: Potential Funding Sources- NYSDEC, NYCDEP, Trout Unlimited
 Project Schedule: Contingent on funding availability
 1. Compile existing fish and insect population data.
 2. Monitor habitat conditions and fish populations at restoration sites.
 3. Quantify stocked and natural fish populations and migration patterns.
 SMP Recommendation: Batavia Kill – FH-02; West Kill- PR 6.6.2, 6.6.1; Schoharie Creek/East Kill- PR 6.6.2, 6.6.1; Manor Kill- PR 5.6.2, 5.6.1
 Date Added to Action Plan: 2009
 Progress: None

F. Promote Increased Recreational Use of Watershed Streams: 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. Some streams have limited or no public access. In order to enhance recreational use of the streams, existing access locations have been mapped and additional access points should be identified. Increasing recreational use of fisheries has also been identified as a priority by the SWAC Habitat and Recreation Subcommittee. Providing stocked fish in public still waters (lakes, ponds), in addition to stream stocking efforts, may improve fishing opportunities and provide for enhanced access to fisheries. Supporting and organizing community or basin-wide fishing events, and promoting interest in fishing for wild fish will help increase recreational use of watershed streams.

GCSWCD Staff: Miles, Gorman
 Project Partners: NYCDEP, Trout Unlimited, NYSDEC
 Project Funding: To be determined
 Project Schedule: 1. Conduct an inventory of access points and create a GIS map of existing locations, 2010.
 2. Identify locations that may provide additional access, 2010.
 3. Investigate the feasibility of increasing the locations of stocked fish to include public still waters (such as Rip Van Winkle Lake or Dolan's Lake, and others), 2010.
 4. Coordinate, organize or support a basin-wide or localized fishing derbies along watershed streams, 2010.
 SMP Recommendation: Batavia Kill – PE-01 (Very High, 3.08); West Kill- PR-6.2.2; Schoharie/East Kil- PR- 6.2.2; Manor Kil- PR-5.2.2
 Date Added to Action Plan: 2009
 Progress: NYSDEC recently published *Public Fishing Rights Maps* that can be obtained on their website. Knowing where the existing public fishing points (also inventoried as part of the Mountaintop Community Resource/Recreation Plan) are located will be used to identify areas that are lacking, such as on the East Kill and along the Batavia Kill.

G. Prattsville Stream Access Parking. GCSWCD is working with the town of Prattsville to create a new parking area for public access to the Schoharie Creek.

GCSWCD Staff: Miles, Flack
Project Partners: Town, NYCDEP, GCSWCD-WAP, others
Project Funding: SMIP Round 1, Town of Prattsville
Project Schedule: 1. Complete design, NYCDEP Revocable Permit and DOT Highway Work Permit in 2010.
2. Construction in 2011.
SMP Recommendation: Schoharie – PR-6.2.2, Batavia Kill – PE-01
Date Added to Action Plan: 2009
Progress: Town approved for SMIP funding October 2009.

H. Windham Path. GCSWCD will assist the Town of Windham with installing a public, non-motorized, multi-use trail along a 65 acre parcel located in the Batavia Kill watershed. The final project is expected to provide recreational access to the Batavia Kill.

GCSWCD Staff: Miles, Flack
Project Partners: Town, NYCDEP, GCSWCD-WAP, others
Project Funding: SMIP Round 2, Town of Windham
Project Schedule: 1. Complete trail layout and permitting May 2010
2. Construction September 2010
SMP Recommendation: Batavia Kill – PE-03, PE-01; Schoharie – PR-6.2.3, PR-6.2.2
Date Added to Action Plan: 2010
Progress: Town submitted SMIP application for funding February 2010. The Town of Windham is working with the Windham Path Committee (comprised of local businesses and residents) to develop a multi-use, non-motorized loop trail along the Batavia Kill and around the town property. Plans have been completed, wetlands have been delineated, and a SWAC SMIP grant was approved in March, 2010 to cover the cost of materials for a boardwalk and footbridges. This project is supported in the Mountaintop Recreation Plan

VIII. On-going Activities

This section includes the on-going action items that began in 2007 and will continue through the duration of stream management plan implementation efforts. This is a dynamic document that will be modified annually to include additional action items or to update existing items. Efforts were made to make each task measurable within the action plan. However, the following items do not have an end, but rather are ongoing throughout the program.

A. Program Administration and Implementation: The GCSWCD will continue to develop and maintain an effective and efficient process for implementation of the stream management plans for Schoharie Creek and its associated tributaries. This process will help to fulfill the NYCDEP FAD and Shandaken Tunnel SPDES permit obligations. Development and implementation of the program is an on-going process.

1. **Program Administration:** GCSWCD will provide overall project administration. Specific activities may include contract administration, book keeping, budgeting, schedule development and reporting.

GCSWCD Staff: Flack, Carl-Seebode, Treacy
Implementation Category: Program Administration and Implementation
Project Partners: NYCDEP, MSMA
Project Funding: NYCDEP, Greene County Legislature, Grants, Other funding sources
Project Schedule: On-going.
Date Added to Action Plan: 2007
Progress: On-going.

2. **Schoharie Watershed Advisory Committee (SWAC):** The GCSWCD and NYCDEP have worked cooperatively to develop a single, watershed-wide project Advisory team, the Schoharie Watershed Advisory Committee, to help guide SMP implementation. The process by which this committee will guide implementation and allocate funding continues to be developed.

GCSWCD Staff: Yost, Martin
Implementation Category: Program Administration and Implementation
Project Partners: NYCDEP, Towns, Villages, Counties, local, county, state and federal agencies, NGO's, landowners
Project Funding: NYCDEP Contract
Project Schedule: On-going review of applications August 1st and February 1st each year.
SMP Recommendation: Schoharie/East Kill – PA-6.5.8; West Kill - PA 6.5.2
Date Added to Action Plan: 2007
Progress: The Schoharie Watershed Advisory Committee (SWAC) continues to meet three to four times a year to assist with funding and programmatic decisions associated with the Stream Management Implementation Program. The SWAC was formed in 2008 and represents the collective interests of local government, property owners, watershed agencies, and non-profit organizations, and consists of appointed representatives from each Schoharie Basin municipality, representatives from three subcommittees (Highway Superintendents, Education and Outreach and Recreation and Habitat), a Greene County Legislator and other local, state and federal agencies. The SWAC participated in the first and second grant round reviews in September 2009 and March 2010.

B. Local Technical Assistance: The GCSWCD and NYCDEP will work 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 & retrofit, stream management activities and land use planning.

GCSWCD Staff: Flack, Martin
Implementation Category: Program Administration and Implementation
Project Partners: NYCDEP, Greene County Legislature, Local municipalities
Project Funding: NYCDEP Contract/ Greene County WAP Funding, Others
Project Schedule: On-going.
SMP Recommendation: Batavia Kill – SC-01, WQ-08; Schoharie/East Kill – FP-6.1.2, PA-6.5.1, RZM-6.7.4, SMA-6.8.2; West Kill – GSMA 6.8.2
Date Added to Action Plan: 2007
Progress: A contract between DEP and GCSWCD provides staffing for technical assistance through 2013. In addition, the GCSWCD has developed an internal technical assistance tracking form in an attempt to maximize responsiveness. In 2009, GCSWCD staff conducted 31 local technical assistance site visits and 10 CSBI site visits.

C. Inter-Agency Coordination: Further coordination between the agencies with stream management responsibilities is a key component of SMP implementation. Specifically, GCSWCD will coordinate with NYSDEC to have all stream disturbance permits (Article 15) undergo an appropriate review by local stream managers; this will help to ensure a high degree of consistency with SMP goals and objectives. To facilitate this process, it is important to provide streamside landowners with resources to help individuals with permit applications and to help develop better alternatives for addressing erosion sites.

1. NYSDEC/ACOE Permit Reviews: The GCSWCD/NYCDEP will continue to work with NYSDEC and the USACE to facilitate review of stream disturbance permits received by the agencies. The permits will be reviewed for their consistency with SMP goals and objectives and to evaluate stream channel morphology issues.

GCSWCD Staff: DuBois, Buchanan
Implementation Category: Program Administration and Implementation
Project Partners: NYSDEC, NYCDEP, ACOE
Project Funding: NYCDEP
Project Schedule: On-going
SMP Recommendation: Batavia Kill – PR-03 (High, 2.5); Schoharie – PA-6.5.1; West Kill – PA 6.5.4, RZM 6.7.1, 6.7.9
Date Added to Action Plan: 2007
Progress: Permit applications will be reviewed as they come in.

D. Catskill Streams Website – The GCSWCD will continue to provide logistical support in the development and maintenance of the Catskill Streams Website (www.catskillstreams.org) as a valuable tool for sharing information with watershed stakeholders.

GCSWCD Staff: Miles, Gorman
Implementation Category: Education on Watershed Protection
Project Partners: NYCDEP
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract
Project Schedule: On-going maintenance and updates as appropriate
SMP Recommendation: Schoharie/East Kill – EO-6.4.3; West Kill – EO 6.4.2
Date Added to Action Plan: 2007

Progress: The website, Catskillstreams.org, is a comprehensive information source for streamside landowners in the Catskill Mountains. The website is updated regularly to include current resources and reports, and to provide a list of upcoming events. In 2010, a more detailed project site map will be added and scoping sessions will be held to plan for future additions.

E. Community Outreach: 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. In addition, in accordance with the MOU between the GCSWCD and local municipalities, GCSWCD is required to provide the municipalities with a detailed action plan of stream management activities in the beginning of each spring. Furthermore, the GCSWCD will regularly report on the status of the annual action plan, and be available at the request of the municipalities to attend meetings, workshops or similar events when the annual action plan or specific items contained therein, require a more detailed understanding by the municipality or its constituents.

GCSWCD Staff: Yost, Gorman
Implementation Category: Education on Watershed Protection
Project Partners: NYCDEP
Project Funding: NYCDEP/GCSWCD Schoharie SMP Contract, CWC, GCSWCD-WAP, others
Project Schedule: 1. On-going production of educational and outreach materials for dissemination of information.
SMP Recommendation: Batavia Kill – EO-08, EO-09, EO-06, EO-10; Schoharie/East Kill – EO-6.4.2, EO 6.4.3, EO 6.4.4, EO 6.4.5, EO, 6.4.6, EO 6.4.7, EO 6.4.8, FP-6.1.7; West Kill – EO 6.4.3, 6.4.4, 6.4.5
Date Added to Action Plan: 2007

Progress: Outreach through the GCSWCD-WAP continues in the form of newspaper articles, newsletters, and by disseminating educational materials to property owners, contractors, and municipal officials. Attendance at municipal and planning board meetings allows WAP staff to provide project updates to municipal leaders and to obtain information on specific municipal needs and issues. In addition, municipal board meetings provide the opportunity to update the municipalities on the progress of stream management plan implementation.

F. Critical Area Seeding Program: 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 Staff: Flack, Mellot
Implementation Category: Creative Stormwater Practices and Critical Area Seeding
Project Partners: GCSWCD, NYCDEP, County and Municipal Highway Departments
Project Funding: To be determined
Project Schedule: On-going - Provide personnel assistance with operation of the hydroseeder.
SMP Recommendation: Batavia Kill – WQ-03; West Kill- WQ-6.3.3; Schoharie/East Kill – WQ-6.3.3; Manor Kill- WQ- 5.3.3
Date Added to Action Plan: 2009
Progress: In the Fall of 2009, we purchased a new hay mulcher and we were able to mulch 7.7 miles of road for the Towns and County. This is still an on-going effort to get all parties involved. But with the new mulcher and the hydro seeder it is working out well.

G. Plant Materials Program: In 2009-2010 the GCSWCD will continue to produce quality native plant materials for its stream restoration projects and riparian buffer plantings. The GCSWCD will pot and grow out approximately 11,000 trees and shrubs for riparian and stream projects.

GCSWCD Staff: Mellot, Weyeneth
Implementation Category: Landowner Stream Assistance
Project Partners: NYCDEP, GCSWCD, Community Volunteers
Project Funding: NYCDEP, GCSWCD
Project Schedule: 1. Produce materials for 2009 restoration season – Spring 2009
2. Continue native seed program.
SMP Recommendation: West Kill – RZM 6.7.8
Date Added to Action Plan: 2007
Progress: Native seed program was initiated in 2008. GCSWCD arranged delivery of 20,000 herbaceous plugs grown from locally collected seeds by Staten Island Greenbelt Center in October 2009. Greene County received 9,800 plugs while the others were distributed to Ulster, Schoharie and Delaware counties.

Schoharie Basin Stream Management Plan Implementation Action Plan - Completed Action Items Updated May 1, 2010

The *Schoharie Basin Stream Management Plan Implementation Action Plan* summarizes the programs and projects of the GCSWCD, NYCDEP and Schoharie Watershed Advisory Committee. The first Action Plan was completed in May of 2007, and is updated annually with a new edition completed every two years. This document summarizes **completed** action items from the previous plan (May, 2007 through May, 2009), and as more projects are finalized from the first Action Plan ('07 – '09) and the current plan ('09 – '11) they will be referenced herein.

I. Program Administration

1. **Program Administration, Staffing Plan (2007)**: 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 the GCSWCD and NYCDEP that began in January of 2009 and will fund watershed activities through January, 2014.
2. **Schoharie Watershed Advisory Committee (Organized, May 2008)**: 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 on ongoing activity, the effort to establish local representation and implementation of the SMP, coupled with technical agency support, has been accomplished. For more information: <http://www.catskillstreams.org/SWAC.html>.
3. **Program Office (April 2008)**: 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 which, in the short time it has been opened, is being used by various local, regional, and state committees working on watershed protection (e.g., Schoharie Watershed Advisory Committee, subcommittees of the SWAC, Mountaintop Supervisor & Mayors Association, WOH Education & Outreach committee, Stream Restoration Committee for NJ Chapter of AWRA, to name a few). For directions to the office visit: <http://www.gcswcd.com/wap/index.htm> or contact Michelle Yost at michelle@gcswcd.com or 518.589.6871.
4. **General Contracting Specification (2009)**: The GCSWCD went through an RFP process to develop a list of "pre-qualified" contractors for miscellaneous contract work, including installing stormwater management practices, drainage improvements, and stream projects. Having the four pre-qualified contractors will shorten the contracting process in times of emergency, such as following floods.
5. **Inter-Agency Coordination**: Further coordination between the agencies with stream management responsibilities is a key component of SMP implementation. Although this is an ongoing activity in Schoharie basin action plans, and everyday interactions among agencies are difficult to account for, the following measurable items have been completed:
 - a. **Riparian Buffer General Permit (2009)**: 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. For more information on the general permit contact GCSWCD.

- b. Restoration Project Permits (turbidity controls) (2007): The GCSWCD and NYCDEP worked with NYSDEC to evaluate alternatives and to offer training to address the complexity of achieving turbidity control during construction. The GCSWCD had two staff members trained as Certified Professional Erosion and Sediment Control specialists, one 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. In addition, the GCSWCD is qualified to teach the 4-hour E/S control certification. Finally, through DEP, GCSWCD purchased dewatering equipment for stream projects and routinely prepares stormwater pollution prevention plans for all size projects.
6. **Local Adoption of SMPs (April 2009)** - 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 as well as seek input from municipal officials in identifying potential future projects based on local needs.

II. Education on Watershed Protection

The GCSWCD continues to work with a wide network of partners to enhance its education and outreach efforts related to stream management, floodplain management, sediment and erosion control and other topics critical to sound watershed management. A number of successful educational projects were completed under the first Action Plan:

1. **Watershed Summits (January 2007 & 2008 & 2009)**: initiated under the Schoharie Watershed Strategy noted below, watershed conferences were held in January '07 and '08 to provide local decision makers and officials educational classes and networking opportunities around watershed protection. Interest in the Summits is evident by the number and diversity of attendees, with all eleven communities in the basin being represented.
2. **Watershed Tours (June 2007 & 2008 & 2009)**: coupled with the GCSWCD annual awards luncheon, watershed tours were organized in June '07 and '08 as a follow up to the successful Summits. Recommended by local officials to continue educational outreach on a basin-scale, the tours are designed to demonstrate best management practices to foster an improved understanding of stewardship practices.
3. **Educational Workshops (2007 and 2008 and 2009)**: although listed as a separate category, educational workshops are built into the Summits and Tours. Topics covered during the '07 and '08 educational events include basics of hydrology, modern stream management techniques based on current stream science, retrofitting stormwater systems, functions of and threats to riparian buffers, SEQRA and subdivisions, SWPPP and Regulations, importance of wetlands to water quality and federal and NYS wetland regulations, and understanding floodplain functions and how to use the 2008 FEMA digital maps. Targeted audiences included elected and appointed officials, planning boards, code enforcement officers, highway department staff and streamside property owners.
4. **Batavia Kill Stream Celebration (Aug. 2007 & 2008 & 2009)**: recommended in the BK SMP and organized through a strong partnership of local communities, watershed agencies, non-profit organizations, educators and businesses, the BKSC has become a premier annual environmental event. At its core, the BKSC is about celebrating and promoting the wise use of our natural resources as they relate to water quality and ecosystem functions. Designed to engage people of all ages, especially children, the Celebration offers interactive exhibits, educational displays, and

activities promoting understanding of the environment. For more information:

<http://www.gcswcd.com/wap/EO/bksc/index.htm>

5. **Websites (2007):** although websites require continuous updating, the www.catskillstreams.org and www.gcswcd.com/wap are established sites that are used to promote project updates and share information on watershed protection issues.
6. **ESC Workshops (2008 and 2009):** sponsored two Construction Erosion and Sediment Control Training Courses that were attended by approximately 150 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.

III. Landowner Stream Assistance

The GCSWCD and NYCDEP recognize the importance of providing assistance to local landowners. The NYCDEP, GCSWCD and SCSWCD have provided necessary training for project staff to be able to provide state-of-the-art technical assistance throughout the watershed. Technical assistance from staff members guide restoration of stream system stability and help to maintain ecological integrity. The technical assistance can range from a landowner consultation to activities that will help to meet the priorities of protecting water quality and establishing riparian buffers. Protection and enhancement of water quality can benefit both the City of New York's water supply and the residents of the Schoharie basin. Completed Landowner Stream Assistance action items include:

1. **Riparian Program Development (2008):** In 2007-08, the Catskill Streams Buffer Initiative (CSBI) was developed to educate and assist streamside landowners in order to provide for improved stewardship of riparian areas. The GCSWCD worked closely with NYCDEP and others to establish program guidelines, policies, protocols and other items required to offer a riparian buffer program to watershed landowners. GCSWCD developed a protocol that utilizes stream feature inventory and vegetation mapping to identify potential riparian planting sites. In addition, GCSWCD, NYCDEP and other agencies and organizations worked together to guide development of the CSBI, develop CSBI Guidelines and GCSWCD hired a program coordinator to guide riparian projects. For more information visit: <http://www.catskillstreams.org/CSBI/>
2. **Plant Materials Program (Progress – 2007, 2008 and 2009):** GCSWCD and NYCDEP staff planted RPM trees at the majority of stream restoration projects and are monitoring 10% of the trees at each site. During the Fall of 2007, 202 RPM trees were planted on 8 different sites. Sedges were planted in beds during the spring of 2007 and were over-wintered to establish better root growth. The project team also potted 7950 trees during the spring of 2007 and planted the following project sites: 3200 trees at Conine, Prattsville; 124 trees on the two sites of Shadow Mt. Bridge, Jewett and Holden, Ashland; 1000 trees at Accardi, Jewett; and 400 trees at Ashland Connector, Ashland. The GCSWCD over wintered approximately 3000 trees each year for spring plantings. In addition, the project team utilized balled and burlaped trees that were obtained from the Plant Materials Center. Finally, a native seed program was initiated in 2008. In 2009, approximately 9,000 trees and shrubs were over-wintered, and 13 planting sites were planted with 4,135 trees and shrubs. For spring 2010, we have order 1,500 trees and will be taking deliver of 6,000 seedlings from Green Belt Nursery that were grown from native seeds collected in the Catskill Mountains.
3. **Catskill Streams Buffer Initiative Educational Materials (2009):** CRSR, Inc. was awarded a contract in February 2009 to conduct a needs assessment, develop a marketing strategy, and develop initial program roll-out with above mentioned educational materials. Based on a needs assessment conducted by CRSR, the Streamside Assistance Program has been renamed the

Catskill Streams Buffer Initiative (CSBI). The Marketing Strategy, Program Slogan, Program Logo, Introduction Language, Program Brochure and Application for funding have all been developed.

4. **Catskill Stream Buffer Initiative Projects**

- a. Kane Property Planting (2009): GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 116 trees and 250 willow stakes were installed in November 2009.
- b. Manor Kill Grogan Property Planting (2009): SCSWCD has a 5 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 54 trees and 500 sedge plugs were installed in November 2009.
- c. Kastanis Property Planting (2009): 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 ~1,500 trees and shrubs.
- d. Deming Road Riparian Project (2009): A stream disturbance permit application has been prepared and submitted to NYSDEC for review and approval. Grading work on an eroded bank was funded jointly by two neighboring landowners and was completed by C&C Excavating in June 2009. During completion of the original project scope, a third landowner approached GCSWCD interested in planting a riparian buffer in open fields adjacent to the original project area. GCSWCD was able to accommodate the additional landowner's request. 723 trees and shrubs and 120 willow stakes were installed on three contiguous parcels.
- e. McRoberts Property Planting (2009): GCSWCD has a 10 year landowner agreement for this property. Riparian Corridor Management Plan is complete. 50 trees and shrubs and 125 willow stakes were installed in November 2009.

5. **Additional Riparian Buffer Pilot Projects**

- a. County Route 6 (2008): Town of Lexington (West Kill): The GCSWCD and the Greene County Highway Dept worked together to implement vegetation stabilization methodologies at a site on the West Kill that was previously scheduled for all rip-rap. 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 inter-planted with the rip rap.
- b. Riparian Buffer Implementation pilot (2007): The GCSWCD/NYCDEP researched a protocol for identifying potential planting sites based upon stream management planning research. In addition, the GCSWCD approached five of the identified parcel owners and moved forward with the Carr Road riparian restoration project.
- c. Vegetation Enhancements (2008): (Batavia Kill, West Kill, Schoharie Creek and Manor Kill): Root Production Method (RPM) trees were planted at Big Hollow, Brandywine and Ashland Connector. 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 was installed as an enhancement to a Greene County Highway project in the West Kill (County Route 6) and at a FEMA project along the mainstem of the Schoharie Creek (Faulkeys). Sedges were added to the County Route 13 culvert project that was completed in 2007. Sedges are excellent at holding soil. Finally, a volunteer planting was conducted in the Manor Kill behind the Conesville town hall.

- d. Shadow Mountain (2007): Town of Jewett (East Kill): The GCSWCD planted 124 trees and shrubs, hydroseeded and interplanted the rip rap at the Greene County Highway Department bridge replacement in Jewett over the East Kill.
- e. Evergreen Planting (2009): Town of Hunter. The GCSWCD/NYCDEP worked with the landowner to develop a planting plan and to obtain a landowner agreement for the property. The Streamside Assistance Program (SAP) riparian planting project was completed in April 2009.
- f. Carr Road Project (2007-2009): Town of Jewett (Schoharie Creek) - The Carr Road riparian project extends over 2,300 feet of the Schoharie Creek in the Town of Jewett. Initiated in 2007, the project had three strategic components: stem injection treatment of Japanese knotweed (*Polygonum cuspidatum*) with glyphosate (Glypro) to prepare the locations for replanting with native vegetation, planting of a 100 foot wide buffer strip from the top of the streambank establishing approximately 2.4 acres of buffer, and enhancing the existing buffer on the immediate streambank by tapering the bank and planting willow tublings and stakes. In 2009, improvements were made to the DEC fishing access parking area and a walking path was improved to the stream.
- g. Sugar Maples Riparian Buffer Project (2008): Town of Windham (Batavia Kill). The GCSWCD has received funding from the ACOE (WRDA) for a project to treat invasive Japanese knotweed and then replant ~ 800' for riparian vegetation along the Batavia Kill.

6. Stream Restoration Projects and Repair

- a. County Route 13a Culvert Upgrade (2007): Town of Lexington: The GCSWCD/NYCDEP worked with the 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. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html
- b. Conine Farm Stream Restoration (2008): (Town of Prattsville (Batavia Kill)): The 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. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html
- c. Holden Stream Restoration (2007): (Windham - Batavia Kill): In 2007, a NYS DOT Article 15 stream disturbance permit was flagged by DEC Region 4 for potential inclusion of a natural channel design approach. NYS DOT welcomed the design and implementation assistance of GCSWCD for this sensitive reach. The project established a geomorphically appropriate channel and floodplain bench and included riparian plantings which restored floodplain function in an area that would have simply been armored with rock.
- d. Schoharie Street Stabilization (2008): (Village of Hunter) Stabilization of approximately 120 feet of high stream bank to protect infrastructure and private property. Project includes stacked and pinned rock riprap as well as vegetated beds. The GCSWCD and NYCDEP also added additional riparian buffer plantings on the opposite bank. Project construction is complete. Additional plantings were installed in the fall of 2009. The new plantings were balled and burlapped River Birch trees. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html

- e. West Kill Restoration Project, Long Road (2009): (Town of Lexington) The GCSWCD/NYCDEP has completed a full geomorphic restoration of approximately 2,400 linear feet of stream on the West Kill in Spruceton valley. The site was characterized by significant bank failure and clay exposures in the banks and stream bed. This was implemented in 2009. Wetland delineation, archaeological investigation and final survey of the site was conducted. Project design work is complete and construction was finished in October 2009. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html
 - f. Oakwood Pistol Club (2009): GCSWCD is leading this CWC Stream Program streambank protection project in the Town of Prattsville. A CWC Stream Corridor Protection Grant has been applied for in the amount of \$99,200 and has been awarded by CWC. Engineering services have been contracted for this project; design plans and specifications are complete and have been submitted for permit. Construction of this project was completed in Summer 2009.
 - g. Windham Golf Course Streambank Project (2009): This was primarily a CWC Stream Corridor 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.
7. **Completed Repair & Modifications of Existing Projects:** The GCSWCD/NYCDEP will undertake additional work on projects completed under previous FAD(s). These activities are undertaken to correct problem areas, to replace vegetation, control invasive species or to make adjustments to stream structures based on monitoring data. Tasks completed under this action item include:
- a. Ashland Connector Reach (2008): (Town of Ashland (Batavia Kill): The GCSWCD completed planting on the streambanks and floodplains at the lower end of the project reach. Additionally, compensatory wetland areas were planted with appropriate species. Limited site cleanup work on access/staging areas was also completed, and the project was surveyed as part of the routine project monitoring schedule. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html
 - b. Farber Farm Stream Restoration (2008): (Town of Jewett (East Kill): Following flooding in 2005 and 2006, excessive erosion resulted in damage to the Farber farm project grading and rock structures. Several rock structures experienced damage as a result of the flood flows which peaked at over 3000 cfs. The damaged structures include 4 rock vanes and 2 cross vanes. The site was originally revegetated through the Conservation Reserve Enhancement Program (CREP). The CREP seedlings never became established, which limited project success and, the lack of vegetation may have contributed to the overall project damages. This project included: repair, 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 to promote the use of the primary channel; bank grading and vegetative stabilization to reduce erosion; and establishment of a riparian buffer along the restored reach. In addition to the vane retrofits, a bankfull bench was added, 1,179 larger trees were planted, willow stakes and approximately 1000 feet of willow fascines were installed, and numerous shrubs, sedges and herbaceous seed were planted throughout the site. For a complete project report: http://www.catskillstreams.org/majorstreams_sc.html
 - c. Broadstreet Hollow Stream (BSH) Restoration Project Repairs (2008): (Town of Hunter, (Esopus Basin): The January 1996 flood caused excessive erosion along a 1,100' section of BSH. The initial restorative action by the USDA Natural Resource Conservation Service (NRCS) resulted in considerably more damage to this unstable

reach. In addition to the damage to streamside residential property, extensive exposures of glacial lake clays and a “mudboil” caused chronic turbidity in BSH from continually entrained suspended sediment. The “mudboil” is a “relief valve” for artesian groundwater conditions, originating in the adjacent failing hillslope. In 2000, the GCSWCD restored the project reach again. There were two main components to the project: (1) stream channel restoration using natural channel design techniques to address erosion and channel instabilities; and (2) a geotechnical investigation of the adjacent hillslope with installation of dewatering wells to reduce the potentiometric pressure driving the artesian conditions. The April 2-3, 2005 flood caused damage to both project components. Two of the three dewatering wells were damaged and now fail to relieve the artesian conditions. Consequently the mudboil has returned and has been present off and on since then. In 2008, the GCSWCD repaired the damaged rock structures, and hired a well drilling subcontractor to attempt to rehabilitate the dewatering wells. The subcontractor found the well heads had been broken and that they couldn't be rehabilitated. After reviewing options, the decision was made to abandon the wells and monitor the project's stability. Installing new wells would have required a large disturbance to the existing forest and continual maintenance, this wasn't the most palatable option for the landowners. The GCSWCD and DEP will continue to monitor the project's stability. For a complete project report For a complete project report:

http://www.catskillstreams.org/majorstreams_ec.html

- d. Lanesville Stream Restoration Project Repairs (2008) (Town of Hunter (Esopus Basin): In 2008, repairs were made on the Lanesville Demonstration Stream Restoration Project. Most repairs 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. Some adjustments were made in the elevation of rock vanes protecting the base of this slope, and additional bioengineering was added to mitigate the gullyng. For a complete project report:

http://www.catskillstreams.org/majorstreams_ec.html

IV. Creative Stormwater Practices and Critical Area Seeding

In order to reduce runoff and protect groundwater resources in the basin, the GCSWCD and NYCDEP support promoting the infiltration of stormwater through state-of-the-art erosion and sediment control techniques such as hydroseeding of open ditches, stormwater techniques to infiltrate water into the ground, wetland enhancement, filter strips, and creation of rain gardens and bioswales to manage stormwater. Completed stormwater and critical area seeding projects include:

1. Community Stormwater Planning (2009): The GCSWCD has initiated a series of projects which to help develop Community Stormwater Management Plans for various Towns and Villages within the Schoharie Basin. The GCSWCD has detailed information on stormwater structures in a GIS format for the Towns of Ashland and Prattsville. GCSWCD has also obtained copies of Community Stormwater Management Plans which have been completed for the Village of Tannersville, Town of Hunter, and Town of Windham.

2. Hunter Mountain: (Village of Hunter) (2009): Following discussions between the 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.

V. Highway and Infrastructure Improvements

During development of SMPs for the various sub-basins, the GCSWCD, NYCDEP, and the SWAC Highway and Infrastructure Subcommittee identified a number of recommended actions that would provide water quality protection. The following were completed between 2007 and 2009:

1. **Hydraulic Analysis (2008):** Provided technical assistance including hydrology and hydraulic assessment to better size culverts for Greene County Highway Department.
2. **Stormwater Maintenance**
 - a. **Hunter Highway (2008):** 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.
3. **Driveway/Curb Cut Specifications (2009):** 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. Communities and landowners may obtain additional assistance by contacting the GCSWCD WAP office if they are interested in updating curb and driveway standards.

VI. Planning and Assessment

Completed Planning and Assessment action items include:

1. **Schoharie Watershed Strategy (2008):** Engaged multiple watershed partners and agencies, municipal officials, and departments (highway, planning, code enforcement) in the strategy's development which focused on landscape sources that contribute to water quality impairments. Some recommendations have been identified as implementation activities within the 2009 - 2011 action plan and the Schoharie Watershed Advisory Committee will review proposals in September 2009 to allocate implementation funding to support those activities. Copy of report can be found here: <http://www.gcswcd.com/wap/municipalassistance/index.htm>
2. **Manor Kill Stream Management Plan (2009):** In 2008, a stream feature inventory, riparian vegetation mapping and significant portions of a stream management plan were completed. The Manor Kill Management Plan was completed in early 2009, and the Town of Conesville adopted it and signed an MOU for implementation with the Schoharie County SWCD. This project also offered an opportunity to expand partnerships, and planning area, to include the Schoharie County Planning Department and Soil and Water Conservation District. For complete plan visit: http://www.catskillstreams.org/Stream_Management_Plans.html
3. **Monitoring of Restored Stream Reaches:**
 - a. **2008:** Restoration project performance monitoring was completed at five sites in 2008.
 - b. **2009:** Monitoring has been performed and reports compiled for the priority monitoring sites, Conine Stream Restoration Project and the Ashland Connector Stream Restoration Project. Additionally the Brandywine Stream Restoration Project and the Farber Farm Stream Restoration Project sites were also monitored and reports compiled.
4. **Mountaintop Recreation Master Plan (2009):** Report available at: <http://www.gcswcd.com/wap/municipalassistance/index.htm>. The 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.

5. **Japanese Knotweed Management Project (2009):** 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 and can be viewed online at: http://www.catskillstreams.org/pdfs/Hudsonia_knotweed.pdf.
6. **Restoration Project Wetland Mapping (2009):** C.T. Male Associates was hired to remap the wetlands on the Ashland and Conine restoration sites to assure ACOE’s wetland mitigation requirements are being met. Wetland mapping and reporting was completed by C.T. Male Associates in 2009.
7. **Greene County All Hazards Mitigation Plan (2009):** In the past, access to federal Hazard Mitigation Grant funds has helped the GCSWCD to mitigate significant flood related problems in Greene County. Since 1996, the GCSWCD has accessed over \$1,000,000 in funds from this program for major projects in the Village of Hunter (Melody wood condominiums) and Town of Lexington (West Kill Stream restoration). New FEMA program rules prohibit access to these funds unless a community has a FEMA approved All Hazards Mitigation Plan in place. 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 the various municipalities and partners to gather input for the plan, which was completed in 2009 and can be accessed at <http://www.greenegovernment.com/draft.htm>.
8. **Catskill Riparian Reference Study (2009):** New York 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”. Report available at: http://www.catskillstreams.org/stewardship_streamsideside_rb.html

VII. Recreation and Stream Habitat Improvements

In the general recommendations of all SMPs enhanced public access to streams for recreational purposes was identified as a priority. The GCSWCD already has a number of these projects underway, and in 2009-2010 will continue to move forward with these projects. Upon completion of the Mountaintop Recreation Master Plan, the GCSWCD and its partners will identify additional opportunities for enhanced recreation access. Assessing, protecting and improving fish habitat have also been recommended in the SMPs. Completed Recreation and Stream Habitat Improvements action items include:

1. **Windham Creamery Pond (2008):** The 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.
2. **Prattsville Conine Park (2008):** The GCSWCD worked with the Town of Prattsville on a master plan for redevelopment of Conine Field. Key conservation issues under consideration 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. Preliminary designs were completed for the park by GCSWCD and provided to the Town of Prattsville for completion.