

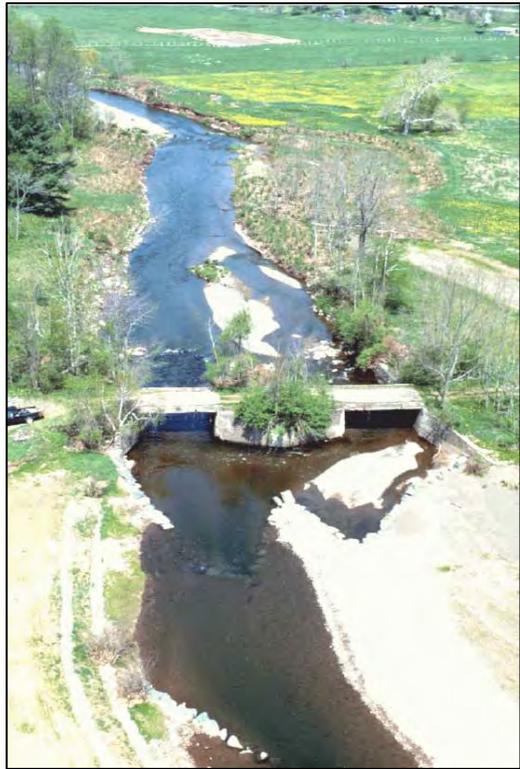
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## VIII. Introduction to General Recommendations

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Although the GCSWCD has actively managed activities within the Batavia Kill watershed since the District's establishment in 1961, the initiation of the Batavia Kill Stream Management Pilot Project in 1996 offered the District an opportunity to look at the whole stream corridor from the watershed scale, and to conduct the assessments necessary to develop a long term management strategy to protect and improve the stream for the benefit of the three watershed towns, the City of New York, and the landowners living alongside the stream.

The previous sections of this SMP have summarized the watershed and reach conditions; in this section, we set the path for future efforts and direction--a "road map," if you will. This series of recommendations is intended to begin the dialog among all of the watershed stakeholders about what has been learned about the Batavia Kill, about the relative importance of the various recommendations, and about our ability together to implement them.



The reader will note that these recommendations are comprehensive and often oriented towards program development. The recommendations request the cooperation and commitment of each town leader, each riparian landowner or business owner, and each agency. While the recommendations could have narrowly addressed actions on the stream alone, they take the long view towards building institutional cooperation and funding streams to ensure long term success, and probable extension to other Greene County streams including the Schoharie Creek, the West Kill and the East Kill. It is also hoped that these programs, especially those addressing development of educational workshops and training programs, and interagency coordination, will be extended through the entire West of Hudson NYC Watershed.

We invite your thoughtful review of these recommendations and participation in the dialog in the coming months.

## Key to Abbreviations Used in Recommendations

ACOE	Army Corps of Engineers	NYCDEP	NYC Dept. of Environmental Protection
BKWD	Batavia Kill Watershed District	NYSDEC	NYS Dept. of Environmental Conservation
CWC	Catskill Watershed Corporation	NYSDOH	NYS Dept. of Health
CCCD	Catskill Center Conservation & D	NYS	NYS Dept. of State
CEO	Code Enforcement Officer	NYSDOT	NYS Dept. of Transportation
CFA	Catskill Forest Association	PFW	Partners for Wildlife Program
EAS	Enhance-A-Stream Grant Program	SEMO	NY State Emergency Management Office
EPF	Environmental Protection Fund	SMP	Stream Management Plan
FAD	Filtration Avoidance Determination	SWMP	Stormwater Management Plan
FEMA	Federal Emergency Management Agency	TU	Trout Unlimited
FHA	Federal Highway Administration	WAP	Watershed Agricultural Program
FMAP	Flood Mitigation Assistance Program	WFP	Watershed Forestry Program
FIRM	Flood Insurance Rate Map	WRDA	Water Resource Development Act
GCSWCD	GC Soil & Water Conservation District	USEPA	U.S. Environmental Protection Agency
GCSWCD-WAP	GC Watershed Assistance Program	USFS	U.S. Forest Service
HMGP	Hazard Mitigation Grant Program	USFWS	U.S. Fish and Wildlife Service
NFIP	National Flood Insurance Program	USGS	U.S. Geological Survey
NRCS	Natural Resource Conservation Service		

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## VIII-A: Flood Prevention

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In the Batavia Kill watershed, flooding has been a concern since the initial settlement of the valley. Of course it is impossible to prevent flooding, but we can work to limit or prevent flood damage. Flooding plays an important role in the ecological health of the Batavia Kill, and flooding of the floodplain also reduces downstream flooding, so whenever possible floodplain area should remain undeveloped (or be restored).



As discussed in previous sections of this SMP, the Batavia Kill Watershed District has provided significant flood protection benefits by intercepting flood waters behind flood control structures, and this is the primary feature of the flood prevention strategy in the watershed. In addition to the flood control project, the Town of Windham has previously completed a flood mitigation plan. In the following sections, the GCSWCD sets forth a number of recommendations related to flood damage prevention in the Batavia Kill watershed. Some recommendations represent projects that are already underway, while others are new action items that could be implemented to reduce flooding damage. The recommendations are broken into four major categories.

- VIII-A.1 Flood Mapping & Regulation
- VIII-A.2 Batavia Kill Watershed District
  - 1. Sediment Management
  - 2. Physical Facilities
  - 3. Residential Flooding
  - 4. Management Plan
  - 5. Emergency Action Plan
- VIII-A.3 Flood Damage Prevention & Outreach
- VIII-A.4 Miscellaneous Recommendations

## VIII-A.1 Flood Mapping & Regulation

As discussed previously in this SMP, revised flood maps (Flood Insurance Rate maps, or FIRMs) designate the expected area of inundation for the flood with a 1% chance of occurring in any given time, also known as the “100 year flood”. For the Batavia Kill, new FIRM maps have been initiated under the leadership of NYSDEC working in partnership with the NYCDEP, GCSWCD and the Army Corp of Engineers. The new flood hazard maps will integrate a number of technologies to produce highly accurate maps that are user-friendly. Digital flood maps will use high resolution LIDAR imagery to develop detailed elevation models, which in turn are integrated with hydrology and hydraulic models, GIS databases, and aerial photographs to produce a final map.

While accurate flood maps are a valuable planning tool, they are only effective when used in conjunction with local regulations. In the Batavia Kill watershed, each municipality has local floodplain ordinances in place as a requirement for participation in the National Flood Insurance Program (NFIP). These local laws are generally close to 20 years old and would benefit from a comprehensive review and revision as deemed appropriate. All floodplain ordinances should be updated to reflect the new and improved maps and other technologies, as well as to better reflect local conditions and needs. Additionally, training and on-going technical support will be a major factor in the use of this new mapping tool. Since the local municipalities currently do not have the necessary hardware, software, or training to use these maps at the local levels, in the initial stages the FIRMS will be maintained by the GCSWCD, with paper copies provided to the local towns. The use of the maps will require various levels of training for local and county planning boards, town boards, Code Enforcement Officers and other users.

<b>NO. FP -01</b>			
<b><i>Recommendation</i></b>	Watershed communities should support the development of digital flood maps for the Batavia Kill Watershed, and actively participate in review of draft maps. The GCSWCD recommends that each municipality adopt the new flood maps upon completion.		
<b><i>Priority</i></b>		<b><i>Task Leader</i></b>	NYSDEC - Flood Protection
<b><i>Funding Sources</i></b>	ACOE - WRDA Grant NYCDEP (project/in-kind) GCSWCD (in-kind)	<b><i>Task Partners</i></b>	GCSWCD NYCDEP Municipalities Greene County Planning Dept.
<b><i>Estimated Cost</i></b>	Not determined	<b><i>Schedule</i></b>	Dependent on map production schedule
<b><i>Notes</i></b>	GCSWCD and NYSDEC have coordinated data collection and surveying assistance. First draft maps due late in 2003.		

<b>NO. FP -02</b>			
<b>Recommendation</b>	The GCSWCD should provide technical and logistical support to the NYSDEC mapping effort. The GCSWCD will provide support to local municipalities in the use of the new FIRM maps and maintain the flood mapping when completed.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP - BK Phase II GCSWCD Greene County Municipalities	<b>Task Partners</b>	NYCDEP NYSDEC Municipalities Greene County Planning Dept.
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	On-going
<b>Notes</b>	GCSWCD and NYCDEP will review tasks and determine level of support appropriate from Batavia Kill Phase II program. Additional funds will be sought as needed.		

<b>NO. FP -03</b>			
<b>Recommendation</b>	Municipalities in the Batavia Kill Watershed should conduct a comprehensive review of current floodplain ordinance and adopt revisions as appropriate. Revisions should reflect current building trends, new technologies and compliance.		
<b>Priority</b>		<b>Task Leader</b>	Municipalities
<b>Funding Sources</b>	NYCDEP - BK Phase II GCSWCD Greene County Municipalities FEMA/SEMO	<b>Task Partners</b>	NYCDEP NYSDEC Greene County Planning Dept. GC Office Emergency Services FEMA/SEMO
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	Start - Winter 2003 Complete Winter 2004
<b>Notes</b>	The GCSWCD will provide technical and administrative support to the review process. Additional partners such as NYSDEC and the Greene County Planning Department should be consulted as appropriate.		

<b>NO. FP -04</b>			
<b>Recommendation</b>	The Town of Windham should enact local regulations which require elevation certifications for any development proposed in the regulated floodplain. The Town should obtain assistance from GCSWCD to review floodplain located projects.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP - BK Phase II GCSWCD Greene County Municipalities	<b>Task Partners</b>	Municipalities Greene County Planning Dept. NYSDEC NYCDEP
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	On-going
<b>Notes</b>	GCSWCD and NYCDEP will review tasks and determine level of support appropriate from Batavia Kill Phase II program. Additional funds will be sought as needed.		

<b>NO. FP -05</b>			
<b>Recommendation</b>	Watershed municipalities should evaluate participation in the FEMA Community Rating System (CRS).		
<b>Priority</b>		<b>Task Leader</b>	Local Municipalities
<b>Funding Sources</b>	FEMA SEMO Municipalities NYSDOS Greene County	<b>Task Partners</b>	GCSWCD GC Planning Dept. NYSDEC NYCDEP FEMA SEMO NYS Association FP Managers National Assoc. FP managers others
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	on-going
<b>Notes</b>	Municipalities may be able to reduce flood insurance premium rates under the CRS. The Municipalities are strongly encouraged to adopt a "No Rise/Good Neighbor" clause in their revised floodplain ordinance.		

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## VIII-A.2 Batavia Kill Flood Control Structures

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The Batavia Kill Watershed District (BKWD) is the primary flood protection resource in the Batavia Kill watershed. As the flood control structures have now reached or exceeded the halfway point in their design life span, it is appropriate to develop long range management plans for the facilities that would address an enhanced inspection schedule, as well as coordination and implementation of rehabilitation activities as necessary. While the flood control structures have been well maintained by the BKWD, there are several items that have been identified as needing immediate attention. At this time, the BKWD and GCSWCD are working with the USDA-NRCS to evaluate the structure. NRCS has identified the BKWD as a priority project under the new federal dam rehabilitation program, and in 2002 completed preliminary analysis of the C.D.Lane structure. Additional studies are scheduled for 2003, with the data to be used to develop and assess rehabilitation strategies. The GCSWCD will continue to participate in the assessment and management plan development.

### Sedimentation

As designed, the structures have a 50 year life span for sediment accumulation. While visual evidence indicates that sedimentation of the Narvo Road and Mitchell Hollow structures is minimal, the C.D.Lane flood control facility appears to have experienced a faster rate of sediment accumulation from the watershed above it. In order to achieve and even extend the CD Lane Park's design life and maintain its capacity to mitigate floods, actions should be taken to reduce sedimentation of the structure. Future dredging of the reservoir will be costly, require extensive environmental review, and may have detrimental impacts on the watershed. This emphasizes the need to take actions to reduce

sedimentation and extend the period of time when dredging of the reservoir is needed far into the future.

<b>NO. FP -06</b>			
<b>Recommendation</b>	Conduct the necessary surveys and compare to as-built surveys of the structure to determine the rate of sedimentation and the remaining available capacity.		
<b>Priority</b>		<b>Task Leader</b>	BKWD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD	<b>Task Partners</b>	NRCS GCSWCD Municipalities Greene County
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	dependent on federal funding availability
<b>Notes</b>	NRCS has tentatively scheduled assessment of sedimentation status in summer 2003. The GCSWCD will provide technical assistance as appropriate. The GCSWCD will continue to promote upstream stability in order to reduce sediment supply.		

<b>NO. FP -07</b>			
<b>Recommendation</b>	Develop a stream-friendly strategy for managing deposition of stream gravel (bedload) at the confluence of the Batavia Kill and C.D.Lane reservoir. Strategy should acknowledge this is a natural delta formation but seek to mitigate excessive aggradation, and maintain stream stability in an upstream direction, including the Big Hollow Restoration Project, fish passage and other stream impacts.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD Grants	<b>Task Partners</b>	NRCS BKWD NYCDEP Municipalities Greene County
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	dependent on federal funding availability
<b>Notes</b>	Traditional gravel removal activities are suspected of creating stream instability upstream of the removal area.		

<b>NO. FP -08</b>			
<b>Recommendation</b>	Work with NYCDEP, NYSDEC and others to reduce excess sediment loading from in-stream and upland sources of erosion above the structure.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP - BK Phase II Grants	<b>Task Partners</b>	NYCDEP NRCS BKWD Municipalities

<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	unknown
<b>Notes</b>	The GCSWCD completed restoration of one mile reach upstream of C.D.Lane park.. GCSWCD has identified additional stream stability problems in management reach 1b which is being monitored and will require restoration.		

## PHYSICAL FACILITIES

While the Batavia Kill flood structures have been well maintained, and are in good to excellent condition, the emergency spillways at the C.D.Lane structure require attention. While recent federal legislation has provided for the authorization of funds for rehabilitation of adequate flood control structures constructed in the past by the NRCS (formally the Soil Conservation Service), the legislation has not had funding appropriated.

**South Emergency Spillway** - On the south emergency spillway (closest to CR 56), there has been repeated flood damage due to the inability of the sod cover to withstand the water velocities when the spillways are actively flowing. In April 1987 and September 1999, the spillway was activated, and in both instances the sod cover was breached and deep gullies were eroded in the spillway's surface. While the damage did not threaten the integrity of the dam itself, the erosion of the spillway has required emergency repairs and is a drain on local resources.

**North Emergency Spillway** - On the north emergency spillway, the watershed district and NRCS have been working for several years to address a stability problem with the steep slope on the face of the spillway. This slope has experienced repetitive damage associated with a shallow soil failure across a significant portion of the steep slope. NRCS is conducting the appropriate analysis to evaluate the impact on the function of the spillway. It does not appear that the slope is in imminent danger of catastrophic failure.

<b>NO. FP -09</b>			
<b>Recommendation</b>	Design and implement mitigation strategy to prevent future failure of south spillway.		
<b>Priority</b>		<b>Task Leader</b>	BKWD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD Grants	<b>Task Partners</b>	NRCS GCSWCD
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	Dependent on federal funding
<b>Notes</b>	NRCS has collected detailed survey data on spillway to facilitate mitigation design.		

<b>NO. FP-10</b>	
<b>Recommendation</b>	Design and implement strategy to stabilize north spillway on C.D.Lane Facility.

<b>Priority</b>		<b>Task Leader</b>	BKWD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD Grants	<b>Task Partners</b>	NRCS GCSWCD
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	dependent on federal funding availability
<b>Notes</b>	Previous repair efforts focused on subsurface drainage and re-contouring of the slope. NRCS is currently proposing a bioengineering solution to stabilize the slope.		

## RESIDENTIAL STRUCTURAL FLOODING

After the flood of September 1999, the GCSWCD discovered that a residence just above the C.D.Lane facility had been flooded. Upon investigation, it was determined that this was a repetitive problem, with the home flooded in 1987. The flooding is a direct result of the flood pool behind the C.D.Lane dam backing up to the home. When the flood event is of a great enough magnitude to cause the emergency spillways to flow, the home is flooded. The GCSWCD is aware of the problem, and has given it high priority under the GCSWCD's flood mitigation program. Site visits have been made by the NRCS and GCSWCD and a strategy has been developed for locating funding, conducting design surveys, and coordinating the project. NRCS will provide the design and specifications for the work. In September 2000, the GCSWCD prepared an application for funding of this mitigation under the FEMA Flood Hazard Mitigation Grant Program (HMGP) but was unsuccessful in receiving funds at that time.

<b>NO. FP -11</b>			
<b>Recommendation</b>	Assess flooding condition and design/implement strategy to protect structure from repetitive flooding.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD Grants	<b>Task Partners</b>	NRCS/BKWD Town of Windham Greene County Landowners
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	Dependent on funding.
<b>Notes</b>	GCSWCD has completed topographic survey of the project area, NRCS has agreed to provide mitigation design. GCSWCD is seeking funds and will be assisted by Town of Windham in implementation of final project.		

## MANAGEMENT PLAN

The flood control structures in the Batavia Kill watershed have now exceeded the half way

point in their design life span. While the structures can be expected to function for many years to come, components of the infrastructure will eventually require rehabilitation or replacement. The GCSWCD supports the efforts of the BKWD to develop a long range management strategy that addresses inspection, operation and management of the structures. In 1999, changes to NYS Environmental Conservation Law provided NYSDEC authorization to promulgate rules and regulations for the development of Emergency Action Plans (EAP) for high hazard dams. Emergency action plans require communities to consider emergencies related to the failure of the dams, and will focus on response and emergency warning. In the Batavia Kill watershed, all three flood control structures are classified as high hazard. The GCSWCD strongly recommends that all future management activities carefully evaluate any potential impacts to stream corridor stability.

<b>NO. FP -12</b>			
<b>Recommendation</b>	Develop a long range management plan to address operation, maintenance and rehabilitation needs of watershed flood control structures.		
<b>Priority</b>		<b>Task Leader</b>	BKWD
<b>Funding Sources</b>	NRCS BKWD Grants	<b>Task Partners</b>	NRCS GCSWCD NYCDEP Municipalities Greene County
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	dependent on federal funding availability
<b>Notes</b>	The USDA-NRCS has identified the BKWD as a priority under the national dam rehabilitation program. Assessments of current conditions are on-going, and will be central to development of the final plan. <b>The GCSWCD strongly recommends that the management plan address long range stream stability to the maximum extent possible.</b>		

<b>NO. FP -13</b>			
<b>Recommendation</b>	Develop comprehensive Emergency Action Plans (EAP) for all Batavia Kill Watershed District structures.		
<b>Priority</b>	High	<b>Task Leader</b>	BKWD
<b>Funding Sources</b>	FEMA - HMGP NRCS - Rehabilitation BKWD Local In-kind (GCSWCD)	<b>Task Partners</b>	GCSWCD NYSDEC - Dam Safety SEMO/FEMA GC Office Emergency Services GC Planning Law enforcement, various
<b>Estimated Cost</b>	\$25,000 Est.	<b>Schedule</b>	2002 - 2003
<b>Notes</b>	GCSWCD has been awarded \$15,000 FEMA/SEMO planning grant to develop an All Hazards Mitigation Plan. The Batavia Kill ERP will be initiated under this process. Advanced components (i.e. inundation studies) will be delayed until NYSDEC completes the new digital FIRM project.		

## VIII-A.3 Education & Outreach

**Note: Additional education based recommendations can be found in VIII-B: Education & Outreach.**

In general, there is a need to provide landowners, municipal officials, planners, developers and other stakeholders in the watershed with information regarding floodplain locations, floodplain function, flood mapping, and the impact of floodplain development on stream conditions.

### Flood Damage Prevention Library

FEMA, the National Association of Floodplain Managers and others have developed extensive materials to assist watershed stakeholders in making sound development decisions related to flooding and flood damage prevention. These materials can only be effective if they are readily available to a wide audience and that audience understands the importance of their information to managing their land and to their safety. The GCSWCD recommends that a local repository for these types of publications be developed in several locations in the watershed. The GCSWCD will request the local libraries in the watershed to provide shelf space for publications in accordance with NFIP standards. Annually, a notice should be published in local newspapers on the availability of the flood damage prevention library.

<b>NO. FP - 14</b>			
<b>Recommendation</b>	The GCSWCD should develop a technical library on flood protection that is readily available to all watershed stakeholders.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	FEMA - HMGP FEMA - FMAP NYC DEP	<b>Task Partners</b>	Municipalities Greene County Planning Dept
<b>Estimated Cost</b>	\$1,500	<b>Schedule</b>	2003-2004
<b>Notes</b>			

### FP-17 Special Flood Hazard Zone Notification

In many instances, landowners are uncertain as to the presence and location of Special Flood Hazard Areas (SFHA) (designated on FIRM Maps) on their property. Knowledge of flood prone areas can help landowners make informed decisions regarding flood risk when considering development and use of their property. Landowners also require accurate knowledge of SFHA when seeking financing from lending institutions. Recent digitization

of the real property tax parcels in the NYC watershed, and the development of digital flood maps by NYSDEC can be integrated into a database that would allow for notification of landowners regarding the presence of SFHA on or near their property or business. The database can be used to develop a mailing list of properties with a SFHA present, and periodically a direct mailing can be made to each property owner. The mailings should include notification of the SFHA presence, as well as information on the importance of floodplains. To provide for further notification to property owners, the GCSWCD will work with the watershed towns and the Greene County Real Property Tax Office to determine if a code for SFHA can be incorporated in the property description maintained in the real property office, and integrated with the landowner's tax bill.

<b>NO. FP - 15</b>			
<b>Recommendation</b>	The GCSWCD should facilitate periodic notification to landowners who have special flood hazard areas located on their property and provide information sessions to address property owner questions about them.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NRCS - Rehabilitation Funds BKWD Grants NYCDEP Batavia Kill funds	<b>Task Partners</b>	NRCS BKWD NYCDEP Municipalities Greene County
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	dependent on funding availability
<b>Notes</b>	Recommendation cannot move forward until digital flood maps are completed.		

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### Recommendation VIII-A.4 Miscellaneous Flood Protection Items

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#### Flood Damage Data Base

Documenting flood damage costs can provide multiple benefits to a community. Areas that demonstrate repetitive damage can be prioritized for mitigation because this cumulative cost damage data provides justification for mitigation grant program funding. Funding is often based on a cost/benefit analysis that requires extensive documentation of past damages. The GCSWCD could develop a simple reporting form to be used by municipalities, as well as private landowners, for reporting cost estimates of flood damages.

<b>NO. FP - 16</b>			
<b>Recommendation</b>	The GCSWCD should facilitate development of a flood damage reporting system to track types of flooding, their location, and the costs associated with flood damage.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD

<b>Funding Sources</b>	Greene County Municipalities FEMA-HMGP FEMA-FMAP NYCDEP Bat. Kill funds	<b>Task Partners</b>	Municipalities GC Planning Department GC Highway Department GC Emergency Services Office Landowners
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	Dependent on funding availability
<b>Notes</b>	Database development should attempt to collect records on past floods to get started, all flooding damages should be reported even if localized. Program will require training, and administrative support to insure success.		

## Flood Mitigation Planning

In 2000, the Disaster Mitigation Act (DMA) resulted in significant changes in the mitigation programs offered by FEMA. Under the 2000 DMA, local communities seeking funding under the Hazard Mitigation Grant Program and Flood Mitigation Assistance Program will be required to have an All Hazards Mitigation Plan approved by FEMA to be eligible for these funds. At the present time, the Town of Windham has a Flood Mitigation Plan developed in 2000 by the GCSWCD under the Flood Mitigation Assistance Program. The GCSWCD has received confirmation that it has received a \$15,200 grant from FEMA/SEMO for development of a county wide All Hazard Mitigation Plan. This Plan will meet the requirement of the DMA and watershed communities are recommended to participate.

<b>NO. FP -17</b>			
<b>Recommendation</b>	Batavia Kill watershed communities are encouraged to participate in the development of a county wide All Hazards Mitigation Plan.		
<b>Priority</b>		<b>Task Leader</b>	
<b>Funding Sources</b>	FEMA - HMGP In-kind (GCSWCD) In-kind GC Planning In-kind GC Emergency Svc	<b>Task Partners</b>	GCSWCD NYSDEC - Dam Safety SEMO/FEMA NYCDEP GC Office Emergency Services GC Planning Law enforcement, various Landowners Others
<b>Estimated Cost</b>	\$25,000 Est.	<b>Schedule</b>	2002 - 2003
<b>Notes</b>	<ol style="list-style-type: none"> <li>1. GCSWCD has been awarded a \$15,200 FEMA/SEMO planning grant.</li> <li>2. Flooding is a primary risk in Greene County,</li> <li>3. The GCSWCD will insure that sound stream management practices are primary in the AHMP.</li> </ol>		

## **Flood Mitigation Grant Programs**

Since 1996, the GCSWCD has been able to secure \$1.1 million for flood mitigation projects in the NYC watershed area. On-going efforts to develop an All Hazard Mitigation Plan will maintain funding eligibility for all Batavia Kill watershed communities. The GCSWCD has identified several projects in the Batavia Kill watershed that should be further evaluated for possible mitigation funding, and will work with local partners to develop competitive grant applications. Potential projects would include, but are not limited to;

1. Starr Residence      Residential flooding of home above the C.D.Lane Flood Control structures (see Management Segment 1).
2. GNH Lumber          Flooding of commercial business in Windham hamlet (See Management Segment 3).
3. Miscellaneous        Several of the recommendations in this section may be eligible for mitigation funding.

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## VIII-B. Education & Outreach

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Increasing public awareness about the importance of the Batavia Kill watershed is critical to the success of this Management Plan, and education is the key to ensuring implementation of balanced natural resource protection measures. The willingness of people and communities to work together depends on an understanding of the importance of the watershed ecosystem and how it relates to their daily lives. Ultimately, people will protect what they care about, and they only care about things that they understand and appreciate.



In the previous sections of this Stream Management Plan, many new concepts related to stream and watershed management have been introduced. In addition to these new concepts, the GCSWCD has identified several areas where local audiences would benefit from technical or awareness training in a variety of topics. To ensure successful implementation of this SMP, the GCSWCD and NYCDEP will work with a diverse mix of partners to refine the recommendations in this section into a detailed Education & Outreach Implementation Plan. The Plan will address details on types of workshops, subject areas, instructors, training methods, and logistics of conducting the various workshops. The following section sets some general recommendations to serve as a starting point for a detailed plan.

- VIII-B.1 Stakeholder Workshops
- VIII-B.2 School Based Education
- VIII-B.3 Publications & Resources

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## VIII-B.1 STAKEHOLDER WORKSHOPS

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In the Batavia Kill watershed, the range of stakeholders with a direct or indirect interest in the health and function of the stream corridor is as diverse as the watershed itself. Stakeholders include private interests such as the landowners who live along the stream, and various constituencies that prize Catskill streams for their recreational value. On the other hand, stakeholders also include a myriad of local, state and federal interests that have responsibility for management and protection of community and natural resources.

### Audience Identification

With a diverse base of stakeholders in the watershed, the GCSWCD proposes that any education and outreach efforts be targeted at specific audiences. While the development of a detailed Education & Outreach Plan would refine target audiences, the GCSWCD proposes that there are three primary audiences. Additional participants or sub-audiences will be identified as these recommendations are moved forward.

Private Interests	a. Landowners (residential and business) b. Recreational users
Municipal Audience	a. Legislative Bodies (town boards, legislature etc) b. Planning Board and Code Enforcement Officers c. Highway Departments/Public Works Departments
Business Sector	a. Realtors/Bankers/Insurance Agents b. Developers c. Contractors

### Workshop Structure

While a planning team will develop the specific details of the workshop program, the GCSWCD has identified several broad categories of workshops recommended for specific target audiences. Workshops should include indoor sessions, as well as field trip and practical exercises. The following list is not inclusive of all possible workshops.

**1. Riparian Landowners** - Sessions need to provide basic understanding of fluvial process, factors impacting stability/water quality, and management decisions that can promote a healthy stream. Sessions should provide landowners with training that will enable them to undertake effective stream protection actions on their own property.

**2. Municipal Leaders** - Sessions need to address the importance of local management of the watershed and stream resources. Municipal leaders also need to understand basic fluvial process, with an emphasis on how local decision makers can support stream health through their leadership. Sessions must address multiple benefits that can be realized by protecting stream and watershed health.

**3. Planning Boards & Code Enforcement Personnel** - The GCSWCD proposes that stream awareness sessions be targeted at this important group of local decision makers. Planning boards have a significant ability to effect change in land use practices that may impact stream health. After planning decisions are made, the local CEO is charged with oversight of development activities, and they in turn must understand the impact of development activities on the stream system.

**4. Local/County/State Highway Department** - This audience has the most direct ability to impact stream health. Day to day activities in the maintenance of road systems and other public infrastructure frequently involves local waterways, and often actions that may seem harmless can create extreme instability problems that grow in size by moving up or downstream and become very costly to repair. The GCSWCD proposes this audience must not only have a knowledge of basic stream process, but they must also have the ability to recognize what changes are occurring in a problem area, as well as the potential impact of any management action they may take. The GCSWCD does not propose that this training would be a substitution for highway departments seeking technical advice from experienced stream managers.

**5. Banks/Realtors/Insurance** - In the experience of the GCSWCD, many landowner inquiries involve floodplains and the flood insurance program. The GCSWCD proposes that a joint workshop session for the financial, real estate and insurance businesses would be an effective vehicle to address flood insurance, lending regulations and other issues related to these industries.

**6. Contractors & Developers** - Local contractors should receive training to allow them to make better decisions regarding impacts they can have on streams. Contractors can benefit from training on new methodologies for addressing stream stability, the permitting process, and project construction issues such as water quality protection. Contractor training should also address stormwater management as well as sediment and erosion control.

Again, this list is not inclusive of all possible audiences and/or workshop topics. The GCSWCD will facilitate an Education & Outreach working group that will develop a detailed plan for conducting workshops in the Batavia Kill watershed. The GCSWCD proposes that many of these workshops will be more effective if conducted over a broader area such as the entire Schoharie basin.

<b>NO. EO-01</b>			
<b>Recommendation</b>	The GCSWCD will facilitate the formation of an Education & Outreach working group to develop a detailed E&O strategy to address the number, type, subjects, instructors, logistics and other details of conducting stakeholder workshops.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP (project/in-kind) Grants	<b>Task Partners</b>	GCSWCD NYCDEP Municipalities GC Planning Dept. Catskill Center NYSDEC NYSDOS Others
<b>Estimated Cost</b>	Unknown	<b>Schedule</b>	1. E&O Working group established by spring 2003  2. Initiate first round of workshops in 2003.
<b>Notes</b>	The GCSWCD recommends that priority focus be placed on landowners, municipal leaders and local planners.		

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## VIII-B.2 SCHOOL BASED EDUCATION

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Long term protection of Batavia Kill stream resources will be greatly enhanced by developing a “stream ethic” in young students. As the future decision makers, today’s youth must be a priority audience. While school curriculum often provide a local focus on stream water quality, there is a need to provide students with a better understanding of the relationship between stream stability and activities such as development or flood response. The GCSWCD proposes that school-based programs should be modified to provide for presentation of basic information on stream morphology and function.

<b>NO. EO - 02</b>			
<b>Recommendation</b>	The GCSWCD, NYCDEP and local schools should support the on-going efforts of the Catskill Center for Conservation and Development to provide stream-based education in the WAJ school district.		
<b>Priority</b>		<b>Task Leader</b>	Catskill Center
<b>Funding Sources</b>	CWC Educational Grants NYCDEP NYSDEC Other Grants	<b>Task Partners</b>	WAJ School District GCSWCD NYCDEP Others
<b>Estimated Cost</b>	unknown	<b>Schedule</b>	
<b>Notes</b>	The GCSWCD recommends that the current program be modified to include presentation of information on stream morphology and relationship to watershed land use, management activities etc.		

<b>NO. EO - 03</b>			
<b>Recommendation</b>	Develop a nature trail and/or outdoor classroom facility at the WAJ to promote educational programs related to natural resources.		
<b>Priority</b>		<b>Task Leader</b>	WAJ School District
<b>Funding Sources</b>	CWC Educational Grants NYCDEP NYSDEC	<b>Task Partners</b>	GCSWCD NYCDEP CWC
<b>Estimated Cost</b>	\$50,000	<b>Schedule</b>	Unknown
<b>Notes</b>	The WAJ school district is currently investigating development of a new school facility that is proposed for a parcel of land located on the Batavia Kill. The site would offer excellent opportunities to develop outdoor educational resources on-site.		

<b>NO. EO - 04</b>			
<b>Recommendation</b>	Work with WAJ school district to evaluate feasibility of conducting field trips to degraded stream reaches, reference sites and GCSWCD restoration sites to educate students on stream management issues.		
<b>Priority</b>		<b>Task Leader</b>	WAJ School District
<b>Funding Sources</b>	CWC Educational Grants NYSDEC Other Grants	<b>Task Partners</b>	GCSWCD NYCDEP CWC
<b>Estimated Cost</b>	\$50,000	<b>Schedule</b>	Unknown
<b>Notes</b>	The WAJ school district is currently investigating development of a new school facility which is proposed for a parcel located on the Batavia Kill. The site would offer excellent opportunities to develop outdoor educational resources on-site.		

<b>NO. EO - 05</b>			
<b>Recommendation</b>	Work with Columbia-Greene Community College to integrate fluvial geomorphology and stream management into their Environmental Studies Program.		
<b>Priority</b>		<b>Task Leader</b>	Columbia-Greene CC
<b>Funding Sources</b>	Tuition Grants State Educational Funds	<b>Task Partners</b>	GCSWCD
<b>Estimated Cost</b>	Not determined	<b>Schedule</b>	Unknown
<b>Notes</b>	The GCSWCD has held preliminary discussions with CGCC regarding the addition of classes on stream management in their new Environmental Studies Programs. This would provide an opportunity for local students to advance their training and potentially apply their education in various capacities in the NYC Watershed.		

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### VIII-B.3 PUBLICATIONS & RESOURCES

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The GCSWCD also proposes a number of education and outreach recommendations that do not fall into the categories above. These activities are focused on “self learning,” and include use of the Internet, interpretive signage, mobile displays and other outreach tools.

<b>NO. EO - 06</b>			
<b>Recommendation</b>	Continue use of the GCSWCD web site to provide information to watershed stakeholders. Upgrade site to allow landowners interaction such as reporting stream changes, problems etc.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP NYSDEC other grants	<b>Task Partners</b>	GCSWCD NYCDEP Others
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	on-going
<b>Notes</b>	The GCSWCD proposes that the Internet can be an effective resource for watershed stakeholders. The site should provide access to publications and project updates.		

<b>NO. EO - 07</b>			
<b>Recommendation</b>	Develop a mobile display focusing on stream management that can be displayed at local events or in public places.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP/NYSDEC CWC Other Grants	<b>Task Partners</b>	NYCDEP Catskill Center
<b>Estimated Cost</b>	\$3,500 - \$5,000	<b>Schedule</b>	not determined
<b>Notes</b>	In the Batavia Kill watershed, events such as the Windham Autumn Affair and Old Prattsville Days are examples of opportunities for use of a display that would focus on current stream management activities. The display could also be left in public spaces such as banks, libraries, post offices, or town halls.		

<b>NO. EO - 08</b>			
<b>Recommendation</b>	The GCSWCD should work with local print media to develop a routine news column to run in local papers. The column would provide current information related to stream management activities and other watershed issues.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD - WAP
<b>Funding Sources</b>	Not applicable	<b>Task Partners</b>	GCSWCD NYCDEP
<b>Estimated Cost</b>	No cost, use existing staff	<b>Schedule</b>	Initiate spring 2003
<b>Notes</b>	GCSWCD Watershed Assistance Program will take the lead. GCSWCD staff and guest writers will produce columns. For publication at least twice per month. Local press includes the Windham Journal, Mountain Eagle and Daily Mail.		

<b>NO. EO - 09</b>			
<b>Recommendation</b>	Develop a series of publications focused on stream management that can be provided to watershed stakeholders and/or used in training workshops		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP - SMP
<b>Funding Sources</b>	CWC Educational Grants NYCDEP/NYSDEC Other Grants	<b>Task Partners</b>	GCSWCD Catskill Center CWC/Others
<b>Estimated Cost</b>	Not determined	<b>Schedule</b>	Unknown
<b>Notes</b>	Currently, there is a lack of publications on stream management readily available to watershed stakeholders. Fact sheets, landowner stream management guidelines, and other topics should be the focus of such publications. GCSWCD, NYCDEP and watershed stakeholders will jointly review potential subjects.		

<b>NO. EO - 10</b>			
<b>Recommendation</b>	Annually, publish a "Watershed Health" report that can be distributed to stakeholders. The report will present updates on projects, results of monitoring efforts, and other relevant information.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD - WAP
<b>Funding Sources</b>	CWC NYCDEP NYSDEC Other Grants	<b>Task Partners</b>	NYCDEP Catskill Center NYSDEC NYSDOS USEPA CWC Others
<b>Estimated Cost</b>	\$5,000 annually	<b>Schedule</b>	Initiate 2003
<b>Notes</b>	GCSWCD Watershed Assistance Program will take the lead on development of the reports.		

<b>NO. EO - 11</b>			
<b>Recommendation</b>	Develop interpretive signage at selected restoration sites.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	CWC Educational Grants NYCDEP NYSDEC Other Grants	<b>Task Partners</b>	NYCDEP Catskill Center CWC Others
<b>Estimated Cost</b>	Not determined	<b>Schedule</b>	Unknown
<b>Notes</b>	Restoration projects such as Big Hollow provide a unique opportunity to develop interpretive signage. The GCSWCD recommends development of small kiosks at either end of the project to provide information on the watershed, the stability problems addressed in the designs, and restoration techniques.		

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## VIII-C Riparian Zone Management

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The role of vegetated riparian buffers in water quality protection and the promotion of stream stability can not be overstated. Healthy, well vegetated riparian buffers filter upland pollutants, provide rooting mass for bank stability, and lower water temperatures. As noted previously in this SMP, overall riparian condition along the Batavia Kill is often poor at best. While some riparian vegetation is present through most of the stream corridor, often the structure of the buffer, including the width, variability of plant types, and dominance of invasive species, is not adequate to ensure long term protection of the stream. As such, the GCSWCD has developed a series of recommendations regarding riparian buffers. These recommendations are presented in three primary categories, including protection of buffers, establishment or enhancement of buffers, and invasive species control.



- VIII-C.1 Protection of Existing Buffers
- VIII-C.2 Riparian Vegetation Establishment/Enhancement
- VIII-C.3 Invasive Species

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## VIII-C.1 Protection of Existing Buffers

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First and foremost, the GCSWCD strongly recommends that priority be given to efforts that will protect existing riparian buffer zones along the Batavia Kill. While the riparian area is currently far from ideal, any additional loss of intact riparian vegetation and its buffer function must be avoided. The protection of riparian buffers already benefits from the NYC Watershed Rules and Regulations because they closely monitor development activities within 100 feet of a watercourse and provide an opportunity for discussion with the landowner or developer on the importance of protecting riparian areas. While large scale disruption of buffers associated with new development may be lessened by the watershed rules and regulations, the GCSWCD has observed a number of activities that occur on a smaller scale, and generally do not fall under existing regulations. Further, the watershed rules and regulations do not strictly prohibit the removal of riparian vegetation, so they cannot be relied upon alone to do the job of protecting existing buffers.

Day to day activities of private landowners can often damage their riparian area and initiate problems down the line. These landowners may not be aware of the potential impacts of their actions. In fact, the GCSWCD has found that landowners often feel that their activities actually benefit stream health. This accentuates the need for increased awareness of the role riparian vegetation has in stream health. The following activities, while not inclusive of all potential impacts, addresses the predominate concerns noted by the GCSWCD.

**Vegetation Maintenance** - Often, in an attempt to maintain their view of the stream, landowners will remove all (or most) of the woody vegetation, and will maintain their lawn right up to the top of the streambank. While the grass vegetation may provide adequate buffering of upland water quality impacts, the loss of shrubs, understory trees and other woody vegetation results in a dramatic reduction in the deep rooted vegetation critical to bank stability and maintaining cooler stream temperatures. In general, stream-side landowners should make every attempt to maintain a diverse and healthy buffer at least 50' in width along their entire corridor. In the lower, flatter sections of the watershed, minimum buffer width should be increased to at a desired minimum of 100'.

Landowners are advised to be selective in their management of riparian vegetation. By limiting mowing and using selective pruning, and by planting species that provide good rooting depth without being tall (blocking views), significant gains in buffer restoration and stream stability can be made. Specific recommendations to address this concern are presented later in this section.

**Yard Waste Disposal** - On many occasions, the GCSWCD has noted that landowners favor the riparian zone for disposal of their yard waste. Grass clippings, leaves and woody brush are often disposed of by dumping over the streambank, with some landowners indicating that they thought this would help protect the streambank from erosion. The GCSWCD's observations have been that these debris piles are more likely to suppress vegetative growth and in fact reduces the

streambank's protection. The dense piles of debris smother living vegetation. While the debris may provide protection from rainfall impact and runoff, the materials provide no value to protection from erosive stream flows.

Landowners should evaluate their disposal of yard waste materials and seek locations outside of the desired buffer width. In cases where alternate disposal locations are limited, yard waste should be well distributed, and not densely piled. Distribution of the material will hasten decomposition and may actually have a positive benefit by adding organic material to the soil. The GCSWCD recommends that Greene County or the local municipalities investigate the feasibility of developing a public composting facility in the watershed area for safe disposal of these materials.

**Stream-side Access** - The GCSWCD recommends that all riparian landowners evaluate potential impacts to the riparian buffer related to their access to the stream. This is of special concern in cases where landowners must access the stream from a high bank or terrace. Repetitive use of a trail can concentrate runoff, damage the vegetation on the trail, and result in localized gully erosion. Often, this condition continues to worsen over time, with the gully getting deeper and the stream-side vegetation being undermined, eventually expanding from a localized problem to a broader area of the buffer zone. The GCSWCD has observed sites in the Catskills where a single short trail down a steep streambank resulted in a major slope failure over 600 feet in length. Landowners should manage their access to the stream such that it prevents erosion and loss of riparian vegetation.

The following represents a series of specific recommendations proposed by the GCSWCD. These recommendations address education, review of buffer impacts, and potential revised or new regulations that would focus on protecting riparian vegetation.

<b>NO. RB - 01</b>			
<b>Recommendation</b>	Educate riparian landowners and others on specific methods to manage their riparian buffers.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP NYSDEC other grants	<b>Task Partners</b>	NYCDEP Catskill Center Cooperative Extension Watershed Forestry Program Catskill Forest Owners Landowners
<b>Estimated Cost</b>	undetermined	<b>Schedule</b>	start sessions fall 2003
<b>Notes</b>	In addition to traditional topics such as mowing, pruning and planting, the GCSWCD recommends that training also address the fact that people want to see and get to the stream. Information on maintaining buffers as a landscape feature, such as selecting plants with aesthetic value as well as growth habits that allow a view without compromising rooting structure, are examples of the information that is needed. In areas with high residential pressure, landowners should come to value their buffers as "stream-side gardens."		

<b>NO. RB - 02</b>			
<b>Recommendation</b>	The Watershed Agricultural Program should re-evaluate all participating farms in the watershed for applicability of existing buffer protection programs. Additional eligible farms that are not in the WAP should be encouraged to apply.		
<b>Priority</b>		<b>Task Leader</b>	Watershed Agricultural Council
<b>Funding Sources</b>	Watershed Ag Program USDA-CREP Program	<b>Task Partners</b>	GCSWCD - WAP Landowners
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	2003
<b>Notes</b>	The GCSWCD has noted several locations along the Batavia Kill where improvements to buffers are required on agricultural lands. These may be participating farms where riparian restoration was not prioritized for immediate funding, or they may be non-participating farms. The GCSWCD recommends that WAP efforts to promote buffers address farmer concerns regarding loss of their production land. The WAP should work with farmers to identify replacement lands (lands outside of the buffer area) for crop or hay production. This will remove the largest obstacle to farmer participation and enable restoration of a significant riparian area along the stream corridor. Increased use of the WAP riparian buffer program will also meet buffer establishment/enhancement recommendations.		

<b>NO. RB - 03</b>			
<b>Recommendation</b>	Provide watershed stakeholders ready access to technical assistance. Such assistance should include site evaluations, development of detailed site management plans, and facilitation of access to watershed programs.		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP - SMP
<b>Funding Sources</b>	NYCDEP NYSDEC USDA NRCS USFWS USEPA	<b>Task Partners</b>	GCSWCD Other Watershed SWCD's WAP CFA NYSDEC - Forestry/Watersheds Landowners
<b>Estimated Cost</b>	undetermined	<b>Schedule</b>	undetermined
<b>Notes</b>	<p>1. The GCSWCD strongly recommends that technical assistance be closely aligned with on-going SMP efforts, and should integrate stream morphology assessment.</p> <p>2. The GCSWCD proposes that the combined Batavia Kill, West Kill and Schoharie watershed projects share a dedicated Riparian Buffer Specialist position at the GCSWCD. This position could also provide assistance to other SMP focus areas.</p> <p>3. Technical assistance should be aggressively marketed to riparian landowners using direct contracts, press and home visits.</p>		

<b>NO. RB - 04</b>			
<b>Recommendation</b>	Watershed municipalities should evaluate existing land use regulations, such as site plan review laws, to determine if adequate consideration is given to riparian buffer impacts.		
<b>Priority</b>		<b>Task Leader</b>	Watershed Municipalities

<b>Funding Sources</b>	NYCDEP NYSDOS CWC Municipalities	<b>Task Partners</b>	GCSWCD NYCDEP GC Planning Department Catskill Center
<b>Estimated Cost</b>	Not determined, minimal	<b>Schedule</b>	2004-2005
<b>Notes</b>	This could be implemented with the assistance of a Riparian Buffer Specialist (see RB-03) or could be contracted out (by either the Towns or GCSWCD) to a planning specialist and funded with Batavia Kill Phase II funds through the GCSWCD.		

<b>NO. RB - 05</b>			
<b>Recommendation</b>	Stream side landowners who practice forest harvesting in the Batavia Kill watershed should be encouraged to participate in the Watershed Forestry Program (WFP) to ensure timber harvesting operations use appropriate methods to reduce or eliminate impacts to the riparian buffer and improve its condition whenever possible.		
<b>Priority</b>		<b>Task Leader</b>	Watershed Forestry Program
<b>Funding Sources</b>	WFP U.S. Forest Service	<b>Task Partners</b>	GCSWCD NYCDEP CFA NYSDEC - Forestry/Watersheds Landowners
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	initiate in 2003
<b>Notes</b>	<ol style="list-style-type: none"> <li>1. GCSWCD will provide information on WFP at public sessions held for the review of the Batavia Kill Stream Management Plan.</li> <li>2. If a Riparian Buffer Specialist position is created, that person should be familiar with WFP programs and encourage landowner participation.</li> </ol>		

<b>NO. RB - 06</b>			
<b>Recommendation</b>	Provide long term riparian buffer protection through permanent conservation easements for both currently degraded and intact buffer areas.		
<b>Priority</b>		<b>Task Leader</b>	Undetermined
<b>Funding Sources</b>	NYCDEP WAP NYSDEC other grants	<b>Task Partners</b>	GCSWCD NYCDEP - SMP NYCDEP - Land Acquisition NYSDEC - Forestry/Watersheds Catskill Center WAP Landowners
<b>Estimated Cost</b>	undetermined  needs further study	<b>Schedule</b>	establish program development committee in 2003  develop draft strategy for increasing easement programs by 2004

<b>Notes</b>	The GCSWCD strongly recommends that a committee of interested parties be convened. The committee should review all existing options to obtaining easements, evaluate roadblocks to increasing landowner participation, and develop an easement program that will result in the greatest participation.
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<b>NO. RB - 07</b>			
<b>Recommendation</b>	Develop landowner incentive programs to encourage participation in riparian buffer protection programs, and pilot the effort in the Batavia Kill watershed.		
<b>Priority</b>		<b>Task Leader</b>	undetermined
<b>Funding Sources</b>	NYS - EPF other sources	<b>Task Partners</b>	NYS NYSDEC Local SWCD's others
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	not determined
<b>Notes</b>	The GCSWCD strongly recommends that NYS develop a state-wide riparian buffer protection incentives program. The GCSWCD is aware of other states where programs similar to New York's Forest Tax Law are used to provide tax relief incentives for participation in riparian protection programs. The GCSWCD proposes that the maintenance of healthy buffer zones provides multiple benefits to the public as a whole, and should be a priority of local, state and federal policies. This effort could be piloted in the Batavia Kill watershed.		

<b>NO. RB - 08</b>			
<b>Recommendation</b>	NYSDEC should develop a Technical and Operational Guidance Series (TOGs) focused on evaluation of riparian impacts during stream disturbance activities.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC
<b>Funding Sources</b>	no funding required	<b>Task Partners</b>	NYCDEP Local SWCD's Others
<b>Estimated Cost</b>	N/A	<b>Schedule</b>	not determined
<b>Notes</b>	The GCSWCD recommends that NYSDEC develop TOGs for stream disturbance/restoration projects that will provide comprehensive and consistent guidance on the review of projects, and the expectations from the applicants. The GCSWCD proposes that a TOG on stream management would help guide applicants to develop better projects. In addition, the TOGs should also apply to NYSDEC management of state riparian lands.		

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## VIII-C.2 Riparian Vegetation Establishment/Enhancement

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While protection programs can go a long way to meeting riparian buffer objectives, current conditions in the Batavia Kill will require a strong proactive approach to restoration and/or enhancement of desirable riparian vegetation. In some places, allowing natural succession to generate woody vegetation may be desirable, while in many other places new plantings

will be required. In several areas, stream channel morphology must be adjusted to a more naturally stable form in order to create conditions for the success of riparian plantings. Riparian restoration strategies must be capable of addressing what is sometimes a highly fragmented buffer condition, with many landowners involved within a very short stream distance. Unlike most agricultural buffer programs where a larger planting may be required and only one landowner is involved, most buffers on the Batavia Kill will often require smaller patches of plantings on multiple properties.

<b>NO. RB - 09</b>			
<b>Recommendation</b>	Use Batavia Kill Phase II funding to leverage additional funds for a comprehensive riparian restoration effort in the Batavia Kill watershed.		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP - SMP
<b>Funding Sources</b>	NYCDEP NYSDEC ACOE/USFS/USFWS	<b>Task Partners</b>	GCSWCD NYSDEC USFS/USFWS/NRCS Landowners
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	Not determined
<b>Notes</b>	<p>While watershed agricultural lands have ready access to cost-share programs for riparian vegetation establishment/enhancement, there is currently no program available to non-agricultural landowners.</p> <p>The GCSWCD's assessment has indicated that extensive plantings would benefit the Batavia Kill stream and while funds are available in the Phase II Project for this effort, it is unlikely that they will be sufficient to restore, manage and maintain the riparian corridor in the Batavia Kill watershed.</p> <p>DEP should work with its partners to develop riparian buffer restoration cost-share programs to assist landowners with planting and maintenance of new buffer plantings.</p> <p>Develop a program to provide interested landowners free, or low cost, plant materials appropriate for use as riparian vegetation. The GCSWCD proposes that there is a certain segment of the riparian community which would take advantage of free plant materials and provide "sweat equity" to improve their buffer areas. The GCSWCD proposes that NYCDEP provide seed funds for a pilot project. The GCSWCD can coordinate with their annual tree and shrub program, and low cost materials could be obtained from the NYSDEC Tree Nursery in Saratoga.</p>		

<b>NO. RB - 10</b>			
<b>Recommendation</b>	NYSDEC and the ACOE should evaluate buffer restoration projects as a possible mitigation requirement on projects with smaller-scale disturbances.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC/ACOE
<b>Funding Sources</b>	Project Sponsors	<b>Task Partners</b>	GCSWCD NYCDEP Landowners / Project Sponsors
<b>Estimated Cost</b>	Not Determined	<b>Schedule</b>	not determined

<b>Notes</b>	In recent years, NYSDEC and the ACOE have increasingly allowed alternate mitigation activities when applicants have minor impacts they have to address, or if site and other conditions do not allow “replacement” mitigation. The GCSWCD strongly recommends that the regulatory agencies give greater consideration to requiring applicants to fund, or undertake, riparian buffer restoration projects as “in lieu” of mitigation when appropriate..
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### VIII-3 Invasive Species

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As noted previously in this SMP, the Batavia Kill is significantly impacted by the presence of the invasive species Japanese knotweed. The knotweed presents a serious threat to riparian buffer health and at this time it is our understanding that it must be addressed if any long term success in re-establishing buffers is expected. In Phase I of the Batavia Kill Pilot Project, the GCSWCD and NYCDEP entered into an agreement with Hudsonia Inc. to conduct a preliminary assessment of Japanese knotweed and its impact on stream stability. As part of this agreement, Hudsonia is surveying effective methods of control in the US and internationally. At the time of this SMP, the GCSWCD and NYCDEP have received the first draft of Hudsonia’s report which is currently under review. Recommendations made by Hudsonia will be included in the final Batavia Kill SMP.

<b>NO. RB -11</b>			
<b>Recommendation</b>	The GCSWCD and NYCDEP will continue to investigate the impact of invasive species on the riparian buffer and implement appropriate demonstration projects to test management strategies.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD/NYCDEP
<b>Funding Sources</b>	NYCDEP others	<b>Task Partners</b>	Hudsonia Landowners
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	Phase II Study 2003 Demonstrations 2004-2006
<b>Notes</b>	The GCSWCD and NYCDEP should engage Hudsonia to complete Phase II of the study, which is focused on inventorying the knotweed population and developing demonstrations of management practices.		

## VIII-D Stream Management Activities

Throughout history, human communities have exerted their influence on stream systems in many ways. Whether it's a dam, a bridge, a roadway, or a home, human activities impact streams. Stream managers struggle to find an effective balance between the needs of the human community and the needs of the stream system. The human activities in the Batavia Kill watershed as a whole will long be the primary factor in the health of the Batavia Kill stream. Long range stream management strategies must therefore emphasize the human element.



The GCSWCD is encouraged by the success to date in increasing watershed stakeholder awareness of how streams respond to various management activities. The following recommendations have been formulated based on the GCSWCD's observations as well as past experiences with watershed landowners, regulators, municipal leaders and others with stream management responsibilities. For the purpose of this SMP, "stream management activities" should be considered to be those actions that in some way impact the stream corridor. In many cases these recommendations are general in nature and will require a coordinated effort of many interests to bring to fruition.

<b>NO. SC - 01</b>			
<b>Recommendation</b>	Develop detailed, science-based guidelines to stream management that are readily available to those entities responsible for stream activities in the Batavia Kill Watershed. Guidelines must emphasize natural channel stability and function.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD/NYCDEP
<b>Funding Sources</b>	NYCDEP NYSDEC	<b>Task Partners</b>	NYSDEC/ACOE Municipalities - leaders, highway Landowners
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	not determined
<b>Notes</b>	Guidance should include items like problem assessment methods, regional hydraulic geometry curves, construction methods, environmental protection standards and other resources required for planning an effective project. Guidance must be readily available to project designers and sponsors, and continually updated as new data is collected. Guidelines should include items such as typical drawings, specifications, permitting instructions and other information that a project sponsor would need. Guidance will be useful in routine activities as well as emergency situations.		

<b>NO. SC - 02</b>			
<b>Recommendation</b>	Provide long term access to technical assistance to landowners and municipalities for assessment of their stream-related problems, develop effective management strategies, and supervise project implementation.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP NYSDEC Greene County Local Municipalities others	<b>Task Partners</b>	GCSWCD NYSDEC Greene County Local Municipalities Landowners
<b>Estimated Cost</b>	undetermined	<b>Schedule</b>	currently covered by GCSWCD/DEP contracts
<b>Notes</b>	The GCSWCD, NYCDEP and local municipalities should evaluate how to insure long range availability of the high levels of technical resources currently available in the Batavia Kill Watershed. While a Phase II contract will extend the ability of the GCSWCD to provide these resources through 2006, implementation of this SMP will require long term technical resources.		

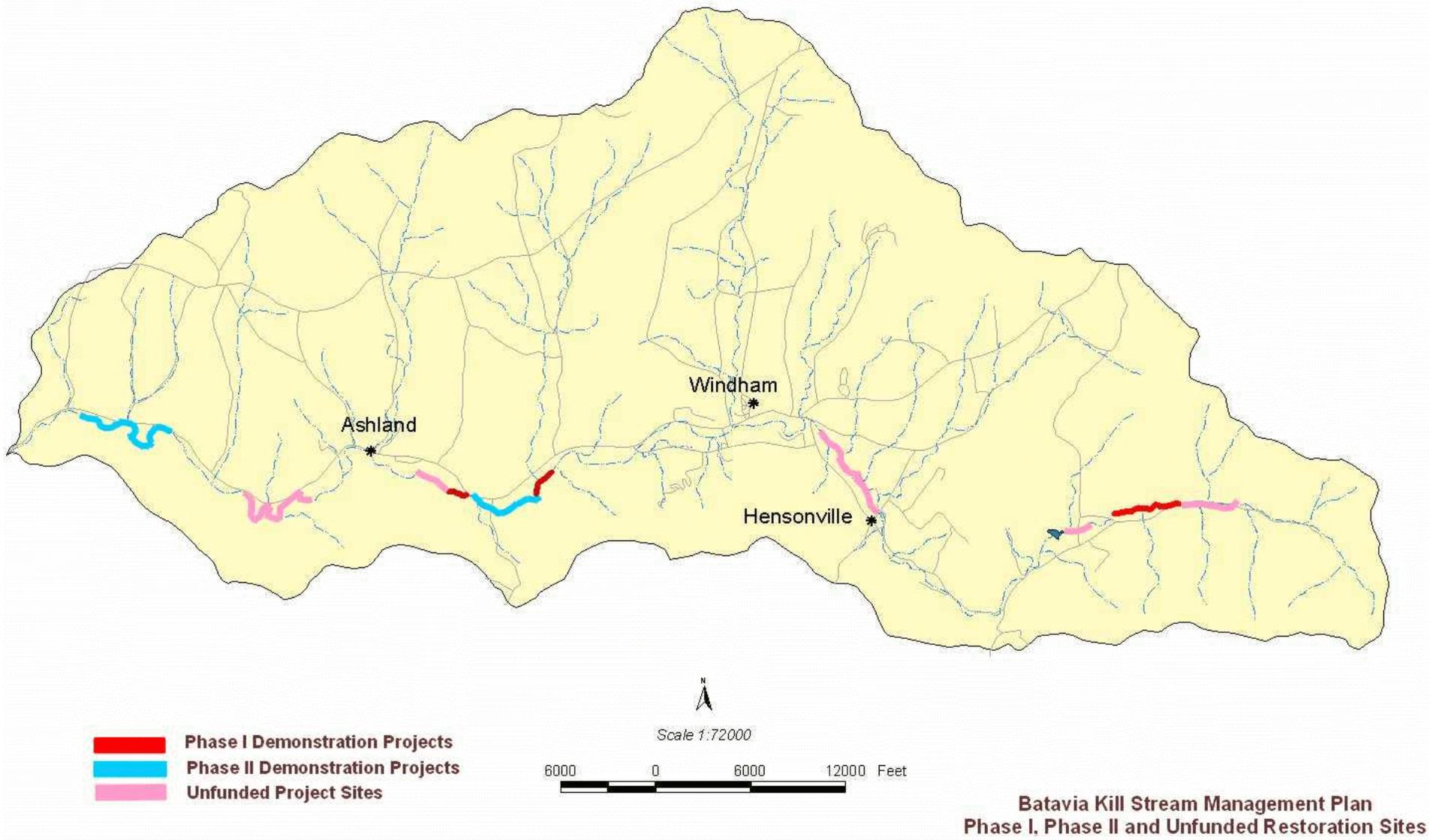
<b>NO. SC - 03</b>			
<b>Recommendation</b>	The Town and County Highway Departments, NYSDOT, and landowners, should integrate natural channel principles in all new projects and routine maintenance activities related to the Batavia Kill stream system.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	Greene County Municipalities Federal Highway Admin FEMA NYS-CHIP	<b>Task Partners</b>	Greene County Local Municipalities NYCDEP NYSDEC ACOE Landowners
<b>Estimated Cost</b>	Varies by project	<b>Schedule</b>	on-going
<b>Notes</b>	<p>Activities related to maintenance of highway infrastructure accounts for the vast majority of stream management activities. Whether it is routine maintenance, new construction, or flood response, highway departments as well as private landowners must maintain their roadways and attendant structures. The GCSWCD proposes that the goals of the highway departments and landowners are not necessarily in conflict with sound stream management. While compromise must be made at times, highway activities can greatly benefit from consideration of stream process.</p> <p>Demonstration restoration projects to date have included several infrastructure components. These projects should continue be used to promote use of NCD methods by highway departments and landowners.</p>		

<b>NO. SC - 04</b>			
<b>Recommendation</b>	Governmental landowners in the Batavia Kill watershed should manage their lands using natural channel stability concepts, and should serve as a model for other private watershed landowners.		
<b>Priority</b>		<b>Task Leader</b>	Individual owners
<b>Funding Sources</b>	Project specific	<b>Task Partners</b>	NYCDEP NYSDEC Local Municipalities Landowners
<b>Estimated Cost</b>	Project Specific	<b>Schedule</b>	undetermined
<b>Notes</b>	NYSDEC, NYCDEP, Municipalities and local Institutions (i.e. WAJ School District), should each conduct an evaluation of all riparian lands, and identify protection, restoration and management needs. The GCSWCD is aware that NYCDEP has established a funding source for such activities on city-owned lands. Protection, restoration and management recommendations as set forth in this SMP should be implemented as appropriate.		

<b>NO. SC - 05</b>			
<b>Recommendation</b>	Integrate the evaluation of stormwater impacts on stream systems in the development of community-based Stormwater Management Plans (SWMP).		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD's Watershed Assistance Program (WAP)
<b>Funding Sources</b>	CWC - Stormwater Retrofits NYSDEC - EPF ACOE - WRDA NYSDOT - Env. Benefits Municipalities	<b>Task Partners</b>	CWC NYCDEP - multiple sections NYSDEC NYSDOT Greene County Landowners
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	2003-2005
<b>Notes</b>	<p>The GCSWCD has placed a high priority on participating in the new stormwater planning program that will be administered by the CWC under the 2002 FAD. The GCSWCD Watershed Assistance Program will take the lead on developing SWMPs on a watershed basis.</p> <p>The Batavia Kill Basin will be prioritized for the first planning effort, and data from the Batavia Kill Pilot Project will be used in development of the SWMP.</p> <p>The GCSWCD intends to take an aggressive, comprehensive approach to stormwater management.</p> <p>This recommendation will be closely coordinated with recommendation SC-03.</p>		

<b>NO. SC - 06</b>			
<b>Recommendation</b>	Provide municipal highway departments and local contractors with hands-on training in various stream management activities. Conduct field days, workshops and demonstration projects to meet this goal.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYCDEP NYSDEC NYSDOT Federal Highway Admin	<b>Task Partners</b>	NYCDEP Local Municipalities Greene County Cornell Local Road Program NYS Association Highway Supers NYSDEC ACOE (regulatory)
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	2003-2006
<b>Notes</b>	The GCSWCD recommends that a comprehensive training program be developed for those entities that are actively involved in stream management activities. The training would provide information on construction methods, stream stabilization "tools" (i.e. rock structures), etc. Workshops must promote hands-on or site-based training.		

<b>NO. SC - 07</b>			
<b>Recommendation</b>	Secure funding commitments for additional unfunded restoration projects on the Batavia Kill as discussed in individual management segments (Section VI).		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP/GCSWCD
<b>Funding Sources</b>	NYCDEP NYSDEC ACOE USEPA Municipalities Landowners	<b>Task Partners</b>	NYSDEC ACOE Landowners others
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	not determined
<b>Notes</b>	<p>In Section VI of this SMP, the GCSWCD identified a number of reaches that are strongly recommended for restoration. At this time, Batavia Kill Phase II funds will address how many of these reaches, but five others are unfunded at this time. The GCSWCD recommends additional restoration in the following segments. They are not presented in any order of priority. <b>All segments are represented in the attached map.</b></p> <p>Reach 1b - MacGlashen Reach 1d - Above C.D.Lane Park Reach 3a - Hensonville Reach 4e - Kastansis Reach 4g - Holden</p>		



## VIII- E Water Quality Protection

In the Batavia Kill watershed, the protection of water quality must be recognized as having benefits to local stakeholders as well as NY City. While City residents may rely on the Batavia Kill's runoff to meet their drinking water needs, it is also a critical resource to local communities. Maintaining high water quality in the Batavia Kill and its tributaries is important to recreational activities, drinking water, and ecological health of the stream system. Since 1990, the GCSWCD has played some role in each of the many watershed programs that have been set up between NYC and upstate interests. During this period, the GCSWCD has facilitated the Watershed Agricultural Program, Watershed Forestry Program, CWC Septic Rehabilitation and Repair program, and the CWC Stormwater Retrofits program. During the Batavia Kill Phase I program, the GCSWCD identified a number of opportunities to protect and enhance water quality in the Batavia Kill by further coordination of these and other programs.



<b>NO. WQ - 01</b>			
<b>Recommendation</b>	Watershed communities should develop and implement comprehensive stormwater management plans that will protect water quality as well as reduce impacts on stream morphology.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	CWC - Stormwater Grants NYSDOS - Planning Grants NYC DEP Batavia Kill funds	<b>Task Partners</b>	Local Municipalities CWC NYCDEP NYSDEC NYSDOT GC Highway GC Planning
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	As soon as program guidelines are in place
<b>Notes</b>	The GCSWCD intends to work on behalf of all watershed municipalities to complete watershed-based Stormwater Management Plans. The project will be under the leadership of th GCSWCD Watershed Assistance Program.  The GCSWCD will integrate SWMP with Batavia Kill SMP.		

<b>NO. WQ - 02</b>			
<b>Recommendation</b>	The GCSWCD should continue to facilitate participation in the Watershed Agricultural Program.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	Watershed Ag Program	<b>Task Partners</b>	WAP NRCS
<b>Estimated Cost</b>	varies by project	<b>Schedule</b>	2003-2006
<b>Notes</b>	<p>The GCSWCD should continue to provide administrative support and technical assistance to implement Whole Farm Plans for farmers in the Batavia Kill watershed. Additional practices are scheduled for Valley View farm and others.</p> <p>The GCSWCD recommends that WAP revisit the Whole Farm Plans for all Batavia Kill farmers to evaluate riparian buffer issues, erosion sources and stream instability. The Schoharie Basin is scheduled for TMDL development for turbidity, and all farms should be re-evaluated for their contribution to turbidity.</p>		

<b>NO. WQ - 03</b>			
<b>Recommendation</b>	Continue to mitigate erosion and sedimentation impacts by supporting the GCSWCD Critical Area Seeding Program.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD-WAP
<b>Funding Sources</b>	CWC NYCDEP NYSDEC	<b>Task Partners</b>	CWC NYCDEP NYSDEC Local Municipalities
<b>Estimated Cost</b>	\$200,000/year	<b>Schedule</b>	on-going
<b>Notes</b>	To increase the benefits of the program, the GCSWCD requires additional funding. The GCSWCD proposes funding a seasonal crew dedicated to implementing seeding projects. Program should continue to be integrated with local highway department maintenance activities.		

<b>NO. WQ - 04</b>			
<b>Recommendation</b>	Riparian landowners should be encouraged to participate in CWC sponsored program to test and repair failing septic systems.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD-WAP
<b>Funding Sources</b>	CWC - Septic Program	<b>Task Partners</b>	CWC
<b>Estimated Cost</b>	undetermined	<b>Schedule</b>	when program opens again
<b>Notes</b>	CWC Septic Rehabilitation and Repair Program is currently closed to Batavia Kill watershed residents. In Phase II, the CWC will focus on all systems close to streams. The GCSWCD will track program availability and promote participation.		

<b>NO. WQ - 05</b>			
<b>Recommendation</b>	The Town of Windham should develop a Wellhead Protection Plan to ensure high water quality in their municipal water system.		
<b>Priority</b>		<b>Task Leader</b>	Town of Windham
<b>Funding Sources</b>	NYSDOS - Planning Grants NYSDEC - NPS Grants Town of Windham	<b>Task Partners</b>	GCSWCD NYCDEP NYSDEC NYSDOH Landowners
<b>Estimated Cost</b>	\$10,000 estimated	<b>Schedule</b>	Town to determine
<b>Notes</b>	The GCSWCD recommends that the Town of Windham address long term protection of their water supply by developing a wellhead protection plan, such a plan should consider conservation easements as a tool in keeping critical lands undeveloped. Any activities associated with protection of wellheads will have a benefit to the Batavia Kill also. The Town may be able to obtain grant funds from various sources to complete this task.		

<b>NO. WQ - 06</b>			
<b>Recommendation</b>	Watershed municipalities should use winter road abrasives that contain minimal silt and clay.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD-WAP
<b>Funding Sources</b>	Municipalities CWC NYCDEP NYSDEC	<b>Task Partners</b>	CWC NYSDEC NYCDEP
<b>Estimated Cost</b>	undetermined	<b>Schedule</b>	2004-2006
<b>Notes</b>	The use of winter road abrasive materials that contain a high silt/clay component can have a direct impact on water quality. Municipalities should be encouraged to use washed sand materials. Cost share funding may be needed to provide incentive to use more highly priced materials.		

<b>NO. WQ - 07</b>			
<b>Recommendation</b>	Watershed landowners should be encouraged to participate in WFP when conducting timber harvesting.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD-WAP
<b>Funding Sources</b>	NYSDEC WFP USFS	<b>Task Partners</b>	WFP CFA NYSDEC Landowners
<b>Estimated Cost</b>		<b>Schedule</b>	
<b>Notes</b>	The WAP offers a number of services to watershed landowners. The GCSWCD-WAP will assist the WFP in promoting the WFP to watershed landowners.		

<b>NO. WQ - 08</b>			
<b>Recommendation</b>		The GCSWCD-WAP should maximize participation in the CWC Stormwater Retrofits Grant Program by providing technical assistance and sponsoring projects in the watershed.	
<b>Priority</b>		<b>Task Leader</b>	GCSWCD-WAP
<b>Funding Sources</b>		<b>Task Partners</b>	NYCDEP NYSDEC NYSDOH USEPA CWC Landowners Local Municipalities
<b>Estimated Cost</b>		<b>Schedule</b>	2002-2006
<b>Notes</b>		<p>The GCSWCD has been actively seeking CWC Stormwater Retrofit Program funds for implementation of water quality projects in the Batavia Kill watershed. One project has been funded, two applications are pending, and the GCSWCD has prioritized several other projects. A summary of priority projects is listed below:</p> <ol style="list-style-type: none"> <li>1. Project Funded Windham Mill Race Project - Town of Windham sponsor</li> <li>2. Applications Pending County Route 56 Drainage Project County Route 41 Drainage Project</li> <li>3. Projects Currently Under Development Windham Mountain Stormwater Wetland Project Greene County Stormwater Facility Maintenance Program C.D.Lane Park Stormwater Drainage Project</li> </ol>	

<b>NO. WQ - 09</b>			
<b>Recommendation</b>		The GCSWCD and its partners should continue to facilitate implementation of stream restoration projects which will reduce impacts from turbidity and TSS.	
<b>Priority</b>		<b>Task Leader</b>	GCSWCD/NYCDEP
<b>Funding Sources</b>		<b>Task Partners</b>	NYSDEC Landowners ACOE USFWS Landowners
<b>Estimated Cost</b>		<b>Schedule</b>	2005-2010 2003-2010?
<b>Notes</b>		The GCSWCD has identified a number of reaches that require restoration. While clay exposures are not readily apparent at all sites, GCSWCD experience has been that the entire corridor is underlain by glacial clays at a shallow depth.	

## VIII- F Public Enjoyment

Historically, the Catskills have been a draw for the wide range of recreational activities they provide. Hiking, camping, fishing, skiing and family vacations at the former great resorts have all drawn people from the surrounding metropolitan areas. While time has not been kind to the tourism industry in the Catskills, the GCSWCD has seen hope in the new emphasis on “eco-tourism.” While the Batavia Kill watershed has much to offer its visitors, the GCSWCD would propose several recommendations that could enhance public use and enjoyment of the stream system.

<b>NO. PE - 01</b>			
<b>Recommendation</b>	Public access for fishing should be increased along the Batavia Kill stream corridor as habitat is improved with restorations and enhanced buffers..		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC/NYCDEP
<b>Funding Sources</b>	NYSDEC NYCDEP other grants	<b>Task Partners</b>	GCSWCD Local Municipalities Trout Unlimited Landowners
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	on-going
<b>Notes</b>	At the present time, there are limited areas open to public fishing. NYSDEC has acquired access near CR 17, and the C.D.Lane park facility is stocked. Land acquisition activities by NYCDEP have resulted in additional streamside lands being available for fishing. Access improvements should be coordinated with local resorts and opportunities for fisheries access should be considered during stream restoration projects.		

<b>NO. PE - 02</b>			
<b>Recommendation</b>	Develop an annual festival celebrating the stream and other natural resources of the Batavia Kill Watershed.		
<b>Priority</b>		<b>Task Leader</b>	Undetermined
<b>Funding Sources</b>	Undetermined	<b>Task Partners</b>	Local chamber of commerce Local Municipalities GCSWCD
<b>Estimated Cost</b>	Not determined	<b>Schedule</b>	
<b>Notes</b>	Theme-based festivals can be effective ways to promote public stewardship and use of stream systems. A stream festival could include a number of activities that would provide an economic benefit as well as increase public awareness of recreational opportunities.		

<b>NO. PE - 03</b>			
<b>Recommendation</b>		Investigate opportunities to develop multi-use, low impact trail systems along the stream corridor.	
<b>Priority</b>		<b>Task Leader</b>	Local Municipalities
<b>Funding Sources</b>		<b>Task Partners</b>	GCSWCD NYCDEP GC Promotion Dept. Local Chambers of Commerce Landowners Resort owners Catskill Center
<b>Estimated Cost</b>		<b>Schedule</b>	not determined
<b>Notes</b>		<p>Trails for hiking, biking, cross country skiing and snowshoeing can provide multiple benefits, including drawing visitors to local resorts and increasing user awareness of stream management issues. Trails should be integrated with interpretive signage.</p> <p>In 2001, a survey conducted by the Windham Chamber of Commerce identified development of a trail system and picnic areas along the Batavia Kill as a priority interest.</p> <p>Trail development efforts must be addressed as a cooperative effort of multiple municipalities and on the watershed scale. Trail systems should be integrated with the NYSDEC trail system.</p> <p>NYCDEP should evaluate their decision making process in regard to recreational uses of acquisition lands. Low impact, passive trail use will not impact water quality, and in fact may provide long term benefits through increased public awareness.</p>	

<b>NO. PE - 04</b>			
<b>Recommendation</b>		Feasibility of developing a fishing-based tourism business should be studied, including an economic analysis and review of resource limitations/needs.	
<b>Priority</b>		<b>Task Leader</b>	GC Planning Dept GC Promotions Dept
<b>Funding Sources</b>		<b>Task Partners</b>	GCSWCD NYCDEP NYSDEC NYS Local business owners Local municipalities Landowners
<b>Estimated Cost</b>		<b>Schedule</b>	not determined
<b>Notes</b>		<p>Studies of fisheries-based tourism in the lower Catskills have found these activities to have a significant benefit to the local economy. The GCSWCD recommends funding of a study to evaluate the potential to enhance fishing-based tourism on the Batavia Kill, as well as the overall Schoharie Basin. Such a study should address stream conditions, resource limitations, and the status of support industries such as tackle shops.</p>	

## VIII- G. Fisheries Habitat

Historically, the Batavia Kill was a thriving trout stream and popular stream to fish. While some still fish the Batavia Kill, it has become less popular. The decline in use of the stream for fishing reflects the decline of the trout population, which in turn reflects some immeasurable but cumulative decline in the stream's water quality and loss of various aspects of important habitats. These types of losses can include blockages of fish from their entry to large tributaries by dams or culverts placed too high, the loss of spawning habitats from stream overwidening, or the heating of the stream from lack of vegetative cover.



The GCSWCD believes that the Batavia Kill is on the road to recovery in large part because of the focus that is now brought to bear on the stream through this SMP and through the restoration projects in the watershed. Most importantly, the implementation of the collective recommendations in Section VIII of this Plan should reestablish the once thriving fishery.

<b>NO. FH - 01</b>			
<b>Recommendation</b>	NYSDEC should complete their evaluation of water withdrawal impacts from snow making, and develop formal guidance for stream managers.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC
<b>Funding Sources</b>	NYSDEC	<b>Task Partners</b>	GCSWCD NYCDEP Trout Unlimited/Other NGO's
<b>Estimated Cost</b>	not determined	<b>Schedule</b>	
<b>Notes</b>	<p>For many years, NYSDEC has been evaluating the fisheries impact of water withdrawals for snow making and other activities. The GCSWCD recommends that formal guidance is needed on this importance issue.</p> <p>The GCSWCD also recommends that NYSDEC expand their investigations to include evaluation of summer low flow impacts on fisheries.</p>		

<b>NO. FH - 02</b>			
<b>Recommendation</b>	The GCSWCD should continue to support the NYCDEP/USGS effort to evaluate fisheries benefits associated with restoration projects.		
<b>Priority</b>		<b>Task Leader</b>	USGS/NYCDEP
<b>Funding Sources</b>	NYCDEP	<b>Task Partners</b>	GCSWCD
<b>Estimated Cost</b>	unknown	<b>Schedule</b>	on-going
<b>Notes</b>	The GCSWCD should continue to provide technical support to assist the USGS and NYC DEP in conducting post-construction monitoring of fisheries habitat conditions at restoration project sites. Monitoring will confirm to benefit fisheries.		

<b>NO. FH - 03</b>			
<b>Recommendation</b>	The GCSWCD, NYCDEP, USGS and NYSDEC should evaluate the need for completing a detailed fisheries habitat assessment on the Batavia Kill and specifically identify if there are manageable efforts (including a thermal study or the identification of cold water springs) that could be undertaken by volunteers through Trout Unlimited or the Greene County Federation of Sportsmen.		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP
<b>Funding Sources</b>	NYCDEP USGS Trout Unlimited - grants	<b>Task Partners</b>	GCSWCD USGS NYSDEC Trout Unlimited GC Federation of Sportsmen
<b>Estimated Cost</b>	unknown	<b>Schedule</b>	to be determined
<b>Notes</b>	Phase I of the Batavia Kill did not include a detailed assessment of fisheries habitat conditions. More detailed recommendations regarding habitat improvement activities will require additional data on existing conditions		

<b>NO. FH - 04</b>			
<b>Recommendation</b>	Implement fisheries habitat improvement projects as may be identified by Trout Unlimited, NYSDEC, NYCDEP and others.		
<b>Priority</b>		<b>Task Leader</b>	GCSWCD
<b>Funding Sources</b>	NYSDEC NYCDEP Trout Unlimited - EAS grants USFWS - PFW Program	<b>Task Partners</b>	NYCDEP Trout Unlimited NYSDEC landowners / Sportsman's Clubs
<b>Estimated Cost</b>		<b>Schedule</b>	to be determined
<b>Notes</b>	Any number of fisheries habitat enhancement practices can be implemented. Examples include riparian buffer establishment or construction of cross vanes to promote pool structure in reaches that are otherwise stable but lack holding areas. Cross vanes would replace the past practice of constructing K-dam pool diggers.		

## VIII- H. Programmatic Resources

It is unlikely that any other watershed in the country has been the subject of the detailed level of watershed management activities that are ongoing in the Catskill Mountains, which serve as the drinking water supply for the City of New York. In a short period of time, an amazing effort to advance water quality protection on multiple fronts has been implemented. In the seven years since the historic watershed MOA, a comprehensive program focused on stream restoration, septic system replacements, stormwater projects, farm and management, community planning, and municipal waste water system development has been undertaken and is making excellent progress.



To further coordinate and institutionalize the stream management planning efforts in the Batavia Kill watershed and the entire NYC Watershed, the GCSWCD recommends the following be undertaken:

<b>NO. PR-01</b>			
<b>Recommendation</b>	NYSDEC should develop a Technical and Operational Guidance Series (TOGs) to guide reviews of permit applications for stream disturbance activities.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC
<b>Funding Sources</b>	No funding required	<b>Task Partners</b>	NYCDEP Local SWCD's Others
<b>Estimated Cost</b>	N/A	<b>Schedule</b>	not determined
<b>Notes</b>	The GCSWCD recommends that NYSDEC develop TOGs for stream disturbance/restoration projects that will provide comprehensive and consistent guidance on the review of projects, and the expectations from the applicants. The GCSWCD feels that a TOGs on stream management would help guide applicants to develop better projects. In addition, the TOGs should also apply to NYSDEC management of state riparian lands.		

<b>NO. PR-02</b>			
<b>Recommendation</b>	Promote the formation of a “Batavia Kill Watershed Association” that can represent the diverse interests of watershed stakeholders and take a proactive position on management of the stream corridor.		
<b>Priority</b>		<b>Task Leader</b>	Watershed Stakeholders

<b>Funding Sources</b>	NYCDEP Private Foundations	<b>Task Partners</b>	Local municipalities GCSWCD NYCDEP
<b>Estimated Cost</b>	\$5,000 seed money	<b>Schedule</b>	initiate 2003-2004
<b>Notes</b>			

<b>NO. PR-03</b>			
<b>Recommendation</b>	NYSDEC should coordinate review of all Article 15 (Stream Disturbance) applications/permits with GCSWCD/NYCDEP to determine if the proposed activity is consistent with this SMP.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC
<b>Funding Sources</b>	No Cost	<b>Task Partners</b>	GCSWCD NYCDEP
<b>Estimated Cost</b>	Note	<b>Schedule</b>	
<b>Notes</b>	<p>The GCSWCD recommends that NYSDEC Region 4 provide copies of all article 15 applications to GCSWCD for review. The GCSWCD must complete its review concurrent and in coordination with NYSDEC to ensure timely response to the applicants.</p> <p>This recommendation must not be seen as a judgement on current permit application review and approval. The GCSWCD feels that in order to be effective managers on the Batavia Kill, knowledge of all stream related activities is essential.</p> <p>A coordinated review by the NYSDEC/GCSWCD will provide access to a broader range of technical resources, and will facilitate coordination of management efforts on a watershed scale.</p>		

<b>NO. PR - 04</b>			
<b>Recommendation</b>	Guidelines that integrate stream form and function must be developed for use by FEMA, NYSEMO and local municipalities during periods of flood response.		
<b>Priority</b>		<b>Task Leader</b>	NYSDEC
<b>Funding Sources</b>	FEMA NYSEMO NYSDEC NYCDEP	<b>Task Partners</b>	FEMA SEMO Highway Departments GCSWCD NYCDEP GC Emergency Services Office others
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	Establish Working group 2003 first draft of guidelines 2004 Final guidelines 2005

<b>Notes</b>	<p>During periods of flood response, municipalities need information and technical support to minimize impacts on stream system stability.</p> <p>FEMA field staff should be trained in basic fluvial geomorphology concepts and use of the guidelines. These methods should be integrated to the greatest extent possible on all Public Assistance projects.</p>
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<b>NO. PR - 05</b>			
<b>Recommendation</b>	NYCDEP should facilitate a watershed wide Technical Advisory Committee that will provide for routine networking between stream managers and all interested local, state and federal interests.		
<b>Priority</b>		<b>Task Leader</b>	NYCDEP
<b>Funding Sources</b>	NYCDEP	<b>Task Partners</b>	GCSWCD NYS - DOH, DOT, DEC, DOS, SEMO ACOE NRCS Local Districts Municipalities Others
<b>Estimated Cost</b>	Undetermined, minimal	<b>Schedule</b>	2003-2006
<b>Notes</b>	With many agencies conducting activities within the watershed, the GCSWCD suggests that NYCDEP prioritize formation of a stream working group. The group should represent all agencies, as well as their various departments, who have any role in stream management. The group should meet at least quarterly.		

<b>NO. PR - 05</b>			
<b>Recommendation</b>	Watershed municipalities should evaluate their existing land use regulations and adopt provisions that will protect stream corridor resources.		
<b>Priority</b>		<b>Task Leader</b>	Local Municipalities
<b>Funding Sources</b>	NYSDOS CWC	<b>Task Partners</b>	GCSWCD NYCDEP Catskill Center GC Planning Department
<b>Estimated Cost</b>	Undetermined	<b>Schedule</b>	Undetermined
<b>Notes</b>	<p>Windham and Prattsville have recently undertaken revisions of their Comprehensive Plan as part of the NYC Infrastructure Program. Provisions that promote stream health should be implemented as presented in their plan.</p> <p>The GCSWCD recommends that the Town of Ashland seek NYSDOS planning grants to complete a comprehensive plan for their community.</p>		