

6.0 General Recommendations

While the earlier sections of this Stream Management Plan (SMP) provided reach by reach recommendations for management of the Stony Clove stream system, there are a significant number of recommendations that will be more effective if implemented on a watershed, community or even programmatic scale. These recommendations were set forth using best judgment, and attempt to think broadly and provide a framework for watershed stakeholders to refine specific actions. In the following sections, the Stony Clove SMP sets forth a fairly detailed list of recommendations related to Education and Outreach, Flood Prevention, Water Quality, Public Enjoyment, Fisheries, Riparian Buffers, Stream Management and Programmatic issues.

Recommendation Structure

In the sections that follow, recommendations include short descriptive narratives, any important background or justification data and a series of standard tables which summarize individual recommendations in each subject area. In each section, information on issues such as funding sources and partnerships represents the range of possible opportunities based on past support or knowledge of funding sources. The listing of any specific agency or group does not represent a commitment by any one entity. You will note that the priority of each recommendation has been left blank. It is the intention of the Stony Clove Project Team to complete this section of each recommendation upon the completion of an extensive public review process. The following information is provided in the recommendation tables that follow;

<i>Recommendation</i>	Narrative description of the actual recommendation
<i>Funding Source</i>	Identifies possible funding source, does not reflect commitment of any individual entity. Funding must be sought on project by project basis.
<i>Task Leader</i>	Identifies lead agency for the project. Based on typical roles of listed entities, or past involvement in similar activities. Does not represent a commitment by any individual entity to assume such a role.
<i>Task Partners</i>	Identified range of potential partners. Based on project team knowledge of programs and interests of various agencies or groups. May include other entities not specifically listed.
<i>Estimated Costs</i>	In many cases, costs are listed as undetermined. In instances when a cost is provided it represents a preliminary estimate.
<i>Schedule</i>	Schedule is to be considered tentative as best. Final schedule will depend on priorities, funding source and other factors
<i>Notes</i>	Provides supplemental information on related on-going or planned activities

6.1 Flood Protection

In the Stony Clove watershed, flooding has been a concern since the early settlement of the valley. Of course it is impossible to prevent floods, but watershed stakeholders can work proactively to reduce or prevent flooding impacts on the community. As discussed in Section 2.6, the Stony Clove is highly prone to flooding activities and historically has resulted in significant damages and the expenditure of significant resources to repair these

damages. Flood related damages and recovery expenditures strain local resources and disrupt the fragile economy of these small rural communities. The impact of floods on private property, public infrastructure and the quality of life, is one of the primary concerns of many watershed stakeholders. The recommendations of the following section represent projects both on-going and proposed initiatives which could be implemented to reduce flood impacts. The recommendations are broken into flood mapping & regulation, educations and outreach, and miscellaneous categories.

Flood Mapping and Review of Floodplain Management Regulations

Revised flood maps (Flood Insurance Rate maps, or FIRMs) for the Stony Clove have been initiated under the leadership of NYSDEC working in partnership with the NYCDEP, GCSWCD the Army Corp of Engineers and the Federal Emergency Management Agency. The new flood hazard maps will integrate the latest digital map production and presentation technologies to produce highly accurate maps which are very user-friendly. While older FIRM maps often made it difficult to locate a specific location or structure, the new FIRM maps are based on detailed aerial photography and terrain maps. This next-generation of FIRM maps are currently being prepared for the Stony Clove by the NYS DEC and will be introduced for public review prior to their adoption by the Town of Shandaken.

While accurate flood maps are a valuable planning tool, they are only effective when used in conjunction with local regulations. In the Stony Clove watershed, the Towns of Hunter and Shandaken both have local floodplain ordinances in place as a requirement for participation in the National Flood Insurance Program (NFIP). These local regulations are generally over 20 years old, and regular review of the rules helps serve both landowner and community interests. 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 to use the new maps at the local levels, in the initial stages the FIRMS will be maintained by the GCSWCD in Greene County, with paper copies provided to the local towns. In Ulster County, maintenance responsibilities for the maps are yet to be determined. DEP is currently preparing agreements with the NYS DEC to provide training for local and county planning boards, town boards, Code Enforcement Officers and other users of the maps and digital map products.

6.1.1	Digital FIRM Maps		
Recommendation	Watershed communities should support the development of digital flood maps for the Stony Clove Watershed, and actively participate in review of draft maps. The GCSWCD/UCSWCD recommends that each municipality adopt the new flood maps upon review and completion.		
Priority	High	Task Leader	NYSDEC - Flood Protection
Funding Sources	ACOE - WRDA Grant NYCDEP (project/in-kind) GCSWCD (in-kind)	Task Partners	GCSWCD NYCDEP Municipalities GC Planning Dept.
Estimated Cost	Undetermined	Schedule	Dependent on map production schedule
Notes	GCSWCD and NYSDEC have coordinated data collection and surveying assistance. 1 st draft maps due in 2005.		

6.1.2	FIRM Technical Support		
Recommendation	The GCSWCD/UCSWCD should provide technical and logistical support to the NYSDEC mapping effort as available, and support local municipalities in the use of the new FIRM maps.		
Priority	High	Task Leader	GCSWCD/UCSWCD
Funding Sources	NYCDEP Greene/Ulster County Municipalities	Task Partners	NYCDEP NYSDEC Municipalities GC/UC Planning Dept.
Estimated Cost	Not Determined	Schedule	On-going
Notes	GCSWCD and NYCDEP will review tasks and determine level of support appropriate. Additional funds will be sought as necessary to support technical assistance.		

6.1.3	Flood Ordinance Review		
Recommendation	Municipalities in the SC Watershed should conduct a review of current floodplain ordinances and adopt revisions as appropriate. Revisions should reflect current building trends, new technologies compliance and integrate broader community plans as appropriate.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	NYCDEP GCSWCD Greene County Municipalities FEMA/SEMO	Task Partners	GCSWCD/UCSWCD NYCDEP NYSDEC - Flood GC/UC Planning Dept. GC/UC Emergency Services FEMA/SEMO
Estimated Cost	Not Determined	Schedule	Start - Winter 2003 Complete Winter 2004
Notes	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.		

6.1.4	Community Rating System		
Recommendation	Watershed municipalities should evaluate participation in the FEMA Community Rating System.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	FEMA SEMO Municipalities NYSDOS Greene/Ulster County	Task Partners	GCSWCD/UCSWCD GC/UC Planning Dept. NYSDEC NYCDEP FEMA/SEMO NYS/National FPM Association
Estimated Cost	Not Determined	Schedule	On-going
Notes	Municipalities may be able to reduce flood insurance premium rates under the Community Rating System. The Municipalities are strongly encouraged to adopt a “No Rise/Good Neighbor” clause in their revised floodplain ordinance.		

Education and 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. The following summary of possible education and outreach initiatives represents only some possible programs or activities.

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. The Stony Clove Project Team recommends that a local repository for these types of publications be developed in several locations in the watershed. Local libraries in the watershed may be willing to provide shelf space for publications in accordance with NFIP standards. Annually, a notice should be published in local newspapers providing notification on the availability of the flood damage prevention library.

6.1.5	Flood Prevention Library		
Recommendation	Access to flood prevention/protection information should be established at multiple repositories in the Stony Clove watershed.		
Priority	Medium	Task Leader	GCSWCD/UCSWCD
Funding Sources	FEMA - HMGP FEMA - FMAP NYC DEP	Task Partners	Watershed Municipalities Local Libraries GC/UC Planning Departments
Estimated Cost	\$2,500	Schedule	2004-2005

<i>Notes</i>	FEMA and others make many of these publications available for free. Funding is needed to allow for person to coordinate ordering of publications, arranging a location for the flood library, and working with the municipalities to coordinate. Project would make a good summer intern project.
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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 which 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.

6.1.6	SFHA Notification		
<i>Recommendation</i>	Watershed municipalities should facilitate periodic notification to landowners who have special flood hazard areas (SFHA) located on their property.		
<i>Priority</i>	Medium	<i>Task Leader</i>	To be determined
<i>Funding Sources</i>	Municipalities Greene/Ulster County FEMA/SEMO Private Foundations	<i>Task Partners</i>	GCSWCD/UCSWCD Watershed Municipalities GC/US Planning Departments NYSDEC – floodplain SEMO/FEMA GC/US Real Property Office
<i>Estimated Cost</i>	Not Determined	<i>Schedule</i>	Dependent on funding availability
<i>Notes</i>	Recommendation cannot move forward until digital flood maps are completed. Program must integrate GIS based data base to be effective.		

6.1.7	Flood Hazard Education Sessions		
<i>Recommendation</i>	Watershed municipalities, working with local and state agencies, should support periodic training sessions on flood related issues. Audience should include municipal leaders, code enforcement staff, planning boards, landowners, realtors, lending institutions and others.		
<i>Priority</i>	High	<i>Task Leader</i>	Watershed Municipalities
<i>Funding Sources</i>	NRCS - Rehabilitation Funds Grants NYCDEP	<i>Task Partners</i>	GCSWCD/USSWCD NYCDEP NYSDEC Greene/Ulster County (various agencies) Cornell Cooperative Extension
<i>Estimated Cost</i>	Not Determined	<i>Schedule</i>	Dependent on funding availability
<i>Notes</i>	NYSDEC and NYSDOS have established education programs geared to local municipalities.		

Flood Damage Data Base

Documenting flood damages 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. Often, funding is based on a cost/benefit analysis which requires extensive documentation of past damages.

6.1.8	Flood Damage Database		
Recommendation	Watershed municipalities should facilitate development of a flood damage reporting system to track types of flooding, their location and the costs associated with flood damage.		
Priority	High	Task Leader	Local Municipalities
Funding Sources	Greene/Ulster County Watershed Municipalities FEMA-HMGP NYCDEP NYSDEC	Task Partners	GCSWCD/UCSWCD Municipalities GC/UC Planning Department GC/UC Highway Department GC/UC Emergency Services Office Landowners
Estimated Cost	Not Determined	Schedule	Dependent on funding availability
Notes	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. These plans are designed to reduce repeat flood damages within a community and can improve a community's Community Rating within the National Flood Insurance Program. As previously mentioned, improvements in the Community Rating can reduce local flood insurance rates to individuals and businesses.

6.1.9	Hazard Mitigation Plans		
Recommendation	Stony Clove watershed communities, particularly Phoenicia, are encouraged to participate in the development of a county wide All Hazards Mitigation Plan.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	FEMA - HMGP In-kind (GCSWCD/UCSWCD) In-kind GC/UC Planning In-kind GC/UC Emergency Svc NYCDEP Greene/Ulster County	Task Partners	GCSWCD/UCSWCD NYSDEC - Dam Safety SEMO/FEMA NYCDEP GC/UC Emergency Services, Planning Law enforcement, various Landowners and Others

<i>Estimated Cost</i>	\$25,000 Est.	<i>Schedule</i>	Not scheduled
<i>Notes</i>	Communities should seek FEMA/NFIP funds to under All Hazards mitigation plans.		

6.2 Public Recreation

Historically, the Catskills have been a draw for the wide range of recreational activities they provide. Hiking, camping, fishing and family vacations at the former great resorts have all drawn people from the surrounding metropolitan areas. Tourism has changed since the hay days of the grand resorts in the Catskills, and there is hope in the new emphasis on “eco-tourism.” While the Stony Clove watershed has much to offer its visitors, the SC Project Team would propose several recommendations that could enhance public use and enjoyment of the stream system.

6.2.1	Public Fishing Access		
<i>Recommendation</i>	Public access for fishing should be enhanced along the Stony Clove stream corridor. Additional public access as well as improvements to parking and access trails is representative of the type of activities which may be possible.		
<i>Priority</i>	High	<i>Task Leader</i>	NYDEC/GCSWCD/UCSWCD
<i>Funding Sources</i>	NYSDEC NYCDEP Trout Unlimited other grants	<i>Task Partners</i>	GCSWCD Local Municipalities Trout Unlimited Landowners
<i>Estimated Cost</i>	Not determined	<i>Schedule</i>	To be determined
<i>Notes</i>	The Stony Clove watershed presents multiple opportunities for enhancing public access for fishing. While there appears to be adequate overall access, by DEC owned easements as well as traditional use, the facilities for parking as well as handicapped access is limited. Town of Shandaken owned land along the Stony Clove for example may be a good location to develop a handicapped access point.		

6.2.2	Streamside Recreational Trails		
<i>Recommendation</i>	Investigate opportunities to develop multi-use, low impact trail systems along the stream corridor.		
<i>Priority</i>	High	<i>Task Leader</i>	Watershed Municipalities
<i>Funding Sources</i>	NYSDEC CWC Other grants	<i>Task Partners</i>	GCSWCD/UCSWCD NYCDEP GC/UC Promotion Dept. Local Chambers of Commerce Landowners Resort owners
<i>Estimated Cost</i>	Not determined	<i>Schedule</i>	Not determined
<i>Notes</i>	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. Trail development efforts must be addressed as a cooperative effort of multiple municipalities and on the watershed scale. Trail systems should be integrated with NYSDEC trail system. Low impact, passive trail use will not impact water quality, and in fact may provide long term benefits through increased public awareness.		

6.2.3	Economic Analysis of Fishing based Tourism – Esopus watersheds		
Recommendation	Feasibility of developing a fishing based tourism business should be studied, including an economic analysis and review of resource limitations/needs		
Priority	High	Task Leader	GC/UC Planning Dept GC/UC Promotions Dept
Funding Sources	CWC NYS Economic Development NYS I Love NY Program Foundation Grants Local Business GC/UC Promotion/tourism depts	Task Partners	GCSWCD/UCSWCD NYCDEP NYSDEC NYS Local business owners Local municipalities Landowners
Estimated Cost	Not determined	Schedule	Not determined
Notes	Studies of fisheries based tourism in the lower Catskills have found these activities to have a significant benefit to the local economy. A study should address stream conditions, resource limitations and the status of support industries such as tackle shops. This recommendation may be more appropriate in the context of a broader Esopus watershed effort.		

6.3 Water Quality

In the Stony Clove watershed, the protection of water quality must be recognized as having benefits to local stakeholders as well as New York City. While City residents may rely on the Stony Clove’s runoff to meet their drinking water needs, it is also a critical resource to local communities. Maintaining high water quality in the Stony Clove and its tributaries is important to recreational activities, drinking water and ecological health of the stream system. The following recommendations are made based upon an awareness of on-going efforts in the NYC watershed, and in some cases may require further investigations and analysis to refine the scope of any proposed activities.

6.3.1	Community Stormwater Management Plans		
Recommendation	Watershed communities should develop and implement comprehensive stormwater management plans which will protect water quality as well as reduce impacts on stream morphology.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	CWC - Stormwater Grants NYSDOS - Planning Grants NYCDEP – WQ Grants FEMA - HMGP	Task Partners	GCSWCD/UCSWCD CWC NYCDEP NYSDEC NYSDOT GC/UC Highway GC/UC Planning
Estimated Cost	Undetermined	Schedule	To be determined
Notes	The GCSWCD will address the Town of Hunter section of the watershed during the current rotation of developing plans for all watershed communities in Greene County. The tentative schedule for the Town of Hunter is 2006. DEP should work with interested partners in Ulster County on similar efforts. Watershed Municipalities should take advantage of CWC funds to complete these plans.		

6.3.2	Watershed Agricultural Program		
Recommendation	The GCSWCD/UCSWCD should continue to facilitate participation in the Watershed Agricultural Program. WAP activities should be integrated with the goals and recommendations of the Stony Clove Stream Management Plan.		
Priority	Low	Task Leader	Watershed Agricultural Council
Funding Sources	Watershed Ag Program NYS Ag & Markets	Task Partners	GCSWCD/UCSWCD WAP NRCS
Estimated Cost	Varies by project	Schedule	On-going
Notes	While there is no large scale agriculture in the watershed, there are a few small farms in the headwaters of several tributaries which may qualify for participation in the Watershed Agricultural Program Small Farms Program.		

6.3.3	Critical Area Seeding Program		
Recommendation	Local municipalities, Greene and Ulster County Highway Departments and NYSDOT, should place a priority on vegetation management on critical areas such as roadside ditches and steep slopes.		
Priority	High	Task Leader	GCSWCD (in Greene County)
Funding Sources	CWC NYCDEP NYSDEC Greene/Ulster Highway Depts Watershed Municipalities	Task Partners	GCSWCD/UCSWCD CWC NYCDEP NYSDEC Watershed Municipalities
Estimated Cost	Unknown	Schedule	On-going
Notes	The GCSWCD currently owns a hydroseeder which is available to both Greene and Ulster county communities. The GCSWCD will seek to develop an MOU with UCSWCD to allow for town of Shandaken use of the equipment. Additional funding is needed to support material and operating costs.		

6.3.4	On-site Waste Water Systems		
Recommendation	Riparian landowners should be encouraged to participate in CWC sponsored program to test and repair failing septic systems.		
Priority	High	Task Leader	CWC
Funding Sources	CWC - Septic Program	Task Partners	CWC Ulster County GCSWCD/UCSWCD Health department Watershed Municipalities SC Watershed Association
Estimated Cost	Undetermined	Schedule	When program opens again
Notes	(a) The CWC Septic Replacement, Rehabilitation and Repair Program has recently been expanded beyond the 60 day travel period waterbodies, and is now available to SC landowners who have septic systems located close to the stream. (b) Landowners should also be provided ready access to information on management of their septic systems. Development of a guide book, and perhaps a printed file folder to hold cleaning/repair records should also be investigated.		

6.3.5	Road Abrasives Program		
Recommendation	Watershed municipalities should evaluate winter road abrasive procedures to address abrasive quality, application methods and spring sweeping.		
Priority	Low	Task Leader	Municipalities
Funding Sources	Municipalities CWC NYCDEP NYSDEC	Task Partners	CWC NYSDEC NYCDEP GCSWCD/UCSWCD GC/UC Highway Departments NYS DOT
Estimated Cost	Undetermined	Schedule	Undetermined
Notes	<p>(a) Winter road abrasive materials containing high silt/clay content can have a direct impact on water quality. Municipalities should be encouraged to use high quality washed sand materials. Cost share funding may be needed to provide incentive to use more highly priced materials.</p> <p>(2) In 2004, the CWC funded acquisition of a vacuum truck for Greene County Highway which will be available to Greene County municipalities, including the Town of Hunter.</p>		

6.3.6	Watershed Forestry Programs		
Recommendation	Watershed landowners should be encouraged to participate in the Watershed Forestry Program when conducting timber harvesting and other forest management activities.		
Priority	High	Task Leader	Watershed Forestry Program
Funding Sources	NYSDEC WFP USFS	Task Partners	GCSWCD/UCSWCD CFA NYSDEC Landowners
Estimated Cost	Determined on case by case basis	Schedule	On-going
Notes	The Watershed Forestry Program offers a number of services to watershed landowners. The GCSWCD-WAP will assist the WFP in promoting the WFP to watershed landowners in the Town of Hunter.		

6.3.7	Stormwater Retrofits		
Recommendation	Watershed Municipalities should participate in the CWC Stormwater Retrofits Grant Program to address stormwater quality issues.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	CWC ACOE NYSDEC USFWS others	Task Partners	NYCDEP NYSDEC NYSDOH USEPA CWC Landowners Local Municipalities GCSWCD/UCSWCD
Estimated Cost	Project Specific	Schedule	2002-2006
Notes	Watershed communities can address water quality impacts from stormwater facilities by undertaking retrofit projects. Projects may have added benefit of addressing flooding and other issues of direct interest to the municipality.		

6.4 Education and Outreach

Increasing public awareness about the importance of the Stony Clove watershed is critical to the success of this SMP. The willingness of watershed stakeholders 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 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 SMP has identified several areas where local audiences would benefit from technical or awareness training in a variety of topics. The following recommendations identify just some of the possible recommendations for public education and outreach.

Stakeholder Workshops

In the Stony Clove 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 which prize the Catskills streams for their recreational value. On the other hand, stakeholders also include a myriad of local, state and federal interests having responsibility for management and protection of community and natural resources. While the development of a detailed Education & Outreach Plan would refine target audiences, the SC Project Team has identified three primary audiences. Additional participants or sub-audience will be identified as these recommendations are moved forward.

- | | |
|-----------------|---|
| Private Parties | a. Landowners (residential and business)
b. Recreational users |
| Municipalities | a. Legislative Bodies (town boards, legislature etc.)
b. Planning Board and Code Enforcement Office
c. Highway Department |
| Business Sector | a. Realtors/Bankers/Insurance Agents
b. Developers & Contractors
c. Contractors |

While a planning team will develop the specific details of the workshop program, the Stony Clove SMP 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 for the promotion of a healthy stream. Sessions should provide landowners with training in effective stream protection actions for 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 the multiple benefits which can be realized by protecting stream and watershed health. Field tours highlighting issues and specific problems with municipal leaders can provide an excellent forum for exchange between the leaders, the public and the resource managers.

3. Planning Boards & Code Enforcement Personnel - Stream awareness sessions should be targeted at this important group of local decision makers. Planning boards have a significant ability to effect change in land use practices which may impact stream health. Likewise, they have a wealth of experience from their reviews to share with the resource managers. 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. Their input to the resource managers will help direct the manager toward the most practical solutions.

4. Local/County/State Highway Department - This group has the most direct ability to impact stream health. Day to day activities in the maintenance of the road systems and other public infrastructure frequently involves local waterways, and often actions which may seem harmless can create extreme instability problems that grow in size by moving up or downstream and become very costly to repair. This group of stakeholders 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. This training would not be a substitution for highways departments seeking technical advice from experienced stream managers on a case by case basis, but would help.

5. Banks/Realtors/Insurance - Many landowner inquiries involve floodplains and the flood insurance program. 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 to 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.

This list is not inclusive of all possible audiences and/or workshop topics. An Education and Outreach working group is suggested as a vehicle to develop a detailed strategy for conducting workshops in the Stony Clove watershed. Many of these workshops will be more effective if conducted over a broader area such as the entire Esopus basin.

6.4.1	Education and Outreach Working Group		
Recommendation	The GCSWCD will facilitate the formation of an Education & Outreach working group to develop a detailed E&O strategy which would address the number, type, subjects, instructors, logistics and other details of conducting stakeholders workshops.		
Priority	High	Task Leader	To be determined
Funding Sources	NYCDEP (project/in-kind) Grants CWC NYSDEC NYSDOS	Task Partners	GCSWCD/UCSWCD NYCDEP Watershed Municipalities GC/UC Planning Dept. Catskill Center NYSDEC NYSDOS Stony Clove Watershed Association Others
Estimated Cost	Unknown	Schedule	1. E&O Working group established by spring 2005 2. Initiate 1 st round of workshops in 2005.
Notes	A priority focus should be placed on landowners, municipal leaders and local planners. E&O efforts should integrate the Stony Clove Watershed Association as a resource for watershed landowners.		

EDUCATIONAL RESOURCES

In addition to organized workshops and on-going school based programs, watershed stakeholders should have ready access to timely and accurate information on stream management issues. Educational resources may include access to Stony Clove geomorphic data for engineers and project designers, or landowner access to guidelines and other technical documents.

6.4.2	Web Based Outreach		
Recommendation	Develop a watershed web site provide information to watershed stakeholders. Upgrade site to allow landowners interaction such as reporting stream changes, problems etc.		
Priority	High	Task Leader	GCSWCD/UCSWCD
Funding Sources	NYCDEP NYSDEC CWC other grants	Task Partners	GCSWCD/UCSWCD NYCDEP GC/UC CCE Others
Estimated Cost	Not determined	Schedule	On-going
Notes	The GCSWCD proposes that the internet can be an effective resource for watershed stakeholders. The site should provide access to publications and project updates.		

6.4.3	News Media Outreach		
Recommendation	Stream managers in the Catskills should work cooperatively to develop a series of columns for publication in watershed newspapers.		
Priority	Medium	Task Leader	To be determined
Funding Sources	Not applicable	Task Partners	GCSWCD NYCDEP
Estimated Cost	No cost, use existing staff	Schedule	Initiate fall 2004
Notes	Existing staff at watershed SWCDs, NYCDEP and other programs could contribute to a column that would be distributed under an established banner. Goal is to develop an identity for the information source. Columns can address general concepts, but should also provide timely updates on floods, program activities, etc.		

6.4.4	Stream Management Publications		
Recommendation	Develop a series of publications focused on stream management which can be provided to watershed stakeholders and/or used in training workshops		
Priority	High	Task Leader	NYCDEP - SMP
Funding Sources	CWC Educational Grants NYCDEP/NYSDEC Other Grants	Task Partners	GCSWCD/UCSWCD Catskill Center CWC GC/UC CCE Others
Estimated Cost	Not determined	Schedule	Unknown
Notes	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. Publications may include existing work as well as resources developed for the broader NYC watershed area.		

6.4.5	Watershed Health Reports		
Recommendation	Annually, publish a "Watershed Health" report that can be distributed to stakeholders. The report will present updates on stream restoration projects, results of monitoring efforts and other relevant information.		
Priority	High	Task Leader	NYCDEP-SMP
Funding Sources	CWC NYCDEP NYSDEC Other Grants	Task Partners	GCSWCD/UCSWCD Catskill Center NYSDEC NYSDOS USEPA CWC Others
Estimated Cost	\$5,000 annually	Schedule	Initiate 2005
Notes	NYCDEP should continue to work with watershed stakeholders and develop annual reports on a subbasin basis.		

6.5 Programmatic Approaches

It is unlikely that any other watershed in the country has been the subject of the detailed level of watershed management that is ongoing in the Catskill Mountain watersheds of the City of New York water supply. Since its inception in 1997, this comprehensive effort to advance water quality protection has achieved significant success. In the six years since the historic watershed MOA, a comprehensive program focused on stream restoration, septic system replacements, stormwater projects, farm management, community planning, and municipal waste water system development, has been initiated and is making excellent progress.

To provide further coordination and to move forward with implementation of the Stony Clove Stream Management Plan, a number of programmatic recommendations are presented. In most cases, the Stony Clove Project Team proposes that these issues be addressed on a major watershed basis (i.e. Schoharie, Esopus etc). Given the number of recommendations, the diversity of interests and the magnitude of the effort required, mobilization of the public and coordination of the agencies/interest groups is necessary to avoid conflict and redundancy. Recommendations are also provided to assist landowners and municipalities with stream related problems, especially to provide guidance through the permitting process and during the planning phase of stream related construction projects.

6.5.1	Watershed Association		
<i>Recommendation</i>	Promote the continuing efforts of the Stony Clove Watershed Association.		
<i>Priority</i>	High	<i>Task Leader</i>	Watershed Stakeholders
<i>Funding Sources</i>	NYCDEP Private Foundations	<i>Task Partners</i>	Watershed Municipalities GCSWCD/UCSWCD NYCDEP
<i>Estimated Cost</i>	\$5,000 seed money	<i>Schedule</i>	On-going
<i>Notes</i>	The SC Watershed Association has been organizing in 2002-2003. The WA can represent the diverse interests of watershed stakeholders and take a proactive position on management of the stream corridor. They can take an investigative role in monitoring the source of problems in the watershed, and coordinating neighborhoods in response to concerns, or organizing volunteers for a variety of efforts.		

6.5.2	Technical Advisory Committee		
<i>Recommendation</i>	NYCDEP should facilitate a watershed wide Technical Advisory Committee (TAC) to provide for routine networking between stream managers and interested local, state and federal parties. The TAC would work with the Watershed Association and the Project Advisory Committee (PAC)		
<i>Priority</i>	High	<i>Task Leader</i>	NYCDEP

Funding Sources	NYCDEP	Task Partners	GCSWCD/UCSWCD NYS - DOH, DOT, DEC, DOS, SEMO GC/UC Planning Departments GC/UC Highway Departments ACOE NRCS Local Districts Municipalities Others
Estimated Cost	Undetermined, minimal	Schedule	2003-2006
Notes	With many local, state and federal agencies conducting activities within the watershed, a technical stream working group would provide an effective vehicle for networking between the groups as well as to address technical issues related to the stream management plans, restoration projects and stream maintenance activities. 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 .		

6.5.3	Stream Permitting Activities		
Recommendation	NYSDEC, USACOE and other regulators should review permit applications for consistency with the recommendations presented in the Stony Clove Stream Management Plan. The SWCDs could also advise municipalities and the public on the permit process in an effort to improve projects and minimize public hardships/discontent.		
Priority		Task Leader	NYSDEC/ACOE
Funding Sources	Minimal added cost for copying SWCD's with permit applications	Task Partners	GCSWCD/UCSWCD NYCDEP
Estimated Cost	Note	Schedule	ASAP
Notes	Development of the stream corridor management plans in the NYC watershed has resulted in a significant commitment to staff training and stream condition assessment. To insure the SMP will be effective, NYSDEC and the ACOE should provide local SWCD's (or other local stream managers) the opportunity to review and comment on permit applications. The local SWCD's would complete a review concurrent and in coordination with NYSDEC to ensure timely response to the applicants. A coordinated review by the NYSDEC/OE and local watershed managers will provide access to a broader range of technical resources, and will facilitate coordination of management efforts on a watershed scale.		

6.5.4	Flood Response Technical Resources		
Recommendation	Guidelines, which integrate stream form and function, should be developed for use during post flood response.		
Priority	Very High	Task Leader	SEMO/NYSDEC/ACOE
Funding Sources	FEMA NYSEMO NYSDEC NYCDEP	Task Partners	FEMA/SEMO Local Highway Departments NYSDOT/NYSDEC Local SWCDs State & Local Emergency Services NYS Floodplain Managers Association others
Estimated Cost	Undetermined	Schedule	Establish Working group 2004 1 st draft of guidelines 2005 Final guidelines 2006

<i>Notes</i>	During periods of post-flood response, municipalities need information and technical support to minimize impacts on stream system stability. Guidelines for “repairs” of flood damaged streams and drainage systems would greatly reduce risk of further instability. While these guidelines would be appropriate at the state level, the NYC watershed may be an ideal location for development of the guidelines due to data availability (i.e. regional curves). Additionally, FEMA field staff (including reserve positions) 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 (PA) projects.
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6.5.5	Local Land Use Ordinance		
<i>Recommendation</i>	Watershed municipalities should evaluate their existing land use regulations, and adopt provisions which will protect stream corridor resources.		
<i>Priority</i>	High	<i>Task Leader</i>	Watershed Municipalities
<i>Funding Sources</i>	NYSDOS CWC	<i>Task Partners</i>	GCSWCD/UCSWCD NYCDEP NYSDEC Catskill Center GC/UC Planning Department
<i>Estimated Cost</i>	Undetermined	<i>Schedule</i>	Undetermined
<i>Notes</i>	Locally developed and managed ordinances related to land use issues are often one of the most effective methods for protection of critical stream resources. Sound management of stream corridors has a direct public benefit associated with reduced impacts on public infrastructure, improved water quality, and enhanced recreational values. In the SC watershed, both the Town of Hunter and Shandaken would benefit from integrating a strong emphasis on stream corridor management in their community comprehensive plans, site plan review laws, zoning or other appropriate local ordinances. Both communities should review the Town of Woodstock stream and wetland ordinance as a model.		

6.6 Fishery Habitat

Historically, the Stony Clove has been characterized as a thriving trout stream and a popular stream to fish. In the watershed, the Stony Clove Rod and Gun Club and others have been active fisheries managers, often undertaking their own stream stocking projects. In 2002, the GCSWCD, in conjunction with NYCDEP and the Cornell University In stream Habitat Program implemented a demonstration of a new fisheries habitat mapping procedure called MesoHABSIM. In general, while the MesoHABSIM assessment indicated a fairly good fishery, the report did note the benefits of improving woody debris management in the channel, as well as establishing and protecting effective stream cover. The recommendations below for continued monitoring and improvement in fish cover are related to other recommendations in this section that emphasize riparian buffers and storm water protection measures. Continued monitoring will provide a measure of the success of these initiatives in terms of the fishery.

6.6.1	Restoration Project Fisheries Monitoring		
<i>Recommendation</i>	The GCSWCD should continue to support the NYCDEP/USGS effort to evaluate fisheries benefits associated with restoration projects.		
<i>Priority</i>	Medium	<i>Task Leader</i>	USGS/NYCDEP/DEC
<i>Funding Sources</i>	NYCDEP	<i>Task Partners</i>	GCSWCD

<i>Estimated Cost</i>	Unknown	<i>Schedule</i>	On-going
<i>Notes</i>	The GCSWCD should continue to provide technical support to assist the USGS and NYCDEP in conducting post-construction monitoring of fisheries habitat conditions at restoration project sites. Monitoring will confirm fisheries benefits. USGS/DEC/DEP should build local capacity to monitor aspects of these projects and fisheries in the remainder watershed		

6.6.2	Habitat Improvement Projects		
<i>Recommendation</i>	Stream Managers should continue to review, and to the extent possible, implement specific recommendations as set forth in the Stony Clove MesoHABSIM Final Report.		
<i>Priority</i>	High	<i>Task Leader</i>	To be determined
<i>Funding Sources</i>	NYSDEC NYCDEP Trout Unlimited - EAS grants USFWS - PFW Program	<i>Task Partners</i>	NYCDEP GCSWCD/UCSWCD Trout Unlimited NYSDEC Stony Clove Rod & Gun Club Landowners Sportsman Others
<i>Estimated Cost</i>	Unknown	<i>Schedule</i>	To be determined
<i>Notes</i>	The MesoHABSIM project noted the need for better woody debris management as well as improved stream cover. These recommendations should continue to be refined at the reach scale.		

6.7 Riparian Zone Management

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 stream water temperatures. As noted previously in this SMP, overall riparian condition along the Stony Clove would benefit for enhanced protection and management in many sections of the stream corridor. While some riparian vegetation is present throughout most of the stream corridor, often the size and structure of the buffer (buffer width, plant density, plant size distribution and diversity of plant species) is inadequate to ensure long term protection of the stream. As such, the Stony Clove SMP has developed a series of recommendations regarding riparian buffers. These recommendations address preservation/protection of buffers, establishment or enhancement of buffers and control of invasive species.

On numerous occasions, local stream managers have observed everyday activities carried out by private landowners that may damage their riparian area and lead to stability problems in the future. These landowners may not be aware of the potential impacts of their actions. In fact, the Stony Clove project team has found that landowners often feel that these activities actually may benefit stream health. This accentuates the need for increased awareness of the role riparian vegetation in stream health. The following activities, while not inclusive of all potential impacts, addresses the predominate concerns noted by the Stony Clove project team.

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. The lack of the taller woody cover also makes it difficult to maintain the cooler stream temperatures vital to trout survival.

In general, stream side landowners should make every attempt to maintain a diverse and healthy buffer of at least 50' along the entire corridor. In the lower, flatter sections of the watershed, minimum buffer width should be increased to at a desired minimum of 100'. In these buffer areas, make every attempt to maintain the naturally occurring vegetation as it is best adapted to local climate conditions. Native plants also require less maintenance and have a better natural reproduction rate. Landowners are advised to be selective in their management of riparian vegetation. Significant gains in buffer restoration and stream stability may be made by limiting mowing and practicing selective pruning of trees and shrubs.

Yard Waste Disposal - Frequently, landowners favor the riparian zone for disposal of their yard waste. Grass clipping, 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. Corridor assessments have shown that debris piles are more likely to suppress vegetative growth and in fact reduce streambank stability. The dense piles of woody cuttings “smother” all living vegetation. While the debris may provide surface 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 spread out 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. Watershed municipalities may want to investigate the feasibility of developing a public composting facility in the watershed area for safe disposal of these materials.

Streamside Access - The Stony Clove Project Team 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” has been observed to concentrate surface runoff resulting in localized gully erosion. Often, this condition continues to worsen over time, with the gully getting deeper and the stream-side vegetation being undermined. The instability generally continues to worsen, eventually expanding from a localized problem to a broader impact on the buffer zone. The project team 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 Stony Clove Project Team. These recommendations address education, review of buffer impacts and potential revised or new regulations which would focus on protecting riparian vegetation.

6.7.1	Technical Resources		
Recommendation	Provide streamside landowners and others detailed technical information on the establishment and maintenance of riparian buffers.		
Priority	High	Task Leader	NYCDEP
Funding Sources	NYCDEP NYSDEC other grants WFP TNC	Task Partners	NYCDEP GCSWCD/UCSWCD Catskill Center Cooperative Extension Watershed Forestry Program Catskill Forest Owners Assoc SC Watershed Association
Estimated Cost	Undetermined	Schedule	Start sessions fall 2003
Notes	To promote effective buffer management, detailed technical information on vegetation management (mowing, pruning), planting methods, plant selection and other topics is essential. Landowners will benefit from a series of fact sheets which present this information in a clear and concise manner. 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." Access to local technical resources will help landowners evaluate their property and develop site specific recommendations.		

6.7.2	Agricultural Buffers		
Recommendation	The Watershed Agricultural Program Small Farms program should evaluate livestock farms in the Stony Clove watershed for participation in the WAC small farms program.		
Priority	Medium	Task Leader	Watershed Agricultural Council
Funding Sources	Watershed Ag Program USDA-CREP Program USFS/FWS	Task Partners	GCSWCD/UCSWCD Watershed Ag. Council Landowners
Estimated Cost	Not determined	Schedule	2003
Notes	There are several small livestock farms in the headwaters of several Stony Clove tributaries. These operations may be eligible for participation in the WAP small farms program. Fencing along streams, and improvements of buffer vegetation may be an appropriate management practice.		

6.7.3	Riparian Technical Assistance		
Recommendation	Watershed Managers should work to provide stakeholders ready access to technical assistance for riparian buffer problems.		
Priority	High	Task Leader	NYCDEP - SMP

Funding Sources	NYCDEP NYSDEC USDA NRCS USFWS USEPA Landowners	Task Partners	GCSWCD/UCSWCD WAP CFA NYSDEC Landowners
Estimated Cost	Undetermined	Schedule	Undetermined
Notes	While agricultural operations and large woodlot owners have ready access to technical assistance and funding programs for riparian buffers, residential properties are not eligible for most of these services at this time. Technical assistance must be closely aligned with on-going SMP efforts and integrate stream morphology assessment. This requires technical staff that is knowledgeable in evaluating local stability as well as buffer management issues. Assistance should include site evaluations, development of site buffer management plans, and facilitation of access to watershed programs which support buffer establishment. Technical assistance should be aggressively marketed to riparian landowners using direct contracts, press and home visits.		

6.7.4	Land Use Ordinance		
Recommendation	Watershed municipalities should evaluate local ordinances such as comprehensive plans, zoning regulations, site plan review laws, subdivision laws and floodplain ordinances to determine if adequate consideration is given to riparian buffers impacts. See recommendation 6.5.5.		
Priority	High	Task Leader	Watershed Municipalities
Funding Sources	NYCDEP NYSDOS CWC Municipalities	Task Partners	GCSWCD NYCDEP GC Planning Department Catskill Center
Estimated Cost	Not determined, minimal	Schedule	2004-2006
Notes	Watershed municipalities will receive multiple benefits from buffer management in their communities. These benefits are far more effective when integrated into all appropriate levels of land use considerations.		

6.7.5	Watershed Forestry Program		
Recommendation	Stream side landowners who practice forest harvest in the Stony Clove watershed should be made aware of the opportunity to participate in the NYC 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.		
Priority	High	Task Leader	Watershed Forestry Program
Funding Sources	WFP U.S. Forest Service	Task Partners	GCSWCD/UCSWCD NYCDEP CFA NYSDEC - Forestry/Watersheds Landowners
Estimated Cost	Undetermined	Schedule	Initiate in 2003
Notes	<ol style="list-style-type: none"> 1. GCSWCD will facilitate landowner access to the WFP through the Watershed Assistance Program. 2. If a Riparian Buffer Specialist position is created, that person should be familiar with WFP programs and encourage landowner participation. 		

6.7.6	Riparian Conservation Easements		
Recommendation	Provide long term riparian buffer protection through permanent conservation easements for both currently degraded and intact buffer areas.		
Priority	High	Task Leader	To be determined
Funding Sources	NYCDEP WAP NYSDEC other grants	Task Partners	GCSWCD NYCDEP - SMP NYCDEP - Land Acquisition NYSDEC - Forestry/Watersheds Catskill Center WAP Landowners
Estimated Cost	Undetermined - needs further study	Schedule	Establish program development committee in 2004 Develop draft strategy for increasing easement programs(s) by 2005
Notes	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 which will result in the greatest participation by interested sellers.		

6.7.7	Landowner Incentives		
Recommendation	Develop landowner incentive programs which would encourage participation in riparian buffer protection programs, and pilot the effort in the Stony Clove watershed.		
Priority	High	Task Leader	Undetermined
Funding Sources	NYS - EPF Other sources	Task Partners	NYS NYSDEC Local SWCD's Others
Estimated Cost	Not determined	Schedule	Not determined
Notes	The GCSWCD has done past research on programs in other states which have developed state-wide riparian buffer protection incentives similar to New York's Forest Tax Law to provide tax relief incentives for participation in riparian protection programs. 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.		

Riparian Vegetation Establishment/Enhancement

While protection programs can go along way to meeting riparian buffer objectives, current conditions on the Stony Clove would benefit from a proactive approach to restoration and/or enhancement of 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 stable form in order to create the conditions necessary 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

larger plantings may be possible because only one landowner is involved, buffers on the Stony Clove will often require smaller patches of plantings on multiple properties.

6.7.8	Watershed Buffer Cost-Share Program		
Recommendation	Seek local, state or federal funding to initiate a riparian buffer program on lands currently not covered by watershed programs.		
Priority	High	Task Leader	NYCDEP
Funding Sources	NYCDEP NYSDEC ACOE/USFS/USFWS	Task Partners	GCSWCD/UCSWCD NYSDEC USFS/USFWS/NRCS SC Watershed Association Landowners
Estimated Cost	Not Determined	Schedule	Not determined
Notes	<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. 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. 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. NYCDEP (or others) could provide seed funds for a pilot project. The GCSWCD/UCSWCD can coordinate with their annual tree and shrub program, and low cost materials could be obtained from the NYSDEC Tree Nursery in Saratoga.</p>		

6.7.9	In Lieu Compensatory Mitigation		
Recommendation	NYSDEC and the ACOE should evaluate buffer restoration projects as a possible mitigation requirement on projects with smaller scale disturbances.		
Priority		Task Leader	NYSDEC/ACOE
Funding Sources	Project Sponsors	Task Partners	GCSWCD/UCSWCD NYCDEP Landowners Project Sponsors
Estimated Cost	Not Determined	Schedule	Not determined
Notes	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/or other conditions do not allow "replacement" mitigation. The Stony Clove project team strongly recommends that the regulatory agencies give greater consideration to requiring applicants to fund, or undertake, riparian buffer restoration projects as "in lieu" mitigation when appropriate..		

Invasive Species

As noted previously in this SMP, the Stony Clove is 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 II of the Batavia Kill Pilot Project, the GCSWCD and NYCDEP are working with Hudsonia Inc. to conduct a

preliminary assessment of Japanese knotweed and its impact on stream stability, and to design and implement a series of treatment pilots. The information from this effort will be transferred to the Stony Clove as well as other NYC watershed areas.

6.7.10	Knotweed Management Resources		
<i>Recommendation</i>	Watershed municipalities should manage knotweed areas in a manner that will prevent the spread and further infestation of the watershed stream corridor.		
<i>Priority</i>	High	<i>Task Leader</i>	GCSWCD/UCSWCD/NYCDEP
<i>Funding Sources</i>	NYCDEP Others	<i>Task Partners</i>	Hudsonia SC Watershed Association Landowners
<i>Estimated Cost</i>	Undetermined	<i>Schedule</i>	To be determined
<i>Notes</i>	(a) The Batavia Kill pilot project should provide preliminary recommendations for knotweed management by 2005. (b) A publication, providing clear and concise information in knotweeds life cycle and how to manage it should be prepared for the entire NYC watershed.		

6.8 General Stream Management Activities

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

The SC Project Team is encouraged by the success to date in increasing watershed stakeholder awareness of how streams respond to damaging management activities. The following recommendations have been formulated based on the project team's observations, as well 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.

6.8.1	Stream Management Guidelines		
<i>Recommendation</i>	Develop detailed, science based guidelines to stream management which are readily available to those entities responsible for stream activities in the Stony Clove watershed. Guidelines must emphasize natural channel stability and function.		
<i>Priority</i>	High	<i>Task Leader</i>	GCSWCD/UCSWCD/NYCDEP

Funding Sources	NYCDEP NYSDEC	Task Partners	NYSDEC/ACOE Municipalities - leaders, highway Landowners
Estimated Cost	Not determined	Schedule	Not determined
Notes	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.		

6.8.2	Technical Assistance		
Recommendation	Provide long term access to technical assistance to landowners and municipalities for assessment of their stream-related problems, development of effective management strategies and to supervise stream project implementation.		
Priority	High	Task Leader	GCSWCD/UCSWCD
Funding Sources	NYCDEP NYSDEC Greene County Local Municipalities others	Task Partners	GCSWCD/UCSWCD NYSDEC Greene County/Ulster County Local Municipalities Landowners
Estimated Cost	Undetermined	Schedule	Undetermined
Notes	The GCSWCD, UCSWCD, NYCDEP and local municipalities should evaluate how to insure long term availability of the high levels of technical resources currently available in the Stony Clove Watershed.		

6.8.3	Highway Activities		
Recommendation	The Town and County Highway Departments and NYSDOT should integrate geomorphology principles in all new projects and routine maintenance activities related to the Stony Clove stream system.		
Priority		Task Leader	GCSWCD/UCSWCD
Funding Sources	Greene County Municipalities Federal Highway Admin FEMA NYS-CHIP	Task Partners	Greene/Ulster County Local Municipalities NYCDEP NYSDEC ACOE Landowners
Estimated Cost	Varies by project	Schedule	On-going
Notes	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 goals of the highway departments/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. Demonstration restoration projects to date have include several infrastructure components. These projects should continue be used to promote use of NCD methods by highway departments and landowners.		

6.8.4	Public Lands		
Recommendation	Governmental landowners in the Stony Clove watershed should manage their lands using natural channel stability concepts, and should serve as a model for other watershed landowners.		
Priority	High	Task Leader	Governmental Landowners
Funding Sources	Project specific	Task Partners	NYCDEP NYSDEC Local Municipalities Landowners
Estimated Cost	Project Specific	Schedule	Undetermined
Notes	NYSDEC, NYCDEP, Municipalities and local Institutions (i.e. School District), should each conduct an evaluation of all riparian lands, and identify protection, restoration and management needs. The SC project Team 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.		

6.8.5	Community Stormwater Plans		
Recommendation	Integrate the evaluation of stormwater impacts on stream systems in the development of community based Stormwater Management Plans (SWMP).		
Priority	High	Task Leader	Watershed Assistance Program (Hunter)
Funding Sources	CWC - Stormwater Retrofits NYSDEC - EPF ACOE - WRDA NYSDOT - Env. Benefits Municipalities	Task Partners	CWC NYCDEP - multiple sections NYSDEC NYSDOT Greene County Landowners GCSWCD/UCSWCD
Estimated Cost	Undetermined	Schedule	2003-2005
Notes	The GCSWCD has placed a high priority on participating in the new stormwater planning program which will be administered by the CWC under the 2002 FAD. The GCSWCD Watershed Assistance Program (WAP) will take the lead on developing SWMPs on a watershed basis, with the Town of Hunter portion of the watershed tentatively scheduled for 2006.		

6.8.6	Practical Training		
Recommendation	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.		
Priority	Very High	Task Leader	NYCDEP
Funding Sources	NYCDEP NYSDEC NYSDOT Federal Highway Admin	Task Partners	GCSWCD/UCSWCD Local Municipalities Greene/Ulster County Cornell Local Road Program NYS Association Highway Supers NYSDEC ACOE (regulatory) NYSDOT
Estimated Cost	Undetermined	Schedule	2003-2006

<i>Notes</i>	The SC Project Team recommends that a comprehensive “hands-on” 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). Workshops must promote hands-on or site based training.
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6.8.7	Stream Stability Restoration		
<i>Recommendation</i>	Secure funding commitments for additional unfunded restoration projects on the Stony Clove as discussed in individual management segments.		
<i>Priority</i>	Very High	<i>Task Leader</i>	NYCDEP/GCSWCD/UCSWCD
<i>Funding Sources</i>	NYCDEP NYSDEC ACOE USEPA Municipalities Landowners	<i>Task Partners</i>	NYSDEC ACOE Landowners others
<i>Estimated Cost</i>	Not determined	<i>Schedule</i>	Not determined
<i>Notes</i>	In this SMP, the SC Project Team identified a number of reaches which are strongly recommended for restoration. Additional restoration sites should be prioritized, ranked and continuing funding sought.		