

## Executive Summary

Elevated turbidity events in the Schoharie watershed adversely impact aquatic habitat, local recreational uses, and can interfere with disinfection processes for NYC's drinking water supply. This Schoharie Turbidity Reduction Strategy (STRS) is the outcome of a proactive planning process designed to expand water quality protection at the local level across the Schoharie Watershed. The strategy relied on a diverse group of watershed partners, particularly local decision-makers, to promote watershed scale recommendations that strengthen the communities' ability to recognize and address potential water quality threats.

Turbidity, the presence of suspended particles in water that reduce light transmission through scattering or absorption, is generally one of the most pervasive sources of non-point source pollution to effectively address. This is especially true with landscape sources that originate from human activities and cause soil erosion which contributes to turbidity. Given the watershed's clay-rich soils and steep topography, turbidity will always tend to be pronounced after heavy precipitation events. Thus the strategy is not about eliminating turbidity, but rather reducing sources caused by landscape alterations. By working proactively with local communities, residents, and watershed agencies, significant strides can be made towards minimizing the degree of water quality impairment while maintaining the scenic and outdoor resources watershed communities rely on to support their local economies. This strategy was created with that objective in mind.

The impetus behind developing a locally-driven strategy to address potential water quality impairments originated with the Stream Management Program, one of many watershed programs funded by the NYC Department of Environmental Protection. In each stream management plan there is a section on general recommendations that, when implemented on a broad, watershed scale, enhance the effectiveness of water quality protection beyond the narrow "site" level. A key element to creating the strategy was working with multiple watershed partners.

Following watershed stewardship principles, this project used a grassroots approach to engage a myriad of watershed stakeholders. The primary audience was local officials and decision-makers across the basin's thirteen municipalities, which collectively represent over 120 officials. Municipal and planning board members, highway superintendents, code enforcement officers, and interested property owners were invited to participate. Government and non-government agencies, and private firms and businesses working in the Schoharie basin were also included in the project setting the stage for a collaborative approach to watershed planning.

A watershed-level working group and steering committee were developed to direct project goals and outreach efforts and to ensure ample local participation. Watershed managers, municipal officials, highway departments, county government and other stakeholders represented different watershed roles on the committees and worked together to develop this multi-objective approach to reducing turbidity sources at the local level.

Outreach methods used to gather information and reinforce the collective approach included public education workshops, focus groups organized around similar decision-making areas, and anonymous surveys. The public educational workshops fueled a desire on behalf of watershed stakeholders for more information, education and networking opportunities. The 2007 Watershed Summit was an excellent opportunity for stakeholders to meet one another, share information, discuss priority concerns, and suggest solutions. Focus group meetings were also a good venue for participants to discuss issues pertaining to specific topical areas, such as highway maintenance and stormwater regulations governing development. Anonymous surveys offered participants the opportunity to share thoughts and ideas on water quality issues and management, and the sample of comments below clearly reflects the intent of the project.

### Comments from the Watershed Summit Survey

1. Improve communication between agencies & the public
2. More education for officials and the public in understanding Water Quality issues

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| <ol style="list-style-type: none"> <li>3. Regulatory agencies &amp; organizations need to engage local officials more to address natural resource protection efforts</li> <li>4. All levels of government need to improve outreach efforts</li> <li>5. People need more information, understanding of the different roles and responsibilities</li> <li>6. Ensure local decision makers are involved</li> <li>7. Assist officials and the public in understanding regulations and rules</li> <li>8. Provide more training and tools for landowners and officials to protect natural resources</li> <li>9. Commitment from regulators to work with and respond to local officials</li> <li>10. Improve working relations across agencies and government, share information and ideas on watershed management</li> </ol> |
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Each outreach method provided relevant information that shaped the strategy’s recommendations, which are grouped into five categories – highway & infrastructure needs, local decision-making, watershed coordination, education & outreach, and technical assistance. The overriding recommendation involves more education and outreach for municipal decision-makers who in turn are a conduit to property owners and developers. Much can be done to clarify misconceptions, coordinate stewardship efforts, model best management practices, ensure consistent follow-through, and interpret regulations among others. Small workshops, public forums, technical training sessions, and development of written material are recommended outreach approaches to increasing awareness of turbidity-related problems at the local level, such as inadequate sediment controls during and after construction, or potential problems with changing natural drainage flows. Getting more information to the right people at the right time will help educate those with decision-making authority and reinforce the collaborative nature of the strategy.

In addition to more education, facilitating meetings that promote effective communication among watershed stakeholders is important. Whether it is a group of code enforcement officers, highway superintendents, planning board chairs, or engineering firms and regulators getting people together to discuss ideas and concerns can open the door to new possibilities and clear up misconceptions. There is also a need for municipalities to assess where water quality threats could be avoided by amending local codes. For example, accounting for riparian buffer impacts in subdivision and site plan laws, or inadequate erosion controls for driveway cuts – a problem noted by most communities.

A summary of the recommendations is provided below and highlights measures local stakeholders could undertake to improve water quality oversight, as well as agency supports that are needed to help local officials and employees in implementing them. A full description including short and long range timeframes and task leaders and partners is provided in Section 6.

**Overview of recommendations**

<b>Highway/Infrastructure</b>
Develop a watershed-wide highway strategy that addresses water quality needs across local, county and state highway systems
Research inter-municipal highway agreements that offer cost-sharing incentives
Develop a proposal to hire a seasonal ditch maintenance crew to serve the entire watershed, or a proposal that would cost-share with municipalities to offset better quality materials, including material for hydroseeder
Develop a process that estimates annually the amount of hydroseeding materials to be used, including purchasing bulk material that can be stored in a central location
Work with GCSWCD to use hydroseeder immediately after ditches are scraped (weather providing), and as time and resources allow, extend hydroseeder to watershed communities in Schoharie & Delaware Counties.
Identify funding sources to help offset costs to municipalities for equipment, stormwater projects and clean road abrasives material
Track egregious problems diverting natural drainage paths that negatively impact public roads or neighboring parcels <ul style="list-style-type: none"> <li>• propose a drainage ordinance addressing these situations, one that could be attached to building</li> </ul>

<ul style="list-style-type: none"> <li>permits</li> <li>develop educational material for property owners on how to manage stormwater runoff</li> </ul>
<p>Work proactively with GCSWCD in scheduling hydroseeder</p> <ul style="list-style-type: none"> <li>Send reminder notices to highway departments</li> <li>Incorporate Schoharie &amp; Delaware County watershed communities as time &amp; resources allow</li> </ul>
Develop list of approved engineers to assist highway depts. with designs & permitting
Strengthen driveway standards at the local, county and state level that incorporate sufficient erosion controls while minimizing the driveway footprint
Prioritize highway and infrastructure needs that protect water quality and submit to the Schoharie Watershed Advisory Committee for funding consideration
Incorporate <i>Recommendations Checklist for Improving Roadside Ditch Management</i> into highway projects (developed by Cornell University Department of Natural Resources)
Research options to unload silt from vacuum truck at select locations on the mountaintop, and determine if vacuum truck is adequate for highway needs based on recommended usage
Purchase snow and ice controls that allow greater control in material spreading and usage
<b>Local officials, decision-makers</b>
Attach fact sheets to building permit, subdivision, and site plan applications on information such as stormwater regulations & funding, best mngt. practices to control runoff, wetland regulations
Work proactively with agency regulators when potential water quality violations are suspected
Organize bi-annual roundtable discussions for code enforcement officers & regulators to discuss common issues, concerns, ideas for improving coordination and monitoring of regulations and code enforcement.
<ul style="list-style-type: none"> <li>Provide training workshops for CEO's on new flood maps (2008), flood zones, floodplain ordinance and development standards</li> <li>Ensure building standards are followed per local floodplain ordinances</li> </ul>
Hold roundtable discussions for Planning Board Chairs to discuss common issues related to watershed management
Schedule workshops on issues of interest to planning and municipal boards
Conduct yearly training on SEQRA for mountaintop planning boards
Evaluate efficacy of local codes to address landscape impacts from development (stormwater, steep slopes, floodplain, stream buffers) and recommend further mitigation where necessary, e.g., amending site plan and subdivision laws to incorporate best management practices for logging, driveway development, hillside development
Ensure planning boards have proper resources to make decisions, e.g., inventory of natural resources (maps), county, state & federal regulations, SEQRA implementation
Develop universal checklist to guide planning boards in project reviews, e.g., what forms need to be completed
Investigate inter-municipal compact agreements that extend wetlands and stream buffers protections beyond individual town borders
Participate in the Schoharie Watershed Advisory Committee
<b>Land use ordinance considerations</b>
Incorporate performance standards for driveways in site plan and subdivision laws to minimize erosion and runoff problems, especially on steep slopes
Incorporate riparian buffer protections in site plan, subdivision and floodplain damage prevention laws
Evaluate feasibility of site plan review for individual residential development to help home builders with siting homes and driveways to minimize erosion and ensure adequate mitigation measures are used
Adopt new FEMA flood maps and update floodplain ordinance according to the NFIP standards
<b>Watershed Coordination</b>
Continue focus group meetings on a basis set by each group
Develop a Schoharie basin newsletter highlighting examples of watershed stewardship efforts
Develop a schedule of regulatory training for watershed stakeholders with appropriate agency, e.g., DEC & DEP on stormwater regulations, ACOE & DEC on wetland regulations
Standardize basin-wide best management practices to minimize erosion from development and provide implementation training where necessary

<b>Education &amp; Outreach</b>
Identify outreach efforts involving private contractors, CEO's, highway management, municipal & planning officials
Develop a <i>Contractor's Book</i> highlighting local, state, federal regulations, BMP's, funding sources
Create a Planning Board Guidance Document on what to look for when approving site plans and subdivisions relating to proper drainage, stormwater runoff
Create an 'ABC' regulations manual for planning boards and project applicants
Develop a universal guidance document for highway departments, contractors, and property owners on culvert sizing and placement considerations incorporating slopes, soils, and drainage patterns
Conduct a minimum of three technical training sessions for local decision-makers
Host public forums at least bi-annually
Create a centralized website of watershed communities' land use codes, regulations, tax parcel data, natural resources, etc., and eventually develop an interactive map of these website resources
Develop a resource library of municipal zoning and planning codes & make accessible to those who do not use the internet
Develop one-page flyers of educational information on topics local officials feel would be useful for property owners and contractors and attach to building permit, site plan and subdivision applications
Send educational material out with municipal tax mailings to save on postage
Host annual stream festivals that offer fun, educational activities for the public on the Catskills streams and other natural resources
<b>Technical assistance</b>
Conduct stream management plans for the Bear and Manor Kills in Delaware and Schoharie Counties
Provide technical assistance to highway departments with permitting, culvert design and placement, and identification of potential stormwater retrofit projects
Create a centralized program to oversee maintenance of stormwater retrofit projects after construction, such as routine maintenance of catch basins
Research feasibility of purchasing a hydroseeder for the watershed communities in Schoharie and Delaware Counties
Create a stormwater liaison position to assist residents, municipalities, and contractors with designing stormwater projects (future or existing retrofits) and applying for CWC funding
Fund identified streambank stabilization projects on farms in the Johnson Hollow basin

These recommendations represent watershed protection initiatives that, when undertaken collectively across the basin, can minimize water quality impairments at the local level. They are meant to guide local efforts in conjunction with regional, state and federal programs to address water quality threats in the Schoharie basin caused by human alterations to the landscape. The plan's coordinated approach is also meant to maximize benefits of existing programs in the Watershed.

Building local awareness and capacity on a watershed scale is a key ingredient to the strategy's success, and significant steps were taken throughout this process toward that end, establishing a foundation upon which to build. The long-term challenge, however, is maintaining local involvement and ownership in implementing the recommendations and continuously reinforcing the "whole is the sum of its parts." The more communities recognize that each plays a part in the "bigger" picture, the more effective the strategy will be in protecting not only water quality but also how communities grow in relation to their natural resources.