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### III. WATER QUALITY ACTION ITEMS

**Goal: To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)**

**Objective 3: Reduce the impact of road sand on water quality and stream habitat.**

Introductory Statement:

Within the watershed, road sand moves easily into the river system and reduces water quality, degrades fish habitat, and ultimately may increase the need for dredging in the Norwalk Harbor, and the removal of sediments behind dams along the river. While road sand is an integral part of each community's safety network in winter, opportunities exist to improve conditions by setting priorities for clean-out frequency, timing, and location of catch basin pump outs and street sweeping.

Supporting Tasks:

1. Obtain and review municipal (and if possible, state) sand and salt application records and policies, and estimates of amounts recovered each year.  
Implementing Group: FCSWCD, Municipalities  
Year Start/End: 1999-2000  
Measure of Success: Records and policies are reviewed. Report recommending modifications to current sand/salt application rates and clean-up schedules produced.
2. Reduce application rates to only what is necessary to maintain safety.  
Implementing Group: Municipalities, CONNDOT  
Year Start/End: 2000-2002  
Measure of Success: Recommendations of report accepted and sand/salt application rates reduced to minimum necessary to maintain safety. Instream sedimentation from road sand visibly reduced from baseline conditions identified by 1996 Streamwalk.
3. Prioritize catch basin pump-outs and street sweeping based on proximity to receiving waters and sensitive habitats and rate of sand accumulation, and accelerate pump-out and street sweeping schedule to as early as possible after winter.  
Implementing Group: Municipalities, CONNDOT  
Year Start/End: 2000-2002  
Measure of Success: Catch basin pump-out and street sweeping schedules modified by all watershed towns to focus on catch basins/roads closest to surface waters and as early after winter as possible.
4. Replace or retrofit storm water catch basins to provide oil and sediment removal prior to discharge to receiving waters in critical areas and sensitive habitats (in conjunction with normal infrastructure improvement planning and implementation), and ensure proper maintenance.  
Implementing Group: Municipalities, CONNDOT  
Year Start/End: Ongoing  
Measure of Success: Storm water catch basins with oil and sediment removal or other appropriate treatment systems incorporated into each municipality's capital improvement plan and installed as appropriate.

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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 4:** Maintain and increase riparian buffer areas.

Introductory Statement:

Riparian buffer areas filter polluted runoff. The Norwalk River Watershed's streamside conditions exhibit extensive loss of riparian vegetation, thereby increasing water quality degradation.

Supporting Tasks:

1. Educate streamside/wetland property owners about the value of riparian buffers.  
Implementing Group: Advisory Committee, Watershed Coordinator(s), NRWA, FCSWCD  
Year Start/End: 1998-2005  
Measure of Success: Informational materials (e.g., brochure) on the value of riparian buffers and the importance of maintaining and restoring them developed and made available to all streamside/wetland property owners.
2. Educate municipal commissions about the value of riparian buffers.  
Implementing Group: Advisory Committee, Watershed Coordinator(s), NRWA, CTDEP, UCONN/CES (NEMO), FCSWCD  
Year Start/End: 1999/2005  
Measure of Success: Workshop on the value of riparian buffers presented to appropriate municipal commissions; timetable for ongoing training established for each town.
3. Develop a guidance manual on riparian buffers for municipal commissions with detailed examples of residential and commercial applications.  
Implementing Group: CTDEP  
Year Start/End: 1999-2001  
Measure of Success: Guidance manual drafted and disseminated.
4. Implement habitat restoration projects using the priority list of sites established by the NRWIC's habitat restoration subcommittee.  
Implementing Group: Advisory Committee, FCSWCD, Watershed Coordinator(s), Federal and State Agencies  
Year Start/End: Ongoing  
Measure of Success: Impaired sites identified through the 1996 Streamwalk and prioritized by the habitat restoration subcommittee restored as opportunities arise. Existing riparian buffers maintained and riparian areas currently devoid of vegetation restored as opportunities arise.



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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 5: Improve solid and liquid waste management at watershed businesses and municipal facilities.**

Introductory Statement:

Many watershed businesses and municipal facilities are located adjacent to streams. Improper storage and disposal of solid and liquid wastes pose a potential threat to water quality and public health.

Supporting Tasks:

1. Ensure management (housekeeping) practices follow local, state, and federal regulations that emphasize education, appropriate storage and waste management, and pollution prevention practices.

Implementing Group: Municipalities, Private Conservation and Civic Community Organizations

Year Start/End: 2000-2005

Measure of Success: Watershed businesses and municipal facilities furnished with information on how to comply with local, state, and federal ordinances/regulations for solid and liquid waste management. Solid and liquid wastes properly stored and disposed of by watershed businesses and municipal facilities.

2. Develop an "Adopt a Stream" program to engage riverside/streamside businesses and property owners in improving stream conditions.

Implementing Group: Advisory Committee, Municipalities, Private Conservation and Civic Community Organizations, NRWA

Year Start/End: 2000-2005

Measure of Success: Fifty percent of riverside/streamside businesses and property owners participate in the "Adopt-A-Stream" program.

3. Develop business and municipal facility workshops (yearly) on special topics related to Objective 5 and hold such workshops annually.

Implementing Group: Advisory Committee, CTDEP

Year Start/End: 2000-2005

Measure of Success: Workshops developed and delivered on an annual basis.

4. Establish a citizens "hotline" to report pollution incidents to state and/or local authorities.

Implementing Group: Advisory Committee, Federal and State Agencies

Year Start/End: 2000-2002

Measure of Success: "Hotline" established and information on how to use it disseminated.

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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 6:** Evaluate the cumulative effect of discharges permitted by both the Connecticut Department of Environmental Protection and the New York Department of Environmental Conservation.

Introductory Statement:

Permitted discharges have an effect on water quality in the watershed. The cumulative impacts are unknown at this time and need to be further evaluated.

Supporting Tasks:

1. Assess and evaluate the cumulative effects of CTDEP and NYDEC permitted industrial, municipal, and stormwater discharges.  
Implementing Group: Federal and State Agencies  
Year Start/End: 2000-2001  
Measure of Success: Evaluation system established; data collected, assessed and evaluated; and results compiled.
2. Publish and disseminate a fact sheet on the cumulative impact of permitted discharges.  
Implementing Group: Advisory Committee, Watershed Coordinator(s), CTDEP, NYDEC  
Year Start/End: 2002  
Measure of Success: Fact sheet published and distributed to appropriate audience.



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### III. WATER QUALITY ACTION ITEMS

<b>Goal:</b> To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)
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**Objective 7:** Maintain adequate base flows in the Norwalk River and its major tributaries.

Introductory Statement:

Stream flows are reduced during summer months in some segments of the Norwalk River Watershed. Stream flow comprises base flow (ground water), overland flow (runoff), interflow (runoff that leaches into the stream through soil), and in portions of the watershed, discharge from sewage treatment plants. The adequacy of existing stream flows to protect water quality and aquatic resources is unknown at this time and needs to be evaluated.

Supporting Tasks:

1. Conduct site-specific instream flow study of the river to determine appropriate flow conditions that will support healthy fish habitat for species currently present and those planned for restoration. The study should use obligate stream species or life stages (including appropriately sited study transects), consider appropriate flows, and include decision criteria agreed to prior to conducting the study.

Implementing Group: Federal and State Agencies

Year Start/End: 2000-2002

Measure of Success: Site-specific instream flow study completed.

2. Evaluate results of instream flow study to determine an appropriate range of flows necessary to support state water quality standards, including whether "flushing" flows are necessary to support healthy riparian areas.

Implementing Group: Federal and State Agencies

Year Start/End: 2002-2003

Measure of Success: Appropriate range of stream flows identified and the necessity of "flushing" flows determined.

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### III. WATER QUALITY ACTION ITEMS

<b>Goal:</b> To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)
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**Objective 8: Reduce the cumulative impacts of development and improve storm water management.**

Introductory Statement:

Storm water runoff from developed areas (i.e., impervious surfaces from commercial and industrial areas and residentially altered landscapes) is a significant threat to continued water quality improvement in the watershed. Cumulatively, storm water runoff results in visible degradation of water quality as water moves downstream towards the mouth of the river. Improvements to storm water quality need to be made and maintained.

Supporting Tasks:

1. Educate municipal land use commissions about the design of effective storm water management systems and required maintenance programs.  
Implementing Group: Advisory Committee, Federal, Regional, and State Agencies, UConn (NEMO)  
Year Start/End: 1998-2000  
Measure of Success: Educational/training programs delivered to all seven watershed municipalities.
2. Reduce the cumulative impacts of current and future development on water quality by implementing best management practices.  
Implementing Group: Municipalities  
Year Start/End: Ongoing  
Measure of Success: Municipal land use commissions use knowledge gained through NEMO/CTDEP training to improve development proposals by reducing impervious surfaces and storm water runoff.
3. Encourage CONNDOT and municipal land use commissions to conduct comprehensive evaluations of storm water management system design and their long-term maintenance plan in the review of permit applications.  
Implementing Group: Advisory Committee  
Year Start/End: Ongoing  
Measure of Success: Improved designs and maintenance schedules on all applications.
4. Ensure state and federal storm water discharge permits have been applied for by compiling a list of sites that appear to require permits and comparing it with the list of existing permits.  
Implementing Group: Advisory Committee, CTDEP, NYDEC, EPA, Watershed Coordinator(s)  
Year Start/End: 2000-2002  
Measure of Success: All facilities/activities subject to storm water permits in the watershed have applied for, and are in compliance with the conditions of the appropriate permit.



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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 8:** Reduce the cumulative impacts of development and improve storm water management (continued).

5. Educate watershed property owners about storm water problems and nonpoint source pollution and urge compliance with permit requirements. Conduct workshops to assist businesses with permit compliance.

Implementing Group: Advisory Committee, Watershed Coordinator(s), Private Conservation and Civic Community Organizations

Year Start/End: 2000-2002

Measure of Success: All property owners made aware of problems caused by storm water, and all facilities/activities subject to storm water permits have applied for and are in compliance with the conditions of the appropriate permit.

6. Educate homeowners, golf course operators, school groundskeepers, and municipal park maintenance staff about the impact of excessive fertilizer use and associated nutrient enrichment on water quality and the benefits of environmentally sound groundskeeping practices.

Implementing Group: Advisory Committee, Watershed Coordinator(s), Municipalities, Private Conservation and Civic Community Organizations

Year Start/End: 1999-2000

Measure of Success: Educational materials (e.g., brochures, fact sheets, and workshops,) developed and delivered through mailings, workshops, and other appropriate mechanisms.

7. Continue or initiate storm drain stenciling programs in each town in the watershed with message reading, "Don't Dump: Drains to Norwalk River."

Implementing Group: Advisory Committee, Watershed Coordinator(s), Municipalities, Private Conservation and Civic Community Organizations

Year Start/End: Ongoing

Measure of Success: Storm drains discharging to surface waters within the watershed stenciled.

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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 9:** Continue water quality monitoring and data collection and assessment.

Introductory Statement:

Continued monitoring of the river's water quality is necessary to support state, municipal, and citizen actions to improve and maintain conditions. Monitoring will establish a baseline for measuring further improvements in water quality and will help identify chronic pollution problems.

Supporting Tasks:

1. Continue water quality monitoring program by Harbor Watch/River Watch. Publish yearly summary and conclusions. Evaluate trends and modify procedures as needed.  
Implementing Group: Advisory Committee, CTDEP, HW/RW  
Year Start/End: 1998-ongoing  
Measure of Success: High quality data collected, analyzed, and disseminated to appropriate agencies/organizations.
2. Develop a hot spot response plan to notify appropriate local and state agencies when obvious pollution is observed.  
Implementing Group: Advisory Committee, CTDEP, HW/RW, Watershed Coordinator(s), NRWA  
Year Start/End: 1998-1999  
Measure of Success: "Hot spot" response plan endorsed by state and watershed towns.
3. Summarize and publish data periodically.  
Implementing Group: Advisory Committee, HW/RW  
Year Start/End: 1998-ongoing  
Measure of Success: Data reports published periodically.
4. Repeat Streamwalk in 2003.  
Implementing Group: Advisory Committee, FCSWCD, Private Conservation and Civic Community Organizations  
Year Start/End: 2003  
Measure of Success: Streamwalk conducted and report published and disseminated.



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### III. WATER QUALITY ACTION ITEMS

**Goal:** To restore and protect surface and ground water to meet state water quality standards throughout the watershed such that the Norwalk River supports its designated uses (e.g., fishing, swimming, drinking water)

**Objective 10:** Ensure proper functioning of wastewater treatment plants.

Introductory Statement:

Wastewater treatment plants in the watershed meet municipal and environmental needs. Properly operated and maintained systems will not further degrade the water quality watershed and will help the river achieve its designated uses. Continued monitoring of wastewater treatment plants and the sanitary sewers system will be necessary to ensure proper operation. Municipalities need to ensure that growth plans do not exceed treatment plant capabilities.

Supporting Tasks:

1. Publish an annual report card showing wastewater treatment plant proficiency.  
Implementing Group: Advisory Committee, CTDEP  
Year Start/End: 2000-ongoing  
Measure of Success: Annual report card published.
2. Ensure future land use development is compatible with current and projected treatment plant capacities.  
Implementing Group: Advisory Committee, Municipalities  
Year Start/End: Ongoing  
Measure of Success: Capacity of existing sewage treatment plants is not exceeded, and the sewer system is not expanded without a comprehensive analysis to determine whether there are more environmentally sound solutions.

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## IV. STEWARDSHIP AND EDUCATION ACTION ITEMS

**Goal:** To educate citizens about the boundaries and functions of the Norwalk River Watershed, the specific needs for protection of and improvement to the river system, the benefits of a healthy watershed to individuals and communities, and the opportunity for the public to speak out on issues and to participate in the stewardship of the watershed

**Objective 1:** Develop a mechanism to monitor “The Plan,” implement such a mechanism, and foster watershed stewardship.

Introductory Statement:

The implementation of this Action Plan needs to be a coordinated, locally-based, watershed-wide activity that continues the work of the Initiative. The development of a watershed advisory committee made up of representatives from each municipality, ensures the plan will be implemented. A coordinator is necessary to follow through with the focus of the advisory committee.

Supporting Tasks:

1. Assemble an “Advisory Committee” to include representatives from the local governments of each of the seven watershed towns and representatives from regional, state, federal, and local environmental organizations.  
Implementing Group: Initiative Committee  
Year Start/End: 1998-ongoing  
Measure of Success: Advisory Committee established.
2. Hire part-time “Watershed Action Plan Coordinator(s),” as a facilitator responsible to the above advisory committee.  
Implementing Group: Advisory Committee  
Year Start/End: 1999-ongoing  
Measure of Success: Position filled. Plan action items start to be implemented. Focus of Advisory Committee maintained.
3. Hold bi-annual workshop of Chief Elected Officials to maintain support of plan implementation.  
Implementing Group: Advisory Committee  
Year Start: 2000-ongoing  
Measure of Success: Plan implementation continues with official support of all watershed towns.



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#### IV. STEWARDSHIP AND EDUCATION ACTION ITEMS

**Goal:** To educate citizens about the boundaries and functions of the Norwalk River Watershed, the specific needs for protection of and improvement to the river system, the benefits of a healthy watershed to individuals and communities, and the opportunity for the public to speak out on issues and to participate in the stewardship of the watershed

**Objective 2: Develop methods to provide information and education about the Norwalk River Watershed.**

Introductory Statement:

Citizens, school systems and municipal decisionmakers need to understand the functions of the Norwalk River Watershed system. Information and education needs to be continuous and to become a permanent way of doing business.

Supporting Tasks:

1. Develop a pamphlet/brochure about the boundaries and functions of the Norwalk River Watershed, with a focus on "what a watershed does for you," and its relation to the public drinking water supply.  
Implementing Group: Initiative Committee, Advisory Committee  
Year Start/End: 1998-1999  
Measure of Success: Brochure published.
2. Conduct watershed education assessment survey. Compile and distribute results to participants, Boards of Education and appropriate town agencies.  
Implementing Group: Initiative Committee  
Year Start/End: Completed  
Measure of Success: Watershed schools furnished with summary information that provides an overview of watershed-related education.
3. Organize meeting of teachers/educators to share ideas about watershed education (1/2 day workshop with presentations and informal gatherings). Share classroom activities.  
Implementing Group: Advisory Committee, Watershed Coordinator(s)  
Year Start/End: Spring 1999  
Measure of Success: Meetings held with watershed educators.
4. Establish yearly meetings of teachers/educators (similar to above). Investigate Continuing Education Credits.  
Implementing Group: Watershed Coordinator(s), Advisory Committee  
Year Start/End: 2001  
Measure of Success: Working groups established. Plan developed.

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#### IV. STEWARDSHIP AND EDUCATION ACTION ITEMS

**Goal: To educate citizens about the boundaries and functions of the Norwalk River Watershed, the specific needs for protection of and improvement to the river system, the benefits of a healthy watershed to individuals and communities, and the opportunity for the public to speak out on issues and to participate in the stewardship of the watershed**

**Objective 2: Develop methods to provide information and education about the Norwalk River Watershed (continued).**

5. Establish environmental education working group of teachers/educators to share existing watershed curriculum and develop new ideas to teach watershed education.  
Implementing Group: Watershed Coordinator(s), Advisory Committee, 6-Town River Board  
Year Start/End: 2000-2004  
Measure of Success: Education working groups established.
6. Develop "tool kits" of watershed activities, with videos demonstrating their use.  
Implementing Group: Watershed Coordinator(s), Advisory Committee  
Year Start/End: 1999-ongoing  
Measure of Success: Tool kits completed.
7. Develop watershed-based outreach program to disseminate stewardship message and provide knowledge of the watershed, its boundaries, and the functions and values of its resources.  
Actions for consideration of the Advisory Committee include, but are not limited to:
  - School competitions
  - Watershed Awareness Day
  - Information kiosks throughout the basin
  - Develop a web site for the basin with links to towns and other stakeholders
  - Develop a regular column about the watershed and its resources in the watershed newspapers
  - Develop a video library of natural resource information.Implementing Group: Watershed Coordinator(s), Advisory Committee, Private Conservation and Civic Community Organizations  
Year Start/End: Ongoing. Priorities set by Advisory Committee and availability of groups.  
Measure of Success: Increased watershed activities regarding watershed awareness.
8. Write a detailed history of the basin.  
Implementing Group: Advisory Committee  
Year Start/End: 2001  
Measure of Success: History written.



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# Chapter 5

## Stewardship, Education, and Putting the Plan in Motion

For many people, the concept of a watershed is a forgotten lesson from a basic biology class in high school. People define their affected area by town, neighborhood, or even property lines, failing to consider that natural resources and the actions that affect them have no regard for such boundaries.

Many of the cumulative and detrimental impacts to the watershed's overall health come, in most cases, unwittingly, from actions of the individuals and land use decision makers who live and/or work in the watershed. These actions are often taken without consideration or understanding of how the larger ecosystem is likely to be affected. This lack of environmental awareness, coupled with the tendency of people to underestimate their cumulative impacts as individuals, points to need of public outreach and education programs. In general, people want to do what is right for the environment and respond positively when the issues are understood.

This outreach program has three aims: 1) to personalize the watershed message and make it relevant to all inhabitants so that they realize why it is important to care about the Norwalk River Watershed; 2) to educate inhabitants about the Norwalk River, its tributaries, and the lands beyond the watercourses and how these three interrelate as a watershed; and 3) to provide inhabitants with knowledge about sound environmental principles that will contribute to a healthy watershed. The program combines stewardship - taking care of the watershed, with education - teaching inhabitants how to provide this care.

### Stewardship

Stewardship begins when the message of responsible watershed management is delivered to all inhabitants of the Norwalk River Watershed and these inhabitants, in turn, understand that each one of them personally has a stake in restoring and protecting the river. The stewardship message must be tailored to people's interests. It can be delivered in various formats, such as:

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- Organizing a watershed awareness day, perhaps in connection with Earth Day or Norwalk's Oyster Festival (held each September). Activities on this day could include a mini-stream walk, both to educate residents about the River and to clean up litter; a kiosk in each town to provide information on "natural" lawn care, septic maintenance, and being a good watershed neighborhood; an amateur photo contest highlighting views of the River; a school-wide art contest (with a watershed theme); or a bike ride, walk, or run that would link the seven towns.
  - Having a competition among watershed schools by asking a particular grade (or grades) to develop ways to educate people about the watershed. Based on the information they acquired, schools could compete in a watershed "bee", testing their knowledge of the watershed historically, environmentally, and politically. Local media would be encouraged to cover this event.
  - Fostering and supporting existing resource protection and education efforts.
  - Providing information to the public about the watershed. For example, a web site for the watershed could be established. A watershed "clearing house" could also be established at each town's library which would contain background information on the Norwalk River and indicate other reference sources.
  - Sponsoring a public workshop series that would focus on specific issues depending on the season (for example, "green" gardening in the spring).

It is envisioned that the Advisory Committee and the Watershed Action Plan Coordinator(s) will work together and develop the most appropriate ways to deliver the stewardship message to watershed inhabitants.

In conjunction with providing information to the general population, municipal officials, particularly those involved in regulating land use, are an equally important component in bettering the health of the Norwalk River Watershed. The content of local regulations and how these regulations are implemented depend greatly on the knowledge and determination of local government officials. Thus, it is recommended that chief elected officials (or their designated representatives) for the seven watershed towns meet frequently to share information about watershed activities, to assess progress of remedial actions, and to maintain support for implementation of this plan.

## **Education**

Education begins with teaching children in the seven watershed towns about the importance of watersheds, in general and the value of the Norwalk River, in particular, to their lives. By becoming more knowledgeable, it is hoped that students will become better stewards of the river in the future.



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As part of the NRWIC's work, the subcommittee on stewardship and education undertook an assessment of water-related studies/activities that each school system currently conducts. A brief survey form was developed and sent to staff familiar with science or biology in the school systems of the six Connecticut towns. Survey results showed that studying the Norwalk River is an integral component of the curriculum at schools that responded. Responses from the survey showed a broad coverage of watershed-related topics by the schools. Respondents indicated that they commonly dealt with such topics as watersheds, the water cycle, the Norwalk River, Long Island Sound, plants, animals, fish/other aquatic animals, and recycling. Infrequently covered were riparian zones, hunting/fishing, and farming. Usually, the Norwalk River and Long Island Sound were addressed in the same school year. The survey also highlighted that there is little consistency and less coordination among schools in studying watershed-related subjects. Textbooks and curriculum differ from school to school. In addition, what topics are covered in what grades varies widely among the schools. Survey results point to the need for cooperation and an exchange of ideas in teaching children how to be good watershed stewards. Indeed, many respondents indicated their interest in collaborating on watershed education.

### **Putting the Plan in Motion**

The guiding principle for plan implementation is that of local action to protect and restore the Norwalk River Watershed. Implementation of the plan needs to be a coordinated, locally-based, watershed-wide activity that continues the Initiative's work. The following two recommendations are suggested as a means to begin to implement the Plan:

1. Formation of an Advisory Committee to include representatives from each municipal government, state, federal, and regional agencies, environmental and civic organizations, and business and industry. To the greatest extent possible, these representatives should have served on the NRWIC. The Committee will ensure that the focus remains on resource improvements for the watershed as outlined in the plan.
2. Hiring of Watershed Action Plan Coordinator(s), a paid, part-time position who will, in cooperation with the Advisory Committee, carry out the action items specified in the plan. The Watershed Coordinator's exact role and responsibilities will be determined by the Advisory Committee.

Putting this plan into action will also require resources. While some of the recommendations in Chapter 4 (for example, adopting minimum 100-foot regulatory review areas adjacent to wetlands) can be accomplished within each of the seven municipalities' existing regulatory programs, others will require additional technical and financial assistance. EPA and CTDEP have already provided grants and NRCS technical assis-

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tance to support the NRWI planning efforts and to begin implementing some recommended actions. These agencies are also committed to providing additional funds over the next several years to support further implementation. NRCS, CTDEP, and EPA are committed to providing continued support to implement the plan. Other state and federal agencies, such as the United States Geologic Survey, the United States Army Corps of Engineers, and the United States Fish and Wildlife Service are lending their extensive technical expertise to water quality monitoring and habitat restoration efforts. Participating groups of the NRWIC, such as the local land use commissions, nonprofits, environmental and conservation groups, and civic organizations are committed to continuing their work for the protection and restoration of the watershed.

This plan will only be a success if the seven municipal governments involved and watershed residents commit themselves to implementing it. While state and federal government agencies can provide support, the driving force for implementation, as it was for the planning effort, lies at the local level.

It's our watershed -- let's take care of it!



*Photo: Members of the Norwalk River Watershed Initiative and other volunteers help restore a streambank along the Norwalk River.*



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# Glossary

- Algae** can be found in both fresh and marine waters. In fresh water, algae are mostly single cell plants. They can color the water green, and they can grow in colonies which can form either long filamentous bodies or form a mat on the stream's substrate. Algae are usually green and slimy and do not have any visible structural characteristics. Algae growth points to nutrient problems in the stream. Marine macroscopic green, brown, and red algae are structurally different from aquatic vascular plants.
- Anadromous Fish** begin life in fresh water, migrate to the sea to reach maturity, and return to freshwater to spawn.
- Best Management Practices** means a practice, procedure, activity, structure or facility designed to prevent or minimize pollution or other environmental damage or to maintain or enhance existing environmental quality. Such management practices include, but are not limited to: erosion and sedimentation controls; restrictions on land use or development; construction setbacks from wetlands or watercourses; proper disposal of waste materials; procedures for equipment maintenance to prevent fuel spillage; construction methods to prevent flooding or disturbance of wetlands and watercourses; procedures for maintaining continuous stream flows; and confining construction that must take place in watercourses to times when water flows are low and fish and wildlife will not be adversely affected.
- Combined Sewer Systems** are designed to allow sewage and storm water to flow together through sewer pipes. Overflows occur when storm water exceeds the capacity of the sewer system. The overflow discharges into local waterways instead of being treated in a sewage treatment plant. The discharges cause periodic water quality violations, particularly from fecal coliform bacteria levels.

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**Erosion/  
Sedimentation**

erosion is the scouring/removal of upland substrate and washing of soil into the waterway. Sedimentation occurs when soils wash into waterways and increase the turbidity of the water. Turbidity (suspended soil particles) reduces both the clarity of the water and the amount of sunlight reaching the plants. It also impairs the respiration of the fish and organisms that live in the waterbody. Sedimentation can result in an increase in surface water temperatures, which decreases dissolved oxygen concentrations in water and lessens the number of spawning habitat as more pools and nest sites are filled.

**Eutrophication**

is the process of enrichment of surface waters with plant nutrients which may cause nuisance algae blooms and excessive growth of aquatic weeds.

**Habitat  
Degradation**

refers to reduction of riparian and tidal and non-tidal wetland vegetation, restriction of tidal exchange, and natural salinity concentrations, streambank or channel erosion, gully erosion, barriers to fish passage, litter and impoundments.

**Hydric Soil**

is a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part. The soil is a good indicator for “wetlands.”

**Hypoxia**

a serious water quality problem in the western section of Long Island Sound, is a low dissolved oxygen condition. Nitrogen fuels excessive growth of marine algae, which eventually die and decay, consuming oxygen in the process. Areas affected by hypoxia are dangerous to marine species that inhabit the Sound.

**Impaired Sites**

are sections of a stream where physical characteristics indicate conditions adverse to fish life and human uses.

**Mitigation**

actions that make conditions less severe or intense.



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<b>Nutrient Enrichment</b>	is the addition of nutrients, such as nitrogen and phosphorous, to a waterbody which enrich the water and can increase algal and plant growth. This addition of nutrients often results from leaking septic systems, fertilizers, and pesticides.
<b>Polluted Runoff (Nonpoint Source (NPS) Pollution</b>	is caused when rain and melted snow flow over and through ground that has been disturbed or impacted by land use activities. This "runoff" carries contaminants from upland areas and deposits them in downstream or downgradient surface and groundwater resources affecting the quality of water.
<b>Riparian Zones</b>	are areas of, on, or relating to the bank of a natural watercourse.
<b>Substrate</b>	the material that makes up the bottom (or floor) of a stream. There is a direct relationship between the stream's substrate and the rate of water flow. The composition of the substrate is indicative of fish habitat quality.
<b>Waste</b>	means sewage or any substance, liquid, gaseous, solid or radioactive, which may pollute or tend to pollute wetlands or watercourses or any waters.
<b>Water Pollution</b>	means the harmful thermal effect or contamination or rendering unclean or impure of any waters by reason of any waste or other materials discharged or deposited therein by any public or private sewer or otherwise so as directly or indirectly to come in contact with any waters.
<b>Watercourses</b>	means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs, and all other bodies of water, natural or artificial, vernal or intermittent, public or private.
<b>Watershed</b>	all of the land and water area from which precipitation runs off and drains into a particular watercourse or waterbody.

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## Wetlands

Connecticut General Statute 22a-38 (Inland):

“Wetlands” means land, including submerged land...inclusive, which consists of any of the soil types designated poorly drained, very poorly drained, alluvial, and flood plain by the National Cooperative Soil Survey...of the Soil Conservation Service of the United States Department of Agriculture; “Watercourses” means rivers, streams, brooks, waterways, lakes, ponds, marshes, swamps, bogs and all other bodies of water, natural or artificial, public or private, which are contained within, flow through or border upon this state...

Connecticut General Statute 22a-2a (Tidal):

“Tidal wetlands” means those areas which border on or lie beneath tidal waters, such as but not limited to banks, bogs, salt marsh, swamps, meadows, flats, or other low lands subject to tidal action, including those areas now or formerly connected to tidal waters, and whose surface is at or below an elevation of one foot above local extreme high water; and upon which may grow or be capable of growing some, but not necessarily all, of the following species...

In New York, freshwater wetlands are defined as follows:

ENV 24-0107 (Article 24 of the Environmental Conservation Law):

(Inland) “Freshwater wetlands” means lands and waters of the state as shown on the freshwater wetlands map which contains any or all of the following: Lands and submerged lands commonly called marshes, swamps, sloughs, bogs, and flats supporting vegetation of the following types ...; lands and submerged lands containing remnants of any vegetation that is not aquatic or semi-aquatic that has died because of wet condition over a sufficiently long period, provided that such wet conditions do not exceed a maximum seasonal water depth of six feet and provided further that such conditions can be expected to persist indefinitely, barring human intervention; lands and waters substantially enclosed by aquatic or semi-aquatic vegetation as set forth ...



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# Appendices

1. Norwalk River Watershed Streamwalk Findings Report Summary 1997.
2. Norwalk River Watershed Initiative: Processes and Actions Taken. February 1997 through October 1998.
3. Norwalk River Watershed Initiative: Review of Existing Municipal Regulations Summary, April 1998.
4. Nonpoint Education for Municipal Officials (NEMO) Project in the Norwalk River Watershed.
5. Norwalk River Watershed Resource Reference List and Reports.





## Streamwalk Findings Report Summary

### What Is The Norwalk River Watershed Initiative?

The Norwalk River Watershed Initiative is part of a planning project undertaken by the municipalities in the watershed area, the U.S. Environmental Protection Agency (EPA) Long Island Sound Office, the Connecticut Department of Environmental Protection (DEP), the U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), and the Fairfield County Soil and Water Conservation District. One of the goals of the initiative is to involve residents in helping develop a plan to restore and protect the watershed.



The Norwalk River Regional Watershed was divided into 26 subwatershed units for collecting data during the streamwalk. The Natural Drainage Basins in the Connecticut map divides the Norwalk River Regional Watershed into three subregional watersheds: the Comstock Brook, the Silvermine River, and the Norwalk River Watersheds. These subregional watersheds have been further divided into local watersheds. The 26 subwatersheds used for the streamwalk are groupings of these local watersheds.

### Norwalk River Watershed Summary

This watershed contains the main stem of the Norwalk River and its perennial tributaries, most of which were surveyed during the streamwalk. The main stem was measured to be approximately 20 miles in length from the outlet of the river at the Norwalk Harbor area to Little Pond in the Town of Ridgefield. The lengths of Ridgefield, Branchville, Cooper Pond, Gilbert Bennett, Mayapple, Goetzen, Copts, and Betts Pond Brooks, and a few other perennial tributaries to the Norwalk River are approximately 16 miles of stream.

During the streamwalk, 72 impaired sites were identified in the Norwalk River Subregional Watershed. Excessive algae growth, impoundments/dams, and streambank manipulation were the three most common types of impairments in the Norwalk River. There were 19 impaired sites identified for algae growth, 15 identified for impoundment, and 12 identified for streambank manipulation. Impaired sites for litter and lack of riparian zone were also common in this area. This watershed also has a large number of pipes discharging directly into the river.

Encroachment and manipulation of the stream have resulted from the construction of Route 7. The uninterrupted width of riparian vegetation in the main stem of the Norwalk River is mostly less than 100 feet, with many sections having less than 25 feet. Streambank protection and stream channelization are common in this stream.

The width of the main stem ranges between 6 and 20 feet on the northern half of the river, and ranges between 30 and 50 feet on the southern half. North of the harbor, the stream's substrate is primarily composed of cobbles, boulders, and sand.

### Streamwalk Results

The streamwalk was conducted from August through November 1996. Fifty volunteers participated. The information in the Streamwalk Report is a direct reflection of the observations the volunteers recorded at the time they walked the stream.

Inventory sheets were used to collect information about the stream system during the streamwalk. The inventory sheets were designed to record only physical observations within and adjacent to the stream corridors. Two separate inventory processes were conducted using the inventory sheets. One sheet (the Norwalk River Segment Survey) was designed to collect data that would provide a general description of the characteristics of the streams corridors. The second sheet (the Impaired Site Assessment Sheet) was designed to identify and describe specific sites where the stream shows physical signs of adverse conditions to cold water fisheries and human use (recreational and consumptive). These sites are referred to as impaired sites. A total of 132 impaired sites were identified during the streamwalk.



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## Silvermine River Watershed Summary

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This watershed contains the main stem of the Silvermine River and its perennial tributaries, most of which were surveyed during the streamwalk. The main stem was measured to be approximately 8 miles in length from its junction with the Norwalk River to John D. Milne Lake in the Town of New Canaan. The lengths of the East Branch Silvermine and West Branch Silvermine Rivers, and Silver Spring, Huckleberry, Thayers, Parting, and Belden Hill Brooks, and a few other perennial tributaries to the river were measured to total approximately 21 miles of stream.

The width of the main stem ranges between 15 and 35 feet. Streamside vegetation was mostly described as deciduous trees and lawns. The uninterrupted width of riparian vegetation was, on the average, less than 100 feet. The stream substrate is primarily composed of cobbles and gravel, except in sections of the stream that have been ponded, where sands and silt are abundant.

During the streamwalk, 48 impaired sites were identified in the Silvermine River Subregional Watershed. Impoundments/dams, lack of riparian zone, and streambank manipulation were the three most common types of impairments in the Silvermine River. There were 26 impaired sites identified as impoundments, 10 impaired sites identified for lack of riparian vegetation, six impaired sites were identified for algae growth, and three for streambank manipulation. Excessive algae growth was also identified as a concern in the Silvermine River, especially because it was frequently found associated with impoundments.

In the Silvermine River, many homeowners have constructed small dams to create ponds in their backyards. Also, to get a view of the river, some homeowners have cleared all riparian vegetation along their side of the stream. Many of these sites have large lawns draining directly into the stream. Increased sediment deposition, increased sunlight exposure, and runoff from fertilized lawns result in excessive growth of algae and large aquatic plants. Temperature also increases in these sites.

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## Comstock Brook Watershed Summary

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This watershed contains the main stem of Comstock Brook and most of its perennial tributaries, most of which were surveyed during the streamwalk. The main stem was measured to be approximately three miles in length from the junction of the stream with the Norwalk River (in the Town of Wilton) to the outlet of East Branch Comstock Brook.

The lengths of the Comstock, Barretts, Spectacle, and East Branch Comstock Brooks, and a few other perennial tributaries to Comstock Brook were measured to total approximately 16 miles of stream.

The width of the main stem ranges between five and 20 feet. Streamside vegetation was described as a mixture of deciduous and coniferous trees. The uninterrupted width of riparian vegetation is on the average greater than 100 feet. The substrate of the southern half of the stream was described as a mixture of cobbles and boulders. The substrate of the northern half was described as a mixture of cobbles and sand.

During the streamwalk, 12 impaired sites were identified. Impoundments/dams were the most common type of impairment in the Comstock Brook Stream System. There were seven impaired sites identified for impoundment. Sedimentation was also identified as a concern. Three impaired sites were identified for sedimentation.

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## The Streamwalk Report

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The streamwalk report is intended to be used by local stakeholders as a planning tool. Therefore, conclusions or recommendations were not part of the report.

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## Sources

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Connecticut DEP 1981 Drainage Basin Maps.

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## For More Information

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For more information, contact:

Fernando Rincon  
Resource Conservationist  
USDA, Natural Resources Conservation Service  
16 Professional Park Road  
Storrs, Connecticut 06268-1299  
(860) 487-4033.

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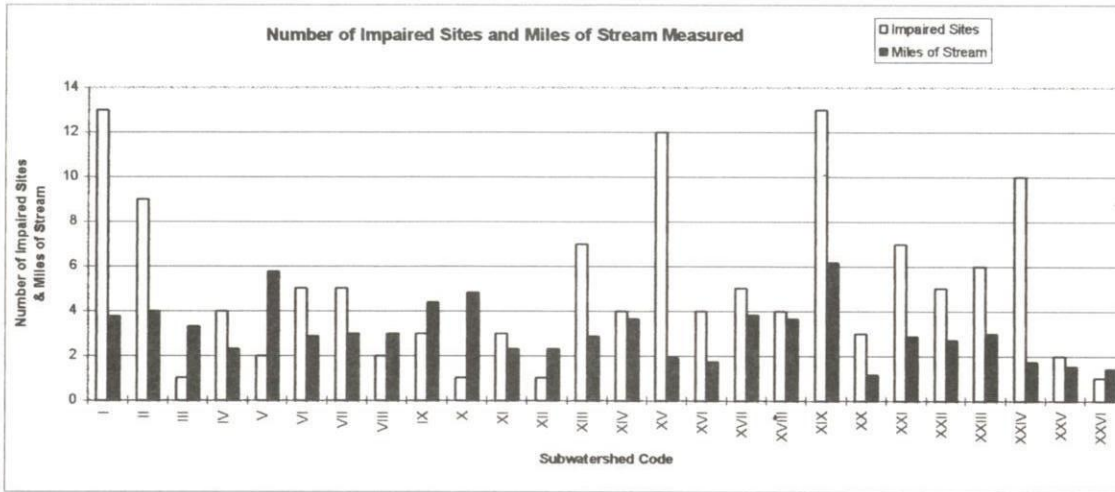


Figure 1

This bar chart illustrates the number of impaired sites observed in each subwatershed during the streamwalk. The number of impaired sites is plotted next to the approximate number of miles of perennial stream measured in each subwatershed.

Figure 1

Figure 2

This bar chart illustrates the number of small ponds (less than 5 acres in surface area) observed by the volunteers in each subwatershed during the streamwalk. The number of impaired sites is plotted next to the appropriate number of miles of perennial stream measured in each subwatershed.

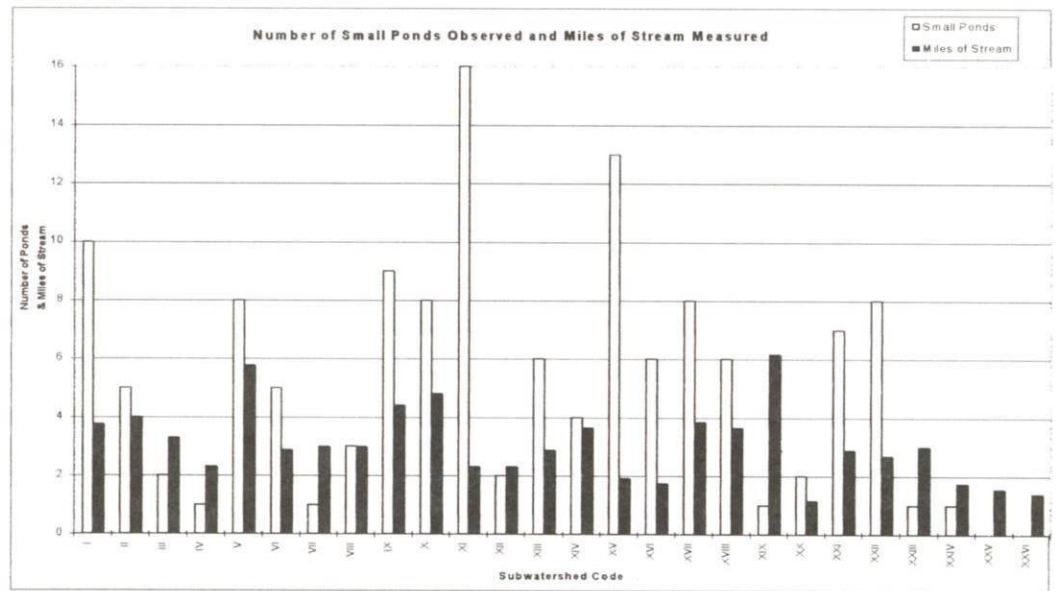


Figure 2

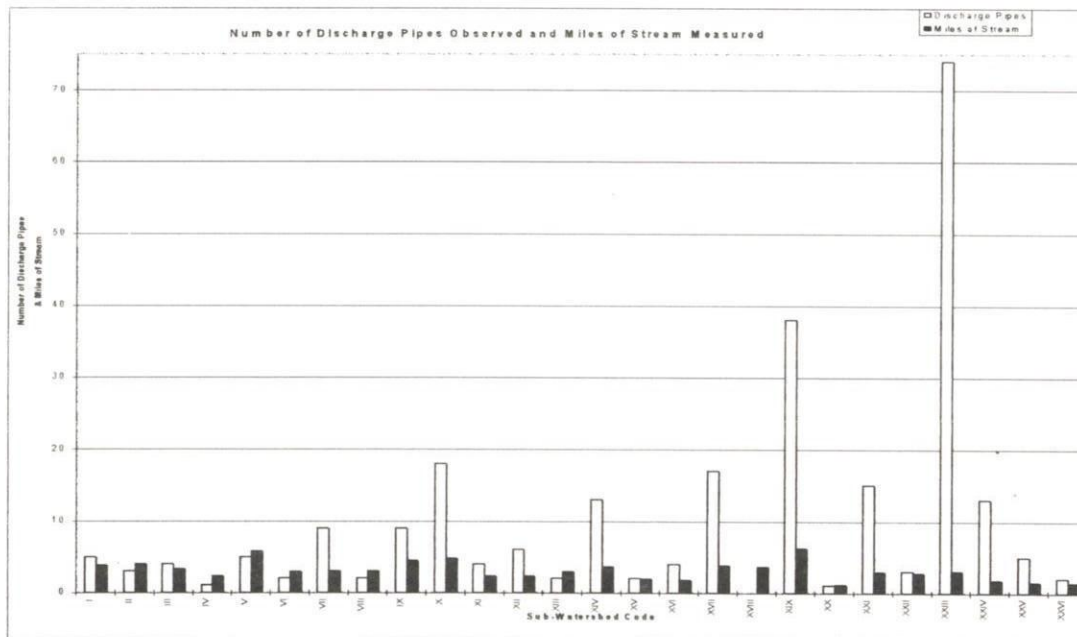


Figure 3

Figure 3

This bar chart illustrates the number of discharge pipes observed by the volunteers in each subwatershed during the streamwalk. The number of impaired sites is plotted next to the approximate number of miles of perennial stream measured in each subwatershed.





## Appendix 2:

### **Norwalk River Watershed Initiative Committee - Processes and Actions Taken February 1997 through October 1998**

- The Committee was formed with representation from federal, state, and regional agencies, the seven municipalities (Norwalk, Wilton, New Canaan, Weston, Redding, Ridgefield in Connecticut and Lewisboro in New York), and over 30 community representatives--both from individual citizens and representatives from local organizations and business interests. The first meeting was held February 20, 1997.
- The Committee reviewed a draft workplan outlining a series of steps that would lead to the development, approval and implementation of a locally-led watershed management plan. It was agreed that the process outline was to serve as a template and that the Committee would decide ultimately what course it would take to reach its goal of developing a watershed plan.
- The Committee agreed to meet monthly and approved meeting agreements on conduct of committee meetings.
- The Committee formed four subcommittees based on the list of issues and interests. They are habitat restoration, water quality; land use/flood protection/open space; and stewardship and education.
- EPA funds the UCONN Cooperative Extension System NEMO (Nonpoint Source Education for Municipal Officials) program for the Norwalk River Watershed Initiative to provide educational outreach to the watershed's municipal commissions at the direction of the Committee.
- The Committee approved the NRWI Public Education and Outreach Plan. This plan is conducted by Save The Sound at the direction of the Committee.
- The Fairfield County Soil and Water Conservation District developed a slide show for the Committee on the resource conditions of the Norwalk River Watershed.
- The subcommittees developed draft goals and objectives for public review.
- The Committee held three public meetings to solicit public comment and discussion about the draft goals and objectives for the watershed. As part of this public comment process, a written survey is developed and mailed to 1,200 watershed residents. Survey results were compiled and analyzed by the Committee.
- The Committee developed a comprehensive stream corridor site impairment list based on Streamwalk data, aerial photo interpretation and input from the community.
- The Committee sponsored focus groups to elicit the viewpoints and perceptions of streamside landowners.
- The Committee issued five NRWI newsletters, which are distributed to residents throughout the watershed.
- The Committee develops and mails to the watershed school systems a watershed education assessment survey.

- As part of the public education plan, teacher training has been conducted for watershed schools educators.
- Formal presentations on the NRWI were made at a number of national, regional and state professional meetings (i.e., Southern New England Conservation District Annual Meeting; the New England Regional Implementation Team of Coastal America; National Association of Conservation Districts' Urban Conference; Connecticut Fund for the Environment's Annual Meeting; Winter Meeting of the Southern New England Soil and Water Conservation Society; Watershed '98 in Denver, Colorado; Annual Meeting of the Soil and Water Conservation Society, San Diego, California).
- The Norwalk River Watershed Association promoted the Initiative in different venues in the watershed, such as informational booths at local festivals and river discovery outings. Over the past two years, the NRWA also sponsored river clean-ups at ten sites in five towns in the watershed.
- NRCS, University of Connecticut, DEP, EPA and Committee members developed a scientific symposium using the Norwalk River Watershed Initiative as a framework for *"Identifying Achievable Ecological Outcomes Within An Urban Watershed"*.
- The Fairfield County Soil and Water Conservation District and the King's Mark Resource Conservation and Development Area received a \$55,000 grant to provide riparian area restoration demonstration projects in the Norwalk River Watershed at the direction of the Committee.
- The Streamwalk presentation was made to the Committee and copies of the report were made available to Committee members, Streamwalk volunteers, and the public.
- NRCS prepares a comprehensive review of watershed municipal rules and regulations for the Committee. Subcommittee uses review to determine potential action items for watershed protection.
- A volunteer citizen monitoring plan was developed and implemented with input from the Committee, NRCS, CTDEP, CT Dept. of Agriculture - Aquaculture Division, and Harbor Watch/River Watch.
- The Committee successfully applied for CTDEP Section 319 grant non point source funds to continue with the priority items identified in the plan.
- CTDEP prepares and presents a proposal on an Early Flood Warning Network (ALERT) to municipal officials of Ridgefield, Redding, Wilton and Norwalk.
- CTDEP prepares feasibility study for the Committee with regards to restoring an anadromous fish run in the Norwalk River.
- Informational brochures prepared for watershed residents. Poster boards developed for the Initiative and displayed at Public Libraries throughout the watershed.
- Trout Unlimited, with help from CTDEP and NRCS, apply for an "Embrace a Stream" grant for coldwater fisheries restoration efforts in selected portions of the Norwalk River Watershed. TU announces award and work begins on two sites in the watershed.
- Chief Elected Official Workshop on draft plan conducted April 1998.
- Release of "The Norwalk River Watershed Action Plan" and Public Signing Ceremony held in October 1998.



## Appendix 3:



*New England Interdisciplinary  
Resources Technical Team (IRT)*

### **Norwalk River Watershed Initiative Review of Existing Municipal Regulations September 1997 Revised April 1998**

#### **Abstract Summary Statement**

This review of local rules and regulations is a component of the Initiative process. This review was conducted by the Natural Resources Conservation Service community planner on the New England Interdisciplinary Resources Technical Team (IRT) with assistance from state and municipal officials.

The reviewer looked at existing municipal regulations and programs for the municipalities in the watershed: Norwalk, New Canaan, Redding, Ridgefield, Weston, Wilton, and Lewisboro, New York. The purpose was to identify the controls, policies, and plans that favor protection and enhancement of the Norwalk River and its watershed. The tabular summary lists characteristics that make a municipality's plans, policies, and regulations similar to or different from another municipality in the watershed. The following regulations and programs were reviewed for each of the seven municipalities in the Norwalk River Watershed. A narrative description for each of the policies and plans and regulations follows the listing.

#### **Policies and Plans**

Plan of Development  
Special Conservation Areas  
Green-way Provisions  
Open Space Plans and Regulation Requirements

#### **Regulations**

Zoning Regulations  
Flood Plain Management  
Buffer Zones  
Aquifer Protection  
Resource Extraction (Including sand & gravel mining)  
Subdivision Regulations  
Storm Water Management  
Erosion & Sediment Control Plans  
Alternative Developments Allowed  
Inland Wetland Regulations - setback provisions

## **Policies, Plans and Regulations Reviewed**

The following plans, policies, and regulations were reviewed because they are the principal provisions for environmental protection within each municipality that, if implemented, will have an impact on the Norwalk River Watershed.

Policies and Plans -- Policies and plans adopted by a municipality provide the overall guidance to achieve the future vision for the community. Existing municipal documents were reviewed for the presence of policies and plans that relate to environmental protection.

Plan of Development -- Municipalities in the Norwalk River Watershed have plans of development or plans of conservation and development. The review of these plans looked at how current the plans are and the extent that they include policies, strategies, and implementation recommendations for protection of the Norwalk River and the watershed.

Open Space Plans and Regulation Requirements -- Municipal regulations and policies were reviewed to determine the extent that they plan for and encourage and or require open space dedication to protect natural areas and provide recreational opportunities. Open space dedication refers to requirements in regulations or town policy to set aside a certain amount of land for permanent open space as part of the subdivision plan approval process. Regulations were reviewed to identify municipal requirements for open space.

Greenway Provisions -- A greenway is an undeveloped corridor of open space land that connects two or more parcels of open space and or park land. The objective of the review for greenway provisions was to determine the extent municipal policy or regulations encourage or require greenway considerations in the land development review process.

Special Conservation Areas -- Unique or especially significant natural areas that have been identified and or designated as valuable special areas for protection as open space. Regulations and town plans were reviewed for inclusion of provisions for special conservation areas.

Zoning Regulations -- Zoning regulations of each municipality essentially determine the current and future land use. Different land uses impact the environment in different ways and to varying degrees. Zoning regulations for each municipality in the Norwalk Watershed were reviewed to identify the controls, policies, and plans that favor protection and enhancement of the Norwalk River and its watershed.

Flood Plain Management -- Flood plains are the relatively flat areas adjoining rivers, streams and coastal areas that can flood and when built upon can be a hazard to life and property. Municipal documents were reviewed to determine the extent that they protect flood plains for their natural function of receiving flood water and dispersing its energy while allowing compatible land uses for both economic potential and protection of natural resources.

Buffer Zones -- Buffer zones are areas of land without structures that are left in their natural state or landscaped to serve as visual or natural barriers between different land uses. Natural areas provide wildlife habitat and screening.



Aquifer Protection -- An aquifer is a geological unit that is capable of yielding usable amounts of potable water. The purpose of this review was to note whether any form of municipal aquifer protection existed.

Resource Extraction -- Resource extraction refers to the excavation and removal of earth materials from a parcel of land. Zoning regulations were reviewed to identify any special permit requirements for the removal of earth materials including sand and gravel mining.

Subdivision Regulations -- Subdivision regulations provide details on the process for subdividing land in each municipality. A subdivision refers to the division of a parcel of land into smaller parcels for sale or building development. Subdivision regulations were reviewed to identify whether or not they contained provisions that could influence the amount and concentration of non-point source pollution contributed by a subdivision.

Storm Water Management -- Storm water management refers to the combination of practices or actions taken to control the quantity, rate of flow, and quality of surface water runoff resulting from rainfall. Storm water management is the planned control of storm water runoff to prevent flooding, erosion and sedimentation, and water quality degradation; and to promote groundwater recharge and minimize the impact of developments on adjacent or downstream land and watercourses. Municipal documents were reviewed to identify provisions for management of storm water.

Erosion & Sediment Control Plans -- An erosion and sediment control plan contains the proper provisions to adequately control erosion and sedimentation and to reduce the potential damage from storm water runoff from a subdivision. Regulations were reviewed to identify requirements for erosion and sediment control.

Alternative Developments Allowed -- Alternative developments are non traditional developments that will assure conservation of land and accomplish some of the following purposes:

- preserve land for park and recreation purposes;
- preserve and protect natural areas;
- preserve wetlands, marshlands or land with other natural values; and
- protect streams rivers and ponds.

Alternative developments (sometimes called conservation developments) may allow an increase in density in part of a parcel in order to protect other more sensitive land. Regulations and plans were reviewed to determine the absence/presence of alternative development provisions.

Inland Wetland Regulations -- Inland Wetland Regulations are regulations adopted by the municipalities in accordance with the Connecticut Inland Wetlands and Watercourses Act codified in Section 22a-36 and 22a-45 of the Connecticut General Statutes. The regulations make provisions for the protection, preservation, maintenance and use of the inland wetlands and watercourses by minimizing their disturbance and pollution. The regulations were reviewed to determine the presence/absence of buffer or setback requirements.

Inland Wetland Regulations Setback Requirements -- The linear distance from a wetland or watercourse that is considered within the regulated area under the municipal inland wetlands and watercourses regulations. It is generally expressed as "The regulated area shall extend for a distance of \_\_\_ feet from wetlands, and \_\_\_ feet from the edge of a watercourse." The regulations were reviewed for the existence of distance requirements.



### **Analyses of Policies and Plans**

- Plan of Development – Five of the seven municipalities have plans over 10 years old; three of the five municipalities are currently updating their plans.
- Special Conservation Areas – Each of the seven municipalities recognize special conservation areas worthy of protection.
- Greenway Provisions -- All the municipalities towns in the watershed consider open space plans with inter-connectedness. Six of the seven municipalities owns identified greenways and trail linkages as a valuable resource.
- Open Space Plans and Regulation Requirements -- Two of the municipalities towns have identified open space goals. Redding has a goal of protecting 25 percent of the town; Ridgefield has a similar goal of 30 percent.

### **Analyses of Regulations**

- Flood Plain Management -- All municipalities meet the minimum National Flood Insurance Program (NFIP) requirements (floodplain fringe development increases the 100-year flood level by less than one foot). Lewisboro prohibits development in the floodplain unless it can be shown that the development won't increase flood levels.
- Buffer Zones – Municipal buffer zone regulations are to separate one land use from another.
- Aquifer Protection -- Four municipalities have provisions for aquifer protection; three others refer to aquifer protection.
- Resource Extraction (Including sand & gravel mining) -- Six of seven municipalities require permits for resource extraction. The other municipalities require approval from the building inspector.
- Storm Water Management -- Weston requires zero increase in peak discharge and volume of runoff from developments. Wilton requires design to full flow. Other municipalities have less restrictive requirements. No municipalities have storm water regulations that address water quality issues.
- Erosion & Sediment Control Plans -- All the seven municipalities in the watershed require soil erosion and sediment control plans. Ridgefield requires an erosion and sediment control plan for any earth disturbing activity.
- Alternative Developments Allowed -- All municipalities have provisions for some type of conservation or alternative developments.
- Inland Wetland Regulations – All seven municipalities have “setback” requirements; these areas from wetlands and watercourses range from 15 to 200 feet. One municipality has four different categories for setback distances. Three others have two different categories.

## Appendix 4:

### **Nonpoint Education for Municipal Officials (NEMO) in the Norwalk River Watershed**

The Norwalk River Watershed Initiative Committee (NRWIC) realized early in the planning process that *water quality in the Norwalk River is, in large part, a function of land use throughout the watershed.* Although there are four municipal sewage treatment plants that discharge to the river, existing data indicates that nonpoint source pollution, or polluted runoff, is the primary contributor to water quality impairments in the watershed. The characteristics of this runoff, both in terms of its chemistry and the rate at which it enters receiving waters, are driven largely by the amount of impervious surfaces in the watershed. Over the years, *the construction of buildings, roads, and parking lots throughout the watershed has severely reduced the natural buffering and filtering capacity of undisturbed soils and vegetation.*

The NRWIC determined that preventing an increase in nonpoint source pollution would require that runoff from new development be minimized, and if possible, prevented. The Committee also determined that achieving this goal would require that local land use decision-makers be provided with the information necessary to guide future development in an environmentally-friendly manner. To address this need, the Environmental Protection Agency awarded a grant to the NEMO Project to provide a series of educational programs utilizing NEMO project methods and materials to the land use boards and commissions of the seven watershed communities.

The NEMO Project of the University of Connecticut Cooperative Extension System is exploring new ways of helping local land use decision makers deal with the complexities of nonpoint source water pollution. Since 1991, the NEMO Project has been developing and conducting educational programs on water quality targeted at local land use officials. NEMO uses computer graphics, remote sensing images, and geographic information system (GIS) maps to portray the links between land use and water quality in a concise, understandable way that makes sense in the busy world of local board and commission members. NEMO stresses planning and site design strategies, in addition to the use of structural stormwater management techniques. Communities may use this information to consider changes to plans of development and conservation, changes to zoning regulations, initiation of open space planning and/or natural resource inventories, and changes in standard procedures followed by commissions.

During 1997 and 1998, NEMO presented at 12 workshops (in 6 of the 7 watershed communities) and reached more than 200 participants. The topics at the workshops included:

- *Impact of development on watersheds*
- *Pollutants in nonpoint source pollution: their sources and effects*
- *Use of watersheds as a planning unit for towns to track cumulative impacts*
- *Land cover types and their effects on water quality*
- *Strategies that communities can use to cope with polluted runoff.*



The more than 200 workshop participants included selectmen and supervisors, members of Planning and Zoning Boards, Inland Wetlands and Conservation Commissions, health directors, parks department directors, highway supervisors and school teachers. Others reached were any volunteers in organizations such as League of Women Voters, Weston High School Environmental Club, Norwalk Maritime Aquarium, Save the Sound, and SoundWaters.

In 1998, EPA-Long Island Sound Office awarded a second-year grant for the purpose of continuing the NEMO educational efforts in the watershed. At the direction of the NRWIC, NEMO will focus its efforts on public education, open space planning, and watershed management and approaches to impervious surface reduction.

## **Appendix 5: Selected Norwalk River Watershed Resource Reference List and Reports**

### **Land Use**

- City of Norwalk, 1990, Plan of Development for the City of Norwalk, Addendum.
- City of Norwalk, 1996, Master Plan of Parks and Open Space, Addendum.
- Connecticut Committee of Regional Planning Association, 1996, Fairfield County/2000 report.
- Connecticut Department of Environmental Protection, Office of Long Island Sound Programs, 1992, Reference guide to coastal policies and definitions.
- Milone & MacBroom, 1995, Norwalk River Valley/Route 7 Linear Trail-Norwalk and Wilton, Connecticut.
- Norwalk River Watershed Association, 1998, How to manage and landscape your property.
- Office of Policy and Management, State of Connecticut, 1998, Conservation and development, policies plan for Connecticut 1998-2003.
- Redding Conservation Commission, 1984, Open Space Plan.
- Ridgefield Conservation Commission, 1990, Ridgefield walk book.
- Ridgefield Conservation Commission Flood and Erosion Control Board, 1989, Open space inventory report.
- Rivers Alliance, 1998, Streamside buffers.
- Town of Redding, 1984, Redding Town Plan of Development.
- Town of Ridgefield, 1980, Comprehensive Town Plan.
- Town of Weston, 1987, Town Plan of Development.
- Town of Wilton, 1996, Wilton Plan of Conservation and Development.
- United States Department of Agriculture (USDA), Natural Resources Conservation Service, 1998, Review of existing municipal regulations- Connecticut (Norwalk, Wilton, New Canaan, Weston, Ridgefield, Redding) and New York (Lewisboro).
- USDA, Soil Conservation Service, 1981, Soil Survey of Fairfield County, Connecticut.
- Westchester County Department of Planning, 1997, Land use trends in Westchester County 1988-1996.
- Westchester County Planning Board, 1996, Patterns for Westchester: the land and the people.
- Westchester County Department of Planning, 1996, Databook Westchester County, New York.



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- Breault, R.F. and Harris, S.L., 1997, Geographical distribution and potential for adverse biological effects of selected trace elements and organic compounds in streambed sediment in the Connecticut, Housatonic, and Thames River basins, 1992-1994, USGS WRIR 97-4169.
- Coles, J.F., 1998, Organochlorine compounds in fish tissue from the Connecticut, Housatonic and Thames river basins study unit, 1992-1994.
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- Connecticut Department of Environmental Protection (CTDEP), Office of Long Island Sound Programs, (OLISP), 1996, Nonpoint source pollution assessment and management plan-Connecticut's 6217 submission.
- CTDEP/OLISP, 1997, Coastal water quality protection-a guide for local officials.
- CTDEP, Bureau of Water Management (CTDEP/BWM), 1998, Adopted stream channel encroachment lines for the Norwalk River watershed.
- CTDEP/BWM, 1998, Connecticut waterbodies not meeting water quality standards (303d list).
- CTDEP/BWM, 1997, Guidelines upland review area regulations-Connecticut's inland wetlands and watercourses act.
- CTDEP/BWM, 1997, Water quality classification mapping for the Housatonic River and Southwest Coastal basins.
- CTDEP/BWM, 1997, Water quality standards.
- CTDEP/BWM, 1997, State of Connecticut's Water Quality Report 305(b) to Congress.
- CTDEP/BWM, 1995, Water quality survey report on the upper Norwalk River.
- CTDEP/BWM, 1991, Norwalk river eutrophication/nutrient analysis.
- CTDEP/BWM, 1982, Derivation of site specific water quality criteria for the Norwalk River at Georgetown, Connecticut.
- CTDEP, New York Department of Environmental Conservation, and the US Environmental Protection Agency, 1994, Long Island Sound Study-The comprehensive conservation and management plan.
- Davies 3rd, B.S., Morrison, J., Kiesman, S.S., and Colombo, M.J., 1997, Water resources data Connecticut water year 1996.
- Davies 3rd, B.S., Bohr, J.R., Morrison, J., Kiesman, S.S., and Loos, D.A., 1996, Water resources data Connecticut water year 1995, USGS Water Data Report CT-95-1.

- Davies 3rd, B. S., Bohr, J.R., Mullaney, J.R., and Morrison, 1995, Water resources data Connecticut water year 1994, USGS Water Data Report CT-94-1.
- Doenges, J.M., Allan, C.P., Benson, J., and Jontos, Jr., R.J., 1993, Protecting Connecticut's water-supply watersheds: a guide for local officials.
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