

Chapter 7 (Urban): Possible New Remedial Measures

Chapter 7 (Urban): Possible New Remedial Measures Introduction

Each Remedial Action Plan shall include:

"An evaluation of alternative additional measures to restore beneficial uses..."

(Great Lakes Water Quality Agreement, as amended in 1987)

This Stage II chapter describes proposed new remedial measures for use impairments identified in the Rochester Embayment Area of Concern. The measures described in Chapter 7(Urban) address conditions in the Embayment by addressing conditions that exist in the urban area of the Embayment's watershed (Monroe County).

Many remedial measures will directly impact more than one use impairment, and may also indirectly impact others. In most cases, there is no single cause for a use impairment. Consequently more than one action will be required to address each use impairment. For this reason, an ad hoc Task Group of the Monroe County Water Quality Management Advisory Committee carefully evaluated the relationships between proposed remedial measures and the use impairments and summarized the linkages in a table that is shown at the beginning of Chapter 7(Urban).

Each proposal for a remedial measure was written with the assistance of professional persons in the appropriate field. Each proposal received three levels of review by:

- Review team composed of persons knowledgeable in the appropriate field.
- Monroe County Water Quality Coordinating Committee.
- Monroe County Water Quality Management Advisory Committee.

Because of the limited amount of resources that is available for additional remedial measures, an Urban Ranking Task Group evaluated the proposals and ranked them in importance to the RAP process according to a specific set of criteria. See Chapter 10 for a description of the urban ranking process and the ranked list of proposed remedial measures.

A Rural Ranking Task Group selected and ranked the proposed measures that are appropriate to rural counties. See Chapter 7(Rural) for the rural proposed remedial measures, and Chapter 10 for a description of the rural ranking process and the ranked list of proposed remedial measures.

Impairments Reference Table

Identification of Use Impairments Impacted by Chapter 7 (Urban) Sections

Each section in Chapter 7 (Urban) was developed with one specific use impairment in mind. However, most of the sections are actually related to more than one use impairment. After the completion of Chapter 7(Urban), a three-person Task Group assisted with identifying all the use impairments associated with each section.

Identification of the use impairments is sometimes obvious, but more often it is subjective. Recognizing that the actions in some sections will have more impact on use impairments than others, the Task Group divided the impacts into two categories: major/direct and minor/indirect.

Major/direct (denoted on the use impairments table by a black square): The actions to address the use impairment are literally actions, rather than recommendations, promotions or educational programs. The impact on the use impairment will be an improvement in an existing condition or the prevention of deterioration in an existing condition. If the actions are implemented, at least some success is ensured.

Minor/indirect (denoted on the use impairments table by a gray square): The actions to address the use impairment are:

- Dependent on the success of an educational program, a recommendation or a follow-up action (but success is not ensured); or
- Planned to address another use impairment, but has a secondary impact on the use impairment in question.

When the Task Group members identified the use impairments associated with each section, they recognized the impact of *preventing* impacts as well as *remediating* impacts.

**Table 7-1
Chapter 7: Summary of Possible New Remedial Measures
and the Use Impairments that They Address**

Possible New Remedial Measures Name and Ch. 7 (Urban) Section #	Use Impairments (see below)												
	1	3	5	6	7	8	9	10	11	12	13	14	
1-Accelerate PCB removal													
2-Critical pollutants outside Embay.													
3 -NYS Water Quality Plan													
4-Polln. Prevention													
5-Landfills & hazardous waste sites													
6-Storm drain message system													
7-Remediation in Genesee R. gorge													
8-IGA with Army Corps of Engrs.													
9-Institute intergovt. agreements													
10-Manage stormwater quality													
11-Impervious surface reduction													
12-Onsite sewage disposal systems													
13-Point source phosphorus loadings													
14-Promote agricultural BMPs													
15-Education on lawn care													
16-Streambank erosion control													
17-Educate officials on wetlands													
18-Lake levels management plan													
19-Critical habitat along waterways													
20-Local govt. land use powers													
21-Ed. about exotic species													
22-Develop public ed. structure													
23-Complete basin plans													
24 - Evaluate new proposals													

Use Impairments Identified in the Rochester Embayment:

- | | |
|--|---|
| 1. Restrictions on fish and wildlife consumption | 9. Drinking water taste and odor problems |
| 3. Degradation of fish and wildlife populations | 10. Beach closings |
| 5. Bird or animal deformities or reproductive problems | 11. Degradation of aesthetics |
| 6. Degradation of benthos | 12. Added cost to agriculture or industry |
| 7. Restrictions on dredging activities | 13. Degradation of plankton populations |
| 8. Eutrophication or undesirable algae | 14. Loss of fish and wildlife habitat |

7.1. Accelerate PCB removal

7.1.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Lake Ontario, tributaries, Genesee River, groundwater

Current conditions that necessitate the measure: Released to the environment, PCBs adsorb strongly to soil and sediment, and may take several years to break down. PCBs have a low water solubility, and in a water environment most PCBs adsorb to particles and sediments. PCBs enter the bodies of fish primarily from ingestion of PCB-contaminated prey, and, to some extent, from sediment, particles in water, and water directly. Once ingested, PCBs have an affinity for fatty tissues. Bioconcentration factors from water to aquatic animals can vary from 26,000 to 660,000, and may depend on the water zone in which the aquatic animal predominantly resides. Presently, PCBs contribute to fish consumption advisories for certain fish species caught in Lake Ontario and various other waterbodies in the Embayment. Likewise, degradation of mink populations within the Embayment has been attributed to the amount of PCB-contaminated fish in their diets.

(See also Chapter 6 section on "PCB ban and related activities.")

7.1.2. Proposed Action a: Schedule reduction of PCBs in equipment

7.1.2.1. Description:

Over the past several years, Rochester Gas and Electric Corporation (RG&E), Niagara Mohawk Power Corporation and New York State Electric and Gas Company have been actively removing PCB oil and PCB equipment from their systems. Equipment identified as containing PCBs through manufacturers' nameplates, or tested and found to contain >500 ppm PCB, require labels identifying them as such. All three utilities have removed all known sources of PCBs in oil of concentrations greater than 500 ppm from their equipment (in the drainage area of the Rochester Embayment). These utilities are also working on removing PCBs in concentrations greater than 50 ppm from other equipment. This typically involves draining the PCB-contaminated oil out of the equipment and then refilling with new oil. All PCB oils and equipment requiring disposal are sent for treatment or disposal to EPA-approved facilities.

All oil spills from electrical equipment are cleaned up as soon as possible, and the spill cleanup debris is sent for proper disposal. This also assures that any PCBs found in such oil and/or soils are not released into the environment.

7.1.2.2. Time required: These electric utilities are continuing with their programs of eliminating PCB-contaminated oils beyond that required by existing regulations. Removal of all known

sources of PCBs in oil greater than 50 ppm will take in the range of 10 to 15 years.

7.1.2.3. Estimated costs: The estimated cost to RG&E alone to complete removal of known amounts of PCB in oil greater than 50 ppm will be at least \$500,000.

7.1.2.4. Possible funding sources: Each electric utility should fund their own activities.

7.1.2.5. Possible implementors: Each electric utility should implement their own activities.

7.1.2.6. Expected benefits: The removal program has been very effective in eliminating PCBs in oil and equipment from the RAP area thus preventing accidental releases into the environment. The continuation of the existing programs will ensure that electrical equipment does not contribute to the fish contamination levels in the future.

7.1.3. Proposed Action b: Educate about and identify equipment containing PCBs within industrial, commercial, municipal and residential locations

7.1.3.1. Description:

It is probable that industrial, commercial and municipal entities may not realize that they own electrical transformers and equipment that contain PCBs. Likewise, individuals may have appliances that contain small quantities of PCBs. A public information program should be initiated educating commercial, industrial, municipal and residential entities about the potential for PCBs to be present in electrical power equipment and appliances. Commercial, industrial and municipal entities should be encouraged to comply with existing PCB regulations.

7.1.3.2. Time required: An educational program of this type would likely take months to a year in order to adequately disseminate this information to the appropriate sources.

7.1.3.3. Estimated cost: Using established newsletters and mailings, costs for implementing this action would be minimal. Likewise use of public service announcements would also be low cost. Both of these approaches require primarily staff time to write and distribute information.

7.1.3.4. Possible funding sources: Counties and industrial, commercial and municipal entities

7.1.3.5. Possible implementors: Industrial, commercial and municipal entities, as well as public environmental interest groups such as the Rochester Committee for Scientific Information and the Rochester Academy of Sciences.

7.1.3.6. Expected benefits: To date, some continuing sources of PCB contamination within the Rochester Embayment have not been identified. However, the proposed program will have a negligible effect upon the PCB contaminant levels of fish within the Rochester Embayment since local PCB sources have not been assumed to be significant contributing factors to the PCB

content within the Embayment. However, the initiation of the proposed program will ensure that PCB-containing equipment does not contribute to the fish contamination levels in the future.

7.1.4. Proposed Action c: Remove and dispose of equipment containing PCBs within industrial, commercial, municipal and residential locations

7.1.4.1. Description:

Improper handling or disposal of PCB contaminated items from industrial, commercial, municipal and residential sources could lead to the release of PCBs into the environment. Commercial, industrial and municipal entities should comply with existing PCB regulations to ensure the proper handling and disposal of these items, while the Monroe County Hazardous Waste Collection Facility will accept residential PCB-containing items.

An example of this approach was found in the Environmental Notice Bulletin of January 18, 1995, published by the New York State Department of Environmental Conservation, which contained Requests For Proposals for the "removal of transformers and related transformer room equipment containing PCBs" and replacement with non-PCB equipment within the State University of New York system. The following SUNY schools within the Rochester Embayment watershed were identified: Brockport, Geneseo, and two at Alfred. The cost of this project for these schools, is on the order of \$3,000,000 and was scheduled for completion in February 1998.

7.1.4.2. Time required: Including program development and implementation of removal, this proposed action could range from months to years. Time requirements must include outage schedules for the electrical service, since this action requires equipment to be taken off-line.

7.1.4.3. Estimated costs: Depending on the piece of equipment, change-out of contaminated for non-contaminated fluids can range from tens to thousands of dollars per unit. As seen in the SUNY example, complete equipment replacement can cost millions of dollars. Residential disposal is estimated to be \$1.50-\$2.50 per pound.

7.1.4.4. Possible funding sources: Industrial, commercial and municipal entities would fund their own activities. Residential programs may be funded by local governments.

7.1.4.5. Possible implementors: Industrial, commercial and municipal entities, as well as the county hazardous waste collection facilities

7.1.4.6. Expected benefits: To date, some continuing sources of PCB contamination within the Rochester Embayment have not been identified. However, the proposed program will have a negligible effect upon the PCB contaminant levels of fish within the Rochester Embayment since local PCB sources have not been assumed to be significant contributing factors to the PCB content within the Embayment. However, the initiation of the proposed program will ensure that

PCB-containing equipment does not contribute to the fish contamination levels in the future.

Authors: Paul M. Sawyko (RG&E), Karen M. Sahler (RG&E)

7.2. Promote interaction with the Lake Ontario Lakewide Management Plan and other Lake Ontario Remedial Action Plans regarding critical pollutant sources located outside the Rochester Embayment watershed

7.2.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Lake Ontario

Current conditions that necessitate the measure:

Sources of critical pollutants such as polychlorinated biphenyls (PCBs), Mirex and dioxin that are responsible for Rochester Embayment RAP impairments of beneficial uses are located outside the watershed as well as within the watershed. Therefore, the Rochester Embayment RAP should monitor and encourage critical pollutant reduction efforts throughout the Lake Ontario Basin.

(See also Chapter 6 sections on "Lake Ontario Lakewide Management Plan," known as the "LaMP," and "Lake Ontario Toxics Management Plan.")

7.2.2. Proposed Action: Provide comments and recommendations to LaMP and RAP decision makers regarding pollutant reduction strategies that address sources of critical pollutants that are located outside the Rochester Embayment watershed

7.2.2.1. Description:

Communications with the LaMP Management Workgroup

Members of the WQMAC would review Lake Ontario LaMP documents in detail. Comments and recommendations regarding control of critical pollutant sources located outside the Rochester Embayment watershed would be provided to the LaMP Management Workgroup for their consideration by representatives of the Monroe County Water Quality Management Advisory Committee (WQMAC). This can be done once a year when the Workgroup expects to visit regularly scheduled meetings of the WQMAC. In addition, WQMAC members should seek representation on the Lake Ontario LaMP public participation Tier II Basin Teams.

(For the purposes of the LaMP, sources of critical pollutants include those from the other Great Lakes via the Niagara River.)

Communications with other RAP Areas of Concern

WQMAC representatives would attend meetings or correspond with other Lake Ontario RAP Committees as appropriate to discuss their local pollutant reduction efforts if they are related to

Rochester Embayment RAP critical pollutants. They would also review other Lake Ontario RAP documents in detail. Comments and recommendations regarding control of critical pollutant sources located outside the Rochester Embayment watershed would be provided to the committee members of other RAPs for their consideration.

7.2.2.2. Time required: Time for the WQMAC to monitor the activities of the Lake Ontario LaMP and the development and updates of other RAPs, and to read and discuss their documents and pollutant reduction strategies. The process is likely to continue over at least a five-year period.

7.2.2.3. Estimated costs: Travel costs for one citizen to attend at least one meeting of another RAP each year for five years: \$200-\$500 per year

7.2.2.4. Possible funding sources: Monroe County, New York State Department of Environmental Conservation, U.S. Environmental Protection Agency

7.2.2.5. Possible implementors: Monroe County Water Quality Management Advisory Committee

7.2.2.6. Expected benefits: The benefit of the comment and recommendation process would be improved communications between the Rochester Embayment RAP and decision makers for the Lake Ontario LaMP and other Lake Ontario RAPs. Improved communication will ensure that Rochester Embayment RAP concerns regarding significant sources of contaminants located outside the watershed will be considered as part of lakewide and other local pollutant reduction strategies.

Authors: Fred Luckey, Carole Beal

7.3. Promote the New York State Water Quality Enhancement and Protection Policy

7.3.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: All surface waters downstream of point sources

Current conditions that necessitate the measure:

Contaminant levels in fish and wildlife populations in Lake Ontario and other waterways exceed current standards, objectives or guidelines. Public health advisories are in effect for human consumption of fish and wildlife.

Fish and wildlife management programs have identified degraded fish or wildlife populations due to a cause within the Lake Ontario watershed.

Chemical contaminants in the ecosystem may affect the human immune or endocrine systems or act as carcinogens.

Additional information:

The New York State Department of Environmental Conservation (NYSDEC) is developing a Water Quality Enhancement and Protection Policy (WQEPP) to maintain the high quality of New York's waters and to advance the goals of federal and state laws to eliminate the discharge of pollutants. New York began developing the WQEPP based on the need to comply with the impending Great Lakes Water Quality Guidance, and the anticipated reauthorization of the Clean Water Act, which is expected to strengthen its antidegradation requirements. (See section in Chapter 6 on "Great Lakes Water Quality Guidance.") While parts of the policy will be required for the Great Lakes Basin, New York State is considering applying all three parts of the WQEPP statewide.

The policy has three main parts, one of which is an existing regulation, Discharge Restriction Categories, and two of which are proposed policy or activity modifications. The promotion of the proposed policies will be described as part of proposed actions.

The first part of the WQEPP, an existing regulation, is Amendments to 6NYCRR Part 701 Concerning Discharge Restriction Categories (effective October 7, 1993). The goal of Discharge Restriction Categories (DRCs) is to protect sensitive waters that cannot assimilate the effects of new discharges or additional discharges of specified substances. Changes include two new discharge restriction categories added to the NYSDEC water use classification system:

- No new discharge: Prohibits any new discharge or an increase in any existing discharge.
- No new discharge of a specified substance: Prohibits the release of the specified substance in new discharges, or an increase in the release of the specified substance in any existing discharges.

The public can know in advance if a facility is planning a new discharge, because the facility would have to obtain a permit modification. The modification would require a notice in the NYSDEC publication Environmental Notice Bulletin.

The types of waterbodies to which DRCs could be assigned are waters of public health concern, waters of significant ecological or recreational value, and sensitive waters at risk from additional discharges. The implementation strategy is scheduled to be completed in 1995.

Because Discharge Restriction Categories are a regulation, they are enforceable by NYSDEC.

7.3.2. Proposed Action a: Promote antidegradation policy

7.3.2.1. Description:

The goal of antidegradation is to maintain the high quality of waters that are currently cleaner than standards now require. (NYSDEC does not maintain an "official" list of waters that are above standards for their use classification. A water body can be above the standard for one chemical but not for another. Any list would become out-of-date when new State regulations are completed to implement the Great Lakes Guidance. At that time, many of the standards will become stricter.)

The new Discharge Restriction Categories, effective in 1993, already provide an enhanced aspect to the existing antidegradation policy. NYSDEC is considering modifications to its existing antidegradation policy. The revised policy would specify a process for reviewing proposed actions that would result in discharges that significantly lower water quality. The process would require:

1. The consideration of alternatives that would reduce or prevent the discharge of pollutants.
2. The weighing of the social and economic benefits of actions that could significantly lower water quality.

Antidegradation is a policy still under development and is not currently enforceable. Development of the policy will be influenced by the antidegradation requirement in the federal Great Lakes Water Quality Guidance. (See Chapter 6 section on "Great Lakes Water Quality Guidance.") The Water Quality Coordinating Committees (WQCCs) of the Rochester Embayment watershed should also influence development of the policy by:

- Commenting to NYSDEC on the process for reviewing proposed actions.
- Promoting pollution prevention instead of discharge.
- Listing the benefits of a strong policy for the Rochester Embayment watershed.

The WQCCs should also ask their county legislatures to pass resolutions supporting a strong antidegradation policy. The resolutions would be forwarded to the NYSDEC.

7.3.2.2. Time required: 20 hours of staff time for one or more WQCC members to study the policy and its benefits for the Rochester Embayment watershed, and to communicate with

NYSDEC.

7.3.2.3. Estimated costs: Cost of staff time would be approximately \$480.

7.3.2.4. Possible funding sources: County, NYSDEC

7.3.2.5. Possible implementors: County, WQCCs, NYSDEC

7.3.2.6. Expected benefits: The antidegradation policy would protect the quality of water bodies that are cleaner than current New York standards.

7.3.3. Proposed Action b: Promote substance ban policy

7.3.3.1. Description:

The goal of substance bans is to protect all water from specific persistent toxic substances, those that are so threatening to the environment that the only way to avoid environmental problems is to ban their use. NYSDEC believes there is a need to develop a substance ban strategy. The proposed strategy consists of three components: (1) screening and prioritizing of chemicals using a criterion, regulatory review, use-tree or life cycle analysis, and waterbody impairment analysis; (2) legal authority options analysis; and (3) public participation.

Other international, federal and state initiatives are underway that may influence the direction of future substance ban efforts:

- The International Joint Commission's Virtual Elimination Workgroup.
- Federal and state policies developed as part of bioaccumulation and persistent toxic chemical controls (see Chapter 6 section on "Great Lakes Water Quality Guidance).
- Reauthorization of the federal Clean Water Act.
- An EPA proposal under the Toxic Substances Control Act to quantify the ecological threat from specific chemicals.

NYSDEC plans to study the regulatory impact of substance bans with technical support from the U.S. EPA.

The statutory authority for New York State to regulate the registration, commercial use, purchase, and custom application of pesticides in New York State is Article 33 of the New York State Conservation Law. Two federal statutes also address substance bans:

- The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). NYSDEC is assigned primary responsibility for elements of FIFRA delegated to New York State. New York State Pesticide Law ECL Section 33-0303(3)(d) authorizes NYSDEC to develop a list of restricted use pesticides subject to conditions and limitations that NYSDEC deems appropriate. "Restricted" may include "distributed, sold, purchased, possessed or used for any purpose". Examples are aldrin, chlordane and DDT.

- The Federal Toxic Substances Control Act (TSCA). Although TSCA allows a state government to prohibit the use of a substance under defined circumstances, the most desirable cause of action for a state is to seek federal legislation because of the multi-media cycling nature of persistent toxic substances in the environment and because of the economic and logistic complexities of their disposal.

The Rochester Embayment RAP Committee (currently the Monroe County Water Quality Management Advisory Committee) should support the completion of a substance ban policy for New York State. If the policy is completed, the RAP Committee should suggest consideration of manufacture, sale and/or use bans for chemicals on the Rochester Embayment list of High Priority Chemical Pollutants (see Stage I RAP, page 5-40, and Stage II RAP, Chapter 3).

7.3.3.2. Time required: 20 hours of RAP Committee staff support time to study the policy and its benefits for the Rochester Embayment Area of Concern, and to communicate with NYSDEC.

7.3.3.3. Estimated costs: Cost of staff time would be approximately \$480.

7.3.3.4. Possible funding sources: County, NYSDEC, U.S. Environmental Protection Agency

7.3.3.5. Possible implementors: County, NYSDEC

7.3.3.6. Expected benefits: Substance bans would protect all water classifications from specific toxic substances.

Author: Carole Beal

7.4. Promote pollution prevention in the Rochester Embayment watershed

7.4.1. Background:

Use impairments addressed: See Table 7-1

Current conditions that necessitate the measure:

Contaminant levels in fish and wildlife populations exceed current standards, objectives or guidelines. Public health advisories are in effect for human consumption of fish and wildlife. Fish and wildlife management programs have identified degraded fish or wildlife populations due to a cause within the Lake Ontario watershed.

Chemical contaminants in the ecosystem may affect the human immune or endocrine systems or act as carcinogens.

7.4.2. Proposed Action a: Initiate comprehensive pollution prevention efforts

7.4.2.1. Description:

Establish a watershed pollution prevention team. It could be a task force composed of Rochester Embayment watershed Water Quality Coordinating Committee (WQCC) representatives who are interested. Ad hoc members should be invited to participate when specific expertise is needed. (Pollution prevention is defined by the U.S. Environmental Protection Agency as "source reduction or other practices that reduce the amount of pollutants that enter the waste stream prior to out-of-process recycling, treatment or disposal." The New York State Department of Environmental Conservation Pollution Prevention Bureau uses the same definition.)

The watershed pollution prevention team would:

- Focus on pollutants appearing on the Preliminary List of High Priority Chemical Pollutants developed for the Stage I RAP (See page 5-40 of the Stage I RAP).
- Perform a preliminary analysis of the sources of each pollutant.
- Establish criteria for selecting one or more pollutants for comprehensive study. The criteria might be the ones that were used by the Priority Pollutant Task Group to select a pollutant for a prevention project (see Chapter 6 section on "Mercury pollution prevention project"): ability to document effectiveness, controversy, public perception of environmental problem, importance to the Remedial Action Plan, source reduction opportunities, cost-benefit analysis.
However, other criteria may be chosen.
- Select one or more pollutants for comprehensive study.
- Identify all known sources of the pollutant(s).
- Identify potential partners to include in development of a workplan to address the pollutant(s).
- Identify options for pollution prevention for each type of source.
- Prepare a workplan to deal with pollution prevention, one source type at a time.

- Invite ad hoc members to participate, depending on the pollutant(s) being addressed.

Mercury has already been chosen as a pollution prevention project, and the strategy for prevention has begun. The ongoing Mercury Task Group project would serve as a model for this process. (See Chapter 6 section on "Mercury pollution prevention project.")

Any comprehensive pollution prevention project would, of necessity, include nonpoint sources. Generally, pollution prevention measures for nonpoint sources cannot be specific to any one pollutant. The watershed pollution prevention team would need to consider which measures would most directly affect the pollutant being addressed in each project. Options include:

- Encourage the establishment of county waste site advisory committees in counties where there is a perceived need, and in which such a committee does not already exist. (See Chapter 6 section on "Monroe County Waste Site Advisory Committee and proper closure of waste sites.")
- Coordinate activities with county Soil and Water Conservation Districts to address contamination from stormwater runoff (may be particularly applicable to phosphorus). Conduct training programs for land-use decision makers on the control of stormwater and erosion at construction sites. Consider establishing the stormwater management specialist position in counties that do not have one. (See Chapter 6 section on "Stormwater Management Specialist.")

(For pollution prevention related actions for citizens, see Chapter 7 section on "Develop public education structure".)

7.4.2.2. Time required: Staff time of the members of WQCCs and volunteer time will be needed on an ongoing basis. The entire process would last for many years.

7.4.2.3. Estimated costs: Multiple agency staff time, costs for technological changes and educational materials. A full-time staff person to coordinate the pollution prevention activities would cost \$38,000-\$50,000 per year.

7.4.2.4. Possible funding sources: Counties, New York State Department of Environmental Conservation (NYSDEC), U.S. Environmental Protection Agency (EPA), individual businesses, trade associations, foundations with an interest in the Great Lakes ecosystem

7.4.2.5. Possible implementors: WQCCs, county health departments, county environmental management councils, county departments of public works or environmental services, county offices of emergency preparedness, county Soil and Water Conservation Districts, volunteers from water quality management advisory committees, industry, academia, NYSDEC

7.4.2.6. Expected benefits: Progress toward the Great Lakes Water Quality Agreement goal of virtual elimination

7.4.3. Proposed Action b: Initiate a process to promote pollution prevention among small businesses in the Rochester Embayment watershed

7.4.3.1. Description:

Establish a Small Business Task Force with representatives from the counties, and from businesses. (An April 1995 meeting coordinated by the Monroe County Department of Environmental Services and the Monroe County Environmental Management Council could serve as a prototype.) It would be most feasible to identify and work with one business type, such as body shops or dry cleaners, at a time. Municipalities could be given assistance, as well as small businesses. The Task Force could coordinate its activities with the watershed pollution prevention team.

The Task Force would work cooperatively with small businesses to introduce pollution prevention options, making full use of existing resources such as:

- The New York State Department of Environmental Conservation (NYSDEC) M2P2 Program. (See Chapter 6 section on "New York State pollution prevention.")
- Technical assistance from the NYSDEC Pollution Prevention Unit. (See Chapter 6 section on "New York State pollution prevention.")
- Assistance available through the New York State Environmental Facilities Corporation.
- Assistance through the New York State Department of Economic Development.
- EPA's Design for the Environment Program. (See Chapter 6 section on "EPA pollution prevention programs.")
- EPA's Pollution Prevention Information Clearinghouse and Pollution Prevention Directory.
- CMA (Chemical Manufacturers Association) Pollution Prevention Resource Manual.
- Information available through trade or professional associations.
- Membership in and information from the National Pollution Prevention Roundtable.
- The Business Council of New York State or the Environmental Business Association of New York State.

Programs that could be initiated are:

- Mentor programs to pair representatives of small and large businesses.
- Volunteer consultants (retired professionals or active professionals whose employers are willing to donate some of their time).

The Small Business Task Force should meet with representatives of the Erie County Office of Pollution Prevention (ECOPP) to learn which of their programs have been successful, which have not, and what could be done differently. The Task force can benefit from the experience of Erie County. The ECOPP is managed by the County Department of Environment and Planning through a \$300,000 grant from EPA. The program targets small- to medium-sized industries that may lack the resources and expertise to investigate waste minimization opportunities on their own. ECOPP serves as a conduit for information on pollution prevention and regulatory

compliance from a nonthreatening and non-enforcement perspective. ECOPP's services are confidential, nonregulatory and free. The Office has identified a number of ways to identify companies for outreach and incentives to encourage participation.

Activities and a consultant's evaluation include:

- Onsite review of operating practices, processes and equipment. Perceived by ECOPP's clients to be the most valuable element of the program.
- Follow-up letters with site-specific recommendations. Readable and understandable.
- Industry and trade group workshops and presentations. Trade organization presentations are effective in communicating the program's services. Satellite conferences are effective to impart detailed information for specific needs.
- Industry-specific and general newsletters. Well researched, topical, informative, readable and to-the-point. An effective tool in marketing ECOPP's services.
- Industrial Advisory Committee, a representative cross-section of the clients ECOPP serves. An effective forum for networking.

A telephone survey to ECOPP's clients revealed that 92% feel that the overall value of ECOPP's services was good to excellent.

7.4.3.2. Time required: The time frame would be decided by the Small Business Task Force.

7.4.3.3. Estimated costs: The cost for staff time of 20 technical experts in government, business and industry to participate in twelve 2-hour meetings per year would be approximately \$12,000 per year. Costs for technological changes in businesses would vary depending upon the type of business. There may also be cost savings for businesses.

7.4.3.4. Possible funding sources: County, NYSDEC, trade and professional associations, small business associations

7.4.3.5. Possible implementors: Joint effort of: county departments of planning, economic development and environmental services, watershed officials, Industrial Management Council, small business associations, Chamber of Commerce, professional societies, Water Quality Coordinating Committees

7.4.3.6. Expected benefits: Progress toward the Great Lakes Water Quality Agreement goal of virtual elimination

7.4.4. Proposed Action c: Encourage municipalities to set examples at their own facilities

7.4.4.1. Description:

County Water Quality Coordinating Committees (WQCCs) should encourage the county, and towns and villages within the county, to set examples for businesses, schools and citizens by

establishing pollution prevention techniques at their own facilities.

The City of Rochester has an active pollution prevention program that can serve as a prototype for other municipalities. It currently applies to the Department of Environmental Services, the City's largest department, but soon it will apply to all departments. The City has established an Environmental Compliance Coordinator position. Some of the Coordinator's activities fall under the strict definition of "pollution prevention". Others do not, but they prevent uncontrolled releases of toxic substances into the environment. Activities include:

- Supporting spill management.
- Giving technical assistance to the purchasing department if a hazardous substance is to be purchased and looking for a substitute.
- Performing compliance inspections at Department of Environmental Services facilities.
- Inspecting hazardous waste transport, storage and disposal facilities and keeping an "approved" list of such facilities.
- Conducting employee education and training on handling and labeling of hazardous materials.
- Promoting distribution of the NYSDEC document Environmental Self-Audit for Small Businesses through the Economic Development Department.
- Managing hazardous and nonhazardous waste transportation and disposal for wastes generated by the City and/or abandoned on City properties.
- Developing the Environmental Compliance/Pollution Prevention Program Manual which also includes information on purchasing, training, policy, and the responsibility of department heads, individuals and management.

7.4.4.2. Time required: For the City of Rochester, one full-time position for an Environmental Compliance Coordinator.

7.4.4.3. Estimated costs: For the City of Rochester, the salary of the Environmental Compliance Coordinator plus the cost of a small number of environmental contractors is \$100,000. The pollution prevention program currently takes about half of the Coordinator's time, because the program is still under development. For another municipality, the costs could be higher or lower depending on how they implement the program.

The program also yields savings, such as less hazardous waste disposal, less reliance on contractors, and potentially avoidance of enforcement fines.

7.4.4.4. Possible funding sources: County, town, village

7.4.4.5. Possible implementors: County, town, village

7.4.4.6. Expected benefits: A municipal program promotes pollution prevention for its own sake, but also becomes an educational program as the municipality makes businesses, schools and citizens aware of the program. The municipality can use what it has learned from the

program to assist businesses, schools and citizens with pollution prevention programs.

Author: Carole Beal

7.5. Promote proper closure/remediation of landfills and hazardous waste sites

7.5.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Groundwater and surface water in the Rochester Embayment

Current conditions that necessitate the measure: Inactive hazardous waste sites located within the Embayment drainage basin, as well as landfills and other disposal sites (coal tar) have been found to contaminate surface water, groundwater, soil or sediment near the sites. Contaminants may eventually make their way into receiving waters and the food chain.

(See also Chapter 6 section on "Monroe County Waste Site Advisory Committee and proper closure of waste sites.")

7.5.2. Proposed Action a: Promote the enactment of a New York State law that would require environmental audits be submitted to local government agencies, including health departments

7.5.2.1. Description:

As property changes hands, often a bank involved in financing or a buyer will require an environmental audit on the property. Information from the audit regarding any waste on the site would assist the County in keeping its information base up-to-date and in evaluating and recommending remediation for the property. New York State law could require that environmental audits completed for property be submitted to pertinent county agencies, such as the Health Department.

The Monroe County Waste Site Advisory Committee (WSAC) should assist the Monroe County Water Quality Management Advisory Committee (WQMAC) in understanding and describing the benefits of such a law for the Area of Concern. The WQMAC, in its role as the RAP advisory committee, should promote the enactment of such a law, and seek the assistance of RAP liaisons at the New York State Department of Environmental Conservation (NYSDEC).

7.5.2.2. Time required (for promotion): 20 hours of staff time for the Waste Site Advisory Committee and the WQMAC to study the benefits of the law for the Rochester Embayment watershed, and to communicate with a NYSDEC RAP liaison.

7.5.2.3. Estimated costs: Promotion: \$500 for staff set-up time. Implementation (if a law is passed): In Monroe County, staff time to review environmental audits, and update the information base cannot be determined fully at this time. Costs may range from \$2,000 to \$5,000 per year.

7.5.2.4. Possible funding sources: County, NYSDEC, property owners

7.5.2.5. Possible implementor: Monroe County Waste Site Advisory Committee

7.5.2.6. Expected benefits: Increased and timely knowledge about properties that are changing hands that incorporate waste sites, and the nature and the quantities of the waste. This knowledge would facilitate WSAC activity in reviewing development proposals and suggesting remediation, and in keeping its information base up-to-date. Remediation would prevent the leaching of toxic chemicals to groundwater and surface waters.

7.5.3. Proposed Action b: Utilize the NYSDEC Report on the Hazardous Substance Waste Disposal Site Study (finalized in 1995)

7.5.3.1. Description:

The NYSDEC Registry of inactive hazardous waste (Superfund) sites lists only sites for which the State has documentation for the presence of hazardous waste. (The definition of hazardous waste is found in Title 13, Article 27 of Environmental Conservation Law.) The Hazardous Substance Waste Disposal Site Study will expand the State Superfund's spending authority because the definition of hazardous "substance" is broader than for hazardous "waste." (The list of hazardous substances is included in 6 NYCRR Part 597.) Many sites for which there is no documentation of disposal and which are a potential health hazard and water polluter could be investigated and remediated.

The Study includes a preliminary nomination of sites which may require further investigation and/or remedial action. Site categories examined in the Study are: sites delisted from the Registry, construction and demolition debris disposal sites, suspected illegal disposal sites, manufactured gas plants, municipal landfills, and any other waste disposal sites containing or suspected of containing hazardous substances. The Study identifies possible revenue sources for cleanup and provides an estimate of the remediation costs.

7.5.3.2. Time required: Staff time to promote remediation of local sites.

7.5.3.3. Estimated costs: Costs for staff time would be approximately \$500. Estimated costs for remediation of various sites are listed in the Study Report.

7.5.3.4. Possible funding sources: NYSDEC

7.5.3.5. Possible implementors: NYSDEC; county waste site advisory committee (to review information and promote remediation of local sites)

7.5.3.6. Expected benefits: Additional waste sites can be investigated and remediated.

7.5.4. Proposed Action c: Promote the finalization of state guidelines for soil testing on property proposed for realty subdivision

7.5.4.1. Description:

Land that has been contaminated by previous uses has potential public health implications. New York State Realty Subdivision Law supports the need to seek information regarding environmental health concerns. The SEQRA process also addresses past land use. Locally the WSAC would work with SEQRA, Realty Subdivision Law Part 74, and the Monroe County DOH Protocol for Characterizing Potential Chemical Contamination in Proposed Realty Subdivisions to achieve its objective of identifying, prioritizing and remediating sites. NYSDOH, under the legal authority of the State Environmental Quality Review Act, should finalize its proposed guidelines for realty subdivisions in order to make the process uniform throughout the state. The guidelines would have local health departments include consideration of possible residual soil contamination in all reviews of subdivision applications. The Guidance would provide written procedure for steps to be taken by the local health department and developer, including a subdivision soil contamination worksheet and protocol for soil testing.

The Monroe County Waste Site Advisory Committee should assist the WQMAC in understanding and describing the benefits of such guidelines for the Area of Concern. The WQMAC, in its role as the RAP advisory committee, should promote the finalization of the guidelines, with the assistance of RAP liaisons at NYSDEC.

7.5.4.2. Time required:

Promotion: 20 hours of staff time for the Waste Site Advisory Committee and the WQMAC to study the benefits of the law for the Rochester Embayment watershed, and to communicate with a NYSDEC RAP liaison.

Implementation: Staff time to review reports and development proposals

7.5.4.3. Estimated costs:

Promotion: \$500 for staff time

Implementation (if guidelines are finalized): Approximately \$1,000.

7.5.4.4. Possible funding sources: NYSDOH; private sector

7.5.4.5. Possible implementors: NYSDOH to finalize guidelines; county waste site advisory committee to recommend actions.

7.5.4.6. Expected benefits: Minimization of public exposure to pesticides and other chemical residues in soil, and minimization of leaching to groundwater and surface waters.

7.5.5. Proposed Action d: Prioritize hazardous substance waste disposal sites according to the need for remediation

7.5.5.1. Description:

Prioritize hazardous substance waste disposal sites according to the urgency for remediation, taking into account the impact of any leaching or exposed waste on water quality.

7.5.5.2. Time required: To be determined after the Report on Hazardous Substance Waste Disposal Site Study is finalized.

7.5.5.3. Estimated costs: Staff time to determine priorities would be a one-time cost of about \$400.

7.5.5.4. Possible funding sources: County; NYSDEC

7.5.5.5. Possible implementor: County waste site advisory committee

7.5.5.6. Expected benefits: If state funding for investigation and remediation becomes available, the County will be able to propose sites for remediation immediately.

7.5.6. Proposed Action e: Conduct field investigations at County waste sites

7.5.6.1. Description:

Most sites on Monroe County's all-encompassing list of waste sites have not been visited recently. Field investigations should be conducted to observe any changes in land use in the area, any leachate outbreak or exposed waste, and whether or not the site is properly covered.

7.5.6.2. Time required: 600-700 hours

7.5.6.3. Estimated costs: Staff time: Approximately \$15,000 to revisit 50 sites. However, there may also be costs for laboratory tests which would depend on the number of samples and the parameters being tested.

Estimated costs per sample:

Metals	\$ 360
Organics, not including dioxins and furans:	\$ 270
Dioxins and furans:	\$1700

7.5.6.4. Possible funding sources: Monroe County; NYSDEC; NYSDOH

7.5.6.5. Possible implementors: Monroe County Waste Site Advisory Committee, Monroe

County Environmental Health Laboratory, Monroe County Environmental Management Council, conservation boards, NYSDEC, NYSDOH, Water Quality Coordinating Committee

7.5.6.6. Expected benefits: The measure would enable the WSAC to update its information base.

Author: Carole Beal

7.6. Expand the storm drain message system

7.6.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Any water body to which a storm sewer drains.

Current conditions that necessitate the measure: The public is unaware that storm drains, such as street catch basins and drop inlets, drain to local streams, ponds and lakes. (In some areas of the City of Rochester, storm drains flow to the Van Lare Wastewater Treatment Plant via the combined sewers system.) Likewise, the public is unaware that dumping household waste products (such as paint, used motor oil, antifreeze, etc.) down storm drains can pollute nearby waterways. Through the food chain, chemicals of concern can bioaccumulate in fish and wildlife.

7.6.2. Proposed Action: Expand the storm drain stenciling project

7.6.2.1. Description:

Storm drain stenciling pilot projects by citizen groups have been conducted since 1992 in Monroe County. Messages were stenciled (painted) on or near storm drains on roads or streets that read: "Don't Dump - Drains to Stream" or "Pond" or "Lake". Stenciling projects done by nonprofit groups, such as neighborhood associations, Boy or Girl Scout troops, 4-H clubs, etc., should continue. The projects are a good educational tool that gets people involved in educating their local community about household hazardous wastes, water quality and pollution prevention. Training should be offered by employees of county departments of transportation or health or by Cooperative Extension. Reflectorized vests, cones and "men working" signs should be provided for participants' protection on roads and streets. The stencils can be purchased through the New York Sea Grant's Drain Stenciling Program or commercial printers/graphic artists.

Because of weather conditions and winter road salting, a message system that relies on stencils and paint, however, lasts only two-three years. Other types of storm drain message systems are proposed that are more durable:

- Metal plaques screwed into concrete or installed with street epoxy. - The manufacturer claims that the plaques last a minimum of seven years and are maintenance-free; they are easy to install and the process can involve local volunteer or service organizations; each installation takes 5-10 minutes.
- Heat-fused plastic pavement markings applied with a heat gun - These would be applied by transportation department personnel. According to the manufacturer, the marking would last for the lifetime of the pavement.
- Message "branded" into concrete during road construction and improvement projects (still in testing phase).

The type of message selected would depend on type of road, gutter and drain, cost, and whether or not volunteers will be involved. The expertise of the county transportation department is needed for decision making. Whatever type of message is selected, brochures describing the project and informing people how to properly dispose of household hazardous waste should be available in libraries and town halls and should be distributed to the neighborhoods during stenciling. Short radio and television spots should also describe the program to inform the general public.

7.6.2.2. Time required: The stencils would be installed from mid-April through the end of October on a yearly basis. The short radio and television spots will be broadcast in April, centered around Earth Day. The brochures describing the project will be available year-round.

7.6.2.3. Estimated Costs:

Cost of stenciling (For all these methods, it is likely that at least one transportation department employee would be involved in application, even in the presence of volunteers):

Stencils and paint:

Stencils - For 50 stencils that says "DON'T DUMP" in four-inch high letters on a 8"x24" stencil:

\$4.00 per stencil on high-impact styrene x 50 = \$200

\$7.50 per stencil on polyester (2-3 times more durable than styrene) x 50
= \$375

Die (from which to make stencils, a one-time cost): \$360

Cost for 200 applications: \$200-\$375 + cost of die (However, the next 200 applications would cost "0")

Paint - \$3/9-oz spray can; \$4/12-oz spray can; 10-15 drains/spray can, depending on the surface (more paint required for asphalt than concrete)

Cost for 200 applications: \$56-\$80 + cost of stencils

Metal plaques: \$2.90 per plaque + \$76 for 200 screws and \$29 for 200 screw anchors.

An initial purchase of one or more appropriate screwdrivers at \$5 apiece, a drill at \$70 and concrete bits at \$10 may also be necessary.

Cost for 200 applications: Approximately \$700 + initial costs for equipment.

Heat-fused plastic pavement markings: \$11-\$20 per unit, depending on the quantity ordered. Up to \$2,000 may be necessary to purchase application equipment.

Cost for 200 applications: \$3400 + cost of application equipment.

Branded message: Because this technique is still in the testing phase, it is too soon to establish costs.

Cost of brochures:

Cost of 20 hours for professional staff to develop the brochure and five hours to plan distribution: Approximately \$800

Printing: \$112.50 for 1,000 brochures

Volunteers from the WQMAC and other organizations can assist with distribution.

7.6.2.4. Possible funding sources: Grants, contributions of staff time from existing agencies, donations from citizen groups and private corporations, corporate sponsorship

7.6.2.5. Possible implementors: County department of health, county department of transportation, county Cooperative Extension, town agencies, nonprofit organizations, community civic groups

7.6.2.6. Expected benefits: The public will become aware of the importance of protecting the aquatic environment from improper disposal of hazardous wastes.

Authors: Craig Civalier, Carole Beal

7.7. Investigate contamination and opportunities for remediation in the Genesee River gorge

7.7.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Genesee River, Rochester Embayment

Current conditions that necessitate the measure: Contamination from sites in the gorge may enter the Genesee River directly, or indirectly via leaching through the bedrock. Contamination may be encountered during development of sites in the gorge area.

Additional information:

In the early 1970s, an oily coal-tar-like substance containing benzene, toluene and xylene (BTX) was detected seeping from the face of the Lower Falls of the Genesee River in the City of Rochester. (See RAP Stage I, p. 5-20 for background information on the Lower Falls.) Seeps were also discovered later in a tunnel built under the river in 1985 from Cliff Street west of the River to Brewer Street east of the River as part of the Combined Sewer Overflow Abatement Project (CSOAP). There is an unproven assumption that the seeps are connected. The contamination appears to be associated with coal tar, a by-product of coal gas manufacture (coal gasification) in the past. The Genesee River gorge has been a major industrial location for 150 years, and there may be other sources.

The Genesee River gorge site (see Figure 7-1), from the Lower to the Upper Falls (approximately 340 acres), was listed in the 1980s on the New York State Department of Environmental Conservation (NYSDEC) Registry of Inactive Hazardous Waste Sites. In 1991 it was delisted from the Registry. In 1994, specific sites in the gorge area were listed on the NYSDEC Hazardous Substances Waste Disposal Site list (see Chapter 7 section on "Promote proper closure/remediation of landfills and hazardous waste sites").

The gorge has been investigated as part of a statewide investigation of coal tar sites by the NYSDEC in cooperation with utilities. Suspected and known coal tar sites are identified in a report by NYSDEC (1994): Report on Hazardous Substance Waste Disposal Site Study.

7.7.2. Proposed Action a: Investigate the feasibility of pumping and remediating material at the Brewer Street Tunnel site

7.7.2.1. Description:

When seeps were discovered under the River during the construction of the Cliff Street CSOAP tunnel, an opportunity existed to divert and remediate the contaminated fluid. Some fluid was

diverted in order to facilitate the construction and to maintain the safety of the workers. 12,500,000 gallons of pretreated wastewater from the tunnel project was pumped to the sanitary sewer from July 25 to December 11, 1985, for subsequent treatment at the Frank E. Van Lare treatment plant. The Rochester Pure Waters District also contracted for the disposal of 57,960 gallons of contaminated liquid (floatables), 1,430 tons of contaminated soils, and 90 cubic yards of absorbent materials.

However, no provision was made to continue the diversion after work was completed. The three CSOAP sewer pipes that were installed were encased in concrete as was a six-inch pipe for contaminated waste at the bottom of the tunnel, parallel to the CSOAP pipes. The crown of the tunnel (now filled with concrete) is about 25 feet beneath the river bed. The Monroe County Department of Engineering states that it is not possible to access the coal tar in the rock through the CSOAP pipes.

A six-inch "creosote pipe" was installed at the request of NYSDEC at the time that contamination was discovered during the building of the tunnel. The pipe leads from the area of contamination under the River to the surface on the Brewer Street side. The cap of the pipe is flush with the pavement of an access road and is outside of the Rochester Gas and Electric (RG&E) security fence.

The possibility of pumping out the fluid at the Cliff Street Tunnel site should be reconsidered, using the following steps:

- Obtain the Cliff Street Tunnel "as built" diagrams.
- Fully evaluate the feasibility of pumping at this site and remediating, including the costs and benefits.
- Identify funding opportunities.
- Conduct negotiations in regard to responsibility for the material and its remediation.
- If determined to be feasible and cost-effective, pump out the material and treat it appropriately.

7.7.2.2. Time required: Evaluations and negotiations would take about one year. Time for pumping would depend on the amount of material that is accessible, and this is unknown.

7.7.2.3. Estimated costs: The cost to remove contaminated material from the rock under the river would depend on the method. It would cost at least \$100,000 to develop a scheme.

7.7.2.4. Possible funding sources: Would be subject to negotiation

7.7.2.5. Possible implementors: RG&E, Rochester Pure Waters District and the Monroe County Department of Environmental Services could be involved as primary implementors, advisors or planners.

7.7.2.6. Expected benefits: Removal of all the material that is accessible from this site will

decrease the chances of contamination reaching the River.

7.7.3. Proposed Action b: Make developers using the existing protocol for development near waste sites aware of the history of contamination in the gorge area, when applicable

7.7.3.1. Description:

The Monroe County Department of Health and Monroe County Environmental Management Council prepared a document, Monroe County Department of Health Development Review Guidelines for Properties within 2000 Feet of Waste Disposal Sites (see Chapter 6 section on "Monroe County Waste Site Advisory Committee and proper closure of waste sites").

Developers following the Guidelines need to be aware that there is a potential for tapping into an accumulation of contaminated fluid and other waste sites in the gorge area. They can be made aware of this possibility by the Monroe County Development Review Committee during their usual review process and through the City of Rochester's Environmental Impact Assessment (see Chapter 6 section on "Erosion and sediment control").

7.7.3.2. Time required: It is part of the established development review process in the City of Rochester.

7.7.3.3. Estimated costs: No additional costs for review. There may be additional costs for the developer to conduct field inspections, tests, laboratory analyses and remediation, as necessary.

7.7.3.4. Possible funding sources: Developer, responsible party

7.7.3.5. Implementors: Monroe County Department of Health, Monroe County Environmental Management Council, City of Rochester

7.7.3.6. Expected benefits: Developers would be aware of the potential for finding contaminated fluid in bedrock fractures within 2000 feet of the site to be developed.

7.7.4. Proposed Action c: Make efforts toward agreement between the Rochester Pure Waters District and the NYSDEC on the Brewer Street construction site

7.7.4.1. Description:

The Brewer Street construction site is located on Rochester Gas & Electric Corporation property on the east side of the Genesee River. It was used by the Rochester Pure Waters District for treatment and temporary storage of the material that had been bored out of the tunnel during the construction of the tunnel from Cliff Street to Brewer Street. The Draft Site Characterization Report: Brewer Street Site was never finalized, and the Rochester Pure Waters District and the NYSDEC have not reached agreement on remediation and closure of the site. In 1995 negotiations were underway between attorneys for Monroe County, representing the Rochester

Pure Waters District, and RG&E, the owners of the property. After resolution has been reached between those two parties, a proposal will be submitted to NYSDEC.

The draft report indicated that compounds of concern, primarily BTX and semi-volatile organics, are present in some subsurface and surface soils, sediments and groundwater. However, it concluded that no additional action be taken by the Monroe County Pure Waters district because of the minimal level of contamination that exists at the site.

7.7.4.2. Time required: 1-5 years

7.7.4.3. Estimated costs: The cost could range from 0 to \$5,000,000.

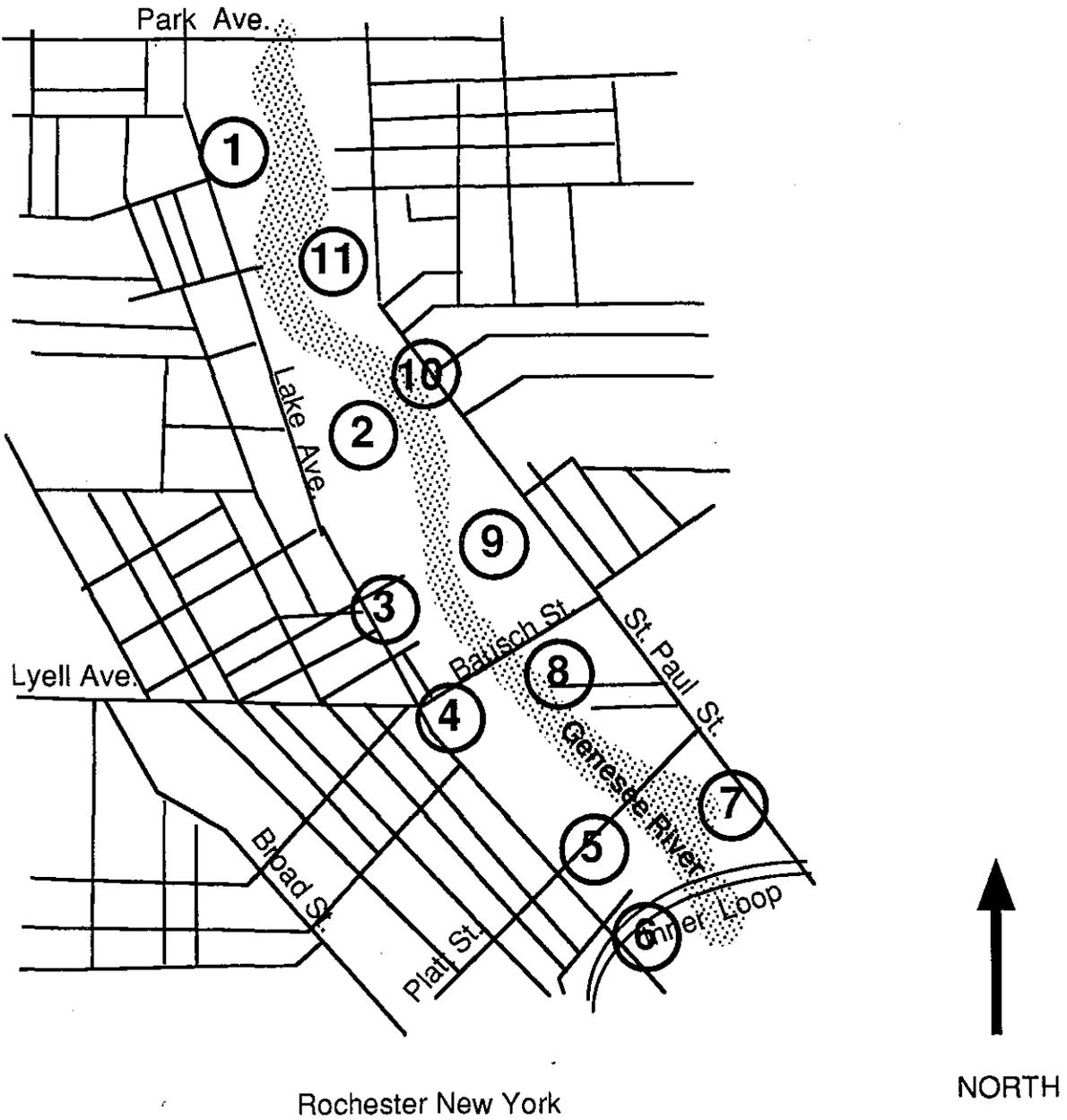
7.7.4.4. Possible funding sources: Subject to negotiation

7.7.4.5. Possible implementors: Subject to negotiation

7.7.4.6. Expected benefits: Appropriate remedial and closure activities will be conducted.

Author: Carole Beal

Stage II Rochester Embayment Remedial Action Plan



Rochester New York

- | | |
|----------------------------|-------------------|
| 1. Deep Hollow Ravine | 7. Fill area |
| 2. Ambrose Street | 8. Fill area |
| 3. Rochester Metal Etching | 9. East Station |
| 4. Fall Street | 10. Fill area |
| 5. Beebee Station | 11. Brewer Street |
| 6. Front Street | |

7.8. Enact an Intergovernmental Agreement with the Army Corps of Engineers

7.8.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Mouth of the Genesee River, Lake Ontario

Current conditions that necessitate the measure:

During channel maintenance of the Rochester harbor at the mouth of the Genesee River, resuspended sediment releases nutrients, fecal coliform and other bacteria, and contaminants to the water. The released materials negatively impact aquatic biota by removing them and by reducing the oxygen content of the water. Depending on the wind and the current, bacteria and nutrients can be carried to the swimming beach just to the west of the mouth of the River (Ontario Beach) and may contribute to beach closings. Resuspended sediment also causes turbidity that makes it difficult for lifeguards and others to see swimmers in the water. Overflow dredging would tend to exacerbate the problem (see Chapter 6 section on "Elimination of overflow dredging").

7.8.2. Proposed Action: Enact a long-term agreement with Army Corps of Engineers

7.8.2.1. Description:

Since 1987, the New York State Department of Environmental Conservation (NYSDEC) has conditioned the Section 401 Water Quality Certification to prohibit overflow dredging in Rochester harbor. The Army Corps of Engineers and its dredging contractors have supported and complied with this dredging restriction. To ensure that restrictions on overflow dredging remain in effect indefinitely, an Intergovernmental Agreement (IGA) between Monroe County and the Army Corps of Engineers should be enacted, with the following groups represented during negotiations:

- Monroe County Department of Health
- Monroe County Department of Parks
- Monroe County Fishery Advisory Board
- City of Rochester
- NYSDEC
- Army Corps of Engineers

The IGA should include the following provisions:

- The frequency of dredging should be minimized overall, and minimized during the swimming season to the greatest possible extent. According to the Army Corps of Engineers, it has no objection to initiating dredging early in the season, but has little control as to the contractor's time requirements for completing the work. The contractor's production rate, which is a function of the type of dredging equipment used,

is a major factor that determines the length of time required for the work to be completed. For example, for a given quantity of sediments in the Rochester harbor, the work can usually be completed in less than 60 days if the contractor uses a hopper dredge. However, if the contractor uses a clamshell bucket to dredge the same amount of sediment, substantially more time is required to complete the work. In addition, for contractual and logistical reasons, including weather-related factors, it would be cost-prohibitive and impractical to restrict dredging in the Rochester harbor between April 15 and June 15, or between September 5 and November 15. Dredging in the harbor is required when shoals impede navigation, and is usually performed annually when funding is available.

- The public should be educated about the dredging process and the disposal locations for dredging spoils.
- Inspections of dredging and of the log of disposal locations should be frequent and effective.
- The use of a Global Positioning System to record disposal locations should be required.

7.8.2.2. Time required: Staff time of officials of Monroe County, the Army Corps of Engineers and NYSDEC to come to an agreement

7.8.2.3. Estimated costs (Monroe County): 40 hours of staff time for a senior environmental planner over the course of six months: approximately \$1,000

7.8.2.4. Possible funding sources: Monroe County, U.S. Army Corps of Engineers, NYSDEC

7.8.2.5. Possible implementors: Monroe County, U.S. Army Corps of Engineers, NYSDEC

7.8.2.6. Expected benefits: The restriction on overflow dredging would remain in effect despite changes in personnel and political climate. Even if contaminated sediments do not force the restriction on overflow dredging, the restriction would continue in order to protect the public beach just west of the mouth of the Genesee River.

Minimizing the frequency of dredging, especially during the swimming season, would help to ensure that dredging will not be responsible for beach closings.

The public would be assured that the Army Corps of Engineers' contractor is not "short dumping" (the practice of disposing of dredged spoils in a location closer to shore than the designated disposal site).

Author: Carole Beal

7.9. Institute Intergovernmental Agreements

7.9.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: the Rochester Embayment watershed

Current conditions that necessitate the measure:

In New York State, as a result of the home rule tradition, land use regulatory authority is concentrated at the town, village, and city levels of government. Land use decisions made at the local government level may have significant impacts on water quality. For example, the increase in impervious surfaces associated with new development increases pollutant loadings to waterways unless mitigation measures are implemented. Frequently, municipalities do not have sufficient staff resources to ensure that new development does not degrade water quality. While proper implementation of the State Environmental Quality Review Act (SEQRA) and the State Pollution Discharge Elimination System (SPDES) permits can result in some mitigation of pollutants associated with new development, that result is not currently commonplace.

7.9.2. Proposed Action: Institute Intergovernmental Agreements

7.9.2.1. Description:

Currently, Monroe County is pursuing the development of water quality Inter-Governmental Agreements (IGAs) with municipalities in order to maximize resources, encourage coordination of activities, and facilitate communication. A water quality IGA is a formal written agreement between government entities which outlines cooperative actions and strategies designed to improve and protect water quality. The Monroe County Water Quality Management Agency (WQMA) has adopted intergovernmental cooperation as a strategy to address water quality impairments. However, as a remedial strategy, IGAs are limited by the fact that they are voluntary agreements and it is possible that some municipalities may not be interested in entering into such an agreement.

The strategy adopted by the WQMA consists of two complementary components, one being the phased development of IGAs. As part of the IGA process, the possibility of establishing special districts (based upon watersheds) as a funding mechanism for stormwater management will be explored. The value of a special district is that it can generate an adequate and reliable revenue stream in an equitable fashion. For more information on this subject, see Chapter 8 "Funding Mechanisms".

The second component of the Agency's strategy consists of the proposed Finger Lakes - Lake Ontario Watershed Protection Alliance. Such an alliance would represent the institutionalization

of the Finger Lakes Aquatic Vegetation Control Program and ultimately consist of the 25 New York State counties in the Lake Ontario watershed. (The Finger Lakes AVCP is a funding appropriation made annually by the New York State Legislature for weed control and water quality programming for an 18-county consortium known as the Finger Lakes Water Resources Board. The program currently depends on lobbying efforts for funding.) The Alliance could be funded by both the New York State Environmental Protection Fund and as a line item in the budget of the New York State Department of Environmental Conservation (NYSDEC). The primary role of the Alliance would be to develop and implement coordinated watershed protection strategies at the local government level throughout New York State's Lake Ontario basin. The implementation of the RAPs would be a major part of this effort.

As of February 1995, water quality IGAs have been adopted, or are being pursued, with the towns of Pittsford, Penfield, Greece, Chili, and Brighton. Each of these IGAs is individually tailored to address both watershed-wide water quality issues and unique local conditions. For example, in the IGA with Greece, Monroe County and the Town agreed to the following goals: (1) design stormwater management systems which protect water quality, (2) initiate public education efforts regarding the benefits of created wetlands, (3) enhance Town ordinances which protect water quality, and (4) initiate the development of a Long Pond watershed plan. Watershed plans are also being initiated for Black Creek (Genesee Basin) and Allens Creek (Lake Ontario Central Basin) as part of the IGAs with Chili, Brighton, Pittsford, and Penfield. It is anticipated that watershed plans for other creeks will be initiated as part of future IGAs. These small watershed plans may serve as an alternative to the Basin Plans.

The ongoing effort to develop IGAs should be continued. This will be a multi-phase effort. The initial phase will involve establishing and implementing individual IGAs between Monroe County and the municipalities within the County including the City of Rochester.

The second phase will involve the development of IGAs among the municipalities located within a particular watershed or sub-watershed such as the Allens Creek sub-watershed or the Long Pond watershed. In the case of Allens Creek, this consolidated IGA would include Monroe County, Henrietta, Brighton, and Pittsford.

Ultimately, watershed-wide IGAs will be developed. For example, the Irondequoit Creek IGA would include Monroe County, Ontario County, Henrietta, Brighton, Pittsford, Penfield, Perinton, Mendon, Victor, East Rochester, and Fairport. The recently initiated Irondequoit Watershed Collaborative is an example of this type of watershed-wide cooperation. This informal group includes representatives from a number of Irondequoit Basin municipalities, as well as representatives from the Monroe County Health Department and the Monroe County Soil and Water Conservation District. The focus of the Collaborative is to discuss common water quality goals and strategies. Currently, the group plans to undertake a number of actions including (1) developing guidance on issues such as erosion control, (2) standardizing stormwater reporting methods, (3) preparing and updating a list of best management practices which are appropriate for the Irondequoit watershed, (4) preparing a matrix of current financing

mechanisms for stormwater management, and (5) commenting on certain types of policies/projects/activities.

The following possible remedial actions, which are included in the Stage II RAP, could be implemented through IGAs:

1. Ensure that restrictions on overflow dredging remain in effect.
2. Promote the implementation of a comprehensive municipal streambank erosion control programs.
3. Encourage the use of local government land use regulatory controls such as environmental protection overlay districts (EPODS) to protect fish and wildlife habitat.
4. Promote the revision of municipal development standards so as to limit the proliferation of impervious surfaces.
5. Coordinate the development and implementation of watershed-based drainage plans.

For more information on these possible remedial measures, see the following Chapter 7 sections: "Intergovernmental Agreement with Army Corps of Engineers", "Develop Streambank Erosion Control Program", "Promote the Use of Local Government Land Use Powers to Protect Fish and Wildlife Habitat", "Reduce and Mitigate Impervious Surfaces", and "Manage Stormwater Quality in Existing and Newly Developing Urban Areas".

7.9.2.2. Time Required: Depending upon staffing resources, one to three years.

7.9.2.3. Estimated Cost: Existing staff resources within the Monroe County Health Department are insufficient to develop, implement, coordinate, monitor, and update all of the water quality IGAs which are needed within the Rochester Embayment watershed. Therefore, a new full-time Environmental Planner (grade 14) position should be created within Monroe County government. The cost of this position would be approximately \$42,000 plus benefits and expenses. The cost of this position would be an ongoing expense. In regards to the implementation of IGAs, it is most likely that the municipalities would bear the costs with technical assistance provided by the County.

7.9.2.4. Possible Funding Sources: Monroe County, municipalities, and Aid to Localities funding

7.9.2.5. Possible Implementors: Counties and the municipalities

7.9.2.6. Expected Benefits: The development of water quality IGAs will facilitate cooperation and collaboration between Monroe County and the towns and villages, thus maximizing resources. The benefits derived from the implementation of IGAs will depend upon what issues (overflow dredging, stormwater management, streambank erosion, impervious surfaces, or loss of fish and wildlife habitat) are addressed in the agreements. If all of these issues are addressed as part of the IGA process, the benefits will be far reaching and address a number of use impairments including degradation of aesthetics, eutrophication or undesirable algae, drinking

water taste and odor problems, beach closings, and the loss of fish and wildlife habitat. For more specific information about expected benefits, see the individual Chapter 7 sections mentioned in the description section.

Author: Todd Stevenson

7.10. Manage Stormwater Quality in Existing and Newly Developing Urban Areas

7.10.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: the Rochester Embayment watershed

Current conditions that necessitate measure:

The runoff from impervious surfaces (such as roads, parking lots, and roofs) associated with urban development transports significant quantities of nutrients, sediments, hydrocarbons, and trace metals to area waters. The results of the local Nationwide Urban Runoff Program indicate that urban runoff is contributing significant quantities of nutrients such as phosphorus to Irondequoit Bay, resulting in eutrophic conditions. Oxygen depletion associated with eutrophication has degraded the value of Irondequoit Bay as habitat for fish and wildlife. Stormwater runoff also transports much of the nutrients which result in excessive quantities of algae in the Rochester Embayment of Lake Ontario. Under certain conditions this algae washes up on shore and creates favorable conditions for bacterial growth which may require swimming restrictions (for more information, see Chapter 6 "Beach Monitoring/Modeling"). Urban runoff is a problem in many areas of the Rochester Embayment watershed although it may not be as extensively documented as in the Irondequoit Bay watershed.

Additional information:

Traditionally, the primary focus of stormwater management activities was to direct stormwater off-site as quickly as possible so as to avoid on-site drainage problems. However, as suburban development (and associated impervious surfaces) continued to expand, the increased quantity of stormwater runoff began to contribute to off-site flooding problems. Therefore, the focus of stormwater management activities shifted to flood control utilizing detention basins.

However, as mentioned above, the local NURP project revealed that urban stormwater runoff contributes significant quantities of nutrients such as phosphorus to receiving waters. Building upon the findings of the NURP, a Monroe County interdepartmental technical team developed the Irondequoit Basin Framework Plan and the Water Quality Management in the Irondequoit Basin Policy Report. These plans advanced a number of proposals to manage urban stormwater runoff including construction site erosion control, wetland flow stabilization, modified detention basins, stream flow stabilization, swirl concentrators, and stream corridor protection. (Many of these proposals have been implemented, or are being pursued, and are discussed in the following sections of the Stage II RAP: Chapter 6 "Erosion Control Technician", Chapter 6 "Irondequoit Basin Stormwater Research, Demonstration, and Implementation", Chapter 6 "Dry Basin Conversions", and Chapter 7 "Streambank Erosion Control Program".) These strategies represent

a significant departure from traditional stormwater management practices in that they address stormwater quality in addition to quantity.

This change in philosophy regarding urban stormwater management must be continued and expanded if the water quality goals for Irondequoit Bay and the Rochester Embayment are to be achieved. (These goals are fully described in Chapter 3 of the Stage I RAP). Most importantly, municipalities and citizens within the watershed must "buy into" the need to manage stormwater quality.

7.10.2. Proposed Action a: Continue Dry Basin Conversions

7.10.2.1. Description:

In existing urban areas, stormwater facilities have historically been constructed to control flood waters without any regard to water quality. In Monroe County there are several hundred developments constructed since the 1960s which contain flood prevention detention basins. During large storm events these basins retain water and then slowly release it. However, during smaller, more frequent storm events, stormwater quickly passes through these basins. Between storm events these basins remain dry. While these basins may be effective in preventing floods, they do not provide any water quality benefit. Nutrient and sediment-rich runoff passes through these basins and ultimately reaches area waters untreated.

Where appropriate, existing dry basins should be retro-fitted to manage water quality in addition to flood control. As described in Chapter 6 "Dry Basin Conversions", Monroe County is engaged in a cost-share program with the towns and villages to convert dry basins into wetlands. This program should be continued in appropriate areas, in order to ensure that phosphorus in stormwater is mitigated.

7.10.2.2. Time required: 5 years

7.10.2.3. Estimated costs: Typically, the cost of converting an existing dry basin into a stormwater wetland ranges between \$2,000 and \$5,000. It is estimated that there are several hundred dry basins in Monroe County. Approximately 50 of these will be converted as part of the existing program. Therefore, the cost of converting the remaining dry basins would be approximately \$750,000. It is recognized that not all of the dry basins would be appropriate for conversion.

7.10.2.4. Possible funding sources: USEPA, NYSDEC, Monroe County, and municipalities

7.10.2.5. Possible implementors: Municipalities, Monroe County

7.10.2.6. Expected benefits: Within stormwater wetlands, there are a number of pollutant removal pathways:

1.) Sedimentation is the primary removal pathway for particulate pollutants. The morphology (form and structure) and vegetation which characterize stormwater wetlands slow runoff velocities thus facilitating settling. Plant roots also help to stabilize the sediments thus limiting the possibility of resuspension.

2.) Adsorption to sediments, emergent plants, or detritus is an important removal pathway especially for pollutants such as phosphorus, trace metals, and some hydrocarbons. Adsorption refers to the adhesion of the molecules of a gas, liquid, or dissolved substance to a surface. Pollutant removal by adsorption is increased as contact time increases.

3.) The physical filtration of stormwater runoff by emergent plants catches trash, debris, and other floatables.

4.) Microbial activity within stormwater wetlands removes nitrogen and organic matter within both the water column and bottom sediments and also helps to immobilize many trace metals into less mobile compounds. The physical characteristics of wetlands provide excellent conditions for microbial (including bacterial) growth.

5.) The uptake of nutrients and metals by wetland plants through their roots is another pollutant removal pathway. This process primarily impacts pollutants deposited in the sediments.

6.) Uptake by algae is a critical removal pathway for soluble pollutants including phosphorus and ammonia. Standing water which characterizes wetlands creates ideal growing conditions for algae.

Locally, stormwater wetlands have been shown to significantly reduce pollutant loadings associated with stormwater runoff. A stormwater wetlands demonstration project, conducted jointly by the Monroe County Environmental Health Laboratory and the United States Geological Survey, found that by doubling retention time trap efficiency is substantially improved. For more information on this subject, see the Chapter 6 section entitled "Dry Basin Conversions".

A valuable resource which describes the details of stormwater wetlands is a publication by the Metropolitan Washington Council of Governments entitled Design of Stormwater Wetland Systems: Guidelines for Creating Diverse and Effective Stormwater Wetland Systems in the Mid-Atlantic Region. This publication covers a number of topics including the range of pollutant removal pathways within stormwater wetlands and critical design features which will increase pollutant removal performance, habitat value, and community acceptability. These features may include increasing the surface area to volume ratio of the stormwater wetland, maximizing the length of flow, creating a complex microtopography, and including safety features.

The issue of secondary environmental impacts associated with stormwater wetlands such as downstream warming are also addressed. Possible strategies to minimize thermal impact include

providing shade, reducing the size of the permanent pool, and locating the wetland away from the stream.

The Design of Stormwater Wetland Systems manual contains the following projections for long term pollutant removal rates for stormwater wetlands in the Mid-Atlantic Region:

Table 7-2: Projected Stormwater Wetlands Pollutant Removal Rates

Pollutant	Removal Rate (%)
Total Suspended Solids	75%
Total Phosphorus	45%
Total Nitrogen	25%
Organic Carbon	15%
Lead	75%
Zinc	50%
Bacteria	2 log reduction

Monroe County is currently working with the New York State Department of Environmental Conservation (NYSDEC) to ensure that these created wetlands do not degrade the few remaining trout streams in Monroe County by contributing to stream warming. The NYSDEC is concerned that as stormwater slowly passes through created wetlands its temperature will be raised and therefore may significantly raise the temperature of the receiving stream. A document produced by the Metropolitan Washington Council of Governments entitled Thermal Impacts Associated with Urbanization and Stormwater Management Best Management Practices compares the thermal impacts associated with various stormwater BMPs. This research indicates that infiltration dry ponds produced the least thermal impact while wet ponds produced the greatest thermal impact. The results of this research are summarized in the following table.

Table 7-3: BMP Temperature Performance¹

Parameter (°F)	Infilt. Dry Pond	Extended Detention Wetland	Extended Detention Dry Pond	Wet Pond
Avg. Baseflow Delta-T	2.6	3.9	5.5	9.7
Max. Baseflow Delta-T	7.6	8.7	9.7	15.1
Avg. Stormflow Delta-T	2.3	2.4	5.2	8.5
Max. Stormflow Delta-T	5.0	7.8	11.2	14.0
Avg. Total Delta-T	2.5	3.2	5.3	1.1
Max. Total Delta-T	7.6	8.7	10.9	9.1

1. Taken from Thermal Impacts Associated with Urbanization and Stormwater Management Best Management Practices by the Metropolitan Washington Council of Governments

When water temperature exceeds 70° F (July and August are the critical months), trout and salmon become stressed and may experience die-offs. Therefore, NYSDEC regulation 6NYCRR Part 704 prohibits discharge at a temperature exceeding 70° F at any time to streams classified for trout. In order to facilitate the placement of stormwater wetlands, NYSDEC Region 8 developed a map which depicts the locations of critical fish habitat in Monroe County that would be most susceptible to the potential thermal impacts of stormwater.

However, members of the Monroe County Water Quality Coordinating Committee (WQCC) believe that the thermal impact of stormwater that is directly discharged from storm sewers to streams may be more significant than that of stormwater which passes through created wetlands. In order to resolve this issue, the Monroe County Environmental Health Laboratory began conducting thermal monitoring of the in-flow and out-flow from an established constructed wetland at Mill Road, in the town of Pittsford, in the spring of 1995. The preliminary results of this monitoring indicate that the design utilized at the Mill Road site is not having a significant thermal impact on receiving waters. The results of this monitoring are being provided to the NYSDEC.

The NYSDEC has also expressed concern regarding the maintenance and seasonal variations in performance of created wetlands. The Monroe County Environmental Health Laboratory is conducting extensive monitoring in order to verify maintenance costs and seasonal pollutant removal effectiveness. The Laboratory will share this data with the NYSDEC.

One of the primary maintenance issues associated with created wetlands is the removal and disposal of accumulated sediments. In order to address this issue, the Laboratory is measuring sedimentation rates at both the Mill Road detention facility and at the Empire Wetlands project (for further information regarding these projects, see Chapter 6 Section 28 "Irondequoit Basin Stormwater Research, Demonstration, and Implementation"). In addition, the Laboratory is

examining the flow of pollutants through these systems in order to better understand where they are stored. While created wetlands have the capacity to retain pollutants, whether or not sediment disposal will become a problem will be determined with data from the Mill Road project. Also, it is important to note that the municipalities are required to accept responsibility for maintenance in order to be eligible for grant funds through the current dry basin conversion program.

In regards to winter performance of created wetlands, monitoring is being conducted at the Mill Road detention facility. The Laboratory does not believe that winter performance will be significantly reduced.

7.10.3. Proposed Action b: Conduct Swirl Concentrator Demonstration Project

7.10.3.1. Description:

A local demonstration of a swirl concentrator as a stormwater management strategy for existing urban areas should be implemented. A swirl concentrator is installed into the existing storm sewer and uses centrifugal force to concentrate solids and direct them in a reduced volume to a sanitary sewer. The remaining cleaner water is discharged to a waterway. The Water Quality Management in the Irondequoit Basin Policy Report identifies five locations that may be suitable for swirl concentrators including a large storm sewer discharge into Irondequoit Creek near the village of East Rochester. Monroe County has applied for funding to conduct an effectiveness evaluation of this technology but has not yet been funded. The pursuit of funds to conduct a swirl concentrator demonstration project should be continued. Until this project is funded, it will be important to evaluate the use of such devices in other locations such as New York City, Oakfield, and Batavia in order to determine how these uses apply to Monroe County's proposal, so that the County can demonstrate the best technology.

7.10.3.2. Time required: not available

7.10.3.3. Estimated cost: The proposed East Rochester swirl concentrator is budgeted at \$126,000.

7.10.3.4. Possible funding sources: NYSDEC, Monroe County

7.10.3.5. Possible implementors: Monroe County Department of Environmental Services, Pure Waters Division in cooperation with the Monroe County Health Department

7.10.3.6. Expected benefits: According to the manufacturer, such a device may reduce total suspended solids (TSS) by up to 60% and biological oxygen demand (BOD) by up to 40%. It is also designed to retain floatables including oils, fats, and grease.

7.10.4. Proposed Action c: Develop Stormwater Wetlands as part of Intergovernmental Agreements

7.10.4.1. Description:

Multi purpose created wetlands that manage stormwater quality should be developed through the process of instituting water quality intergovernmental agreements (IGAs). A water quality IGA is a formal written agreement between government entities which outlines cooperative actions and strategies designed to improve and protect water quality. As of January 1996, Monroe County has developed IGAs with several municipalities. For more information on IGAs, see the Chapter 7 section entitled "Institute Intergovernmental Agreements".

The Allen's Creek Stormwater Drainage Facility is an excellent local example of a multi purpose created wetland. This facility is designed to address drainage and water quality problems in the Allen's Creek watershed. The project consists of a stormwater detention pond on the East Branch of Allen's Creek, as well as channel improvements along the East Branch and Knowlton Creek. These improvements were recommended in Pittsford's 1982 Comprehensive Drainage Plan. The primary purpose of the project is to address increased flooding during smaller storms. This type of flooding results from runoff from impervious surfaces associated with new development in the watershed.

7.10.4.2. Time required: not available

7.10.4.3. Estimated costs:

The primary cost associated with developing IGAs consists of staff time. The cost of funding a position within the Monroe County Department of Health to develop and implement IGAs would be approximately \$42,000 per year. The cost of developing multi purpose created wetlands would vary considerably. The Allen's Creek Stormwater Management Facility is a large-scale, regional project and is estimated at over \$1,000,000 with the impoundment facility estimated at approximately \$700,000.

7.10.4.4. Possible funding sources: NYSDEC, Monroe County, municipalities

7.10.4.5. Possible implementors: Monroe County, municipalities

7.10.4.6. Expected benefits: see Action A above. A number of other remedial measures could be implemented utilizing IGAs. For additional information, see the Chapter 7 section entitled "Institute Intergovernmental Agreements".

7.10.5. Proposed Action d: Develop Stormwater Wetlands as part of Watershed Drainage Plans

7.10.5.1. Description:

Multi purpose created wetlands that manage stormwater quality should be developed as part of watershed-based drainage plans. Monroe County and some of the municipalities have already developed drainage plans. However, these plans follow political, rather than watershed, boundaries and fail to address water quality issues. In addition, many of these drainage plans, such as the County plan, are seriously out of date.

Drainage issues should be addressed on a watershed, rather than municipal level, because the actions of upstream municipalities have significant impacts on downstream communities. Watershed-based drainage plans which identify (1) current drainage infrastructure, (2) locations where drainage problems exist, and (3) drainage-related water quality problems, as well as make recommendations for improvements would facilitate a comprehensive and systematic approach to drainage problems and drainage-related water quality impairments.

7.10.5.2. Time required: 10 years

7.10.5.3. Estimated costs: It is estimated that if Monroe County was divided into four basins, the cost of developing watershed-based drainage plans would be approximately \$125,000 per basin. As mentioned in Action C above, the cost of created wetlands vary considerably. The cost of the Allen's Creek wetland was approximately \$700,000.

7.10.5.4. Possible funding sources: NYSDEC, Monroe County, and municipalities

7.10.5.5. Possible implementors: Monroe County, municipalities

7.10.5.6. Expected benefits: see Action A above. Streambank erosion control programs could also be developed and implemented as part of watershed-based drainage plans. For additional information, see the Chapter 7 section entitled "Develop Streambank Erosion Control Program".

7.10.6. Action e: Promote the Use of Biofilters where Appropriate

7.10.6.1. Description:

Through the implementation of IGAs, the use of biofilters (enhanced grass swales) should be promoted within the watershed. Biofilters are an earthen conveyance system (ditch) in which pollutants are removed from stormwater by filtration through grass and infiltration into the soil. Biofilters can provide sufficient runoff control to replace curb and gutter in low density single-family residential subdivisions and on highway medians. However, biofilters are usually not appropriate in areas with poorly draining soils or in highly urbanized areas because the

substantial volume of runoff associated with large quantities of impervious surfaces is likely to result in severe erosion within the swale. In addition, in some suburban areas there may be a need to address possible homeowner concerns regarding the aesthetic characteristics of biofilters.

In general, the pollutant removal capacity of biofilters is a function of the contact time of the runoff through the swale and should be maximized by increasing detention time. This may be achieved by using check-dams, increasing the width of the swale, or developing pocket wetlands in conjunction with the biofilter. Biofilters are most appropriate in areas which are characterized by low slopes (less than 5% where expected flow rates are not expected to exceed 1.5 feet per second) and permeable subsoils.

7.10.6.2. Time required:

7.10.6.3. Estimated costs: As mentioned in Action C above, the primary cost associated with the development of IGAs consists of staff time. The cost of funding a position within the Monroe County Department of Health to coordinate the development and implementation of IGAs would be approximately \$42,000 per year. The cost of a biofilter ranges between \$5 and \$15 per linear foot. In general, biofilters are less expensive to construct than gutters although they may require more land.

7.10.6.4. Possible funding sources: Counties within the Rochester Embayment watershed and municipalities

7.10.6.5. Possible implementors: Counties and municipalities

7.10.6.6. Expected benefits:

The Metropolitan Washington Council of Governments made the following pollutant removal projections for grassed swales. The pollutant removal capability of biofilters which include check dams is expected to be much greater.

Table 7-4: Projections for Grassed Swale Pollutant Removal Rates¹:

Pollutant	Removal Efficiency
Total Suspended Solids (TSS)	70%
Total Phosphorus (TP)	30%
Total Nitrogen (TN)	25%
Trace Metals	50 - 90%

1 - Taken from A Current Assessment of Urban Best Management Practices as prepared by the Metropolitan Washington Council of Governments.

7.10.7. Action f: Expand Highway Projects Task Group Effort

7.10.7.1. Description:

The Highway Drainage Task Group of the Monroe County Water Quality Coordinating Committee (WQCC) should expand its scope and work with municipal departments of public works and the New York State Department of Transportation to ensure that road projects implemented by these agencies consider water quality issues. The Monroe County WQCC should also communicate with other WQCCs in the Rochester Embayment Watershed regarding the potential to implement this type of project in other counties.

During 1995, this Task Group conducted a one year trial in which it acted as a liaison to the Monroe County Departments of Transportation and Engineering for major highway and bridge improvement projects. Members of the Task Group reviewed plans and provided input as to how projects might be improved in regards to stormwater management and water quality in general. With the completion of the one year trial period, it is expected that water quality considerations will have become fully integrated into project planning and programming within the county's transportation agencies.

7.10.7.2. Time required: 3 years

7.10.7.3. Estimated costs: Staff time within the participating agencies.

7.10.7.4. Possible funding sources: NA

7.10.7.5. Possible implementors: NYS Department of Transportation, counties, municipalities

7.10.7.6. Expected benefits: Water quality impacts would be considered by departments of transportation (state, county, and municipal) in the planning, design, and construction of road projects.

Additional Information: There are a number of land use planning strategies which may be utilized to reduce the quantity of stormwater, or mitigate its impact, and these are discussed in the following sections of Chapter 7: "Develop Streambank Erosion Control Program", "Promote Impervious Surface Reduction", and "Promote the Use of Local Government Land Use Powers to Protect Fish and Wildlife Habitat".

In addition, a valuable resource which should be consulted throughout the decision making and implementation process is the Urban/Stormwater Management Practices Catalogue as prepared by the NYSDEC. This catalogue provides a brief description of a number of management practices that may be appropriate for newly developing and/or existing urban areas.

Author: Todd Stevenson

7.11. Reduce and Mitigate Impervious Surfaces

7.11.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies: waterbodies in the urbanized areas of the Rochester Embayment watershed

Current conditions that necessitate the measure:

The proliferation of impervious surfaces (roofs, roads, driveways, parking lots) associated with urban development in the Rochester Embayment watershed has increased the quantity of urban runoff to local waters, thus contributing to water quality degradation. According to research published in *Watershed Protection Techniques* (Vol. 1, No. 3, Fall 1994), streambank integrity and fish habitat quality decline rapidly as the quantity of impervious surfaces in the watershed increases, with a level of 10% imperviousness being an important threshold beyond which channel stability and biodiversity is likely to be poor.

Increased urban runoff associated with the proliferation of impervious surfaces contributes to water quality degradation by increasing pollutant loadings, streamflows, and stream temperatures. Urban runoff may contain a number of pollutants including phosphorus, hydrocarbons, trace metals, or motor oil. Locally, the Irondequoit Basin Nationwide Urban Runoff Program (NURP) found that urban runoff is contributing significant amounts of phosphorus to Irondequoit Bay thus resulting in eutrophic conditions (see the Chapter 6 section entitled "Irondequoit Basin Stormwater Research, Demonstration, and Implementation"). Similar problems exist throughout the Rochester Embayment watershed. The increased streamflows which result from urban runoff contribute to larger and more frequent floods, streambank instability, and habitat degradation (see the Chapter 7 section entitled "Streambank Erosion Control Program"). Stream temperature is also impacted by impervious surfaces. The runoff from impervious surfaces results in increased stream temperatures which may degrade a stream's value as habitat for certain species of fish such as trout which require cool water that is rich in oxygen.

Additional information:

Within the Rochester Embayment watershed, land development policies and regulations frequently encourage the proliferation of impervious surfaces that ultimately contribute to water quality degradation. For example, zoning regulations and municipal ordinances in many suburban municipalities result in low density urban development that requires an expansive transportation network and therefore huge quantities of impervious surfaces.

Research published in *Watershed Protection Techniques* (Vol. 1, No. 3, Fall 1994) found that

"transport-related imperviousness [as opposed to rooftop imperviousness] comprised 63% to 70% of total impervious cover at the site in 11 residential, multifamily and commercial areas where it had actually been measured". In terms of water quality degradation, transportation related imperviousness may be more significant than rooftop related imperviousness because the runoff from rooftops may be directed towards a landscaped area and allowed to infiltrate into the soil whereas runoff from parking lots and roads is generally directed towards streams or other water bodies.

Unfortunately, while rooftop-related impervious coverage is indirectly limited by means of density zoning, transportation related imperviousness is encouraged by excessive minimum parking requirements and road width requirements. This problem is most pronounced in commercial districts where developers are required to construct large parking lots which are fully utilized only during the holidays. The quantity of transportation related impervious cover associated with urban development varies dramatically depending upon design factors. For example, field studies published in Watershed Protection Techniques (Vol. 1, No. 3, Fall 1994) found that impervious cover associated with medium density single family home developments ranged between 25% and 60%. This variation is possible because municipal ordinances generally require that a specific quantity of parking be provided yet do not place a cap on the maximum impervious coverage allowed.

Nationally, a number of communities are seeking to address the impacts of impervious surfaces on water quality including the City of Olympia, Washington which, in conjunction with the Washington State Department of Ecology, developed an "Impervious Surface Reduction Study". As part of the study, parking and impervious surface site coverage analysis was conducted. This research indicated that vehicle-oriented pavement offers the greatest potential for reduction and that commercial/industrial and high density residential land uses contain the most vehicle-oriented pavement. Using this information, along with other research, the following recommendations for action were developed. Although some of these actions may not be relevant or appropriate for the Rochester Embayment watershed, they illustrate the types of actions which other communities are taking to address the impact of impervious surfaces on water quality.

Overall Recommendations:

1. Integrate impervious surface reduction into policies and regulations.
2. Establish growth management policies that encourage infill of urban areas and reduce urban sprawl [promote development in existing urban areas rather than in undeveloped areas].
3. Provide a public transit system and alternative modes of transportation that reduce the need for streets and parking.

Recommendations for Vehicle-Oriented Pavement:

4. Develop standards for narrower residential streets with reduced, but adequate, parking opportunities.
5. Use pavers [concrete grid and modular pavement whose spaces are filled with pervious

materials such as sod, sand, or gravel] and other pervious surfaces for low use areas such as overflow parking and emergency access roads.

6. Narrow alley widths, use alternative surfaces for alleys, or design alleys to drain to vegetated strips or central drains [This may not be relevant for suburban areas in the Rochester Embayment watershed].
7. Encourage cooperative parking such as joint (combined), shared, and coordinated parking.
8. Encourage underground or under-the-building parking and the construction of multi-storied parking structures.
9. Develop flexible parking regulations related to parking region-wide that limit the amount of impervious surface, while still providing for true parking needs [these might include flexible parking requirements [the parking analysis suggests that local parking policies could be revised to meet a high average demand rather than a single peak-day use].
10. Construct narrower sidewalks or sidewalks on only one side of the street, and/or slope sidewalks to vegetated strips or gravel catchments.

Recommendations for Construction Practices and Landscaped Areas:

11. Limit soil compaction on newly developed residential and commercial sites, especially those sites with sensitive features. Reduce soil compaction and restore infiltration capacity on already cleared sites whenever possible.
12. Limit land clearing on newly developed residential and commercial sites, especially those sites with sensitive features.
13. Encourage measures such as neighborhood covenants and/or add plat map conditions that protect existing vegetation and undisturbed areas.

Recommendations for the Design and Placement of Buildings:

14. Encourage cluster development that minimizes impervious surfaces.
15. Encourage the building and use of taller structures to reduce the size of building footprints.

Recommendations for Community Involvement and Education:

16. Develop and distribute printed materials that complement the study's recommendations.
17. Develop and provide training and technical assistance to the region's development and business community.

Projections indicate that if these recommendations are implemented, a 10% to 20% reduction in impervious surfaces will be achieved. Thus far, an educational effort has been initiated and the City of Olympia's parking, street, and development standards have been revised in accordance with the goal of reducing impervious surfaces.

Another strategy which some communities are utilizing to address the proliferation of impervious surfaces is the creation of stormwater special districts whose fee assessment is based at least partially on the quantity of impervious surface present on each parcel. This fee is designed as a type of "sin tax" to discourage the construction of excessive quantities of impervious surfaces. The revenue which is generated is used to fund remedial actions such as stormwater wetlands,

oil/water separators, and pollution prevention programs. This strategy is used in a number of communities including Bellevue, Washington and Cherry Creek, Colorado. The feasibility of this strategy for the Rochester Embayment watershed will be examined as part of the process of developing intergovernmental agreements.

Using the Olympia study as a model, the following actions should be implemented in order to reduce the impact of impervious surfaces on water quality:

7.11.2. Proposed Action a: Organize an Impervious Surfaces Reduction and Mitigation Education Workshop

7.11.2.1. Description:

A workshop should be organized in order to educate the development community, municipalities, and the general public regarding the impact of impervious surfaces on water quality and possible mitigating strategies. One option would be to utilize the existing annual Land Use Decision Making series that is organized by the Monroe County Department of Planning and Development. Impervious surfaces could be a sub-topic for one of the sessions. However, the disadvantage of this option is that many topics are covered as part of this series and the amount of time that could be devoted to the issue of impervious surfaces would be very limited.

Another option would be to organize a workshop exclusively on the reduction and mitigation of impervious surfaces. The advantage of this approach is that the subject could be explored in much greater detail because more time would be available.

Mitigating strategies that might be addressed in a workshop include (1) using pervious materials, (2) encouraging cluster development and infill development, (3) revising parking requirements, and (4) developing stormwater wetlands. The use of pervious materials (such as gravel, mulch, or porous pavers) should be encouraged in overflow parking areas. These materials allow stormwater to infiltrate into the soil thus reducing the quantity of runoff and associated water quality impacts.

The use of cluster development is another mitigating strategy that should be encouraged. The advantage of a cluster development is that it requires fewer roads and therefore less impervious surfaces. For more information regarding cluster development, see the Chapter 7 section entitled "Promote the Use of Local Government Land Use Powers to Protect Fish and Wildlife Habitat". Infill development should also be encouraged because suburban development is a primary source of new impervious surfaces.

There are a number of mitigating strategies relative to municipal parking standards that should also be encouraged. For instance, municipalities should be encouraged to revise their parking standards so as to facilitate "cooperative parking". The term "cooperative parking" refers to parking facilities that are shared by businesses with noncompeting hours of operation. As a

result, the overall quantity of parking is reduced. For example, a retail store and a movie theater might be allowed to share the same parking facilities rather than each construct their own.

Municipalities should be encouraged to base their parking requirements on a high average of trips generated rather than square footage and a one day peak demand. Parking ordinances that are based upon a one day peak demand ensure that there will be adequate parking during the holiday season yet result in vast quantities of under utilized parking lots during the remainder of the year. Using high average demand as the basis for parking ordinances ensures that a more equitable balance between providing for parking needs and water quality is obtained.

Municipalities could also supplement their existing minimum standards with a maximum parking ratio. This would serve as a useful mechanism to prevent developers from constructing significantly more parking than required by the municipality. Research conducted as part of the Olympia Impervious Surface Reduction Study found that developers frequently construct significantly more parking than required by the municipality.

Stormwater wetlands should also be promoted as a strategy to mitigate the impacts of impervious surfaces on water quality. For additional information on this subject, see the Chapter 7 section entitled "Manage Stormwater Quality".

7.11.2.2. Time required: If the existing workshop were utilized, minimal time would be required. If an Impervious Surfaces workshop were to be organized, several months of preparation would be required.

7.11.2.3. Estimated costs: If the existing workshop were utilized, costs would be minimal and consist exclusively of staff time in preparing for the lecture. The cost of conducting an impervious surfaces workshop would consist primarily of staff time because the other expenses would be covered by the registration fees. It is estimated that the cost of staff time to organize the conference would be approximately \$5,600 (assuming that a county environmental planner would spend approximately 25% of their time over a period of six months to organize the conference).

7.11.2.4. Possible funding sources: If the existing workshop series were utilized, it is not anticipated that additional funding would be needed. If an impervious surfaces workshop were organized, some of the costs could be covered by registration fees.

7.11.2.5. Possible implementors: Monroe County Departments of Health and Planning and Development, the Environmental Management Council, private consultants, and the Planning Council

7.11.2.6. Expected benefits: A reduction or mitigation of the impacts of impervious surfaces on water quality.

7.11.3. Proposed Action b: Use a Local Water Quality Not-for-profit Organization to Assist Municipalities in Reducing the Quantity of Impervious Surfaces and/or Mitigating the Impacts of Impervious Surfaces

7.11.3.1. Description:

A local not-for-profit organization, modeled after the Friends of the Buffalo River, should be created in order to serve as an advocate for water quality. As such, it should encourage municipalities to revise their zoning ordinances and other regulations so as to discourage the construction of unnecessary impervious surfaces. Currently, several not-for-profit organizations are working with local municipalities to preserve open space and encourage stewardship of natural resources. For more information, see Chapter 6 "Non-Government Organization Habitat Protection" and Chapter 7 "Develop Public Education Structure".

7.11.3.2. Time required: The time required to establish a local water quality not for profit organization would be approximately one year. The time required for this organization to work with the municipalities within the Watershed in order to mitigate the impacts of impervious surfaces would be approximately five years.

7.11.3.3. Estimated costs: The annual budget of a local water quality not-for-profit organization would be in the range of \$70,000 to \$100,000 to cover staff and some implementation activities. The cost of working with the municipalities would consist primarily of staff time.

7.11.3.4. Possible funding sources: Grants, memberships, and private donations

7.11.3.5. Possible implementors: Municipalities. The establishment of a not for profit organization could be implemented by the members of the Water Quality Management Advisory Committee or the Water Quality Coordinating Committees.

7.11.3.6. Expected benefits: A reduction of the impacts of impervious surfaces on water quality

7.11.4. Action c: Use Intergovernmental Agreement Process to Mitigate the Impacts of Impervious Surfaces on Water Quality

7.11.4.1. Description:

The intergovernmental agreement (IGAs) process should be utilized to encourage municipalities to address the impacts of impervious surfaces on water quality by revising their parking regulations or by encouraging cooperative parking, cluster development, and the use of porous paving materials. Currently, Monroe County is developing and implementing water quality intergovernmental agreements with the towns and villages (see the Chapter 7 section entitled "Institute Intergovernmental Agreements"). As part of this process, municipal parking ordinances should be reviewed and opportunities to make revisions (that would contribute to a

reduction in impervious surfaces) should be identified.

7.11.4.2. Time Required: three years

7.11.4.3. Estimated Cost: The costs associated with developing IGAs consists primarily of staff time. However, existing staff resources within the Monroe County Health Department are insufficient to develop, implement, coordinate, monitor, and update all of the IGAs which are required. Therefore, a new full Environmental Planner (grade 14) position would need to be created. The cost of this position would be approximately \$42,000 plus benefits and expenses.

7.11.4.4. Possible Funding Sources: Monroe County

7.11.4.5. Possible Implementors: Counties and municipalities

7.11.4.6. Expected Benefits: Mitigation of the impacts of impervious surfaces on water quality

Author: Todd Stevenson

7.12. Identify and solve onsite sewage disposal system problems

7.12.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Lake Ontario and Rochester Embayment tributaries, groundwater

Current conditions that necessitate the measure:

New York State Department of Environmental Conservation nonpoint source assessments have indicated many areas where failing septic systems may be leading to water quality problems. The problem of failing septic systems can be remedied in a number of ways. Which method is best will depend upon the conditions in the area where the problems exist. In addition to ongoing methods (see Chapter 6 section on "Identify, solve and prevent onsite sewage disposal systems problems"), there are proposals for additional methods.

7.12.2. Proposed Action a: Conduct septic system surveys where known problems exist

7.12.2.1. Description:

The county health department could prepare a map of individual complaints and system repair locations. The map and the knowledge of health department staff would allow identification of areas where a high frequency of onsite sewage disposal system failure is occurring. The Geographic Information System (GIS) may be utilized to facilitate the mapping. Home surveys in these areas could then document the extent of system failure problems. Follow-up could include system repair or extension of sanitary sewers. Counties have the authority to order a homeowner to repair a failing septic system within a certain length of time, or the county can levy a fine of \$1,000 per day until repairs are made.

7.12.2.2. Time required: As an example of the staff time required to conduct this proposed action, the Monroe County Health Department estimates that an additional public health sanitarian may have to be hired in order to do the mapping, field surveys and required follow-up.

7.12.2.3. Estimated costs:

County costs: Approximately \$43,250/year if an additional public health sanitarian is needed

Homeowner costs (the many variables make costs difficult to predict):

- Tanks
 - 1250-gallon (for 3-bedroom home, installed) \$850-\$1,800
 - 1500-gallon (for 4-bedroom home, installed) \$1,150-\$2,200
- Conventional leachlines, \$6-10/foot \$1,200-\$6,000
- Full-size raised system worst case (sand and leach lines)

3-bedroom home	\$12,000
4-bedroom home	\$15,000

7.12.2.4. Possible funding sources: County budget general fund, homeowner

7.12.2.5. Possible implementors: County health department

7.12.2.6. Expected benefits: The measure, combined with follow-up actions, should prove to be highly successful in localized areas to reduce pollution from failing septic systems. However, in some areas, problem soils and small lot sizes will make system repairs very difficult to achieve. Also, opposition could develop due to the fact that some residents do not have the financial ability to repair or replace their septic systems, or may not regard this as a priority.

7.12.3. Proposed Action b: Scheduled pumpouts

7.12.3.1. Description:

Scheduled pumpouts could be required by town or county law or initiated by a homeowners' association or lake association. An example is Genesee County where pumpouts are required every two years. The pumpout is considered to be solely the responsibility of the homeowner. The County does not inspect unless there is a complaint or a property transfer for which a lending institution requires an inspection.

7.12.3.2. Time required: The time required depends on whether or not the pumpouts are enforced by inspections and by the number of residences

7.12.3.3. Estimated costs: The costs to a county depend on whether or not the pumpouts are enforced by inspections and by the number of residences. The costs to the homeowner are \$95-\$135 for a 1,000 gallon tank.

7.12.3.4. Possible funding sources: Community development block grants, self-help program, private foundations

7.12.3.5. Possible implementors: County health departments, homeowners' or lake associations

7.12.3.6. Expected benefits: Technical feasibility should not be a problem unless there is a lack of septic disposal capacity. Whether voluntary or required, benefits would be maximized if inspections are conducted to make sure septic systems are being pumped.

7.12.4. Proposed Action c: Septic tank maintenance district (STMD)

7.12.4.1. Description:

A septic tank maintenance district (STMD) could be established under New York State law regarding wastewater disposal districts that can be established by counties or towns. It is a district whereby property owners pay to have someone regularly pump out and inspect their septic systems. When the district is established, residents may be required to upgrade their systems to current standards.

7.12.4.2. Time required: Staff time of county personnel to monitor pumpout and inspection records

7.12.4.3. Estimated costs:

County: Costs associated with staff time

Homeowner costs:

- Inspection
 - Routine inspection: \$40-\$100
 - Property transfer inspection:
 - Premises occupied: \$100-\$200
 - Premises unoccupied: \$150-\$300
- Pumpout: \$95-\$135 for a 1,000 gallon tank
- Replacement
 - Tanks
 - 1250-gallon (for 3-bedroom home, installed) \$850-\$1,800
 - 1500-gallon (for 4-bedroom home, installed) \$1,150-\$2,200
 - Conventional leachlines, \$6-10/foot \$1,200-\$6,000
 - Full-size raised system worst case (sand and leach lines)
 - 3-bedroom home \$12,000
 - 4-bedroom home \$15,000

7.12.4.4. Possible funding sources: Community development block grants; self-help program; private foundations; property owners

7.12.4.5. Possible implementors: The county legislature and State Department of Audit and Control would have to approve the formation of a STMD.

7.12.4.6. Expected benefits: A STMD would only work well in areas where soils and lot sizes allow adequate septic systems to be built and maintained over the long term. The establishment of a STMD would be somewhat complex, and would require initial upgrading of septic systems by the residents. The need to pay an annual fee might be resented unless people were convinced that the problem was severe and that other options, such as sewer hookups, were less desirable. In its operation, a STMD would be effective since it would not depend on the decisions of individual homeowners to maintain their systems.

7.12.5. Proposed Action d: Periodic inspections and permits

7.12.5.1. Description:

County health departments could require that all septic systems in the county be inspected periodically at the expense of the homeowner by a certified inspector and issued a permit to discharge. This program has been initiated in Cayuga County (outside of the Rochester Embayment watershed). The Cayuga County Sanitary Code requires periodic inspections. They are being phased in over a seven-year period.

In addition, prior to any property transfer in Cayuga County, all septic systems must be inspected by a certified inspector and a report must be issued to the Health Department. If a lending institution requires a septic system inspection prior to refinancing, this inspection must be carried out by a certified inspector and a report filed with the Health Department.

After an inspection report has been filed with the Cayuga County Health Department, the Health Department will issue a discharge permit to the homeowner, unless it determines that the system is in failure. Individuals with failed systems will be required to repair or modify their systems.

The Cayuga County Health Department classifies systems (other than failed) as:

- Meets design standards - The system is operating properly and conforms to design standards. Will be issued a permit to discharge for a term of up to five years.
- Meets existing standards - The system is operating properly and was constructed in accordance with a valid permit at the time of construction. Will be issued a permit to discharge for a term of up to five years. (There are provisions for systems that were not constructed in accordance with a valid permit.)
- Substandard - System is operating properly, but cannot meet the conditions set forth in the above classifications. Will be issued an interim permit to discharge for a minimum term of one year. Interim permits may contain specific conditions or restrictions.

Once a permit has been issued, inspection will occur every five years in most cases. Properties fronting highly valued waters such as Owasco Lake and Little Sodus Bay (inlet of Lake Ontario in the Town of Sterling) will be inspected more often.

Cayuga County has privatized the inspection process. The County conducts a training program and examination for inspectors. Those that pass are put on a list which is given to homeowners.

Because the program is new, the County has conducted educational programs for real estate agents, town boards, attorneys, Bar Association, environmental groups, and watershed groups for Owasco Lake and Little Sodus Bay.

7.12.5.2. Time required: If the inspection process is privatized, there will be no time responsibility for the County for inspections. There will be start-up time when the program is

new.

7.12.5.3. Estimated costs: If the inspection process is privatized, there will be no cost responsibility for the County for the inspections. The costs will be borne by the homeowners. Homeowner costs depend on the type of inspection:

- Routine inspection: \$40-\$100
- Property transfer inspection:
 1. Premises occupied: \$100-\$200
 2. Premises unoccupied: \$150-\$300

When the program is new, there will be start-up cost commitments which are not representative of what they will be after the program is well underway. These include: double-checking of inspections, installation of new filing systems, training programs for inspectors, and educational programs.

7.12.5.4. Possible funding sources: County, homeowners

7.12.5.5. Possible implementors: County health department, county legislature

7.12.5.6. Expected benefits: A system that may fail during a period of high groundwater or after unusually heavy usage may not fail during a dry period or during normal usage. Therefore, inspection should uncover possibilities for failure of the system during stress, or signs of past failures, such as odor, overabundant or burned vegetation, and puddling. As a result of the inspections, there would be fewer cases of failing septic systems, and homeowners would bear the burden of repair.

7.12.6. Proposed Action e: Inspection program on a watershed basis

7.12.6.1. Description:

An inspection program can be conducted on a watershed basis as it is around Skaneateles Lake, the primary drinking water supply for the City of Syracuse. (not within the Rochester Embayment watershed). Skaneateles Lake Watershed Rules and Regulations require that septic systems within the watershed be inspected to ensure that they are operating properly. The inspection may consist of a visual reconnaissance of the property near the septic system, as well as a dye test. The program is conducted by the City of Syracuse. If a septic system malfunction or violation is detected, the City requests that the problem be corrected. If the identified violation is not corrected, the Onondaga County Department of Health is notified and provides assistance to eliminate the problem.

The Keuka Watershed Improvement Cooperative, formed by an inter-municipal agreement of six towns and two villages surrounding Keuka Lake, developed a model wastewater law as its first project. A consultant worked with the local watershed inspectors to develop the law. State and

local agencies reviewed it and the Cooperative endorsed it before it was sent to the local municipalities for passage. All the municipalities in the watershed had passed the law by Sept. 1993.

The Keuka Watershed Improvement Cooperative is overseen by a Board of Directors, consisting of chief executive municipal officials of the watershed. The Cooperative has a professional staff that includes a watershed program manager. One of the manager's primary responsibilities is the supervision of local watershed inspectors to ensure uniform and fair enforcement of the wastewater law. The inspectors check septic systems and other sources of pollution in accordance with the uniform model law. The watershed program manager is responsible for working with a homeowner to rectify a failing septic system (at the homeowner's expense).

7.12.6.2. Time required: Time of two full-time staff persons

7.12.6.3. Estimated costs:

Skaneateles Lake watershed: Two full-time employees for inspections at approximately \$20,000 each, plus vehicle maintenance, and sampling program.

Homeowner costs for inspection:

- Routine inspection: \$40-\$100
- Property transfer inspection:
 1. Premises occupied: \$100-\$200
 2. Premises unoccupied: \$150-\$300

Keuka Lake watershed: The Keuka Lake Foundation, Inc., raised in excess of \$150,000 for the three-year watershed program development. Ongoing expenses are \$80,000 per year for the watershed program manager, and \$8,000-\$10,000 per year for each town's part-time inspector.

7.12.6.4. Possible funding sources: Municipalities, county, homeowners, foundation

7.12.6.5. Possible implementors: Municipality, county health department, intergovernmental agreement program staff

7.12.6.6. Expected benefits: There would be few cases of failing septic systems; water quality in the watershed would be protected; homeowners would bear the burden of repair. A program, such as that for the Skaneateles Lake watershed, may be useful in small watersheds where a waterbody is being used for drinking water, and there is not a filtration plant in place.

7.12.7. Proposed Action f: Water conservation

7.12.7.1. Description:

Water conservation won't help a system in failure, but it will extend the life of a system. Water conservation can be recommended where septic systems are still functioning but are undersized or in poor condition. Less water discharged to the system means less chance for overflow. The feasibility of water conservation depends on the condition of the septic system, the willingness of residents to conserve water, and the extent to which they already minimize water use. Devices such as water conserving faucets and toilet tank barriers can help. Regular follow-up would help to ensure that residents remember to conserve.

7.12.7.2. Time required: Could be incorporated into an educational program such as described in Action g

7.12.7.3. Estimated costs: The costs of creating or procuring educational materials for distribution (\$200-\$500)

7.12.7.4. Possible funding sources: County health department (for education), homeowner (for water conservation devices)

7.12.7.5. Possible implementors: County health departments, homeowners' or lake associations.

7.12.7.6. Expected benefits: Water conservation can extend the life of an onsite system.

7.12.8. Proposed Action g: Education

7.12.8.1. Description:

For all alternatives involving septic system maintenance and repair, educational materials and programs for homeowners should be provided.

Printed materials that may be used include:

- Northern Virginia Planning District Commission pamphlet Your Septic System: A Reference Guide for Homeowners. There is also a videotape version available through the EPA Small Flows Clearinghouse (800-624-8301).
- New York State DOH pamphlet Septic Systems: Operation and Maintenance.
- Cornell Cooperative Extension fact sheet Septic Tank Additives.
- Cornell Cooperative Extension fact sheet Terminology for Onsite Sewage Treatment Systems.
- Cornell Cooperative Extension 13-page bulletin Septic Systems, Soils, and Groundwater Protection.

- Michigan State University Cooperative Extension manila folder Maintaining Your Septic System, printed with information and blank tables for record keeping. (The Oswego County Environmental Management Council and Health Department designed a modified version).

A homeowner who will be maintaining a septic system can receive educational materials in the following ways:

- Information packets available through real estate agents, the developer's engineer, or lawyers who assist home buyers at real estate closings.
- Printed materials mailed to homeowners when a permit or construction approval is mailed.
- Printed materials available at health departments, town halls, cooperative extensions, libraries, hardware or building supply stores.
- A video distributed through the public library system.

Presentations on septic system maintenance and problems would also be appropriate at home shows, hardware or building supply stores or cooperative extension or health department programs. A presentation could be a speaker or a video, alone or in combination.

7.12.8.2. Time required: One half-time public health sanitarian

7.12.8.3. Estimated costs: Approximately \$21,625 for the public health sanitarian, plus cost of creating, copying or procuring educational materials (\$200-\$500)

Total: approximately \$22,000

7.12.8.4. Possible funding sources: County, New York State Department of Health, New York Cooperative Extension

7.12.8.5. Possible implementors: County health department and/or Environmental Management Council, Cooperative Extension

7.12.8.6. Expected benefits: Homeowners would understand how septic systems work, why they need to be maintained, and the problems that are caused by poorly operating systems.

Author: Carole Beal

7.13. Implement a phosphorus point source management strategy

7.13.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Rochester Embayment, ponds downstream of point sources of phosphorus

Current conditions that necessitate the measure: Although the open waters of Lake Ontario have reached the Great Lakes Water Quality Agreement (GLWQA) target value of 10.0 $\mu\text{g/l}$ of phosphorus, the nearshore areas in the Rochester Embayment remain eutrophic. These areas experience massive blooms of *Cladophora* and other algae that contribute to the other impairments listed above. Phosphorus is the limiting nutrient for plant growth in most temperate latitude lakes and is the nutrient that can most feasibly be controlled in most cases. (See Chapter 9 section on "Monitoring for eutrophication or undesirable algae". A proposed monitoring action is to measure phosphorus at defined sampling sites in the littoral zone of the Rochester Embayment.)

Additional Background: Wastewater treatment plants (WWTPs) are the major point sources of phosphorus. Large treatment plants that discharge into Lake Ontario or a tributary have phosphorus concentration limits associated with New York's implementation of the GLWQA, as amended in 1987, and their State Pollution Discharge Elimination System (SPDES) permits.

WWTP Effluent Concentration Limits

<u>Actual Flow</u> (not design flow)	<u>Existing effluent concentration limit</u>
More than 1 million gal/day:	1.0 mg/l phosphorus
Less than 1 million gal/day:	No phosphorus limits

Stricter limits apply to WWTPs with an actual flow over 1 million gallons per day if there is intermediate ponded water between the discharge and Lake Ontario. The stricter limits do not apply to WWTPs with an actual flow less than 1 million gallons per day.

The permit limits for large treatment plants that discharge directly to Lake Ontario (Frank Van Lare, Northwest Quadrant, Town of Webster) and those that discharge to the Genesee River (Gates-Chili-Ogden, Eastman Kodak Company) are set at 1.0 mg/l (or 1 ppm) phosphorus. The three treatment plants that discharge to Lake Ontario do so just outside the Embayment (see Stage I RAP, page 3-28, for map). (A consultant is studying the economic and technical feasibility of closing the Gates-Chili-Ogden Plant and pumping the sewage instead through a new pipeline to the Van Lare Plant.)

Data for calendar year 1994 show that the Monroe County Pure Waters treatment plants (Frank Van Lare, Northwest Quadrant, Gates-Chili-Ogden) discharged less phosphorus than New York

State Department of Environmental Conservation (NYSDEC) SPDES permits require. The Webster plant discharged at its permit limit during that year.

Table 7-5. Phosphorus Loadings from Monroe County WWTPs

WWTP	Average daily flow mgd	Daily average influent conc. mg/l	Daily average Effluent conc. mg/l	Daily average Effluent loading, lbs	Annual loading, tons
(Limit)			(1.00)		
Van Lare	94.5	2.82	0.78	617	112.6
NWQ	14.95	3.62	0.90	112	20.4
GCO	10.72	3.91	0.64	57.3	10.5
Webster	4.87	5.2	1.0	40.6	7.4

Phosphorus effluent concentrations for some other treatment plants in the Rochester Embayment watershed for 1994 are listed below. All have a permit limit of 1.0 mg/l (a monthly average) because they discharge over 1 million gallons per day and discharge to a tributary of Lake Ontario.

<u>Treatment plant</u>	<u>Range of monthly averages, mg/l</u>	<u>Discharges to:</u>
Albion	0.4-1.3	Sandy Creek, West Branch
Avon	<1.0	Genesee River
Dansville	0.14-0.72	Canaseraga Creek
Wellsville	0.4-1.1	Genesee River

If the arithmetical average is exceeded, this is reported to NYSDEC, along with the cause of the problem and plans to correct it.

The actual impact to the Embayment of the three WWTPs that discharge just outside of the Embayment is uncertain. If these three are included as sources, point sources contributed approximately one-third of the total loading of phosphorus to the Rochester Embayment area in 1990-1991 (see Stage I RAP pages 5-58, 5-62 and 5-63). Excluding these three as sources, point sources contributed approximately one-tenth of the total loading.

7.13.2. Proposed Action a: Establish an annual phosphorus pollutant loading goal for the Rochester Embayment. Set annual pollutant loading limits for any permitted facilities that discharge phosphorus that will help achieve this goal

7.13.2.1. Description:

In addition to permit limits in terms of concentration, there should also be permit limits in terms of annual loading. Steps to be taken in setting permit limits on annual loading are data gathering, goal setting, cost/benefit analysis, and implementation.

Data gathering, modeling and analysis:

- Near-shore phosphorus concentrations in other areas along the south shore of Lake Ontario where algae problems exist and where no reported problems exist.
- The impact of near-shore phosphorus reduction on sport fish populations.
- The current near-shore phosphorus concentration in the Embayment.
- The current total loading to the Embayment.
- Current loading from Embayment watershed facilities including Van Lare, Northwest Quadrant and Webster Wastewater Treatment Plants.
- The effects on the Embayment of Van Lare, Northwest Quadrant and Webster Wastewater Treatment Plants.
- Seasonal variations in concentration, loading, and negative impacts.
- Watershed characteristics such as soil types, land use, climate, elevation and hydrography (characteristics of bodies of water such as flow and depth).

Goal setting:

- The loading range at which there would not be negative impacts.
- The goal for phosphorus loading reduction from all sources including nonpoint sources.
- The goal for phosphorus loading reduction from facilities.

Cost-benefit analysis:

- The potential benefits of reduced phosphorus discharge from facilities to the impairments listed at the beginning of this section.
- Approximate costs for major upgrades of facilities, such as biological treatment methods, chemical flocculants and processes to precipitate phosphorus.

Implementation (if the cost-benefit analysis determines that benefits to the Embayment outweigh the costs):

- Identify the facilities for which loading limits are necessary.
- Compute permit annual loadings for identified facilities using the calculated negative impact loading (see goal setting).
- Compute concentration limits.
- Implement the computed limits through a local sanitary code, in cooperation with the NYSDEC.

7.13.2.2. Time required: Staff time of Water Quality Coordinating Committee members and other experts from the Rochester Embayment watershed for the steps listed above, and an ongoing effort for facilities to make changes that would reduce phosphorus discharges. The entire process would take approximately ten years.

7.13.2.3. Estimated costs:

Steps 1-3: If computer modeling is incorporated into the process, a consultant would be required and costs would be in the range of \$200,000-\$400,000 (depending on how much information is already available). If a simple model is used which would not require a computer or a consultant, rough estimates could be performed in approximately 10 days by an environmental professional at a cost of approximately \$2,400. However, a rough estimate would probably not be considered adequate for a project that will have such a large impact on facilities.

Step 4: Implementation would cost approximately \$5,000 in time for environmental professionals. There could also be large operational costs for facilities to design and install new treatment processes. The costs would vary among facilities. An example: It would cost approximately \$350,000 per year for the three Monroe County operated wastewater treatment plants to remove an additional 0.5 ppm (0.5 mg/l) total phosphorus.

7.13.2.4. Possible funding sources: Entity responsible for the treatment plant, user fees

7.13.2.5. Possible implementors: Monroe County Water Quality Coordinating Committee

7.13.2.6. Expected benefits: If phosphorus loadings from facilities decrease, there would be fewer negative impacts from excessive algae and other aquatic plants in the littoral zone of Lake Ontario. There would be fewer drinking water taste and odor problems and fewer beach closings. The appearance of the shoreline would be more pleasing without algae washed upon it. Plankton communities would become more typical of mesotrophic conditions (with a moderate amount of dissolved nutrients). Decreased phosphorus loadings would also benefit any ponded areas downstream of a facility, such as the Greece Ponds in Monroe County, because the ponds would be less subject to eutrophication.

7.13.3. Proposed Action b: Maximize phosphorus removal from the effluent of any permitted facilities without a phosphorus limit and a flow of less than 1 million gallons per day

Background: As noted above, large facilities that discharge into Lake Ontario, or a tributary thereof, have phosphorus effluent concentration limits of 1.0 mg/l. However, there are many small facilities in the Rochester Embayment watershed that *do not* have phosphorus effluent concentration limits unless there are documented negative water quality impacts. Small facilities, especially those that discharge into streams (with limited assimilative capacity), may be contributing to eutrophication problems.

7.13.3.1. Description:

County health, engineering and/or environmental services departments should work with the municipal operators of small facilities to calculate the phosphorus loadings from these sources. If it is determined that these small facilities are contributing to eutrophication problems, a cost-benefit analysis should be conducted in order to develop appropriate loading goals. Ultimately, the county departments could provide technical assistance to municipal operators in order to reduce phosphorus discharges.

This assistance might be similar to cooperative efforts between the Monroe County Department of Environmental Services (DES) and the Village of Spencerport to reduce phosphorus discharges to Northrup Creek from the Spencerport WWTP. At the suggestion of DES staff, ferrous sulfate was added to the treatment process during 1995. As a result, total phosphorus discharge from the Spencerport WWTP was reduced from 2-3 mg/l to 0.7-0.9 mg/l.

7.13.3.2. Time required: 3 years

7.13.3.3. Estimated costs: Example: The costs for chemicals at the Spencerport plant are approximately \$3,000 per year. There is no equipment cost because surplus Monroe County equipment is used.

7.13.3.4. Possible funding sources: County, municipalities

7.13.3.5. Possible implementors: County, permitted dischargers

7.13.3.6. Expected benefits: A reduction in phosphorus discharges to area waters

7.13.4. Proposed Action c: Perform a literature search to determine the fate of phosphorus during wastewater treatment plant sludge incineration

7.13.4.1. Description:

Phosphorus is emitted during sludge incineration. It is uncertain what percentage is captured by an incinerator's scrubber and what percentage is emitted to the atmosphere. A literature search would yield information about case studies where this has been determined. If the literature search reveals that a significant amount of phosphorus may be released to the atmosphere, subsequent actions could be taken to reduce the amount.

7.13.4.2. Time required: The time of a student intern for a one- to two-month project

7.13.4.3. Estimated costs: Approximately \$1,150 for a one-month project or \$2,300 for a two-month project. It may also be possible to obtain the assistance of a student intern who is earning

college credit instead of money.

7.13.4.4. Possible funding sources: County environmental services or health department, NYSDEC

7.13.4.5. Possible implementors: County environmental services or health department

7.13.4.6. Expected benefits: Knowledge about whether or not phosphorus is released to the atmosphere during incineration. If it is, a subsequent action would be to reduce it.

7.13.5. Proposed Action d: Promote the use of nonphosphate-based alternatives for commercial and residential dishwasher use

7.13.5.1. Description:

New York prohibits the sale of household cleaning products with added phosphorus (in the form of phosphate) except for products used in automatic dishwashers, food and beverage processing equipment, and dairy equipment. (See Chapter 6 section on "Phosphate detergent ban.") The phosphate in products for those uses is limited to 8.7% by weight. The exemption for dishwashers was recommended by the NYSDEC in 1973 on the grounds that no feasible substitute was available and that dishwasher compounds amounted to only 3% of the phosphate discharge at that time.

Restaurants and other high-volume users of phosphate-based detergents that are not in an area where public sewers are available would be the primary target of this action. Although septic systems are generally considered to be nonpoint sources, some large restaurants in unsewered areas have commercial sand filters with a discrete discharge point, and can be considered to be point sources. However, users discharging to a public sewer would help the municipal treatment plant meet the goal of Action A if they also used phosphate-free detergents.

A study should be conducted of nonphosphate-based detergents. They should be evaluated for:

- Cleaning effectiveness.
- Safety for contact with cooking and eating utensils and with food industry equipment.
- Safety for user.
- Cost.
- Environmental impacts.
- Regulatory issues

The study could include:

- A literature search.
- Contacts with NYSDEC and the NYS Department of Health, and their equivalents in other states.
- Contacts with representatives in the detergent industry.

The initial research could be conducted by a student intern working with NYSDEC, the New York State Department of Health (DOH), a county department, or Cornell Cooperative Extension.

If a potentially satisfactory substitute exists, a pilot project should begin with a high-volume user not on a public sewer. The incentive for the user could be a supply of free detergent for the duration of the pilot project.

If a pilot project is successful, use of the substitute could be promoted in the following ways:

- If use is to be voluntary, educational materials and programs should be provided by NYSDEC, New York DOH, county departments, Cooperative Extension, professional organizations for the restaurant business and for the food and dairy industries.
- Use of the substitute detergent could be specified in the SPDES permit.

Although the primary target of this action is high-volume users not on a public sewer, an educational program could be extended to users on public sewers in order to reduce the loading at the sewage treatment plant and to the general public in order to achieve further reductions.

7.13.5.2. Time required: Initially the time of a student intern for a three-month to six-month project

7.13.5.3. Estimated costs: Approximately \$3,450 for a three-month project or \$6,900 for a six-month project. It may also be possible to obtain the assistance of a student intern who is earning college credit instead of money.

7.13.5.4. Possible funding sources: NYSDEC, New York DOH, restaurant or food processing industry professional organizations

7.13.5.5. Possible implementors: NYSDEC, New York DOH, Cooperative Extension, county departments, restaurant or food processing industry professional organizations

7.13.5.6. Expected benefits: The greatest benefits would be the reduction in phosphate discharge from septic systems of high-volume commercial users who are not on sewers and a reduction in phosphate that must be treated at the sewage treatment plant. Further but smaller benefits would be realized if individual consumers, especially those relying on septic systems, switched from phosphate-based to phosphate-free detergents.

7.13.6. Proposed Action e: Establish a policy on package treatment plants as part of developments

7.13.6.1. Description:

Package treatment plants are made entirely at a factory and then moved onsite. They can be

manufactured in a range of capacities up to one million gallons per day. The operator that is responsible for maintenance and monitoring does not have to be onsite all the time. A permit from NYSDEC is required for their use, and they are subject to NYSDEC inspection. They can treat wastes effectively if they are maintained properly and monitored. However, improper maintenance, minimal monitoring and infrequent inspection are problems that can be associated with package treatment plants.

A policy should be established in Monroe County to limit and place conditions on the establishment of package treatment plants as part of developments. One example of a condition would be the requirement for discharge from the plant to be directed to a constructed wetland. Other conditions could involve requirements for monitoring and maintenance. Communication with the NYSDEC during the development of the policy is essential, because NYSDEC has authority for granting or denying permits for package treatment plants.

7.13.6.2. Time required: Approximately 80 hours of staff time at the professional level will be required to establish a policy.

7.13.6.3. Estimated costs: Approximately \$2,000

7.13.6.4. Possible funding sources: Monroe County, NYSDEC.

7.13.6.5. Possible implementors: County health department, NYSDEC

7.13.6.6. Expected benefits: The installation of package plants will be limited. When they are installed, there will be conditions placed upon the permit that will help to prevent problems.

Authors: Carole Beal, Todd Stevenson

7.14. Promote Agricultural Best Management Practices

7.14.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies: the entire Rochester Embayment watershed

Current conditions that necessitate measure:

Agriculture is a primary land use in the Rochester Embayment watershed. The improper management of tillage, fertilizer, pesticides, manure, or waste water can result in nutrient (primarily phosphorus) and sediment contamination of water resources. The Stage I Rochester Embayment Remedial Action Plan identified agricultural runoff as an important contributor to eutrophication which has contributed to drinking water taste and odor problems, beach closings, degradation of aesthetics, degradation of phytoplankton and zooplankton populations, and loss of fish and wildlife populations.

While recent federal legislation has attempted to address erosion which results from agricultural practices, nutrient management has not been a major focus. However, in the Rochester Embayment watershed, there is a recognized need to address both soil erosion and nutrient management. Because soil testing is frequently not included in farm fertility programs, excessive quantities of manure or chemical fertilizer may be applied to fields. This manure or fertilizer can be washed off the field and contribute to water quality degradation.

7.14.2. Proposed Action: Intensify the Implementation of Agricultural Best Management Practices

7.14.2.1. Description:

Agricultural Best Management Practices (BMPs) are proven strategies designed to address specific nonpoint source water quality problems by preventing or reducing the availability, release, or transport of substances which adversely affect surface and ground water quality. Currently, the Consolidated Farm Service Agency (CFSA, formerly known as the Agricultural Stabilization and Conservation Service), Soil and Water Conservation Districts (SWCD), and Cornell Cooperative Extension (CCE) are engaged in efforts to (1) educate agricultural producers regarding BMPs and (2) facilitate implementation of BMPs. For information regarding these efforts, see Chapter 6 "The Promotion of Agricultural BMPs".

In order to increase the implementation of agricultural BMPs in the Rochester Embayment Watershed, additional staff or consultants, as well as additional funds for cost-share assistance, will be required. Specifically, an Agricultural BMP Coordinator position should be created (within the SWCDs, Natural Resource Conservation Service, or CCE) in order to facilitate the implementation of BMPs within the Watershed. A number of strategies should be utilized to

facilitate the implementation of BMPs including demonstrations, individual consultations with agricultural producers, and the provision of cost share assistance. The focus of these efforts should include Integrated Crop Management (ICM) and Whole Farm Planning.

The advantage of demonstrations as a strategy to facilitate the implementation of BMPs, is that they do not require a great deal of the farmer's time, are non-threatening, and very "real-world". Possible topics for demonstrations include manure injection into the soil, the use of cover crops, and new precision pesticide sprayers. These demonstrations might be organized by equipment dealers who are anxious to market their products or by Cornell Cooperative Extension whose mission is to bring the latest research to the public. Consultants who have completed CCE's crop consultant certification program, and thus are knowledgeable regarding water quality issues, should be utilized in this educational effort.

Integrated Crop Management (ICM) should be one of the focuses of this educational effort. ICM is a holistic agricultural production strategy which emphasizes nutrient and pest monitoring, information-based and precise application of fertilizers and pesticides, and cost efficiency. Important actions which might be taken as part of an ICM strategy include soil and manure testing, pest identification and population counts, and equipment calibration and refinement.

ICM is an approved conservation practice under CFSA's Agriculture Conservation Program. As part of this program, agricultural producers who bear a part of the cost of an approved conservation practice are eligible for federal cost-share assistance. In the Spring of 1995, the Monroe County SWCD was awarded \$37,000 through the New York State Environmental Protection Fund for promoting nutrient management through soil testing and the use of cover crops. Because ICM implementation became eligible for cost-share assistance only recently, there is a need to implement these types of projects in order to increase the acceptance and adoption of ICM principles within the local agricultural community.

Whole-farm planning should be another focus of this intensified education effort. This concept refers to a comprehensive farm planning process in which the impacts of agricultural management systems on all types of natural resources (i.e. water, soil, rare species, etc.) are considered and addressed. Such an approach would replace the existing structure in which numerous narrowly focused plans are developed in order to comply with a range of different government programs. Currently, whole-farm planning as a policy is being examined at both the federal (Food Security Act re-authorization) and state (Responsible Environmental and Agricultural Planning proposal) levels.

7.14.2.2. Time required: 5 years

7.14.2.3. Estimated costs: The cost of funding an Agricultural BMP coordinator position would be in the range of \$35,000 to \$40,000 per year including salary and associated expenses. The cost of funding consultants would be in the range of \$7-\$10 per acre of cropland. The cost of the expanded cost share assistance program would be in the range of \$150,000 per county per year

depending upon the nature and extent of agricultural activity within a particular county.

7.14.2.4. Possible funding sources: In recognition of declining federal funds to support the implementation of agricultural BMPs, the coordinated pursuit of alternative funding sources is required. The WQCCs, SWCDs, CCE, NRCS, and other interested parties within the Watershed should jointly pursue funding in order to support an Agricultural BMP Coordinator position and obtain additional cost-share funds. This cooperation should be facilitated through periodic meetings organized by the New York State Soil and Water Conservation Committee.

Possible funding sources include counties, Aid to Localities funds, foundations, and the New York State Agricultural Non-Point Source Grant Program (administered by the Environmental Protection Fund). This program is administered by the New York State Department of Agriculture and Markets and funded by the New York State Environmental Protection Fund. These funds became available to address agricultural non-point sources in 1994 when roughly \$800,000 was distributed among 21 projects (as mentioned above, Monroe County was one of the recipients). In 1995, roughly \$1,000,000 is allocated to address agricultural non-point sources. The advantage of utilizing the WQCCs to coordinate the pursuit of these funds is that it would demonstrate (as required) strong local support, integration with the county's water quality strategy, and that a watershed approach is being used.

7.14.2.5. Possible implementors: WQCCs, SWCDs, CCE, and the NRCS. In some counties within the Watershed, the WQCC may not be active. In these cases, another agency is responsible for coordinating water quality activities.

7.14.2.6. Expected Benefits: The widespread implementation of agricultural BMPs would minimize nutrient and sediment runoff from agricultural operations into area waters.

Authors: Frank Winkler, Todd Stevenson

7.15. Intensify and Focus Public Education Effort Regarding the Proper Use of Lawn Care Fertilizers and Pesticides

7.15.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies: the Rochester Embayment watershed

Current conditions that necessitate the measure:

The residents of the Rochester Embayment watershed place a high value on an aesthetically pleasing lawn and landscape. Unfortunately, certain lawn care management practices can contribute to water quality degradation. The improper or excessive use of lawn care fertilizers may contribute to cultural eutrophication and habitat degradation in local waters. The improper or excessive use of lawn care pesticides may contribute to toxic contamination of local waters and threaten public health and wildlife habitat. There is a need to educate the public regarding these impacts, as well as how their lawn care practices may be modified in order to protect water resources.

Currently, Cornell Cooperative Extension (CCE) is engaged in a wide range of lawn care educational efforts which target consumers, commercial lawn care companies, and golf courses. Integrated Crop Management (ICM) is an important component of this educational effort. ICM is a holistic management strategy which emphasizes nutrient and pest monitoring, information-based and precise application of fertilizers and pesticides, and cost efficiency. Important actions which might be taken as part of an ICM strategy include soil testing, pest identification and population counts, and equipment calibration and refinement. For additional information regarding existing lawn care education programs, see the Chapter 6 section entitled "Educate the Public Regarding the Proper Use of Lawn Care Fertilizers and Pesticides".

7.15.2. Proposed Action a: Conduct Demonstration Project

7.15.2.1. Description:

Implement the Monroe County Cornell Cooperative Extension's (CCE) proposal to demonstrate the impact of yard maintenance activities on water quality. The project would involve identifying a residential neighborhood where watershed inputs could be monitored and where baseline water quality data is available. Water quality sampling would then be performed in order to determine the extent to which runoff from residential lawns contributes to nutrient/pesticide contamination of the watershed.

The next stage of the project would be an educational program that would teach residential property owners and lawn care professionals the cultural and pest management techniques that

maintain lawn quality and at the same time reduce pollutants in runoff. Ultimately, water quality sampling would be conducted in order to determine the effectiveness of the educational effort.

7.15.2.2. Time required: two years

7.15.2.3. Estimated costs: \$100,000, which includes the salary of a full time employee

7.15.2.4. Possible funding sources: counties, NYSDEC

7.15.2.5. Possible implementors: CCE

7.15.2.6. Expected benefits:

The demonstration project would quantify and reduce nutrient and pesticide runoff to local waters. The project would also quantify the effectiveness of an educational program. The results of the program could be transferred to other locations within the Watershed.

7.15.3. Proposed Action b: Targeted Public Education Effort

7.15.3.1. Description:

Neighborhoods adjacent to water bodies with a history of eutrophication problems (such as the Rochester Embayment of Lake Ontario, the Greece Ponds, and Irondequoit Bay) would be the target of an intense educational campaign. This campaign should include meetings with neighborhood associations in order to discuss local water quality problems and the impacts of lawn care practices on water quality. These meetings would be followed-up by field visits in order to educate residents regarding lawn care management practices that could be implemented in order to improve water quality.

7.15.3.2. Time required: The targeted education program could be implemented over a period of four months (February through May).

7.15.3.3. Estimated cost: The campaign would require 50% of the time of one full time employee for approximately four months. Therefore, the cost of the program would be approximately \$7,425.

7.15.3.4. Possible funding sources: counties, NYSDEC

7.15.3.5. Possible implementors: CCE, Monroe County Health Department

7.15.3.6. Expected benefits: Residents would be educated regarding the impacts of lawn care practices on water quality, thus contributing to a reduction in nutrient and pesticide runoff to area waters.

7.15.4. Proposed Action c: Implement Homescape Program

7.15.4.1. Description:

The Homescape Program should be implemented in the Rochester Embayment watershed. This program was originally developed in Prince William County, Virginia and has more recently been implemented in Erie County, New York. The purpose of the Program is to reduce suburban nonpoint source water pollution by encouraging homeowners to adopt environmentally sensitive lawn and landscape practices.

The Homescape Program consists of identifying a residential subdivision to be the target of the educational effort, training volunteers and homeowners, monitoring reductions in fertilizer and pesticide usage, and publicizing successes. A unique aspect of the Program is the use of volunteer Master Gardeners. Each participating homeowner in the targeted subdivision is assigned a trained Master Gardener who helps the property owner monitor their use of water, fertilizers, and pesticides and provides information regarding Best Management Practices. This one on one assistance ensures greater participation and stricter adherence to the appropriate management practices. These Master Gardeners are trained through the Cornell Cooperative Extension (CCE) by university faculty. In the case of the Erie County program, additional water quality training was provided by New York Sea Grant and CCE.

At the initiation and completion of the Program, a survey is taken in order to monitor fertilizer and pesticide usage. On-site demonstrations by lawn and landscape professionals and a demonstration garden featuring native plants were also included as part of the Erie County program. Those homeowners that participated in the program received an engraved landscape rock in recognition of their efforts.

7.15.4.2. Time required: One year

7.15.4.3. Estimated Costs: The cost of implementing the Homescape Program at a location in the Rochester Embayment Watershed would be minimal because the Master Gardeners are volunteers and speakers donated their services. The primary costs associated with the program would consist of staff time (one-half time for one employee for a period of six months would cost approximately \$11,250), the engraved rock (approximately \$40 each times 15 - 20 homeowners), and the demonstration garden (approximately \$400). The total cost for a one-year program would be approximately \$12,250.

7.15.4.4. Possible funding sources: counties, NYSDEC, Great Lakes Protection Fund

7.15.4.5. Possible implementors: Cornell Cooperative Extension, New York Sea Grant, Soil and Water Conservation Districts, and Counties within the Watershed.

7.15.4.6. Expected benefits: A reduction in fertilizer and pesticide runoff into area waters.

Authors: Liz Berkley, Tom Nally, Todd Stevenson

7.16. Develop Streambank Erosion Control Program

7.16.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Rochester Embayment watershed

Current conditions that necessitate the measure:

Streambank erosion is a natural process which continuously adds sediments and nutrients to water courses. However, human activities in the Rochester Embayment watershed such as urban development and agriculture have significantly increased the rate of streambank erosion. Activities associated with urban development which contribute to this process include the destruction of streambank vegetation and the proliferation of impervious surfaces. Vegetation is critical for holding streambank soil in place. Impervious surfaces increase the quantity of stormwater runoff thus increasing stream flow and erosion (see the Chapter 7 sections entitled "Promote Impervious Surface Reduction" and "Stormwater Management in Existing and Newly Developing Urban Areas"). Agricultural activities, such as allowing livestock to damage streambanks, may also contribute to erosion (For additional information see the Chapter 7 section entitled "Promote Agricultural Best Management Practices").

The excessive sediment and nutrient loadings associated with severe streambank erosion destroy fish and wildlife habitat and promote aquatic weed growth. Suspended sediments contribute to increased turbidity which impairs plant photosynthesis, reduces vision (which is critical for sight feeding fish), and clogs the gills of both invertebrates and many adult fish. As sediments settle out of the water column, they may smother fish eggs and non-moving invertebrates. Excessive aquatic weed growth (eutrophication) may contribute to drinking water taste and odor problems and oxygen depletion.

Severe streambank erosion may also threaten structures and roads.

Additional information:

Streambank erosion control programs should address existing erosion problems, as well as seek to prevent the creation of additional erosion problems. Currently, in the Rochester Embayment watershed, several municipalities are utilizing environmental protection overlay districts (EPODS) and other land use controls to address stream corridor issues. Although the use of EPODS may help to prevent the creation of additional streambank erosion problems, they do not address existing erosion problems.

An EPOD is designed to provide the municipality with an additional level of control over environmentally sensitive areas such as stream corridors. The EPOD supplements, rather than

replaces, the existing underlying zoning. Applicants who wish to conduct a regulated activity within the overlay district must comply with specific standards which are designed to minimize the impacts of human activities on environmentally sensitive resources.

For example, in the case of the Town of Brighton's (Genesee River Basin and the Lake Ontario Central Basin) watercourse protection districts, applicants must comply with a number of conditions including the retention of a natural vegetative buffer of one hundred (100) feet from each bank. In addition, new structures in the watercourse protection district must be designed and constructed in accordance with the erosion and stormwater control standards as found in the NYSDEC "Stream Corridor Management" manual.

The Town of Mendon's (Genesee River Basin and Lake Ontario Central Basin) Factors Affecting Development ordinance is another strategy that may be used to protect stream corridors. The ordinance provides the Mendon Planning Board with the authority to require a conservation easement to the Town in order to protect sensitive environmental areas such as streams and floodplains. The conservation easement may restrict or prohibit certain activities including construction, the removal of vegetation, and the use of fertilizers and pesticides.

7.16.2. Proposed Action a: Develop streambank erosion control programs as part of watershed-based drainage plans

7.16.2.1. Description:

Comprehensive streambank erosion control programs should be instituted as part of the process of developing watershed-based drainage plans. The development of Intergovernmental Agreements would be the first step towards developing these plans and implementing the associated remedial actions.

Streambank erosion control programs should include land use regulations, policy changes, and the construction of innovative erosion and flow control structures. For example, municipalities should be encouraged to adopt EPODS as described in the background section. In addition, the NYSDEC Stream Corridor Management: A Basic Reference Manual describes a number of land use strategies which municipalities may employ to protect streams. The manual also outlines a number of policy areas which should be examined in order to ensure that local government actions are not degrading streams. These include highway construction/maintenance and building inspection/zoning enforcement.

Innovative erosion and flow control structures that mitigate drainage, erosion, and water quality problems without impairing the recreational, aesthetic, or habitat value of the stream should also be developed as part of the process of developing watershed-based drainage plans. The NYSDEC publications Stream Corridor Management: A Basic Reference Manual and Hydrologic and Habitat Modification Management Practices Catalogue describe a number of Best Management Practices (BMPs) for protecting streambanks and enhancing fish habitat

including rock deflectors, rip-rap, log cribbing, gabion baskets, fencing, and greenbelt buffer strips. Unfortunately, some of these practices, such as the installation of rip-rap, create an ecological barrier between the aquatic and terrestrial zones and are not aesthetically pleasing.

Therefore, wherever possible, bio-engineering should be employed to remediate streambank erosion. Bio-engineering is a technique that utilizes live plants instead of unnatural or hard materials. As an example, a bio-engineered cribwall consists of a hollow, interlocking arrangement of timbers constructed as a wall. This structure is filled with soil and layers of live branch cuttings. Once the cuttings have taken root and grown, they will eventually take over the structural functions of the timbers. The end result is a stable, vegetated slope. For more information, see the Chapter 7 section entitled "Identify and Restore/Enhance/Protect Critical Habitat along Waterways".

The use of innovative flow control structures should also be utilized to minimize streambank erosion. For example, in urban areas which experience streambank erosion during smaller, more frequent storms, regional detention ponds should be considered. Impacts from smaller, more frequent storms are associated with the proliferation of impervious surfaces which accompanies urbanization. Although many developments constructed since the 1960s contain small flood prevention detention basins which retain stormwater during large storm events, these basins do not retain stormwater runoff during small storms.

In order to address this problem, the Town of Pittsford (Lake Ontario Central Basin) is constructing a regional detention pond that will control stream flow (and therefore reduce streambank erosion) during small storm events, as well as mitigate the water quality impacts of stormwater on receiving waters. For more information on Pittsford's regional pond, see the Chapter 7 section entitled "Manage Stormwater Quality in Existing and Newly Developing Urban Areas".

The advantage of utilizing drainage plans to address streambank erosion is that this problem is inextricably linked with drainage and stormwater management issues. Traditionally, drainage plans have been developed at the municipal or county level and have focused on flooding rather than erosion problems. However, the watershed level is a more logical level at which to address drainage/flooding and erosion because the remediation of these issues requires extensive intermunicipal cooperation. Although traditional drainage plans indirectly impact streambank erosion by addressing the peak rate of stormwater flow, such plans generally do not identify the locations of severe streambank erosion nor develop a plan for remediation of water quality problems.

Watershed-based drainage plans have a number of advantages over traditional municipal drainage plans. One of the primary advantages is that the issues of drainage, streambank erosion and water quality are so interrelated that remedial measures which address one may also address another. Another advantage is that remedial actions which address these issues may be capital intensive and therefore may require cooperative funding from a number of municipalities in order

to be implemented. Also, the development of these plans will encourage municipalities to collectively examine the issues of land use, drainage, erosion, and water quality. This process is critical as the land use policies of upstream municipalities have a significant impact on downstream municipalities.

7.16.2.2. Time required: 10 years

7.16.2.3. Estimated costs: It is estimated that if Monroe County was divided into four basins, the cost of developing watershed-based drainage plans would be approximately \$125,000 per basin. The primary cost associated with developing IGAs would consist of staff time. The cost of funding a position within the Monroe County Department of Health to develop and implement IGAs would be approximately \$42,000 per year. The cost of constructing streambank erosion control structures would vary considerably. As examples, the cost of a roughly 120' long by 3' high bioengineered cribwall was approximately \$6,400 (Canadian) whereas the regional pond constructed in Pittsford cost approximately \$700,000 (for the impoundment facility).

7.16.2.4. Possible funding sources: NYSDEC, counties, municipalities

7.16.2.5. Possible implementors: counties and municipalities

7.16.2.6. Expected benefits: a reduction in sediment loadings to area streams. In addition, watershed-based drainage plans would address other issues such as stormwater quality. For additional information, see the Chapter 7 section entitled "Manage Stormwater Quality".

7.16.3. Proposed action b: Use a Not-For-Profit Organization in order to Develop Streambank Erosion Control Programs

7.16.3.1. Description:

A local water quality not-for-profit organization should be established in order to educate municipal officials, planning / conservation boards, agricultural producers and citizens regarding the need to establish stream corridor protection programs. For information regarding the creation of such an organization, see the Chapter 7 section entitled "Develop Public Education Structure". As described in Action A, streambank erosion control programs should consist of land use regulations, policy changes, and innovative erosion and flow control structures. A number of strategies may be utilized in this educational campaign including demonstration projects.

A demonstration project might involve a cooperative effort between a municipality and the New York State Department of Environmental Conservation (NYSDEC), the Water Quality Coordinating Committee (WQCC), and the local water quality not for profit organization to develop, implement, and publicize a model stream corridor management program. This program might include the development of an EPOD ordinance, the construction of a bio-engineered erosion control structure, or the establishment of streambank vegetation. This model program

would then be transferred to other municipalities within the watershed.

7.16.3.2. Time Required: The time required to establish a local water quality not for profit organization would be approximately one year. The time required for this organization to implement a demonstration project with a municipality would be approximately two years.

7.16.3.3. Estimated Cost: The annual budget of a local water quality not for profit organization would be in the range of \$70,000 to \$100,000 to cover staff expenses and some implementation activities. The cost of the demonstration project would consist primarily of staff time.

7.16.3.4. Possible funding sources: Grants, memberships, and private donations

7.16.3.5. Possible implementors: The establishment of a not for profit organization could be implemented by the members of the Water Quality Management Advisory Committee and Water Quality Coordinating Committees. Once developed, the erosion control programs would be implemented by the municipalities.

7.16.3.6. Expected Benefits: A reduction in streambank erosion and associated water quality impacts

Author: Todd Stevenson

7.17. Educate local officials and the public on the value of wetlands

7.17.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Any water body that borders one or more wetlands

Current conditions that necessitate measure: Currently, expanding development has the potential to displace existing wetlands and to create new wetlands. Of particular concern for fish and bird habitats are wetlands that are adjacent to water bodies such as the Lake Ontario, Braddock Bay, and Irondequoit Bay shorelines. Many local officials who have the authority to make land use decisions in these areas are unaware of the benefit of wetlands to fish and wildlife habitat. Officials with land use decision making responsibilities need to be provided with information that will result in protection and enhancement of such areas. The general public also needs to be educated so that they support land use decision-making that supports wetlands.

7.17.2. Proposed Action a: Workshop for local officials

7.17.2.1. Description:

A workshop for local officials would include a local wetland tour to educate participants on the benefits of wetlands and discuss opportunities and methods to make land use decisions that benefit wetlands. The audience would include town and village board and city council members, planning board members, conservation/environmental board members, building inspectors, and department of public works staff. The workshop location should be convenient and close for the audience it expects to educate. If representatives from the entire Rochester Embayment watershed are to be educated, many workshops would need to be held in a minimum of four locations.

7.17.2.2. Time required: Workshops are proposed to be held once a year for new officials. Three- to five-hour sessions with a break, lunch, and a tour would be included.

7.17.2.3. Estimated costs: The costs would include the use of an indoor facility, educational materials (some of which exist but need to be assembled, and others which may have to be prepared), advertising, staff or volunteer time for organization, and refreshments. The total estimated cost, including staff time, is expected to be less than \$2,500 per workshop (approximately \$10,000 for four workshops).

7.17.2.4. Possible funding sources:

- Grants
- Contributions of staff time from existing agencies
- Fees for workshop participation

7.17.2.5. Possible implementors:

Organizers and Co-Sponsors

- Environmental management council(s)
- The Nature Conservancy
- County health department(s)
- Department(s) of planning and development
- New York State Department of Environmental Conservation (NYSDEC)
- County Soil and Water Conservation District(s)
- County fisheries advisory board(s)
- County planning councils
- Town supervisor association(s)

Workshop presenters/contributors

- University faculty
- US Army Corps of Engineers
- NYSDEC
- New York State Department of State
- County environmental management council(s)
- County Soil and Water Conservation District(s)
- County department(s) of health
- County department(s) of planning and development
- Towns or villages
- The Nature Conservancy

7.17.2.6. Expected benefits: Public officials with a background on the importance of wetlands that will result in a receptive attitude to the protection and development of wetlands in municipalities.

7.17.3. Proposed Action b: Distribution/presentation of wetlands information

7.17.3.1. Description:

This action involves ensuring the development and staffing of a speakers bureau to solicit audiences and give presentations of the Monroe County Environmental Management Council (EMC) slide show, or a video on the value of wetlands. The Speakers Bureau would be a group comprised of individuals knowledgeable about wetlands and committed to marketing and staffing wetland talks, slide shows, videos, etc. An agency or an individual would need to take primary responsibility so that there is a single contact for scheduling. The audience would include local planning officials, real estate developers and agents, adult citizens and students (including students at Finger Lakes Community College Environmental Conservation/Law program).

In Monroe County, the Wetland Education Committee of the Water Quality Coordinating Committee (WQCC) sends letters to all municipalities in the County requesting to be placed on

the agendas of their planning or conservation boards. The Wetland Education Committee gives a presentation on the value of wetlands, particularly conversion of dry basins to wetlands.

7.17.3.2 Time Required: Videos, slide shows and subsequent discussions would take approximately one hour. One day of training may also be needed once a year for volunteers who would staff the presentations. Less than one day a week of staff or volunteer time would be needed to arrange presentations. If the presentations were given twice a week, an additional five hours a week would be needed by speakers bureau volunteers.

7.17.3.3. Estimated Cost: Costs include duplication of slide shows, and staff or volunteer time to update the slide show(s), prepare and conduct a volunteer training session, and staff the speakers bureau. The costs should total no more than \$2,000 per year, assuming that the group of volunteers who give the presentations would remain the same for a significant period of time.

7.17.3.4. Possible funding sources:

- NYSDEC
- County governments
- Corporate donations

7.17.3.5. Possible implementors:

- County environmental management councils
- The Nature Conservancy
- NYSDEC

7.17.3.6. Expected benefits: People will become more aware of the functions and benefits of wetlands and support development, management and preservation of wetlands areas.

7.17.4. Proposed Action c: Community photography/art contest/display of local wetlands photographs/art

7.17.4.1. Description:

A photography contest would be advertised and promoted in local schools, colleges, and in the community at large. Age categories would be established for entries. The entries would be displayed locally. The contest forms would include information on wetlands discussing practical methods to avoid damaging wetlands or their inhabitants by contest participants while taking their photographs.

7.17.4.2. Time required: Staff or volunteer time for advertising, display, judging, and set up is estimated to take approximately 120 person hours.

7.17.4.3. Estimated costs (assuming volunteer time):

- Application design, copying, and distribution: \$500
- Advertising: \$500
- Awards: \$500 (also seek donations)
- Total costs: \$1,500

7.17.4.4. Possible funding sources:

- Corporate donations
- United States Environmental Protection Agency (U.S. EPA)

7.17.4.5. Possible implementors:

- Conservation and environmental boards
- Local government and town boards
- The Nature Conservancy
- Sierra Club
- Trout Unlimited
- Bassmasters
- County Soil and Water Conservation Districts
- NYSDEC
- Cornell Cooperative Extension

7.17.4.6. Expected benefits: This would spark community interest and awareness about wetlands to create an appreciation for these areas with aesthetic and habitat value stressed.

7.17.5. Proposed Action d: Make elementary and middle school teachers aware of wetlands curriculum materials and encourage field trips

7.17.5.1. Description:

A listing of programs, contacts, and brief descriptions of elementary school curricula would be prepared and distributed to teachers. Also included could be information on local wetlands to visit with suggested activities for different age groups. Materials could also be loaned to teachers before acquiring via an informal "library."

Wetlands education curricula already exist for teachers. Examples include:

- "Aquatic Wild" (affiliated with "Project Wild")
- Great Lakes in My World, developed by the Ohio Sea Grant Education Program
- The Finger Lakes, It Begins With You, developed by the U.S. Fish and Wildlife Service in Cortland, N. Y.
- Wow, Wonders of Wetlands, written and illustrated by Brit Slattery, available from Environmental Concern Co. of Maryland

7.17.5.2. Time required:

- Research and development of information: 120 person hours
- Duplication/mail distribution: 24 person hours
- Answering questions of teachers: 40 person hours per year

7.17.5.3. Estimated costs:

- Research and development of information \$1,800
- Duplication/mail distribution \$700
- Answering questions \$600
- Total costs \$3,100

7.17.5.4. Possible funding sources:

- Universities/colleges (for work-time costs an intern opportunity exists)
- Sea Grant Extension/Cornell Cooperative Extension (for printing or distribution costs)
- Grants (printing and distribution costs)
- NYSDEC
- Teachers associations
- School board associations

7.17.5.5. Possible implementors:

- Universities/colleges
- Sea Grant Extension/Cornell Cooperative Extension
- NYSDEC
- Teachers associations
- School board associations

7.17.5.6. Expected benefits: By creating a listing of resources available and an easy means to obtain the information, teachers/schools would be more likely to include wetlands education in the curriculum, and more children and their parents would be made aware of the value of wetlands.

7.17.6. Proposed Action e: Facilitate/advertise community wetlands tours

7.17.6.1. Description:

This involves promoting educational/recreational tours at local wetland areas highlighting the beauty, ecological significance, and functions of wetlands. The Village of Fairport, Monroe County, has the potential to become a significant participant in this action. The Village owns a 10-acre wetland area known as Thomas Creek Wetlands. As of March 1994, the Village is seeking funding and approval for the Thomas Creek Wetlands Project to use the Thomas Creek area as a passive recreational/ educational/ water quality resource. The Village intends to

promote this resource to people in the Village and to visitors using the Erie Canal.

7.17.6.2. Time required: Staff and volunteer time for the activities and for promotion (advertisement in local papers or on community calendars) are necessary.

7.17.6.3. Estimated costs: Staffing is the main cost for promoting and advertising the tours/walks. Staffing tasks would include developing and distributing pamphlets and other kinds of advertising. It is likely this could be done with one day or less per week of a staff person. Likely cost is \$5,000 per year.

7.17.6.4. Possible funding sources:

- Bergen Swamp Preservation Society
- Fish and Wildlife Management Areas, NYSDEC
- The Nature Conservancy
- Nature centers
- County parks and recreation departments
- Towns and villages
- Donations

7.17.6.5. Possible implementors:

- Bergen Swamp Preservation Society
- Fish and Wildlife Management Areas, NYSDEC
- The Nature Conservancy
- Nature centers
- County parks and recreation departments
- Towns and villages

7.17.6.6. Expected benefits: Any member of the community can participate in an activity that is both recreational and educational.

7.17.7. Proposed Action f: Prepare and/or distribute a pamphlet that summarizes the New York State Freshwater Wetlands Act

7.17.7.1. Description:

This action involves the development of an understandable, clear and concise explanation of the New York State Freshwater Wetlands Act that would be mailed to a targeted audience. The pamphlet would emphasize what the Act means for construction, real estate and local government. This action needs to include an inventory of existing pamphlets to see whether an existing pamphlet can be used or modified.

7.17.7.2. Time required: The review of existing pamphlets and/or efforts to modify existing pamphlets or prepare new pamphlets would require a minimum of 140 person hours of staff

and/or volunteer time. The development of a mailing list and the actual mailing would take another 100 person hours.

7.17.7.3. Estimated costs: Work time for staff and mailing are the costs. If paid staff were used for the research and development of the written materials, and for the development of the mailing list, staff costs would be approximately \$5,000. Printing and mailing costs would be an additional \$300 to \$800. The project cost should fall below \$7,000.

7.17.7.4. Possible funding sources:

- NYSDEC
- The Nature Conservancy
- Environmental management council(s)
- Real estate associations

7.17.7.5. Possible implementors:

- NYSDEC
- The Nature Conservancy
- Environmental management council(s)
- Real estate associations

7.17.7.6. Expected benefits: The implementation of this action is expected to improve awareness that will lead to improved land-use decision making by public officials.

Author: Marie Lewis

7.18. Reform Lake Levels Management Plan in order to Mitigate Impacts on Shoreline Wetlands

7.18.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies: Lake Ontario, shoreline wetlands, and littoral areas

Current conditions that necessitate measure:

The regulation of water levels within the Great Lakes - St. Lawrence River Basin is a relatively recent phenomenon. Unfortunately, research conducted as part of the Levels Reference Study: Great Lakes - St. Lawrence River Basin indicates that the existing lake levels regulatory plan (1958-D), which has lowered both the elevation and range of water levels within Lake Ontario (relative to natural conditions), has resulted in a reduction in the extent and integrity of shoreline wetlands.

The power and navigation works in the St. Lawrence River (known as the St. Lawrence Project), which control the outflow of Lake Ontario, were constructed in the 1950s under the jurisdiction of the International Joint Commission (IJC). The "Orders of Approval", issued by the IJC, dictate that the St. Lawrence Project is to be designed, constructed, and maintained in such a manner as to minimize adverse impacts on riparian (shoreline property) owners, navigation, and hydropower interests. Impacts upon recreation and fish and wildlife are to be considered but are not part of the legal mandate. The Orders of Approval established both upper and lower target levels for Lake Ontario, and a set of eleven criteria that any regulation plan must meet. The IJC established the International St. Lawrence River Board of Control to monitor the operation of the St. Lawrence Project and insure compliance with the requirements of the Orders of Approval. It was the Board of Control that formulated the regulation plan 1958-D, which was adopted in 1963, and remains in effect today.

In 1986, in response to widespread flooding and erosion of shorelines in the Great Lakes, the governments of the United States and Canada requested that the IJC research methods of alleviating the adverse consequences of fluctuating water levels. A Levels Reference Study Board was formed which conducted a six year investigation into fluctuating lake levels, the results of which were published in a report entitled the Levels Reference Study: Great Lakes - St. Lawrence River Basin. In its report the Board made 42 recommendations for action including coordinated and comprehensive land use and shoreline management programs and the development of emergency preparedness plans. The Board opposed the construction of additional structures to further regulate the levels and flows of the Great Lakes and St. Lawrence River. High cost, the severity of associated environmental damage, and limited benefits were cited as the basis for this opposition.

As part of the Levels Reference Study, field studies were conducted at 35 wetlands on Lakes Superior and Ontario in order to determine the relationship between changes in water levels and changes in the extent of wetlands and species diversity. The studies compared the current condition of Lake Ontario's shoreline wetlands with historical data. Researchers concluded that the reduction in the elevation and range of the water level in Lake Ontario, brought about by regulation of its outflows, has had a significant adverse effect on the extent, diversity, and integrity of its wetlands. According to a model developed for the IJC, the current regulation plan has resulted in a 31% loss of shoreline wetland habitat in Lake Ontario.

For instance, during the spring, water levels are generally 1 to 1-1/2 feet lower under the regulation plan which often results in totally dry shoreline wetlands or wetlands with too little water for utilization by fish and wildlife. In some cases, fish spawn may be destroyed. In the autumn, low water levels may strand young-of-the-year fish in wetlands. During winter, wetlands which under natural conditions would be flooded may stand dry. This accounts for the scarcity of winter muskrat populations, as well as, other wetland winter fauna. The lack of high lake levels in Lake Ontario has also allowed exotics such as purple loosestrife (*Lythrum salicaria*) to thrive at the expense of native species and allowed shrub and old field communities to take over higher elevation wetlands.

Fluctuating lake levels are also critical for maintaining the integrity of shoreline wetlands. As a result of the implementation of regulation plan 1958-D, the elevation of Lake Ontario ranges from 243.27 to 247.27 feet. This 4 foot range in lake levels represents a significant reduction relative to the 7-1/2 foot range which existed under natural conditions. Fluctuating lake levels are critical for maintaining biological diversity and health. For example, high lake levels periodically eliminate dominant plants. When levels recede, less competitive species are able to grow from seed, complete at least one life cycle and replenish the wetland seed bank before being replaced with the more dominant plants. This maintains the diversity which, in turn, allows habitat diversity and the resultant variety of fish and wildlife that depends on the wetlands. Wetlands need one high period and two consecutive low periods every ten years on average to maintain this diversity (Levels Reference Study Board, (1993) Levels Reference Study: Great Lakes - St. Lawrence River Basin Annex 2 Land Use and Management). Lake level fluctuations can also have a strong impact on fish reproductive success.

7.18.2. Proposed Action: Reform Lake Levels Management Plan in order to Mitigate Impacts on Shoreline Wetlands

7.18.2.1. Description:

The Monroe County Water Quality Coordinating Committee (WQCC) should communicate with the International Joint Commission (IJC) and the St. Lawrence River Board of Control regarding the need to revise the Orders of Approval and the existing regulation plan so as to include environmental interests, as well as riparian, navigation, and hydropower interests (as recommended by the Lake Levels Reference Study Board).

7.18.2.2. Time Required: 1 - 3 years

7.18.2.3. Estimated Cost: Staff time

7.18.2.4. Possible Funding Sources: No new funding is needed

7.18.2.5. Possible Implementors: Monroe County WQCC

7.18.2.6. Expected Benefits:

A potential increase in the extent, diversity, and integrity of shoreline wetlands along Lake Ontario. Wetlands are critical as habitat for fish and wildlife. Shoreline wetlands are utilized by nearly all of the fish species present in Lake Ontario during some period of their life cycle. Changes in wetlands will therefore affect the deepwater communities, as well as those species generally thought of as inhabiting the nearshore. Fishery and wildlife resources are important contributors to the local economy and quality of life. Wetlands also play an important role in flood and pollution control.

Currently, there is no method which will, with a high level of confidence, provide quantitative predictions of changes in wetland area and diversity caused by specific changes in regulation (the model which was developed by the Lake Levels Reference Study Board is qualitative in nature). One of the reasons for this is that every shoreline wetland is characterized by its own unique microtopography and morphology. These characteristics play an important role in determining how a shoreline wetland will be impacted by changes in the lake level. Therefore, it is very difficult to generalize about how shoreline wetlands might be affected by a specific change in lake level regulation.

Author: Todd Stevenson

7.19. Identify and Restore/Enhance/Protect Critical Habitat along Waterways

7.19.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies:

The entire Rochester Embayment watershed

Current conditions that necessitate the measure:

Fish and wildlife habitat along or in waterways throughout the Rochester Embayment watershed has been lost as a result of a number of factors including urban/suburban development, draining of wetlands, deforestation, boat traffic, dredging, sedimentation, and eutrophication. The Stage I Rochester Embayment Remedial Action Plan (RAP) cites the decline in the number of black terns nesting in Braddock Bay, the absence of bald eagles, and the decline of native fish species (the fish community of the lower Genesee River exhibits low species diversity as a result of heavy sediment loads from the upper watershed) as evidence of this loss of fish and wildlife habitat.

In recognition of the need to protect fish and wildlife habitat, a number of agencies and organizations maintain databases of critical habitats, including the Monroe County Environmental Management Council (EMC), the New York State Departments of State (NYSDOS) and Environmental Conservation (NYSDEC), and The Nature Conservancy. In 1995, the EMC completed its Protection of Environmentally Sensitive Areas report that identifies and describes the most valuable environmentally sensitive areas in the County that should be targeted for protection (this was not an inventory of habitats or open space). The following sites were selected as part of this effort:

Irondequoit Bay Ecosystem (Towns of Irondequoit, Penfield, and Webster)
Braddock Bay Ecosystem (Town of Greece)
Lake Ontario Wetlands Ecosystem (Towns of Hamlin and Parma)
Great Bend (Town of Mendon)
Corbett's Glen (Town of Brighton)
Rush Oak Openings (Town of Rush)
Round Pond - Island Cottage Complex (Town of Greece)
Rita Shaw Estate (Town of Irondequoit)
Industry - Genesee River Site (Town of Rush)
Sweden 7 Wetland (Town of Sweden)
Nine Mile Point (Town of Webster)
Whitebrook Wetlands (Town of Perinton)
Thayer Bluhm Victor (Town of Perinton)
Area 202 Rush (Town of Rush)

Peninsula (Honeoye Falls)
Clarkson 20 (Town of Clarkson)
HO-9 (Black Creek wetlands in the Town of Sweden)

Another valuable habitat database is maintained as part of the Significant Coastal Fish and Wildlife Habitats Program. The purpose of this program, which is a cooperative effort of the NYSDOS and the NYSDEC, is to preserve the recreational, commercial, and ecological benefits derived from New York's coastal fish and wildlife resources. As part of the program the most significant coastal habitats in the State are identified, mapped, and described. The following criteria are used to identify the most significant coastal habitats:

- 1.) The habitat is essential to the survival of a large portion of a particular fish or wildlife population.
- 2.) The habitat supports populations of species which are endangered, threatened, or of special concern.
- 3.) The habitat supports populations having significant commercial, recreational, or educational value.
- 4.) The habitat exemplifies a type which is not commonly found in the State or in a coastal region.

Also, the significance of certain habitats increases to the extent that they could not be replaced if destroyed.

The NYSDOS uses this database when performing consistency reviews of federal and State actions which affect the coast. In addition, municipalities which prepare Local Waterfront Revitalization Programs as part of the New York State Coastal Management Program are required to protect designated significant habitats.

In the Rochester Embayment watershed, the following habitats have been designated as part of the DOS Significant Coastal Fish and Wildlife Habitats program:

- Irondequoit Creek/Bay (Lake Ontario Central Basin/Irondequoit Basin)
- Genesee River (Genesee River Basin)
- Slater Creek (Lake Ontario West Sub-basin)
- Braddock Bay / Salmon Creek (Lake Ontario West Sub-basin)
- Sandy Creek (Lake Ontario West Sub-basin)

Another valuable habitat data base is the North American Waterfowl Management Plan. The purpose of the Plan, which was signed by the United States and Canada in 1986, was to create a blueprint for maintenance of adequate habitat to halt the decline of waterfowl. As part of this effort, key habitat ranges, such as the Lower Great Lakes/St. Lawrence Basin (including the Rochester Embayment), were identified. For each of these habitat ranges, goals and objectives were established and critical resource areas were identified. In addition, resource protection and

enhancement needs were identified through assessment of major sources of habitat impediment.

The following resource areas in the Rochester Embayment watershed were identified as part of the Lake Shore Marshes Focus Area Plan (a component of the North American Waterfowl Management Plan):

- Yanty Creek Marsh
- Sandy Creek Harbor Marsh
- Benedict Beach Marsh
- Cowsucker Creek Marsh
- Brush Creek Wetlands
- Lighthouse Beach Wetlands
- Payne Beach Wetlands
- Braddock Bay Wetlands
- Cranberry Pond and Wetlands
- Long Pond Wetlands
- Buck Pond Wetlands
- Round Pond Wetlands
- Slater Creek Wetlands
- Genesee River
- Durand-Eastman Park Wetlands
- Irondequoit Creek Wetlands
- Irondequoit Bay

Another habitat database is maintained as part of the New York Natural Heritage Program. This program is a cooperative effort of the NYSDEC and The Nature Conservancy (an international not for profit organization). The goal of the program is to maintain an up-to-date inventory on the status and distribution of rare and endangered animals and plants and the best examples of New York's ecological communities.

7.19.2. Proposed Action: Identify and Restore/Enhance/Protect Critical Habitat In and Along Waterways

7.19.2.1. Description:

A program should be implemented to identify and rank critical habitat in and along waterways in the Rochester Embayment watershed with the ultimate goal being the restoration/enhancement/protection of the most significant habitats.

Step 1: Identify Critical Habitats

Initially, available databases such as those described above should be analyzed in order to develop a list of waterway habitats. If additional data is required, resources such as the Ontario Ministry of Natural Resources' (OMNR) Guidelines for Collecting Baseline Aquatic Habitat

Data for the Great Lakes Areas of Concern should be utilized. This document provides a comprehensive list of the types of data which should be compiled, important background information, and possible data sources.

Step 2: Rank Critical Habitats

Once a comprehensive database of critical waterway habitats in the Rochester Embayment watershed has been compiled, these habitats should be systematically ranked. The joint Environment Canada - United States Environmental Protection Agency's (USEPA) State of the Lakes Ecosystem Conference: Aquatic Habitat and Wetlands of the Great Lakes Working Papers outlines a methodology for ranking habitat types according to ecological significance. Ecological significance is determined by evaluating a particular habitat's role/impact on: (1) nutrient cycling, (2) productivity, (3) water quality and quantity, (4) life cycle of species, (5) biodiversity, and (6) indicator species. Using this system, coastal shorelines and marshes are generally considered to be the most ecologically significant habitat type.

Step 3: Develop Program to Restore, Enhance, or Protect Critical Habitat

Upon completion of this ranked list, a program to restore, enhance, and/or protect these critical habitats should be developed. In addition, a responsible party and funding sources should be identified. A document published by the National Research Council of Canada entitled Methods of Modifying Habitat to Benefit the Great Lakes Ecosystem presents a wide range of completed or ongoing habitat restoration and enhancement projects in various Great Lakes Areas of Concern that should be considered for implementation in the Rochester Embayment watershed. Examples include the creation of wetland pods, soil bioengineering, and the restoration of natural habitat structure. Wetland pods, constructed of chicken wire and designed to protect re-established aquatic plants and serve as a haven for juvenile fish, have been constructed in both Collingwood and Hamilton Harbours.

Soil bioengineering combines structural, biological, and ecological concepts to construct living structures for erosion, sediment, and flood control. For example, a bioengineered cribwall consists of a hollow, interlocking arrangement of timbers constructed as a wall. This structure is filled with soil and layers of live branch cuttings. Once the cuttings have taken root and grown, they will eventually take over the structural functions of the timbers. The end result is a stable, vegetated slope. From a habitat perspective, the advantage of bioengineering, as opposed to conventional methods of erosion control such as the installation of rip-rap, is that it does not function as an ecological barrier between aquatic and terrestrial areas. Soil bioengineering has been utilized in Collingwood Harbour for streambank protection and fish habitat enhancement.

In the Toronto area of concern, efforts are underway to enhance fish habitat in the littoral zone of Lake Ontario through the placement of woody brush and fallen trees at sheltered warm-water sites in order to develop physical complexity in areas degraded and simplified by lake-filling, dredging, and the installation of erosion control structures.

A number of strategies should be considered to protect habitat in and along waterways including

Environmental Protection Overlay Districts, the acquisition of lands or easements, and stewardship programs. For more information regarding these ideas, refer to the following Chapter 7 sections: "Promote the Use of Local Government Land Use Powers to Protect Fish and Wildlife Habitat" and "Develop Streambank Erosion Control Program".

Step 4: Program Implementation

The final stage of the project will consist of the actual implementation of the program to protect critical habitat in and along waterways. During Step 3, the organizations and agencies that should implement the program would be identified.

7.19.2.2. Time required: 10 years

7.19.2.3. Estimated cost:

The primary cost associated with developing and ranking a list of the critical habitats would consist of staff time. The extensive use of volunteers could greatly reduce the amount of staff time required to conduct these steps of the project.

The cost of different habitat enhancement projects varies greatly. In some cases, projects may be suitable for volunteer groups led by a technical expert. The administrative and installation costs associated with the development of three 15' x 15' wetland pods in Collingwood Harbour amounted to \$7,000 (Canadian). The cost of a roughly 120' long x 3' high bioengineered cribwall was about \$6,400 (Canadian). The projected cost of construction of two linear brush shelters (which consist of 55 weighted brush shelters and 21 fallen logs and tree crowns) along the Toronto shoreline is expected to be about \$25,000 (Canadian).

The costs associated with developing EPODs would consist primarily of staff time. The cost of purchasing habitats or easements would vary greatly depending upon the property.

7.19.2.4. Possible funding sources: New York State Aid to Localities, Great Lakes Protection Fund, private donations

7.19.2.5. Possible implementors:

Both the development of the list of critical habitats (step 1) and the subsequent ranking of this list (step 2) might be completed by a Monroe County Water Quality Management Advisory Committee (WQMAC) task force that includes representatives from the Monroe County Environmental Management Council, the New York State Department of Environmental Conservation, and not for profit organizations such as the Nature Conservancy and the Genesee Land Trust.

The habitat enhancement projects might be conducted by Soil and Water Conservation Districts, Water Quality Coordinating Committees, or county departments of health or planning. Activities

such as implementing stewardship programs, obtaining conservation easements, and working with municipalities to develop EPODS, might be conducted by existing not for profit organizations or by a local water quality not for profit organization (see the Chapter 7 section entitled "Develop Public Education Structure").

7.19.2.6. Expected benefits: The restoration, enhancement, and/or protection of habitat would contribute to increased fish and wildlife populations and thus address existing beneficial use impairments. In addition, recreational fishing and wildlife observation are important contributors to the local economy. Also, natural diversity contributes to the quality of life in the Rochester Embayment watershed.

Author: Todd Stevenson

7.20. Promote the Use of Local Government Land Use Powers to Protect Fish & Wildlife Habitat

7.20.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: the Rochester Embayment watershed

Current conditions that necessitate measure:

A number of activities associated with land development may degrade or destroy valuable fish and wildlife habitat in or along waterways. These may include the development of steep slopes, the removal of vegetation, and the destruction of wetlands or woodlots. Stream corridors, shorelines, and near-shore areas are critical for the survival of a great number of species. Many fish and wildlife species that spend most of their life cycle dispersed over a vast geographic area concentrate in shore or near-shore areas during migration, spawning, or nesting.

For example, The Nature Conservancy's migratory bird study indicates that migratory birds concentrate in forested habitat along the shore of Lake Ontario before they begin their non-stop flight over the Lake. Among The Nature Conservancy's 240 study sites around the perimeter of Lake Ontario, the Island Cottage Woods location, in the Town of Greece in the Lake Ontario West Basin, contained by far the greatest species diversity with more than 50 species recorded. The Conservancy attributes this to the fact that Island Cottage Woods is one of the few undeveloped areas on the south shore of the Lake.

The development of steep slopes (generally, those with slopes greater than 15%) may contribute to stream habitat degradation or loss by causing slope failure which results in increased sediment, and associated nutrient runoff into area waters. These sediments may remain suspended in the water column or may be deposited on the bottom of the water body. Suspended sediments contribute to increased turbidity which impairs plant photosynthesis, reduces vision (which is critical for sight-feeding fish), and clogs the gills of both invertebrates and many adult fish. As sediments settle out of the water column they may smother fish eggs and non-motile (non-moving) invertebrates. Ultimately, if the water body has a pebble bottom it may be covered by sediments, thus resulting in a loss of spawning habitat and creating a less favorable habitat for many of the organisms that live in such areas and serve as fish food. In addition, the nutrients associated with sediment runoff may contribute to eutrophication problems and oxygen depletion.

The removal of streambank or shoreline vegetation eliminates both protective cover and possible nesting sites and also allows more sunlight to reach the water, thus increasing its temperature and reducing dissolved oxygen levels. Many valuable fish species such as trout require cool waters and high dissolved oxygen levels in order to survive. In addition, streambank vegetation is

critical in stabilizing the streambank (thus reducing erosion and sedimentation) and filtering pollutants.

Wetlands, which provide habitat for a vast range of species, are also frequently threatened by land development. Some of these species are permanent residents, while many others depend on wetlands at various stages in their life cycles. The tremendous biological productivity of wetlands, particularly coastal wetlands, provides forage for many species and nursery conditions for sub-adult fish. According to one estimate (Whillans 1982), wetland losses in the more intensely settled areas of the Lake Ontario Basin may be as high as 75%.

In recognition of the value of wetlands, both federal and state regulations have been enacted to protect them. The United States Army Corps of Engineers (USACOE) regulates filling and dredging in wetland areas and the New York State Department of Environmental Conservation (NYSDEC) regulates activities in freshwater wetlands larger than 12.4 acres in size. Although these regulations have slowed the loss of wetlands, there remains an ongoing net loss in the quantity and quality of wetland habitat.

Additional information:

There are a number of land-use strategies which local governments may employ in order to mitigate the habitat degradation or destruction frequently associated with land use activities, including the use of Environmental Protection Overlay Districts (EPOD), conservation easements, cluster development, large-lot zoning, wetlands protection ordinances, and the designation of land as critical environmental areas. In addition, the Genesee/Finger Lakes Regional Planning Council is working with two municipalities to develop new partnerships and management programs which will facilitate the protection of wetlands. Municipalities may also utilize erosion control strategies and the SPDES Stormwater Permit program, as well as work with private land trusts to protect fish and wildlife in or along waterways. For more information on these topics see Chapter 7 "Develop Streambank Erosion Control Program", Chapter 6 "Federal Stormwater Regulations", and Chapter 6 "Non-Governmental Organizations Habitat Protection and Acquisition".

An Environmental Protection Overlay District (EPOD) is designed to provide the municipality with an additional level of control over environmentally sensitive areas such as steep slopes, wetlands, stream corridors, or woodlots. The EPOD supplements, rather than replaces, the existing underlying zoning. The term overlay refers to the map which delineates the location of the environmental features regulated by the ordinance. Applicants who wish to conduct a regulated activity within the overlay district must comply with specific standards which are designed to minimize the impacts of human activities on environmentally sensitive resources.

In the Rochester Embayment watershed, there are a number of municipalities with EPODs. The Town of Penfield's (Lake Ontario Central Basin) EPODs, which are designed to protect watercourses, steep slopes, and woodlots, serves as a useful illustration. For example, applicants

who wish to conduct a regulated activity within a Town of Penfield Watercourse Protection District must demonstrate that the proposed activity will not adversely impact water quality, watercourse flood carrying capacities, rate of sedimentation, rate/velocity of groundwater runoff, or the natural characteristics of the watercourse. Regulated activities include clearing, dredging, excavating, depositing of materials, construction, placement of a septic system, and any activity which alters the natural flow pattern of the watercourse. Other municipalities within the watershed which utilize EPODs include Perinton, Brighton, Irondequoit, and Hamlin. From a water quality perspective, EPODs such as those in the towns of Perinton and Hamlin are particularly valuable in that they protect wet areas (i.e. wetlands) which may not be protected by federal or state regulations.

The use of conservation easements is another technique which a municipality might employ in order to protect fish and wildlife habitat. A conservation easement is a legal agreement between a landowner and the municipality designed to preserve the natural, scenic, or agricultural condition of the land. The landowner may receive compensation or a tax abatement in exchange for the easement. In the agreement, the landowner voluntarily places restrictions on specific uses of the property. For example, excavation or subdivision may be prohibited. However, the land owner continues to enjoy all the rights of land ownership except for those specifically given away in the easement.

A number of municipalities within the Rochester Embayment watershed use conservation easements to protect fish and wildlife habitat including the Town of Perinton in the Lake Ontario Central Basin. Under Perinton's very active program, land owners may receive tax abatements in return for granting a conservation easement to the Town. The amount of the abatement is determined by the length of the easement. Both agricultural and uncultivated parcels are eligible. However, unlike an EPOD, Perinton's conservation easements program is not specifically directed at environmentally sensitive areas that might have a serious impact on critical fish and wildlife habitat along waterways. Instead, the program is directed at the protection of open space in general.

In addition, it is important to recognize that the use of this type of easement is only a temporary means of limiting development, as the penalties associated with breaking the easement are small relative to the potential profits associated with development. Since 1976, as Perinton has continued to develop, the total number of acres in easement, as well as the size of the average easement, have declined. In recognition of this fact, Perinton is considering using permanent conservation easements to protect land with recognized environmental value.

Municipalities may also promote or require cluster development as a technique to protect fish and wildlife habitat along waterways. In a cluster development, the existing density allotment of a property is retained but the lot sizes and building setback requirements are reduced with the balance of the property remaining as open space. State law (Section 278 of New York State General Municipal Law) allows municipalities to require clustering in certain districts. In terms of fish and wildlife habitat, the advantage of a cluster development is that this type of

development can be easily designed so that important habitat resources such as stream corridors, small wetlands, and woodlots are left intact. In addition, cluster developments require fewer roads, therefore, result in fewer impervious surfaces. The stormwater runoff from impervious surfaces may contribute to eutrophication and habitat degradation unless mitigating strategies are implemented. For more information see the Chapter 7 section entitled "Manage Stormwater in Existing and Newly Developing Urban Areas".

Currently, cluster development is widely used in the Rochester Embayment watershed. For example, in the town of Pittsford's (Lake Ontario Central Basin) Rural Residential District, a parcel may be developed at the standard density of one residential unit per ten acres or at a density of 1.3 residential units per acre provided that a number of conditions are met. One of these conditions requires that a minimum of 50% of the land within the parcel be permanently designated as rural conservation. The use of land designated as rural conservation is limited to agriculture, park land, and open space. A number of criteria are used in the selection of land within a parcel to be designated as rural conservation including the preservation of environmentally sensitive lands.

Large-lot zoning is another technique which municipalities may use to protect fish and wildlife habitat along waterways. For example, in Perinton's Limited Development Districts (LDD), single-family dwellings are permitted as a conditional use at a maximum density of one unit per five acres. The LDD is Perinton's version of an EPOD and is designed to protect environmentally sensitive areas such as steep slopes, floodplains, and wetlands. When conducting a site plan review for a proposed project within a LDD, the Perinton Planning Board considers a number of issues including the impact of the project on water and air quality, as well as fish, wildlife, and plant habitat. As part of the review process, the Town may require that the applicant implement mitigating measures in order to preserve or enhance the value of the LDD in protecting water quality, habitat, protection from erosion and effect upon the overall site drainage.

Municipalities may also develop ordinances designed to protect important natural resources which serve as critical fish and wildlife habitat. For example, the Town of Pittsford has developed a Wetlands Protection ordinance which is designed to protect small wetlands which may not be protected by existing state or federal regulations. Applicants who wish to conduct a regulated activity (such as draining, dredging, excavation, filling, or construction) within a wetland must obtain a permit from the Town. The ordinance contains a number of standards which are utilized in making permit decisions. For example, the ordinance states "No permit shall be issued by the agency pursuant to this Article unless the agency shall find that the proposed regulated activity is consistent with the policy of this law to preserve, protect, and conserve freshwater wetlands and the benefits derived therefrom..." (Pittsford Code Article VII Section 25-706.(b)(1)).

A rarely used strategy which municipalities may employ to facilitate the protection of fish and wildlife habitat is the designation of important environmental features as Critical Environmental Areas (CEA), as permitted under Article 8 of New York's Environmental Conservation Law.

Any unlisted action proposed within a CEA is automatically designated as a Type I (environmentally significant) action in regard to the State Environmental Quality Review Act process. Municipalities within the Rochester Embayment watershed may not be using this approach because they perceive that it does not possess the "teeth" that an EPOD does.

Additional land use regulatory strategies which municipalities may employ to protect fish and wildlife habitat include the transfer of development rights (TDR) and the purchase of development rights. These strategies are rarely utilized in the Rochester Embayment watershed because they tend to be expensive and/or burdensome from an administrative perspective. However, variations of these strategies may be useful in certain circumstances.

In an effort to assist municipalities in these efforts to protect important environmental resources, the Genesee/Finger Lakes Regional Planning Council (G/FLRPC) has undertaken a Sustainable Options for Wetlands project. The goal of this project is to bring together a wide range of stakeholders, including the towns of Victor (Lake Ontario Central Basin) and Farmington, the Genesee Land Trust, the Finger Lakes Land Trust, the New York State Department of Environmental Conservation (NYSDEC), and private property owners, in order to develop a model management program to protect wetlands without stifling economic development. The towns of Victor and Farmington were selected as the subjects for this effort because they are rapidly growing communities which contain significant wetland resources. As an integral part of the project, the wetland resources of the two towns will be mapped on a Geographic Information System. Ultimately, the model ordinances and strategies which are being developed will be transferable to other municipalities within the watershed.

7.20.2. Proposed Action a: Develop Non-traditional Partnerships to Protect Fish and Wildlife Habitat

7.20.2.1. Description:

Non-traditional partnerships to protect fish and wildlife habitat in and along waterways should be developed throughout the Rochester Embayment Watershed. These partnerships would focus on the management of habitat resources (including wetlands, shorelines, and stream corridors) through the use of municipal land use powers. The Genesee/Finger Lakes Regional Planning Council's (G/FLRPC) Sustainable Options for Wetlands project (as described above) would serve as a model for these partnerships.

The first step in this process would involve identifying municipalities that should be the focus of this type of effort. Most likely, these would be municipalities that contain substantial habitat resources yet do not have ordinances or programs in-place to protect these resources. In addition, a work plan that outlines the order in which these partnerships would be formed would need to be developed. Those municipalities whose habitat resources are facing immediate threat from rapid urban/suburban growth, agricultural practices, or other factors would be targeted first.

The process of developing these non-traditional partnerships would include the following activities:

1. Identify/map habitat resources
2. Bring together the full range of stakeholders and reach a common understanding regarding the issues--this may be achieved through a series of workshops
3. Develop consensus regarding resource management goals and objectives
4. Develop appropriate processes, programs, or ordinances that will achieve the stated goals and objectives

7.20.2.2. Time required: 1 year per municipality

7.20.2.3. Estimated costs: The cost of this action would consist primarily of staff time on the part of the participating agencies and organizations. The cost of the G/FLRPC's Sustainable Options for Wetlands project was approximately \$35,000.

7.20.2.4. Possible funding sources: counties, municipalities, G/FLRPC, grants

7.20.2.5. Possible implementors: G/FLRPC, counties, NYSDEC, municipalities, not-for-profit organizations, New York State Planning Federation, New York State Department of State, Kaplan Foundation

7.20.2.6. Expected benefits: The effective use of municipal land use powers to protect critical fish and wildlife habitat. Wetlands and stream corridors that serve as critical wildlife habitat also perform important flood and stormwater management functions and are a valuable recreational asset.

7.20.3. Proposed Action b: Use the Process of Developing Intergovernmental Agreements to Institute Measures to Protect Fish and Wildlife Habitat

7.20.3.1. Description:

As part of the process of developing Intergovernmental Agreements (IGAs) between Monroe County and the municipalities and counties within the Watershed, water quality staff should review municipal ordinances and recommend amendments that could be made that would help to protect critical fish and wildlife habitat resources such as stream corridors and wetlands. Water quality staff should also provide technical assistance in support of the development of possible new municipal ordinances that would serve to protect habitat. The process of developing IGAs is fully described in the Chapter 7 section entitled "Institute Intergovernmental Agreements". As mentioned in that section, existing staff resources within the Monroe County Health Department are insufficient to develop, implement, coordinate, monitor, and update all of the Water Quality IGAs that are required in the Rochester Embayment Watershed. Therefore, a new full-time Environmental Planner position should be created to conduct this task.

7.20.3.2. Time Required: The time required to develop the IGAs would be approximately three years. The implementation of IGAs would be an ongoing process.

7.20.3.3. Estimated Cost: The cost of the newly created position would be approximately \$42,000 plus benefits and expenses.

7.20.3.4. Possible Funding Sources: counties, Aid to Localities funding

7.20.3.5. Possible Implementors: counties, municipalities, G/FLRPC, New York State Planning Federation, New York State Department of State, Kaplan Foundation

7.20.3.6. Expected Benefits: Improved coordination and cooperation among the counties and municipalities, as well as an increase in the number of municipalities using techniques such as EPODS, conservation easements, cluster zoning, and large lot zoning to protect critical fish and wildlife habitat.

Author: Todd Stevenson

7.21. Educate about exotic species introduction and limit the spread of exotic species

7.21.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Surface waters, wetlands (depends on the species)

Current conditions that necessitate the measure:

Exotic (non-native or nonindigenous) plant and animal species have changed the species balance in the Lake Ontario ecosystem and the Rochester Embayment watershed ecosystem. Examples are:

- Purple loosestrife (*Lythrum salicaria*), an aggressive wetland plant that displaces cattails and other native plants, thereby displacing the animals that rely on the native plants for food and shelter.
- Zebra mussel (*Dreissena polymorpha*), which clings to boat hulls, piers and buoys, clogs intake pipes, and filters the water of microscopic nutrients. (See Chapter 6 section on "Zebra mussel control systems.")
- Eurasian milfoil (*Myriophyllum spicatum* L.), an aquatic plant which has exploded in American lakes, clogs shallow water and attracts organisms that breed disease.

Exotic species that have recently been introduced or potentially could be introduced into the Lake Ontario ecosystem, if preventative measures are not taken, include:

- Ruffe (*Gymnocephalus cernuus*), which competes with perch and walleye, has high reproductive capacity and high adaptability, and so is a threat to commercial and sport fishing and to predator/prey balance.
- Water chestnut (*Trapa natans* L.) whose exponential growth can, in a few years, totally clog a bay. The plant's seed has exceedingly sharp spines that can penetrate a heavy-soled shoe.
- Spiny water flea (*Bythotrethos cederstroemii*), a one-half-inch long predatory zooplankton that feeds on smaller zooplankton. It may compete for food with young fish, and with fish that eat zooplankton throughout their lives. It may also lacerate the guts of fish that eat them, which could lead to secondary infections.

Many species that are really exotic to the Great Lakes have come to be accepted as natural. They include the following fish species:

- Brown trout
- Chinook salmon
- Coho salmon
- Carp
- Alewife

7.21.2. Proposed Action a: Encourage funding for the educational component of the New York State Nonindigenous Aquatic Species Comprehensive Management Plan

7.21.2.1. Description:

In 1990 the federal government passed the Aquatic Nuisance Prevention and Control Act, authorizing federal funding for state activities for the prevention and remediation of adverse impacts resulting from the introduction of nonindigenous aquatic species. In July 1991 the New York State Legislature passed Chapter 456 of the Laws of 1991 which required the New York State Department of Environmental Conservation (NYSDEC) to develop a Nonindigenous Aquatic Species Comprehensive Management Plan in order to be eligible for the federal funding. The Plan, a three-year program, was intended to identify areas and activities, other than those related to public facilities, where technical and financial assistance is needed to eliminate or reduce environmental, public health, and safety risks associated with nonindigenous aquatic species. (There is a second plan to address the impacts within public facilities.) The Plan was completed in November 1993, and approved by the federal Aquatic Nuisance Species Task Force in March 1994. However, the federal government never appropriated the money, and the funding authorization was to end September 30, 1995. NYSDEC is hoping for a reauthorization for funding.

In September 1994, the U.S. Fish and Wildlife Service informed the New York State Division of Fish and Wildlife that the Service was able to obtain \$68,500 from Congress for funding New York's Management Plan for the period Oct. 1, 1994 through September 30, 1995, as a pilot project (New York was the first state to complete a plan). NYSDEC then prepared a one-year Plan to accommodate the amount of time and funding available, and which would contribute toward the goals of the three-year Plan.

The limited one-year program for which NYSDEC has received funding has the following objectives:

- Educate the public about nonindigenous aquatic species through warning signs (about Eurasian milfoil, zebra mussel and water chestnut) at all boat launch sites, both public and private. Regional NYSDEC Fish and Wildlife Offices will post the signs at state launches and make them available to others. NYSDEC also plans to purchase brochures from Minnesota Sea Grant about the ruffe, and make them available at the regional Offices.
- Evaluate the potential for zebra mussels to bioaccumulate toxic substances from waterbodies and pass these substances up food chains.
- Conduct a regional zebra mussel monitoring and impact assessment program in the Finger Lakes region.

The original three-year Plan, for which NYSDEC is seeking funding, identifies four goals:

- Reduce the potential for future introductions into New York waters.
- Reduce the potential for species that have been introduced into New York waters to

- spread into uncolonized waters.
- Minimize harmful economic, ecological, and social impacts resulting from nonindigenous aquatic organisms that have already been introduced, or are proposed for introduction into New York waters.
 - Educate the public on the importance of preventing nonindigenous aquatic species introductions, and how the harmful impacts of these species can be reduced or mitigated.

Objectives toward the educational goal are to:

- Establish an information, outreach, and distribution network for reaching interested and impacted groups and individuals with information and materials.
- Warn the public about potential adverse impacts from a newly introduced nonindigenous aquatic species.
- Communicate appropriate measures to control the spread of a newly introduced species.

County Water Quality Coordinating Committees should promote the funding of the three-year program and comment on the desirability of its continuation after the three years are over. To make the best use of limited funding, the WQCCs should point out the goals and objectives that they think are the most important for NYSDEC to implement and should recommend specific actions that would benefit the Rochester Embayment watershed.

7.21.2.2. Time required: NYSDEC: Three years for the original Plan. At the end of three years, NYSDEC, with comments from the public, would assess the program, realizing that any further funding may have to come solely from the state. NYSDEC would, however, seek continued funding from alternative sources.

WQCCs: 20 hours of staff time to publicize the availability of the NYSDEC educational program, and to promote its continuation.

7.21.2.3. Estimated costs: NYSDEC: The estimated cost of the three-year Plan is \$350,000 per year. A reauthorization would allow the federal government to fund 75% of the program. The New York State portion would be \$87,500 per year. WQCCs: Cost of 20 hours of staff time would be approximately \$500.

7.21.2.4. Possible funding sources: County, U.S. Fish and Wildlife Service, NYSDEC

7.21.2.5. Possible implementors: County, NYSDEC

7.21.2.6. Expected benefits (of the educational objectives in the three-year proposal):

Newspapers can play an important role in informing people initially about a nonindigenous aquatic species, but cannot be counted on to provide continuous or updated coverage. The information disseminated to the public should alert them to the issue of introductions, provide any immediate precautions to reduce potential impacts, and refer them to sources of reliable, in-depth information. A feedback mechanism should be identified so that the public can request

further information and express concerns. Information must be constantly updated, as more and better information becomes available, in order to ensure that the appropriate message is being delivered. The NYSDEC Fish and Wildlife Office proposes to fill this role of information dissemination, updating, and feedback mechanism.

NYSDEC must identify what segments of the population will be affected when an introduction occurs, what the potential impacts will be, and what the impacted public should do in response. The information should be rapidly disseminated to the public, even if the anticipated impacts are not classified as detrimental.

Good information distribution systems include:

- New York Sea Grant and Cornell Cooperative Extension.
- Boat registration system and safe boating classes.
- Fishing and hunting license materials; short messages added to fishing hot lines.
- Motor vehicle registration materials.
- NYSDEC regional offices as an outlet for printed materials and pamphlets.
- The state Federation of Lake Associations.
- Scouts, 4-H, and the NYSDEC State Aquatic Recreation Education Program.
- New York science teachers, with materials produced by Sea Grant or a NYSDEC subcontractor, and made available to them.

The NYSDEC states that local governments have significant responsibilities in responding to nonindigenous aquatic species, and suggests responses:

- Post signs along waterfronts.
- Provide information.
- Monitor and coordinate with state monitoring.
- Accomplish localized control, removal, or elimination.
- Sponsor and coordinate information meetings.

The benefits of a NYSDEC educational program could be limited by lack of knowledge about the program's availability, and by the potential for the program to end after three years.

7.21.3. Proposed Action b: Develop exotic species curricula for grades 5-12

7.21.3.1. Description:

There are very few materials currently available about the issue of nonindigenous species, except for zebra mussel. Curricula should be developed for grades 5-12 on exotic species, their introduction, and their impacts on ecosystems. Good examples to use are:

- Purple loosestrife, because it can be observed on field trips in wetland areas throughout the Rochester Embayment watershed.
- Zebra mussel, because it can be observed in a classroom aquarium.

Separate curricula for grades 5-8 and 9-12 should be designed for:

- Parks education programs.
- School science classes.
- 4-H or Scouting groups.
- Summer recreation programs.

For zebra mussel, Sea Grant offices publish a wide range of materials that are appropriate for teachers and other adults and senior high school students. They also publish a few items for children and about other aquatic nuisance species. Available materials for youth and adults about zebra mussels and other nonindigenous species are shown in Table 7-6. The following Sea Grant program newsletters have entries about education and nonindigenous species:

<u>Newsletter</u>	<u>Sea Grant Office</u>
The HELM	Illinois-Indiana
Upwellings	Michigan
The Seiche	Minnesota
Coastlines	New York
Twine Line	Ohio
Littoral Drift	Wisconsin
Zebra Mussel Update	Wisconsin
Coastal Educators News	New York

Additional resources on exotic species in general need to be discovered or developed.

7.21.3.2. Time required: One half-time educator for one year

7.21.3.3. Estimated costs: Approximately \$20,000 for an educator, plus the costs of computer, copier, paper and other supplies

7.21.3.4. Possible funding sources: U.S. Fish and Wildlife Service, NYSDEC, education foundations

7.21.3.5. Possible implementors: New York Sea Grant, Cornell Cooperative Extension, NYSDEC, science teachers' association

7.21.3.6. Expected benefits: Students will better understand the nature of ecosystems by studying the introduction of a new species.

7.21.4. Proposed Action c: Encourage the NYSDEC to implement a ban on the sale of purple loosestrife in New York State

7.21.4.1. Description:

A formal appeal should be made to the State of New York that the State ban the sale of purple loosestrife, as other states have done. The appeal could be initiated by county Water Quality Coordinating Committees (WQCCs), the Water Resources Board of the Finger Lakes Association, Inc., and/or nonprofit organizations with an interest in habitat. The first contact with the State would be with the NYSDEC Division of Fish and Wildlife to enlist assistance in collecting supporting information and data, and to begin the legal process. The entity making the appeal and the NYSDEC should support the appeal with:

- Information and data supplied by habitat experts from educational and nonprofit organizations and various government agencies.
- Case studies from states which have banned the sale of purple loosestrife.

7.21.4.2. Time required: Part-time effort for six months to one year to prepare an appeal

7.21.4.3. Estimated costs: Environmental professionals: 160 hours of staff time to hold meetings, make contacts and coordinate:\$4,000. Intern: 80 hours to research and organize information and data: \$0-\$600. Total:\$4,000-\$4,600

7.21.4.4. Possible funding sources: NYSDEC, nonprofit organizations

7.21.4.5. Possible implementors: County WQCCs, Water Resources Board, nonprofit organization

7.21.4.6. Expected benefits: The action would limit the spread of purple loosestrife to that of natural means.

Author: Carole Beal

**Table 7-6
Educational Resources**

Name	Type	Grade Level	Sea Grant Office or Other Publisher
Aquatic Exotic	catalog of audio-visuals and other materials	mainly adult	Wisconsin
Aquatic Immigrants of the Northeast	fact sheets	middle and high schools	Connecticut
Invasion of an Exotic Species: Stop the Zebra Mussel	fact sheets and classroom activities	grades 8-12	Virginia
Traveling Trunk and Zebra Mussel Mania Curricula*	science resource kit, 10 hands-on activities	focus on grades 5-6, useful also for grades 7-8	Illinois-Indiana
Field Guide to Aquatic Exotic Plants and Animals	10-page brochure about 11 common exotics	adult	Minnesota
Aquatic Exotic News	newsletter	adult	Connecticut
ANS Update**	quarterly newsletter	adult	Great Lakes Commission

*Zebra Mussel Mania's introductory activity is about nonindigenous species in general. A "Traveling Trunk" is expected to be available in October 1995. The Trunk provides educators with tools to teach about the full range of problems associated with zebra mussels and provides an overview of other nonindigenous species. The activities integrate math, English, social studies and the arts into the science learning experience.

**The Great Lakes Commission encourages the use of ANS Update: News from the Great Lakes Panel on Aquatic Nuisance Species as an insert in the newsletters of other groups.

Addresses

Connecticut Sea Grant Marine Advisory Program, Univ. Connecticut, 1084 Shennecossett Rd., Groton, CT 06340-6097.

Illinois-Indiana Sea Grant Program, Univ. Illinois, 65 Mumford Hall, 1301 W. Gregory Dr., Urbana, IL 61801.

Minnesota Sea Grant Exotic Species Information Center, Univ. Minnesota, 2305 E. Fifth St., Duluth, MN 55812-1445.

Sea Grant Communications, Virginia Inst. of Marine Science, P.O. Box 1346, Gloucester Point, VA 23062.

Univ. of Wisconsin Sea Grant Inst., 1800 University Ave., Madison, WI 53705-4094.

Great Lakes Commission, The Argus II Bldg., 400 Fourth St., Ann Arbor, MI 48103-4816.

7.22. Develop Public Education Structure

7.22.1. Background:

Use impairments addressed: See Table 7-1

Affected water bodies: the Rochester Embayment watershed

Current conditions that necessitate the measure:

As major reductions in point source discharge are being achieved, the importance of nonpoint source water pollution is becoming more apparent. The New York State Department of Environmental Conservation (NYSDEC) estimates that 80% of the remaining pollution problems that interfere with the use of waterbodies in New York State are the result of nonpoint source pollution. In the Rochester Embayment watershed, the Irondequoit Basin Nationwide Urban Runoff Program documented that nonpoint sources of pollution are the primary contributors to eutrophication in Irondequoit Bay. Because many types of nonpoint source pollution are the result of citizen actions, there is a growing need to intensify existing public outreach efforts. For information regarding existing educational efforts, see Chapter 6 "Educational Efforts Designed to Develop Public Stewardship of the Watershed".

Additional information:

Currently, a number of government agencies and not-for-profit organizations are involved in the development of public stewardship of the Rochester Embayment watershed including the Monroe County Health Department, the Soil and Water Conservation Districts (SWCD), the Natural Resources Conservation Service (NRCS), and the Genesee Land Trust. However, these efforts have been limited by funding and staff time. Therefore, there is a need to both coordinate and intensify stewardship building activities.

In 1994, the Monroe County Water Quality Management Advisory Committee (WQMAC) developed a "Public Outreach, Education, and Publicity Workplan". Many of the actions proposed in the workplan have been implemented and are discussed in the above mentioned Chapter 6 section. The following actions were brainstormed and proposed in the workplan, but have not been implemented.

- Prepare and distribute videos as public service announcements
- Enlist Ad Council for assistance
- Develop short, catchy name for the "Remedial Action Plan"
- Create mascot for public events (note: we have used a "Ronny the Raindrop" mascot belonging to the Natural Resources Conservation Service for some events already)
- Prepare and distribute annual report video
- Prepare and distribute watershed map/sites

- Enlist artist to design graphic/logo for the RAP
- Browns Race laser show
- Sponsor/Promote Educational Coursework
- Coordinate with Helmer and Genesee Country Museum
- Develop interactive graphics on computers for school or groups to use
- Prepare float for use in parades
- Hold contests (photography, poster, essays)
- Establish environmental industry of the year award
- Water quality debate

Additional educational actions which have been suggested include the following:

- Print placemats and/or bookmarks with water quality information
- Develop an Enviropark
- Throughout the Watershed, establish household hazardous waste collection centers and "clean sweep" collection programs for pesticides
- Initiate educational programs for citizens on pesticide use and household hazardous waste
- Implement a program comparable to the Hamilton Harbour Stewardship Project. This program consists of the following activities:
 - 1) landowners in the watershed are contacted regarding the critical role they play in maintaining the environment
 - 2) staff conduct site visits in order to discuss stewardship issues with property owners
 - 3) landowners are linked with existing programs in order to facilitate habitat restoration and/or streambank erosion control projects
 - 4) landowners are encouraged to enter into voluntary stewardship agreements

7.22.2. Proposed Action a: Establish a local water quality not-for-profit organization

7.22.2.1. Description:

A local water quality not-for-profit organization should be formed in order to plan, coordinate, fund, and implement educational activities within the Rochester Embayment watershed. Such an organization would also serve as an advocate for water quality. For example, the not for profit organization might assist municipalities in developing ordinances and policies which protect fish and wildlife habitat or limit the proliferation of impervious surfaces. This organization should also monitor the implementation of the RAP.

The creation of a not-for-profit organization would require assembling a board of directors, creating a mission statement, developing by-laws, recruiting a core group of volunteers/organizers, and establishing appropriate linkages to the community, including a possible advisory committee. In addition, a fund-raising strategy, a budget process, and the hiring of staff would be necessary. In order to become a legal not-for-profit, an organization must be registered with the New York State Department of State and the United States Internal

Revenue Service. Therefore, some legal assistance would be needed.

7.22.2.2. Time required: Approximately one year

7.22.2.3. Estimated cost: The cost of establishing a local water quality not-for-profit organization would be approximately \$4,000. This estimate assumes that a county environmental planner would devote approximately one month of staff time to facilitate the creation of this organization. It is estimated that the annual budget of a local water quality not for profit organization would be in the range of \$70,000 to \$100,000 to cover staff and some implementation activities.

7.22.2.4. Possible funding sources: Counties, grants, memberships, and private donations.

7.22.2.5. Possible implementors: Counties, WQCCs, and the WQMAC

7.22.2.6. Expected benefits:

Educational efforts build public stewardship of water resources and therefore result in reduced nonpoint source pollution. For example, stewardship activities such as the responsible use of lawn care fertilizers or the proper maintenance of septic systems would contribute to improved trophic conditions and fish/wildlife habitat in area waters. In addition, an informed public is essential in order to create support for policies which protect water resources such as land use planning.

In addition, a local water quality not-for-profit organization could be involved in a wide range of implementation actions. These actions are described in the following sections: "Reduce and Mitigate Impervious Surfaces (Chapter 7)", "Develop Streambank Erosion Control Program (Chapter 7)", "Promote the Use of Local Government Land Use Powers to Protect Fish and Wildlife Habitat (Chapter 7)", "Monitoring for Aesthetics - Litter (including fish carcasses)(Chapter 9)", "Monitoring Fish and Wildlife Habitat (Chapter 9)", and "Monitor Enforcement of Existing Regulations (Chapter 9)".

7.22.3. Proposed Action b: Create a Water Quality Education Coordinator Position

7.22.3.1. Description:

A full time position should be created within the Monroe County Health Department, Cornell Cooperative Extension, or the Soil and Water Conservation District in order to coordinate water quality education activities in the Rochester Embayment watershed. This person would work with a permanent subcommittee of the WQMAC in order to develop and implement a stewardship workplan.

7.22.3.2. Time required: Not calculated

7.22.3.3. Estimated cost: The cost of creating a water quality education coordinator position (Environmental Planner, Grade 14) within County Government would be between approximately \$35,000 and \$42,000, plus benefits and expenses. The cost of this position would be an ongoing expense.

7.22.3.4. Possible funding sources: Counties, grants

7.22.3.5. Possible implementors: The establishment of a water quality education coordinator position could be implemented by Monroe County, Cornell, or the SWCD.

7.22.3.6. Expected benefits: As described in proposal A, education efforts develop public stewardship of water resources and therefore contribute to reduced non-point source pollution.

Author: Todd Stevenson

7.23. Complete basin water quality plans

7.23.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Surface waters of the Rochester Embayment watershed

Current conditions that necessitate the measure:

The Rochester Embayment watershed is divided into three drainage basins (see Figure 7-2):

- Lake Ontario West Basin (Note that the watersheds of all streams within Monroe County, that flow directly into Lake Ontario west of the Genesee River Basin, are included in the Lake Ontario West Basin. This delineation allows Monroe County to have consistent water quality policy throughout the County.)
- Genesee River Basin
- Lake Ontario Central Basin/Irondequoit Basin

Each of these basins has a different pattern of land use and, in some cases, different use impairments and different types of sources. In order to gather as much information as possible about each basin and use an ecosystem approach, it became necessary to involve the government officials and citizens who work and live in each basin.

7.23.2. Proposed Action: Complete basin water quality plans for each of the three drainage basins in the Rochester Embayment watershed

7.23.2.1. Description:

Early in the Remedial Action Plan (RAP) process for the Rochester Embayment Area of Concern, it was found to be appropriate to develop basin plans to identify and address problems in each basin that affect the water quality in the AOC and the water quality in the basin waterways. This effort was initiated at the same time as the Stage I RAP and as a basis for it. A great deal of information was gathered about the environmental setting of the three basins and the goals and objectives for each of these three basins. Some work was also completed to identify water quality conditions in these basins. All of the collected information was used in the stage I RAP document.

A model for these basin plans was the Irondequoit Bay water quality management plan which was completed in 1986 and is now in the implementation phase. (Like the RAP, the Irondequoit Bay management plan took a watershed approach toward remediation.) Basin plan development has been assisted by advisory committees that were established as basin subcommittees of the Monroe County Water Quality Management Advisory Committee (WQMAC). These advisory committees helped identify basin use impairments through discussions and through field surveys. The basin subcommittees also established water quality and resource use goals and objectives. In

addition, completed written work on the basin plans was done by the Stage I RAP consultant team headed by the Center for Governmental Research. The content of each basin plan is parallel to the Rochester Embayment RAP. A listing of major chapters of the basin plans along with the preparation status of each is shown in Table 7-7.

Preparation of the basin plans was suspended in 1994 because funds originally allocated to complete the RAP and the basin plans had been completely expended and the New York State Department of Environmental Conservation directed Monroe County to concentrate on the completion of the Stage I and II RAP in order to fulfill its contract.

Basin plan preparation for the Genesee Basin, the Lake Ontario West sub-basin, and the Lake Ontario Central sub-basin should be completed with some modification to the original outlines. The focus should shift from basin-wide planning and implementation to watershed planning and implementation for individual streams within the basins. Basin-wide background information, water quality goals and objectives, and analysis of impairments would remain as written. Proposals for remedial measures and their implementation would focus on individual stream watersheds and involve citizens of the watersheds.

In order to complete basin plans, staff time will need to be allocated, and the basin subcommittees and/or watershed subcommittees will need to be activated. As many implementors as possible should be identified at the beginning of the planning process. Many are listed below; there may be others. These implementors should be represented in plan preparation in order to avoid potential conflict among implementors.

7.23.2.2. Time required: The equivalent of one-half to one year for two full-time positions for each basin plan (The actual time would be longer than one year.)

7.23.2.3. Estimated costs:

One environmental planner, grade 14:	\$41,191 (+ benefits)
One student intern	<u>\$15,288</u>
Total	\$56,479 for one year (maximum cost)

Assuming one-half year for each basin plan, this action would cost \$84,719 for three plans.

7.23.2.4. Possible funding sources: New York State Department of Environmental Conservation, Monroe County and other basin counties

7.23.2.5. Possible implementors: Monroe County Department of Health, WQMAC, Water Quality Coordinating Committees, Water Resources Board of the Finger Lakes Association, regional planning councils, NYSDEC

7.23.2.6. Expected benefits: Restoring the beneficial uses and attaining resource use goals for each basin with the support and enthusiasm of basin officials and residents will ultimately help to

meet the goals of the Rochester Embayment RAP.

Authors: Carole Beal, Margy Peet

Figure 7 - 2

Monroe County Basins

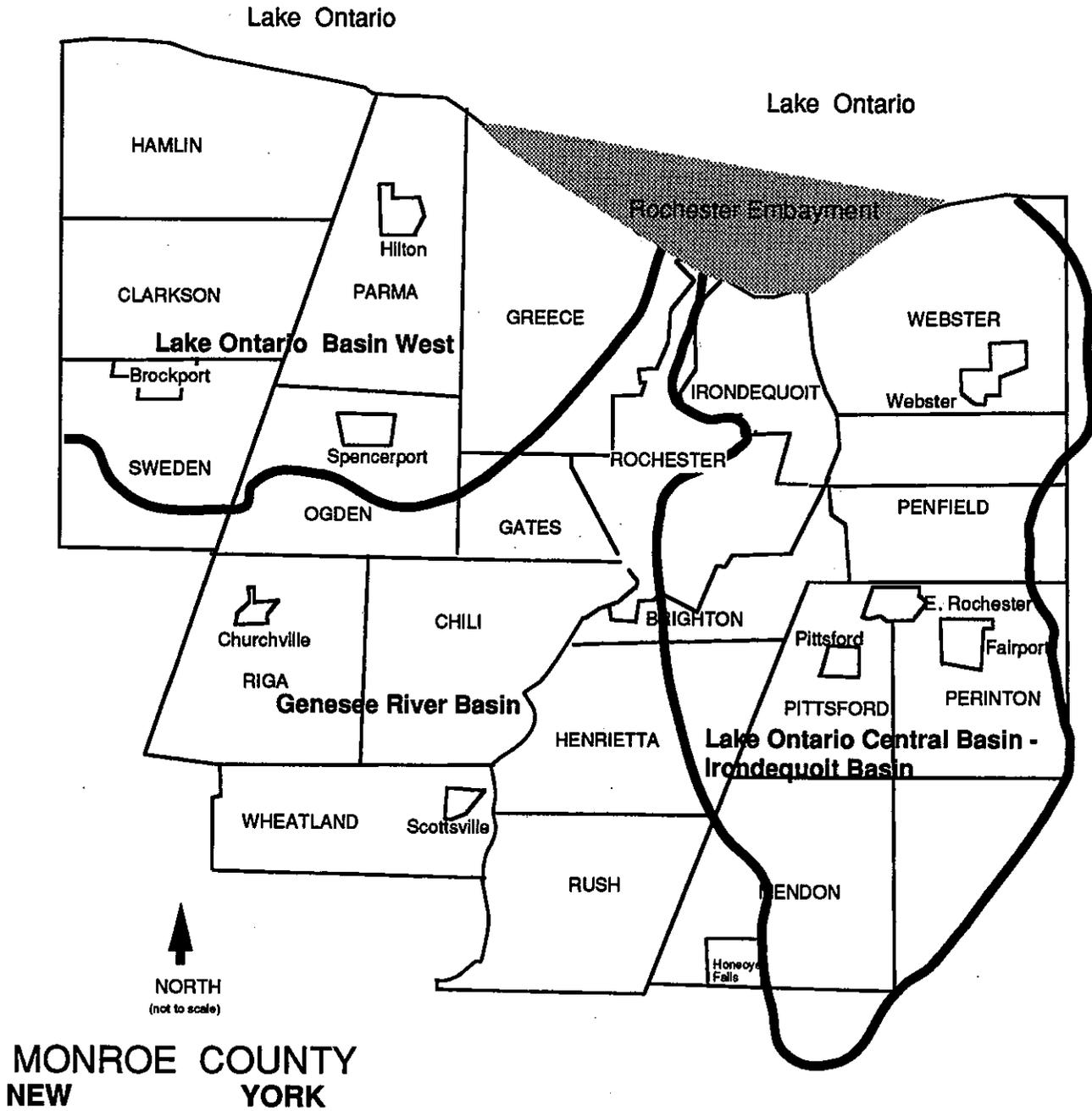


Table 7-7
STATUS OF BASIN PLAN DEVELOPMENT
March 1994

CHAPTER	L.O.W. Basin Status	L.O.C. Basin Status	Genesee Basin Status
Introduction	no start	no start	no start
Environmental Setting	done	done	done
Water Quality & Resource Goals & Objectives	done	done	done
Impairments/conditions	draft 1	Nearly Final	draft 1
Analysis of Remedial Measures to Address Impairments	SOME	INFO	DRAFTED
Analysis of Remedial Measures to Achieve Other Goals	SOME	INFO	DRAFTED
Basin Plan of Action	no start	Iron. Basin done	no start
Monitoring & Program Assessment	no text SOME MONITORING	no text	no text
Commitments Received to Carry out Actions	no text	no text	no text
			SEVERAL COMMITMENTS In WQCC Workplan and Intergovernmental Agreements

7.24. Continually evaluate and implement proposals for possible new remedial measures

7.24.1. Background:

Use impairments addressed: See Table 7-1

Affected water body: Potentially all water bodies of the Rochester Embayment watershed

Current conditions that necessitate the measure: See "Description"

7.24.2. Proposed action: Continually evaluate and implement proposals for possible new remedial measures

7.24.2.1. Description:

The Monroe County Water Quality Management Advisory Committee (WQMAC) anticipates that many possible new remedial measures, studies and monitoring activities will be proposed during the Stage II RAP review process and during the implementation phase of the RAP (Stage III). The value of each new proposal deserves the same consideration for potential implementation as the proposals presented in Chapters 4 (studies), 7 (remedial measures) and 9 (monitoring) of the Stage II RAP. A review process every three years is proposed for:

- Possible new remedial measures
- Possible new studies, and
- Possible new monitoring activities.

The first review period should begin in 1997. It would include remedial measures, studies and monitoring activities proposed during the review of the Stage II RAP. After the 1997 review period, there would be review periods every three years.

The process for annual review will be as follows:

Step #1: The person responsible for the proposal should submit the proposal in writing with as much detail included as possible (see Stage II RAP Chapter 7 sections for information needed). The proposal should be submitted to:

- The WQMAC, c/o Monroe County Department of Health Water Quality Planning staff (for proposals that affect Monroe County).
- The Genesee/Finger Lakes Regional Planning Council or the Finger Lakes/Lake Ontario Watershed Protection Alliance (for proposals that affect rural counties).

If a proposal is presented orally at a public meeting, the name of the person responsible and a telephone number should be recorded, so that a written proposal or more information can be requested.

Step #2: The proposal will be held in a file until the next review period. During the holding time, additional information can be added, if needed. The proposal can also be sent during this time to

appropriate reviewers for their comments, and can be revised accordingly. The author of the proposal must be involved in the revision process. During the holding time, it may be desirable to periodically distribute a list of proposals to WQMAC, the Monroe County Water Quality Coordinating Committee (WQCC) and the New York State Department of Environmental Conservation (NYSDEC).

Step #3: The proposal could be evaluated during the next review period either by an ad hoc committee of the WQCC or by a task group comprised of:

- At least 2 WQMAC members.
- At least 1 WQCC member.
- At least one Monroe County official.
- At least one NYSDEC official.
- At least one town official, if an action to be implemented by towns is proposed.
- A representative of any other proposed implementor.

Step #4: The review process will be somewhat similar to the 1996 ranking process for Chapter 7 actions, but there will also be some differences:

- The proposal will be given a score according to the final criteria adopted during the 1996 ranking. However, the scoring process will be more important than the actual score. The process will lead the task group to consider the criteria of cost, benefit, feasibility and popularity for each proposal.
- When several proposals are being considered simultaneously, each will be considered on its own merits. An actual ranked list will have less importance than in the 1996 ranking process because there may not be a great number or diversity of proposals. In some review periods, all proposals could be recommended; in other review periods, none could be recommended.
- In making recommendations, the task group may want to use the range of scores for "recommended" actions in the 1996 ranking process as a guideline for additional actions to be recommended.
- The final product of the task group will be a list of "recommended" actions and a list of "not recommended" actions. Items on the "not recommended" list should be filed; they may become more appropriate during some future year.
- The process of developing the lists will be documented.

Step #5: The "recommended" list and "not recommended" list will be presented to the full WQMAC and the full WQCC for their review and changes. The WQMAC and the WQCC will then present their "recommended" lists to the Monroe County Water Quality Management Agency (WQMA) and NYSDEC, in a manner similar to the 1996 process.

Step #6: The WQMAC will decide how to include public comment in the review process.

Step #7: Commitments to implement the adopted actions must be obtained in a manner similar to the 1996 process.

Step #8: The workplan of the implementor may have to be adjusted to accommodate the new action. The new action will not replace an action to which the implementor is already committed, but may deserve a higher priority in scheduling.

Step #9: New remedial measures, studies and monitoring activities chosen as the result of this process will be reported as one component of RAP updates.

7.24.2.2. Time required:

- Attendance at 3 task group meetings by six task group members
- Student interns (to assist with writing, research and review of the proposals): Up to 10 hours/proposal (There may be as many as 20 proposals during 1997.)
- Monroe County Department of Health Water Quality Planning staff (oversight and support for intern and task group activities):
 - Task group activities: 60 hours/year
 - Student intern supervision: 2 hours/proposal

7.24.2.3. Estimated costs:

- Attendance at 3 task group meetings: 3 meetings x 2 hours/meeting x 6 task group members x \$24/hour (for environmental professionals) = Approximately \$900
- Student intern (writing, research and review of the proposals): 10 hours/proposal x \$7/hour = \$70/proposal. There may be as many as 20 proposals during 1997, and therefore costs of \$1,440. However, the student intern may work for college credit, and not for wages.
- Monroe County Department of Health Water Quality Planning staff (oversight and support for intern and task group activities):
 - Task group activities: 60 hours/year x \$24/hour (environmental professional) = \$1,440/year
 - Student intern: 2 hours/proposal x \$24/hour = \$48 for each proposal, or \$960 for 20 proposals
 - Total for staff = \$2,400

Total cost/year = \$3,300 - \$4,740

7.24.2.4. Possible funding sources: NYSDEC, Monroe County

7.24.2.5. Possible implementors: Monroe County Department of Health staff, WQMAC, WQCC or a nonprofit organization (to coordinate the review and ranking of proposed actions)

7.24.2.6. Expected benefits: This action would allow the Rochester Embayment RAP to be an evolving, growing process. The RAP can:

- Change as needs change.
- Build upon previous actions.
- Incorporate new creative ideas.

- Add ideas based on new technologies.

Author: Carole Beal