

# **CAYUGA COUNTY WATER QUALITY STRATEGY 2013 Update**



**Adopted by the  
Cayuga County Water Quality Management Agency  
on October 10, 2013**

**Cayuga County Water Quality Strategy  
2013 Update**

**TABLE OF CONTENTS**

	<b>Page(s)</b>
<b>I. Introduction and Background</b>	
Cayuga County Water Quality Management Agency.....	1
Cayuga County Water Quality Strategy .....	2
<b>II. Development of the Cayuga County Water Quality Management Strategy.....</b>	<b>2</b>
<b>III. Implementation of the Cayuga County Water Quality Management Strategy...</b>	<b>3</b>

**Attachments**

- Attachment 1: WQMA Member Agencies
- Attachment 2: Working Groups Charge
- Attachment 3: From Goals to Actions
- Attachment 4: Information Sheet on the Priority
- Attachment 5: Draft topics and Subtopics
- Attachment 6: Work plans
- Attachment 7: Final priorities for 2013

## **I. Introduction and Background**

Water quality is important to Cayuga County and its residents. Cayuga County contains three Finger Lakes, 1 major river and one Great Lake. The major watersheds in Cayuga County are Lake Ontario (70,789 acres), Seneca River (144,719 acres), Owasco Lake (104,138 acres), Cayuga Lake (120,869 acres), and Skaneateles Lake (14,144 acres). Owasco Lake is also the primary source of water for approximately 45,000 County residents.

### ***Cayuga County Water Quality Management Agency***

The Cayuga County Water Quality Management Agency (WQMA) was created by County Legislative Resolution #445-90 in November 1990 to serve the Cayuga County Legislature in meeting its responsibilities in the management and protection of the County's water resources. The mission of the WQMA is to protect and improve the quality of water in Cayuga County.

The purpose of the WQMA is to advise the Cayuga County Legislature on matters related to water resource management and planning. The WQMA is charged with identifying problems, proposing priorities, and promoting the coordination of activities in the management and protection of the County's water resources. More specifically, the WQMA is charged with:

1. Creating and maintaining a comprehensive planning and implementation program for water quality management in Cayuga County.
2. Coordinating the responsibilities of agencies and watershed associations with interest in water quality management in Cayuga County.
3. Providing greater public input into the process of water quality management and related programs.
4. Providing an effective public education program to develop public understanding and support for water quality management in Cayuga County.

The membership of the WQMA consists of:

- Cayuga County Legislature's Environmental Advisors
  - Director of Cayuga County Planning and Development
  - Director of Cayuga County Environmental Health
  - Director of Cayuga County Parks and Trails
  - Director of Cayuga County Soil & Water Conservation District
  - Cayuga County Solid Waste Management Program Administrator
  - Cayuga County Cooperative Extension Director
- Non-County, Local Officials
  - Town of Owasco
  - City of Auburn

- Cayuga County Association of Town Supervisors
- Cayuga County Association of Villages
- Representatives from Waterbody Associations in Cayuga County
  - Cayuga Lake Watershed Network
  - Duck Lake Association
  - Lake Como Association
  - Owasco Watershed Lake Association
  - Skaneateles Lake Association

### ***Cayuga County Water Quality Strategy***

The Cayuga County Water Quality Strategy (Strategy) serves to guide policy and activities related to water issues in Cayuga County. The purpose of the Strategy is identify and prioritize water quality problems and concerns and determine how to address the prioritized water quality issues and concerns. The Strategy does this by setting goals and defining objectives. It also allows County Agencies, local officials and waterbody representatives to work together to protect and improve County water resources. The Strategy should be used to guide the allocation of resources, both personnel and financial, and determine future work related to water resources in the County.

The Cayuga County Water Quality Management Agency is responsible for revising and updating the Strategy with input from the public and interested agencies. It should be updated as needed.

## **II. Development of the Cayuga County Water Quality Management Strategy**

In February 2012, members and partners of the WQMA ranked issues with a number from 1 (most important) to 9 (least important). These priorities were watershed neutral and did not supplant the work currently being done. The priorities were intended to inform the collective action and focus of the WQMA.

### **Priorities as Ranked by the Cayuga County WQMA**

Issue	Ranking:
Sediment/Nutrients	97
Invasive and Nuisance Species	96
Education: public education, learning through doing (for example citizen science)	86
Collaboration/Coordination: with members of the WQMA and other groups (like the Owasco Watershed Management Council) to avoid duplication of services	75
Stream Restoration and Stabilization	67
Bacteria	66
Stormwater: includes land development because that tends to increase stormwater	63
Solid and Hazardous Wastes: includes hazardous chemical collections and electronics collections and yard waste.	52
Natural Gas Drilling	28

In March 2012, the WQMA held a facilitated discussion of these issues and the priorities of the WQMA. This resulted in the establishment of sediment/nutrients, invasive and nuisance species, bacteria, and solid and hazardous wastes as the top priorities. At this meeting, the WQMA passed the 2012 WQMA Workplan with one priority which was “Complete the update of the Cayuga County Water Quality Strategy and begin its implementation; clarify commonalities between the objectives and the strategies of the working groups in order to focus members and partners toward implementation of an integrated plan.”

Members, designees and partners of the WQMA were requested to join working groups for the development of the Strategic Plan. The working groups were: Sediment and Nutrient Reduction; Invasive Species; Coliform Bacteria or Solid and Hazardous Wastes. Each working group was provided with the following documents:

- Working Groups Charge (Attachment 2)
- From Goals to Actions (Attachment 3)
- Information Sheet on the Priority (Attachment 4)
- Draft topics and Subtopics (Attachment 5)

The working groups, except for the Solid and Hazardous Wastes working group, met throughout 2012 and early 2013 and developed their work plans. These work plans were all approved at the April 4, 2013 WQMA meeting. They are included as Attachment 6.

These working groups met again in April and June of 2013 and decided which priorities in their work plans that they would concentrate on in 2013. The final list of priorities were approved at the June 6, 2013 WQMA meeting and are included as Attachment 7.

### **III. Implementation of the Cayuga County Water Quality Management Strategy**

At the June 6, 2013 WQMA meeting, the working groups then became the following implementation groups:

- Sediment and Nutrient Reduction Implementation Group
- Invasive Species Implementation Group
- Coliform Bacteria Implementation Group

These implementation groups will be responsible for implementing the priorities from the group’s work plan and report on their progress at WQMA meetings.



**Attachment 1:**  
**WQMA Member Agencies**





## **ATTACHMENT 1: WQMA MEMBER AGENCIES**

### **CAYUGA COUNTY LEGISLATURE'S ENVIRONMENTAL ADVISORS**

#### **Cayuga County Department of Planning and Economic Development**

County Office Building, Fifth Floor

160 Genesee Street

Auburn, NY 13021

Phone: 315-253-1276, Fax: 315-253-1499

Email: [planning@co.cayuga.ny.us](mailto:planning@co.cayuga.ny.us)

Website: <http://www.cayugacounty.us/DoingBusiness/PlanningandEconomicDevelopment.aspx>

The Cayuga County Department of Planning and Economic Development is a department of county government. Among its functions are planning and advisory services to municipal government in land use and economic development.

#### **Programs and Activities:**

- Provides administrative assistance to the WQMA.
- Serves as a liaison between member agencies and organizations; Federal, State and Regional agencies; and public/private parties concerned with water quality issues and water resource management.
- Assists in the development and formulation of long and short-term plans.
- Identifies possible funding sources.
- Assists in the preparation of grant applications.
- Administers the County's Finger Lakes - Lake Ontario Watershed Protection Alliance (FL-LOWPA) Program.
- Sustains the County's Geographic Information System (GIS), which includes land use and wetland information and is used to perform environmental impact analyses.
- Reviews and comments on proposed development activities which may impact local waterbodies.
- Developed the Owasco Lake Watershed Management Plan, Duck Lake Watershed Management Plan and the Lake Como Watershed Management Plan in conjunction with many agencies.

#### **Cayuga County Environmental Health Department**

County Office Building, Second Floor

160 Genesee Street

Auburn NY, 13021

Phone: 315-253-1405, Fax: 315-253-1156

Website:

<http://www.cayugacounty.us/LivingWorking/HealthWellness/EnvironmentalHealth.aspx>

Environmental Health is a Division of the Cayuga County Department of Health and Human Services. This Division oversees numerous programs in order to protect the public health of the residents of Cayuga County.

#### Programs and Activities:

- Statutory authority to enforce the Owasco Lake Watershed Rules and Regulations.
- Statutory authority to enforce the Cayuga County Sanitary Code.
- Assists in the planning, formulation, and implementation of water quality management projects and programs.
- Regulatory agency for the implementation of the Federal Safe Drinking Water Act through the NYS Sanitary Code, Part 5. Activities include promoting and helping develop watershed rules and well head protection programs for protecting drinking water supplies, ensuring adequate treatment and quality monitoring of public water supplies, approval of new sources of water and maintaining a file on all public water systems.
- Regulates public bathing beaches in the County under the authority of the NYS Sanitary Code, Part 6.
- Participates in identifying funding sources, liaison activities, environmental impact assessments, research and monitoring and advisory functions.

#### **Cayuga County Parks and Trails Department**

Emerson Park

6914 East Lake Road

Auburn, New York 13021

Phone: 315-253-5611

Email: [parks@co.cayuga.ny.us](mailto:parks@co.cayuga.ny.us)

Website: <http://www.cayugacounty.us/LivingWorking/ParkCommission.aspx>

#### The Cayuga County Park and Trails Department has four major components:

1. The Sterling Nature Center, Sterling , NY
2. Emerson Park, Auburn, NY
3. Owasco Flats Nature Preserve, Moravia and Venice, NY
4. The County Trails system is located in the central and northern parts of Cayuga County

#### Mission:

The Cayuga County Parks and Trails Departments mission is to enhance the quality of life for the citizens of Cayuga County by providing leisure, cultural, and educational services while preserving, conserving, and promoting our natural and physical resources.

#### Programs and Activities:

- The Sterling Nature Center was established by Cayuga County in 1997 to manage the natural resources and foster understanding and appreciation for the natural environment through guided and unguided nature study and interpretive programs. The Center oversees 1,400 acres of ecologically sensitive land consisting of wetlands, woodlands, and meadows. Much of the property is protected by three conservation easements. The property has nearly two miles of undeveloped Lake Ontario shoreline and includes sections of Sterling Creek to the south and Nine Mile Creek to the north. The center contains a variety of habitats in addition to the lakeshore and stream banks there are 246 acres of wetlands, 1,055 acres of forest and shrub and 99 acres of open fields and brush. The center is open dawn to dusk and features over 5-miles of trails, an interpretive center and a canoe launch. The center participates in invasive species control.

- Emerson Park was founded in 1944 when Fred L. Emerson donated much of the property to Cayuga County. The park contains 135 acres with nearly a mile of Owasco Lake Shoreline and over a mile of Owasco Riverfront. Emerson Park is the home of The Emerson Park Pavilion, The Merry-Go-Round Playhouse Theatre, The Ward W. O'Hara Agricultural Museum, an 18-hole disc golf course and a bathing beach. The park has a small marina and two boat launches providing access to Owasco Lake and the Owasco River, one for power boats and one for canoes and kayaks. In addition to the public access provided by these facilities the marina and launch provide access for the Owasco Lake Watershed inspector and scientists studying the lake. The park hosts many recreational and athletic events as well as an annual Owasco Lake Day, which provides a forum for water quality issues. The park hosts a United States Geological Survey water gauging station and promotes water quality through educational signage. The park has a retention pond that helps to filter water entering Owasco Lake.
- Owasco Flats Preserve is an 89-acre site on the south end of Owasco Lake. The preserve includes approximately 1,000 feet of Owasco Lake frontage and 3,000 feet of Owasco Inlet shoreline. The site is open dawn to dusk and offers hiking, fishing, bird watching and photography opportunities. There is a canoe launch providing access to the south end of Owasco Lake and the Owasco Inlet. The entire flats area has been identified as key to the cleanup of Owasco Lake as 55% of the water entering Owasco Lake comes from the inlet.
- Cayuga County Parks and Trails oversees the county trail system including the Cato/Fair Haven Trail, the Hojack Trail, the Cato/Brutus Trail, the Auburn/Fleming Trail and sections of the Erie Canal Trail. The trails are abandoned railroad beds. Approved uses on all trails include hiking, biking, cross county skiing and horseback riding. Snowmobiling is permitted on designated trails and ATVs may be allowed on some trails in the future.

### **Cayuga County Soil and Water Conservation District**

7413 County House Road

Auburn, NY 13120

Phone: 315-252-4171, Fax: 315-252-1900

Email: [cayugaswcd@cayugaswcd.org](mailto:cayugaswcd@cayugaswcd.org)

Website: <http://www.cayugaswcd.org/>

The Cayuga County Soil and Water Conservation District (SWCD) was established in 1944 by resolution of the County Board of Supervisors, after the public indicated, through a series of public hearings, that a conservation district was needed to assist landowners and units of local government in the conservation of soil, water, and related natural resources.

SWCD provides technical assistance to landowners and units of local government in planning and implementation of conservation practices that relate to soil and water resources.

The objective of the SWCD is to improve and protect the land, water, and related natural resources; to discourage potentially harmful land and water practices; and to develop and implement conservation programs which will enhance the natural resources in Cayuga County and New York State.

### Mandates

The NYS Soil and Water Conservation District Law was amended in 1989 to declare the improvement of water quality to be a state policy along with the control and abatement of nonpoint sources of water pollution.

### Local Authorization

On March 13, 1978 the Cayuga County SWCD was designated, through resolution by the County Legislature, the local planning, management, and implementing agency to protect the water resources of Cayuga County from the following sources of nonpoint source pollution: agriculture, construction, silviculture, mining, stream and road bank soil erosion.

### Programs and Activities

- Planning and technical assistance for managing soil, water, and related natural resources.
- Technical assistance on the implementation of Best Management Practices for water quality.
- Nutrient Management Program
- Conservation Education; Regional, State, and National Envirothon; Conservation Field Days.
- Administer Americorps Conservation Program: a hands-on youth program.
- FL-LOWPA Program: harvesting aquatic vegetation in several waterbodies in Cayuga County.
- Erosion, Sediment Control and Stormwater Management Program: technical assistance to landowners and municipalities on erosion/sediment control and stormwater management.
- Wastewater Management Program: survey, design, and inspect septic systems for homeowners.
- Cayuga County Flood Control Program: technical assistance to landowners and municipalities on water quantity management; mitigation for flood damage.
- Review land development proposals for municipalities for potential environmental impacts.
- Assist the County and City governments with Economic Development; planning and implementation.
- Voting member in the Central New York Resource Conservation and Development Project.
- Promote watershed management planning in conjunction with many agencies.
- GRAZE NY Program: provide technical assistance to landowners that are developing a prescribed grazing system.
- Wood Waste Recycling Program: utilize a tubgrinder to turn woody debris into mulch for municipalities.
- Conservation Mowing Program: utilize mowing equipment to maintain and create grasslands.
- Work with and house the Owasco Lake Watershed Inspection Program.

### **Cayuga County Solid Waste Management Program Office**

County Office Building, 5<sup>th</sup> Floor

160 Genesee Street

Auburn, NY 13021

Phone: 315-253-1276, Fax: 315-253-1499

Email: [planning@co.cayuga.ny.us](mailto:planning@co.cayuga.ny.us)

Website:

<http://www.cayugacounty.us/DoingBusiness/PlanningandEconomicDevelopment/SolidWasteManagement.aspx>

Programs and Activities:

- Coordinates Household Hazardous Waste Collection programs.
- Agricultural chemical Clean Sweep programs.
- Tire collection, electronics, Freon appliances and propane tank recycling programs.
- Recycling and composting education.
- Cooperative marketing of recyclable materials.
- Compiling annual and biannual recycling and solid waste management reports.
- Compile and track information on inactive solid waste facilities.
- Assist municipalities with solid waste issues, particularly related to recycling drop off sites.

**Cayuga County Cornell Cooperative Extension**

248 Grant Avenue

Auburn, NY 13021

Phone: 315-255-1183

Email: [cayuga@cornell.edu](mailto:cayuga@cornell.edu)

Website: <http://counties.cce.cornell.edu/cayuga/>

Mission

The mission of the Cornell Cooperative Extension of Cayuga County is to empower people to improve their lives and communities through learning partnerships that put research and experiential knowledge to work.

Water quality, conservation of natural resources and solid waste management are priority issues in Cayuga County. Cornell Cooperative Extension of Cayuga County has responded by educating youth and adults to better their understanding of the link between personal choices and the effect that these choices have on the environment. It acts as an informational clearinghouse to the public and private sectors on a myriad of environmentally related issues. Their ability to disseminate information, involve the general public in important issues, and provide the WQMA with feedback makes the Extension a vital part of the agency and to the development of a water quality management strategy.

Programs and Activities:

- Environmental and agricultural education and outreach for youth and adults.
- Integrated pest management.
- Hazardous waste collection events for homes, farms, schools, municipalities, and businesses.
- Water quality education programs including workshops on well maintenance, erosion control, aquatic invasive species, stream monitoring, etc.
- Residential and agricultural composting.
- Nutrient management.
- Conservation Field Days.

- Displays, newsletters, newspaper articles and other outreach methods on environmental and agricultural topics.

### **NON-COUNTY LOCAL OFFICIALS**

#### **Cayuga County Association of Town Supervisors**

##### **Programs and Activities:**

- Conduit for passing information from the WQMA such as best practices, approaches to zoning, other laws, etc. for consideration by localities.
- Provide the WQMA with input from local governments as to any new regulations or laws that might be proposed on a county or regional level.
- Provide information on local problems or suggestions that could result in better water quality.
- Coordinate with town highway departments pertaining to drainage or road salt policies.
- Advise Town planning boards of WQMA activities and subsequently provide the WOMA with essential feedback regarding the local response to proposed projects and programs relating to water quality issues.

#### **Cayuga County Association of Villages**

##### **Programs and Activities:**

- Conduit for passing information from the WQMA such as best practices, approaches to zoning, other laws, etc. for consideration by localities.
- Provide the WQMA with input from local governments as to any new regulations or laws that might be proposed on a county or regional level.
- Provide information on local problems or suggestions that could result in better water quality.
- Coordinate with town highway departments pertaining to drainage or road salt policies.
- Advise Town planning boards of WQMA activities and subsequently provide the WOMA with essential feedback regarding the local response to proposed projects and programs relating to water quality issues.

#### **City of Auburn**

Memorial City Hall

24 South Street, Auburn, NY 13021

Website: <http://ci.auburn.ny.us/>

The City of Auburn has an inherent interest in water quality management since it is the primary proprietor of the County's largest and important natural resource. Since Owasco Lake provides drinking water for city residents and nearby towns and villages, the City is extremely interested to see that the water quality of the lake be maintained at the highest possible level. The City is also responsible for the operation of the municipal water filtration plant and the sewage treatment plant.

#### **Town of Owasco**

2 Bristol Ave., Auburn, NY 13021

Phone: 315-253-9021

E-mail: [owasco1@centralny.twcbc.com](mailto:owasco1@centralny.twcbc.com)

Website: <http://www.cayugacounty.us/portals/1/owasco/mysite7/Government/Departments.html>

The Town of Owasco has an inherent interest in water quality management since it is proprietor of the County's largest and important natural resource, Owasco Lake. The Town of Owasco provides drinking water from Owasco Lake to its residents and to the Town of Fleming, and is extremely interested in to see that the water quality of the lake is maintained at the highest possible level. The Town is responsible for the operation of its water filtration plant and sanitary sewer system.

### **REPRESENTATIVES FROM WATERBODY ASSOCIATIONS IN CAYUGA COUNTY**

#### **Cayuga Lake Watershed Network**

Zabriskie Hall, Wells College

170 Main Street

P.O. Box 348

Aurora, NY 13026

(315) 364-2992

E-mail: [steward@cayugalake.org](mailto:steward@cayugalake.org)

Website: [www.cayugalake.org](http://www.cayugalake.org)

The Cayuga Lake Watershed Network was founded in 1998. The Network is a board-run, membership organization with a steward (executive director). The Network "identifies key threats to Cayuga Lake and its watershed, and it advocates for solutions that support a healthy environment and vibrant communities." These goals are accomplished through programs that promote education, communication and leadership across the lake's 800 square mile watershed, which includes 45 municipalities and extends into seven counties. The Network works collaboratively with other organizations such as the Cayuga Lake Watershed Intermunicipal Organization, the Cayuga Lake Water Monitoring Partnership, the Floating Classroom, the Cayuga County Water Quality Management Agency and other water quality coordinating committees, research groups, agency staff, and citizen-powered watershed protection organizations.

#### **Programs and Activities:**

- A springtime conference is held for the public at the north end of the lake on a topic of concern or interest.
- An autumn conference is held for the public at the south end of the lake on a topic of concern or interest.
- A "traveling roadshow" with a topic of interest to the public makes several appearances annually in communities around the lake.
- Springtime creek cleanups are organized in cooperation with community and watershed groups lakewide.
- We support and educate about citizen monitoring of water quality.
- The Network works with local communities to help solve chronic water quality problems in tributaries or along the lake.
- We produce a quarterly newsletter, "Network News," and hold an annual fundraiser dinner-dance.
- We provide displays and activities at public events such as Earth Day, Water Week, Lansing Harbor Fest.



- The Network is developing an Intern program for college and high school students.

### **Duck Lake Association**

P.O. Box 295

Cato, NY 13033

E-mail: [bedademo@tds.net](mailto:bedademo@tds.net)

#### **Programs and Activities:**

- Aquatic weed control including identification and removal.
- Conducting water sampling through the CSLAP Program.
- Conducting water sampling such as coliform sampling.
- Identifying lake level problems, mainly beaver dam issues.
- Examining jet ski problems on the lake.
- Initiating a program to create awareness of the dangers of spreading unwanted weeds and zebra mussels as well as feeding ducks and geese.

### **Lake Como Association**

PO Box 95

Homer, NY 13077

#### **Programs and Activities:**

- Aquatic weed control including identification and removal.
- Conducting water sampling through the CSLAP Program.
- Identifying lake level problems, mainly beaver dam issues.

### **Owasco Watershed Lake Association**

P.O. Box #1, Auburn, NY 13021

24 hour Hotline: (315) 255-6360

E-mail: [owlanews@gmail.com](mailto:owlanews@gmail.com)

Website: <http://www.owla.org>

A citizen-based association that promotes cooperation and leadership in the comprehensive management of land use, water quality, recreation, agriculture and a host of other issues as they pertain to Owasco Lake and its watershed.

#### **Programs and Activities:**

- Act as an informational and environmental action center for matters concerning Owasco Lake and its watershed, in conjunction with individuals, and other organizations, the news media, and all levels of government.
- Foster appreciation of the natural resources present in the Owasco Lake Watershed area and the importance of protecting them through sound environmental management.
- Provide leadership in support of the wise use of land and water, and in the control or pollution of all types.
- Engage in studies, research and fact-findings in all areas of Association concern.
- Encourage the wise management of fish and game, good forestry practices, safe operation of boats and all other types of marine vehicles, proper maintenance of navigation aids and



of the lake's water levels, observance of laws and regulations by the individual, and fair and proper law enforcement for the individual.

- Promote public interest and understanding of the matters which relate to the purpose of the Association.

**Skaneateles Lake Association, Inc.**

PO Box 862

Skaneateles, New York 13152

Email: [skanlakeassoc@att.net](mailto:skanlakeassoc@att.net)

Website: <http://www.skaneateleslake.org/>

Not-for-profit corporation and member of the New York State Federation of Lake Associations and the Finger Lakes Regional Watershed Alliance (FLRWA). Their mission is to take all action necessary to protect and improve the water quality of Skaneateles Lake and to protect and improve its watershed; to promote environmentally and aesthetically sound regional management of Skaneateles Lake and its watershed by encouraging cooperation among the Skaneateles Lake watershed municipalities; and to engage in activities appropriate to further the purposes of the corporation including public education, community organizing, fund-raising, publicity, working with village, town, county, state and federal officials.

**Programs and Activities:**

- Education and public awareness.
- Eurasian watermilfoil control program.

**WQMA PARTNER AGENCIES**

**Central New York Regional Planning & Development Board**

126 N. Salina Street,

100 Clinton Square, Suite 200

Syracuse, NY 13202

Phone: 315-422-8276

E-Mail: [mail@cnyrpdb.org](mailto:mail@cnyrpdb.org)

Website: <http://www.cnyrpdb.org/>

The Central New York Regional Planning & Development Board (CNY RPDB) is a public agency established in 1966 (under State municipal law), and is supported by Cayuga, Cortland, Madison, Onondaga and Oswego Counties. CNYRPDB's goal is to study local public policy issues, and to help develop and implement plans that will enhance the future of the Central New York Region through four program areas: Comprehensive Planning, Economic Development; Energy Management, and Environmental Management

The primary goal of the CNYRDDB's Environmental Management program is to promote the careful stewardship of the region's environmental resources with a major focus in the area of water resources management. Designated as the regional water quality management planning agency for Central New York, the CNY RPDB provides ongoing assistance to localities on a

variety of water resource issues. It also serves as the statewide water resources program coordinator on behalf of the New York State Association of Regional Councils (NYSARC) and the New York State Department of Environmental Conservation (NYSDEC).

Programs and activities:

- State Pollutant Discharge Elimination System (SPDES) Phase II Stormwater Program
- Partnership for Regional Invasive Species Management
- Regional Floodplain and Stormwater Management Symposium
- County Water Quality Coordinating Committees
- Regional Cooperation & Collaboration
- Water Resources Education / Information / Outreach
- Lake and Watershed Management Planning
- Regional Nonpoint Source Strategy Meeting Series
- Regional Water Quality Activities Inventory
- NYS DEC Water Management Advisory Council
- Professional Development Training program for engineers, landscape architects and architects

**Finger Lakes Institute**

Hobart and William Smith Colleges  
601 S. Main Street Geneva, NY 14456  
(315) 781-4390  
E-mail: [fli@hws.edu](mailto:fli@hws.edu)  
Website: <http://fli.hws.edu/>

The Finger Lakes Institute at Hobart and William Smith Colleges is dedicated to the promotion of environmental research and education about the Finger Lakes and surrounding environments. In collaboration with regional environmental partners and state and local government offices, the Institute foster environmentally sound development practices throughout the region, and disseminates the accumulated knowledge to the general public.

Programs and Activities:

- The Finger Lakes Institute, along with Hobart and William Smith Colleges' faculty and students, conducts scientific research of the eleven Finger Lakes and surrounding watersheds in collaboration with watershed management and environmental protection programs.
- Develops and offers a variety of web-accessible curricular and educational resources for K-12 students and teachers.
- Conducts professional development programs for teachers and other educators and hosts school groups for various programs, including its EPA award winning *Science on Seneca* program for high school students.
- Community outreach activities include lectures, workshops, symposia and conferences on a variety of environmental topics, along with a range of public service events for students and the public.
- Issues a monthly electronic newsletter, and hosts a research clearinghouse and makes web-accessible resources on the Finger Lakes available on its website (<http://fli.hws.edu/>).

**Institute for the Application of Geospatial Technology, Inc.**

Cayuga Community College

199 Franklin St., Suite 300

Auburn, NY 13021-3025

E-mail: [info@iagt.org](mailto:info@iagt.org)

Website: <http://www.iagt.org>

The Institute for the Application of Geospatial Technology is a not-for-profit 501c3 corporation located on the campus of Cayuga Community College. It provides a range of applied geospatial information technology based services including remote sensing, aerial photography, global positioning systems, geographic information systems, 3d visualization and light detection and range finding. Its clients include members of the private sector, the educational community and the governmental community from local to international levels.



**Attachment 2:**  
**WQMA Priorities Working Groups Charge**



## **ATTACHMENT 2: WQMA PRIORITIES WORKING GROUPS CHARGE**

### **WQMA Charge**

The purpose of the WQMA is to advise the Cayuga County Legislature on matters related to water resource management and planning. The WQMA is charged with *identifying problems*, *proposing priorities*, and *promoting the coordination of activities* in the management and protection of the County's water resources. More specifically, the WQMA is charged with:

1. Creating and maintaining a comprehensive planning and implementation program for water quality management in Cayuga County.
2. *Coordinating* the responsibilities of agencies and watershed associations with interest in water quality management in Cayuga County.
3. *Providing greater public input* into the process of water quality management and related programs.
4. *Providing an effective public education program* to develop public understanding and support for water quality management in Cayuga County.  
(*italics added*)

### **WQMA 1 – 3 Year Priorities**

As part of the process of reviewing and updating our strategic plan, we have identified four priority areas for the next 1 – 3 years: 1) Sediment/Nutrients; 2) Invasive and Nuisance Species; 3) Coliform Bacteria (Pathogens); and 4) Solid and Hazardous Waste.

It is the task of the working groups to expand upon the general goal in each of these areas by detailing more specific objectives and determining how the objectives can be achieved through programs and activities. In accordance with the charge of the WQMA, this task should be undertaken while maintaining a focus on three areas: coordination, public input, and public education.

### **Foundation Idea and Plans**

The underlying idea is to coordinate efforts of the various component WQMA groups toward the achievement of shared outcomes. This contrasts to past WQMA efforts which tended to focus on identification of activities and programs of member groups with little coordination of programming efforts. This approach differs in that each participating group will be asked to support efforts to identify outcomes and to direct program efforts, collaboratively with other member activities, to their realization.

### **Working Group Charge**

The time horizon for these efforts is 1 – 3 years. Each group is requested to:

- develop sub goals and objectives spanning the planning time line;
- specify strategies and program efforts that will lead to their achievement;
- identify lead and supporting agencies in each of the program areas; and
- specify how results of activities can be measured in order to assess progress in accomplishing objectives.

Given the limited resources available, this clearly will require making choices among competing interests. It is the group's charge to make such choices.

### **Composition and Focus of Working Groups**

Whenever possible, in developing objectives, programs and plans each of the major water bodies represented in the WQMA (Owasco, Cayuga and Skaneateles Watersheds, Duck Lake and Lake Como) should be specifically considered.

The chair of each working group, whenever possible, should be a member of WQMA. Membership in the groups, however, is not limited to WQMA members if the addition of other members will promote the realization of the defined goal.

All plans will be reviewed and approved by the full WQMA by majority vote.



**Attachment 3:**  
**From Goals to Actions: Organizing Tasks and Responsibilities**  
**Supporting the Mission of WQMA**





# Strategic Plan

## From Goals to Actions

### Organizing Tasks and Responsibilities Supporting the Mission of the WQMA

The work of formulating plans that address the priority issues of organizations like the WQMA involves the identification of goals, objectives, strategies, and actions.

**Goals** are broad statements indicating general intentions. Goals are the "what" of the planning process; they communicate what the members of the organization want it to ultimately accomplish. Draft working goals for each of the WQMA's priority issues have been distributed for review. As is the convention, they describe ideal outcomes in somewhat ambiguous terms. The ambiguity of goal statements is intended to help promote early agreement among members and other stakeholders on what they will cooperate in working toward. It is often useful to break particularly broad, comprehensive goals down into two or three less abstract sub-goals in order to make it easier to see how to proceed.

**Objectives** are well-defined, targeted statements supporting goals. Like goals, objectives also describe the "what" of the process, but in more precise, time-specific, and measurable terms than those found in goal statements. There are usually several objectives for each goal.

The standard form for an objective is:

(verb noting direction of change) + (area of change) + (target area, feature, or population) + (degree of change) + (time frame)

For example:

Objective: To reduce the spring mean total phosphorus concentration in the waterbodies listed in Table 1 to no more than 20 parts per billion (micrograms per liter) by the summer of 2015.

**Strategies** are the "how" of the process; they describe the approaches or methods that will be employed to achieve objectives

For example:

Strategy: Enhance existing local land use and development regulations to make them more effective in limiting phosphorus loading delivered to waterbodies in Cayuga County

**Actions** are the specific tasks that will be taken to execute the strategies. They describe the things that will be done to actually make the plan successful.

For example:

Compile a reference file of stream buffer protection regulations from various jurisdictions where such regulations have proven useful; draft model regulations and promote their adaptation and adoption by Cayuga County towns and villages

When formulating strategies and specifying actions it is important to avoid simply describing existing programs and work plans. The process should also include analyses of tactics and approaches that have not yet been attempted but which may hold promise. It is also critical that the agencies responsible for carrying out each task are clearly identified.

**Attachment 4:**  
**WQMA Priority Issues Information Sheets**



## ATTACHMENT 4: WQMA PRIORITY ISSUES

### 1. Sediment/Nutrients

#### Sediment

Soil that is eroded and transported by natural causes may enter waterbodies as sediment containing fine sand and silt, nutrients, bacteria, and other pollutants that can reduce water quality and cause the degradation of aquatic habitat. Sedimentation may also result in the creation of nutrient enriched areas where invasive plants can thrive. Streambanks, unvegetated areas, construction sites and agricultural land are predominant sources of sediment.

Water quality impacts caused by silt and sediment are apparent in Sterling Creek, Dutch Hollow Brook and minor tributaries of Owasco Lake.

#### Nutrients

Nutrients such as phosphorus and nitrogen are needed for normal, healthy growth of vegetation. However, excessive levels of nutrients can cause nuisance algal blooms and increase weed growth in a waterbody. As these plants die and decompose, fish and other aquatic life are negatively impacted by the resulting reduction in oxygen available in the waterbody. The growth of blue green algae may become stimulated in nutrient enriched lakes, ponds and slow-moving streams. Blue green algae produce toxins that pose a health risk to people and animals when large enough quantities come into contact with the skin or are accidentally ingested.

Nutrient enrichment can also reduce water clarity, depreciate the recreational value of waterbodies, and cause taste and odor issues in drinking water. Human activities in residential, urban, and agricultural areas often results in the deposition of significant amount of nutrients across the landscape. Nutrients from fertilizers, manure, eroded soil particles, septic systems, and pet waste can be carried by stormwater runoff into nearby lakes and streams.

Water quality impacts caused by nutrient enrichment are apparent in Cold Spring/North Brook, Owasco Outlet, minor tributaries to Owasco Lake, upper Big Salmon Creek and its tributaries, Sterling Creek, the upper Owasco Inlet, tributaries to Duck Lake, and Little Sodus Bay.

**Major Goal: Reduce sediment and nutrient loadings to acceptable levels in waterbodies where problems or impacts caused by sediment and nutrients are apparent, and prevent excessive loadings in all other waterbodies across the County.**

## **2. Invasive and Nuisance Species**

When a species that is not indigenous to an area is able to establish itself and reproduce so rapidly that it causes ecological damage, it is considered an invasive species. Invasive species can alter the physical environment, reduce species diversity, decrease property values, and negatively impact fisheries and recreational resources.

The nonindigenous Asian clam was found in the Emerson Park area of Owasco Lake in 2010. This clam is capable of growing and spreading rapidly, and potentially cause biofouling (clogging of water intake pipes) and algae blooms, as well as displacement of native species. The potential for biofouling is a major concern since the water intake pipes for the City of Auburn and Town of Owasco are in this area.

Other invasive animal species currently found in waterbodies in Cayuga County are fishhook waterflea, Chinese mystery snail, zebra mussels and spiny waterflea.

An aquatic invasive plant that is spreading in Cayuga County is the water chestnut. This plant has been found in Sterling Creek and the Seneca River. Water chestnut forms dense, impenetrable surface mats that can damage the habitat of native species and negatively impact recreational resources. Water chestnut can be controlled by harvesting and hand pulling before it gets too dense. Other aquatic invasive plant species in Cayuga County include Eurasian watermilfoil, curly leaved pondweed and European frog-bit. An aquatic plant species that we are concerned about keeping out of Cayuga County is hydrilla. Hydrilla has been found in the Cayuga Inlet and it is one of the most aggressive invasive plants, capable of forming thick mats that choke waterbodies.

**Major Goal: Prevent the introduction of new invasive species into Cayuga County and prevent the spread of invasive species within Cayuga County.**



### **3. Coliform Bacteria (Pathogens)**

Coliform bacteria are microorganisms that are present in the environment and in the digestive tracts and feces of all warm-blooded animals. While these bacteria are not normally the cause of serious illness, their presence in the water system can indicate that it is contaminated by disease-causing organisms (pathogens) also of fecal origin. Since it is relatively easy and inexpensive to test for coliform bacteria, coliform testing is often performed to determine if water is polluted by fecal matter derived from such sources as domestic pets, livestock, wildlife, and septic systems.

Water quality impacts caused by pathogen contamination are apparent in Owasco Lake. Contamination by pathogens is also suspected in Little Sodus Bay.

**Major Goal: Reduce fecal coliform bacteria concentrations to levels meeting quality standards in all Cayuga County waters affected by these pollutants.**

## **4. Solid and Hazardous Waste**

### **Household Hazardous Waste**

Leftover household products that contain corrosive, toxic, ignitable, or reactive ingredients are considered to be “household hazardous waste” or “HHW.” Special care is required when disposing of products such as paints, cleaners, oils, batteries, and pesticides containing potentially hazardous ingredients. Examples of improper disposal of household hazardous waste includes pouring it down the drain, on the ground, into storm sewers, or in some cases putting it out with the trash. The dangers of such disposal methods might not be immediately obvious, but they can result in the pollution of the environment and the creation of human health risks.

### **Electronic Waste**

Electronic waste produced by households, businesses, governments, and industry may include computers, monitors, televisions and other items containing hazardous materials such as lead and mercury. If electronics are not disposed of properly, these materials can cause environmental problems including surface and groundwater contamination.

### **Yard Waste**

Improper management of lawn clippings, leaves, brush, and other organic matter from the yard has the potential to cause numerous water quality problems. Yard waste can contribute a harmful overload of nutrients to waters, resulting in algal blooms, plant dieback, and the depletion of oxygen needed by fish and aquatic insects. When dumped along stream banks, yard waste can suffocate and kill the plants whose roots and cover protect against stream bank erosion.

**Major Goal: Provide opportunities for residents and small businesses of Cayuga County may to dispose of household hazardous waste, electronics, and yard waste in an environmentally responsible manner.**

**Attachment 5:**  
**Draft Topics and Subtopics of Working Groups**



## **ATTACHMENT 5: DRAFT TOPICS AND SUBTOPICS OF WORKING GROUPS**

### **Sediment/Nutrients Working Group**

#### **Sediment**

Sediment can contain

- Bacteria
- Nutrients
- Pollutants

Sources of Sediment

- Streambanks
- Unvegetated Areas
- Construction Sites
- Agricultural Land
- Stormwater
- Steep Slopes
- Sewer Systems

Impacts of Sediment

- Can be dependent on soil types
- Reduce Water Quality
- Nutrient Enriched Areas
- Degrade Aquatic Habitat
- Decrease clarity
- Increase turbidity
- Limits ability to treat drinking water

Waterbodies Impaired by Sediment (NYSDEC PWL)

- Sterling Creek
- Dutch Hollow Brook
- Minor Tributaries to Owasco Lake

#### **Nutrients**

Nutrients

- Phosphorus
- Nitrogen

Excessive Nutrient Impacts

- Algal Blooms
  - Toxic Blue Green Algae
    - Health Risk
    - Odor and Taste in Drinking Water

- Increase Weed Growth
  - Negative Impacts to Fish and Aquatic Life
    - Oxygen Depletion
    - Too many weeds to inhabit
- Reduce Water Clarity
- Depreciate Recreational Value
- Limits ability to treat drinking water
- Taste and Odor in Drinking Water
- Opportunities for invasive species

#### Sources of Nutrients

- Agriculture
  - Fertilizers
  - Manure
  - Eroded Soil Particles
- Residential and Urban
  - Septic Systems
  - Pet Waste
  - Eroded Soil Particles
  - Yard Waste
  - Sewer systems
- Construction
  - Eroded Soil Particles
- (Stormwater)
- Natural Sources

#### Waterbodies Impacted by Nutrients (NYSDEC PWL)

- Cold Spring/North Brook
- Owasco Outlet
- Minor Tributaries to Owasco Lake
- Upper Big Salmon Creek and its Tributaries
- Sterling Creek
- Upper Owasco Inlet
- Tributaries to Duck Lake
- Little Sodus Bay

#### Control of Sediment/Nutrients

- Phase II Stormwater Regulations-Construction
- Education
- Homeowner Prevention

## **Invasive and Nuisance Species Working Group**

### Aquatic Species:

- Plants
  - Hydrilla
  - Water Chestnut
  - European Frogbit
  - Eurasian Watermilfoil
  - Curly Leaf Pondweed
- Animals
  - Asian Clam
  - Chinese Mystery Snail
  - Bloody Red Shrimp
  - Quagga Mussels
  - Zebra Mussels
  - Snakehead
  - Rock Snot
- Virus
  - VHS- Viral Hemorrhagic Septicemia

### Terrestrial Species

- Plants
  - Japanese Knotweed
  - Garlic Mustard
  - Purple Loosestrife
- Insects
  - Asian Longhorn Beetle
  - Emerald Ash Borer
  - Hemlock Woolly Adelgid
- Animals
  - Feral Pigs

### Introduction Pathways

- Boats
- Water Gardens
- Aquariums
- Gardens
- Firewood
- Animals
- Ballast Water
- Contaminated Soil
- Flooding
- Wading Boots and Other Fishing Gear
- Bait Buckets
- Intentional Introduction

- Live Food Industry
- Vehicular Transportation
- Illegal Stocking
- Nursery

#### Control/Mitigation Methods

- Prevention
- Mechanical Treatment
  - Handpulling
  - Mechanical Harvesting
  - Cutting
  - Mowing
  - Burning
  - Mats/Bottom Barriers
  - Diver Assisted Hand Harvesting
  - Dredging
  - Water Level Drawdown
- Chemical Treatment
- Biological Treatment
- Cultural
  - Education

#### What Species of Concern are in What Cayuga County Waterbodies

- Cayuga Lake
  - Hydrilla
  - Eurasian Watermilfoil
- Owasco Lake
  - Asian Clam
  - Chinese Mystery Snail
  - Eurasian Watermilfoil
- Duck Lake
  - Eurasian Watermilfoil
- Lake Como
  - Eurasian Watermilfoil
- Sterling Creek
  - Water Chestnut
  - European Frogbit
- Seneca River and Cayuga/Seneca Canal
  - Water Chestnut
  - Bloody Red Shrimp
- Cross Lake
  - Water Chestnut

#### Effects of Invasive Species

- Alter physical environment



- Reduce species diversity
- Decrease property values
- Negatively impact fisheries
- Negatively impact recreational resources
- Cause algae blooms
- Negatively impact drinking water source
- Biofouling

What can cause an increase in aquatic invasive plants:

- Nutrients
- Increased water clarity due to zebra and quagga mussels
- Sediment deposition in lakes and at mouth of creeks

Aquatic plants reproduce by

- Seeds
- Fragmentation
- Roots (rhizomes, tubers, turions, stolons, etc.)

## **Coliform Bacteria Working Group**

### Sources:

- Agriculture
- Wildlife
- Pets
- Septic Systems
- Boats
- Sewer Systems

### Impacts

- Human Health impacts
- Loss of recreational use
- Hazard to drinking water

### Waterbodies Impacted by Bacteria (NYSDEC PWL)

- Owasco Lake
- Little Sodus Bay (suspected)

### Control

- Septic System Inspection Program
- Geese Management
- Education
  - Pet owners
  - Boaters
  - Farmers
  - Households
  - Municipalities
- Pet Waste Collection Stations and Education
- Dumping stations for boats
- Best Management Practices for Agriculture

## **Solid and Hazardous Waste Working Group**

### **Household Hazardous Waste**

Corrosive, toxic, ignitable, or reactive household products.

#### Includes

- Paints
- Cleaners
- Oils
- Batteries
- Pesticides

#### Improper Disposal Includes

- Pouring down the drain
- Pouring down storm sewer
- Pouring onto the ground
- Put in trash
- Dumping

#### Impacts

- Can cause surface and groundwater contamination.
- Human health risks
- Pollution of the environment

### **Other Hazardous Wastes**

Schools, farms, municipalities and County Agencies

Provide information on medication disposal, syringe disposal.

Other information same as household hazardous waste.

### **Electronic Waste**

#### Includes

- Computers
- Monitors
- Televisions
- Other electronics containing hazardous materials such as lead and mercury

Hazardous materials in electronic waste include

- Lead
- Mercury
- Fire retardant
- Cadmium

- Lithium

#### Impacts

- Can cause surface and groundwater contamination.
- Human health risks
- Pollution of the environment
- Improper disposal

#### Cayuga County Conducts Hazardous Waste Pickups

- Safer homes, schools and businesses for residents and emergency response workers.
- Protection of our lakes and groundwater from improper disposal.

#### New York State Electronic Equipment Recycling and Reuse Act

#### Yard Waste

##### Includes

- Lawn Clippings
- Leaves
- Brush
- Other Organic Matter from the Yard

##### Impacts

- Nutrients can enter water
- Yard waste on streambanks can suffocate and kill plants leading to erosion

**Attachment 6:**  
**Working Group Work Plans**



# **Sediment and Nutrient Reduction**

## **Introduction**

This final report of the Sediment and Nutrient Reduction Working Group of the WQMA describes the Group's recommended strategies for addressing the issue of sediment and nutrient loading in the waterbodies of Cayuga County. It presents data on the phosphorus loading potential of subwatersheds in the County, and advances a methodology for member agencies of the WQMA and others to use in evaluating techniques to manage loading from a variety of sources. Since actions taken pursuant to the objectives of any of the other three focus areas of the Strategic Plan can affect systems and processes that influence sediment and nutrient loading, the methodology may also be useful in helping the WQMA develop synergistic programs and implement an integrated approach to improving water quality.

## **Goal, Objective, and Strategies**

**Goal:** Reduce sediment and nutrient loadings in waterbodies where problems or impacts caused by sediment and nutrients are apparent, and prevent excess loadings in all other waterbodies across the County.

**Objective:** Support the application of best management practices to treat or reduce causal factors of sediment and nutrient loading in areas and situations where they will have the greatest effect.

**Strategy #1:** Focus sediment and nutrient reduction activities in:

- The subwatersheds of waterbodies identified by the NYS Department of Environmental Conservation or other trusted authority as impaired by sediment or nutrient loading (Appendix 1); and
- The subwatersheds identified by the Sediment and Nutrient Reduction Working Group of the WQMA as having the highest relative potential for phosphorus loading based on their land cover characteristics

**Strategy #2:** Use the methodology recommended by the Sediment and Nutrient Reduction Working Group of the WQMA to evaluate and choose between alternative management practices to propose and apply.

## **Phosphorus Loading Potential of Subwatersheds**

Nutrient loads to a waterbody are dependent on a variety of characteristics of the waterbody's watershed including soils, topography, land cover, precipitation, land use activities, and conservation practices that might be taking place. GIS analysis performed by Cayuga County

have shown that while any of these factors can potentially account for localized variation in nutrient loading, the one characteristic of the landscape that accounts for the greatest differences in nutrient loading potential between different watersheds in Cayuga County is land cover. Relative differences in the nutrient loading potential of hydrological units at a certain level may be reliably estimated on the basis of what is known about the quantities of nutrients that are generated by the different types of land cover present [1,2].

Maps showing eighteen different categories of land cover in Cayuga County have been prepared using satellite-derived data recorded in 2006 and distributed by the U.S. Geological Survey (USGS). The land cover categories are listed in Appendix 2 along with their respective phosphorus export coefficients - estimates of the quantities of phosphorus they generate per unit area per unit time (kg/ha/yr). Calculations incorporating export coefficients yield measurable, testable estimates of the nutrient loads that are important components of nutrient budgets in which the levels of nutrients entering, circulating within, and exiting a waterbody are modeled. Phosphorus is the nutrient of primary concern here because it is considered the most important limiting factor for the growth of aquatic organisms in lakes and ponds. Overgrowth of algae and aquatic plants stimulated by unnaturally high concentrations of phosphorus is a leading cause of water quality problems in Cayuga County.

Phosphorus binds very readily to particles of soil and organic matter [3]. Because of this, eroded sediment transported by runoff is a significant source of phosphorus in lakes and streams. The most effective nutrient reduction programs are, therefore, those that address runoff that may contain phosphorus attached to particles in sediment as well as runoff that may contain the relatively smaller amounts of "free" phosphorus that is unattached and in a soluble state.

Maps showing boundaries of subwatersheds of the most detailed level of classification in the hydrological system of the USGS have been prepared using what is known as the 12-digit Watershed Boundary Dataset.

Appendix 3 contains a map depicting the results of a GIS analysis in which the average phosphorus export coefficients were calculated for each subwatershed. Based on consideration of land cover alone, the subwatersheds with the highest average export coefficients may be regarded as having the highest phosphorus export potential. A larger scale map showing the distribution of various land cover classes across two subwatersheds is contained in Appendix 4.

## **Methodology for Evaluating Management Practices**

### Selection of Alternative Practices to Consider

The methodology begins with the selection of alternative practices to consider. The Working Group has prepared an annotated list of sediment and nutrient reduction management practices classified into five categories: waste management, soil management, runoff management, nutrient management, and water resource protection (See Appendix 5). Clues to the situations in which one or more management practice might be effective are provided by their description and classification. While the list is quite comprehensive, it is not intended to be all-inclusive. Those



who may have specialized knowledge of additional practices and their applicability in specific areas should consider them in the evaluation process as necessary.

Two references served as the primary sources of information on the items in the list:

- The Natural Resources Conservation Service (NRCS) Field office Technical Guide (FOTG) for Cayuga County, Section 4 – Conservation Practices ([efotg.sc.egov.usda.gov/treemenuFS.aspx](http://efotg.sc.egov.usda.gov/treemenuFS.aspx)), and
- The U.S. Environmental Protection Agency National Pollutant Discharge Elimination System (NPDES) National Menu of Stormwater Best Management Practices, Part 4 – Construction and Post-construction ([cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm](http://cfpub.epa.gov/npdes/stormwater/menuofbmps/index.cfm)).

Additional technical information on the practices and their applicability is provided in these references. Users of the evaluation methodology are encouraged to refer to them frequently to check for revised descriptions, newly described practices, and other changes and updates.

### Weighting of Evaluation Criteria

A set of criteria for evaluating alternative practices is described in Appendix 6. These criteria were developed by modifying a preliminary list advocated by Cornell University's PRO-DAIRY Program to include additional considerations suggested during a brainstorming session of the Working Group.

The evaluation criteria are listed in a matrix in Appendix 7 along with the various landscape types in which management practices may be applied. When completed for each practice being contemplated by checking off the criteria that might impact decisions to apply the practice in each landscape type that might be encountered, the matrix may be useful in making preliminary decisions about the practice/landscape type combinations that deserve further consideration.

In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.

Numerical weights indicating the relative importance of each criterion are shown in Appendix 8. The numerical weights were determined using a method known as the Analytical Hierarchy Process (AHP). Under this method, weights are derived from an analysis of rankings established by making a series of judgments based on pairwise comparisons. Several meetings of the Working Group were held during which every possible pair of criteria was discussed and each member separately ranked the importance of what they considered to be the more important criterion in each pair on a scale from 1 to 5. The final weights were calculated by analyzing and combining the responses of all of the members.

The weights are intended to serve only as a starting set of importance values, and are subject to revision as the process is tested and the results of its application in various situations are reviewed.

#### Evaluation of Practices - Completing the Evaluation Matrix

Appendix 9 contains a matrix for use in evaluating alternative management practice/landscape type combinations. In each matrix the weighted values of the criteria that are expected to be met in each practice/landscape type combination are entered in the corresponding spaces. Where a criterion cannot reasonably be expected to be met, the space is left blank. The total score for a particular practice/landscape type combination is calculated by adding all of the values in the practice/landscape type column. The practice/landscape type combinations with the highest total scores are those predicted by the methodology to have the potential to be the most effective.

#### **Example**

Appendix 10 contains sample matrices that have been completed to illustrate the implementation of the methodology in a hypothetical case study.

In this case, a project is being considered to control stormwater on residential sites using structural best management practices. Three practices have been selected to compare: 1) rain gardens; 2) porous pavement; and 3) roof runoff structures. The first two practices would be implemented in medium density development areas and the third would be implemented in agricultural farmstead settings. The three management practice relevance matrices provide an early indication of the relative feasibility of each practice, while the final matrix serves as a tool for calculating scores for each practice/landscape type combination based on the weights previously assigned to the criteria.

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[1] Nutrient Loading Estimates for Lakes. Rast, W. and Lee, G.F. Journal of Environmental Engineering. Vol. 109, No. 2. April 1983.

[2] Watershed Weighting of Export Coefficients to Map Critical Phosphorus Loading Areas. Endreny, Theodore A. and Wood, Eric F. Journal of the American Water Resources Association. Vol. 39, Issue 1. February 2003.

[3] Soil and Applied Phosphorus. Schulte, E.E. and Kelling, K.A. University of Wisconsin-Extension Cooperative Extension Publication A2520, 1996.

**APPENDIX 1: NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION SECTION 303(d) LIST OF IMPAIRED WATERBODIES REQUIRING A TMDL OR OTHER STRATEGY**

<b>Waterbody Name (WI/PWL ID)</b>	<b>County</b>	<b>Class</b>	<b>Pollutant</b>	<b>Source</b>
Duck Lake (0704-0025)	Cayuga	C	Phosphorus	Unknown
Owasco Inlet, Upper, and tribs (0706-0014)	Cayuga	C(T)	Nutrients	Municipal, Agriculture
Cayuga Lake, Southern End (0705-0040)	Tompkins	A	Pathogens	Municipal, Non-Point Source
Cayuga Lake, Southern End (0705-0040)	Tompkins	A	Phosphorus	Municipal, Non-Point Source
Cayuga Lake, Southern End (0705-0040)	Tompkins	A	Silt/Sediment	Municipal, Non-Point Source
Lake Ontario Shoreline, Central (0302-0042)	Cayuga	A	Dioxin	Contaminated Sed.
Lake Ontario Shoreline, Central (0302-0042)	Cayuga	A	Mirex	Contaminated Sed.
Lake Ontario Shoreline, Central (0302-0042)	Cayuga	A	PCBs	Contaminated Sed.
Crane Brook and tribs (0704-0024)	Cayuga	C	Salts	Unknown
Owasco Lake (0706-0009)	Cayuga	AA(T)	Pathogens	Wildlife/Other Sources

*Source –NYSDEC, 2012*

## Appendix 2

### National Land Cover Dataset Land Cover Classes

CLASS NAME	P COEFF (kg/ha/yr)*	Coeff Source
Developed, High Intensity	0.70	1
Developed, Medium Intensity	0.40	1
Developed, Low Intensity	0.10	1
Developed, Open Space	0.10	1
Cultivated Crops	2.10	1
Pasture/Hay	0.45	1
Grassland/Herbaceous	0.28	1
Deciduous Forest	0.07	1
Evergreen Forest	0.20	1
Mixed Forest	0.14	1
Scrub/Shrub	0.28	1
Palustrine Forested Wetland	0.09	1
Palustrine Scrub/Shrub Wetland	0.09	2
Palustrine Emergent Wetland	0.10	1
Unconsolidated Shore	0.19	2
Bare Land	0.28	1
Palustrine Aquatic Bed	0.10	2
Open Water (ignored in the analysis)		

\*1 kg/ha/yr = 0.892 lbs/ac/yr

Sources of coefficients:

- 1 Oneida Lake Watershed Nutrient Management Plan: Phosphorus Budget,  
Prepared for the Central New York Regional Planning Board, EcoLogic LLC, 2007
- 2 Estimated by Cayuga County Planning Dept. Staff based on characteristics  
shared with the other classes

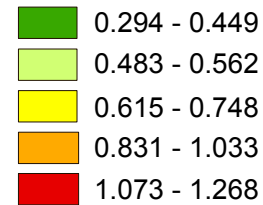
# APPENDIX 3

## Average Phosphorus Export Coefficient

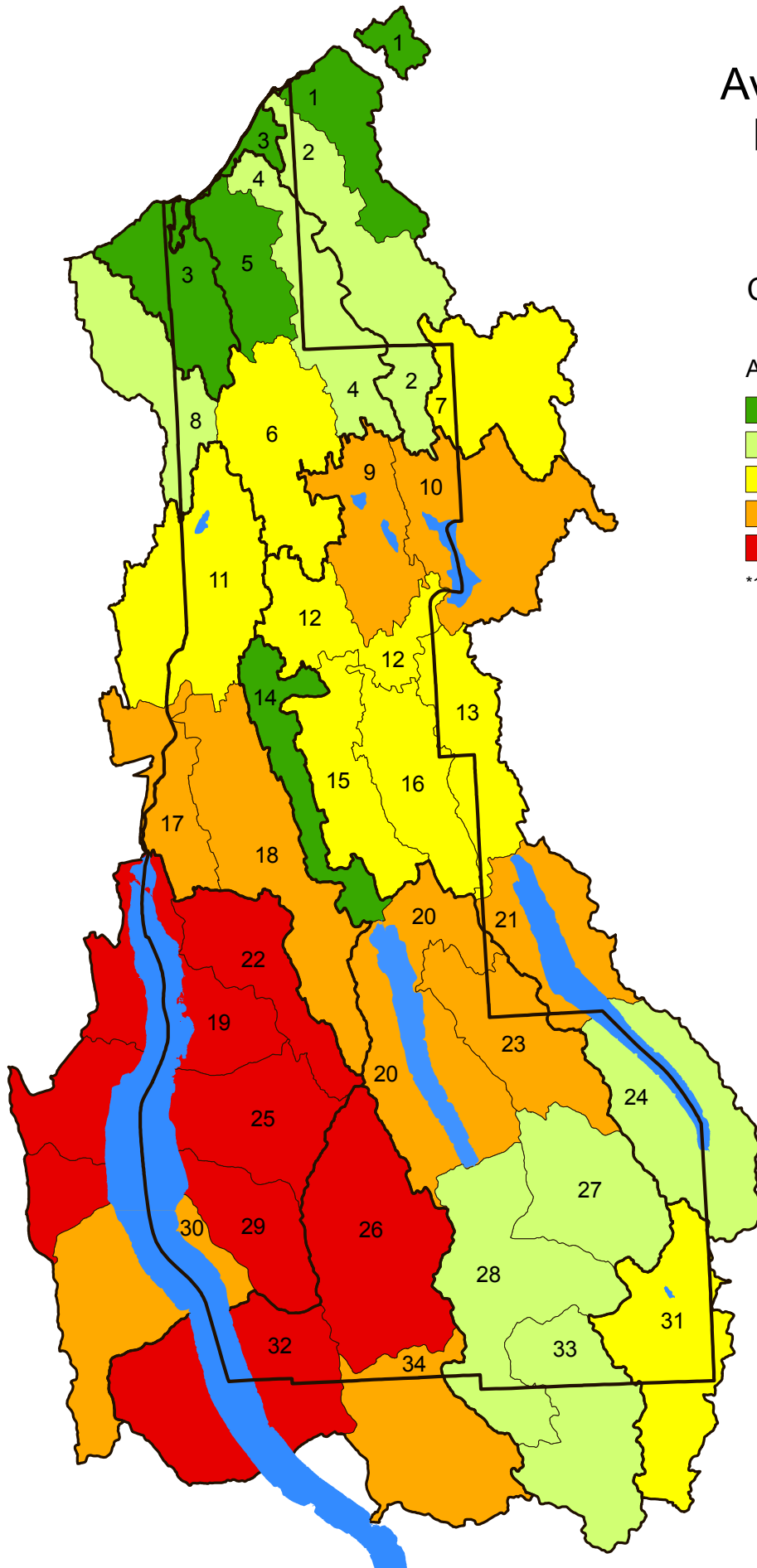
By Subwatershed Level  
Hydrological Unit

Cayuga County, New York

Average Export Coefficient (kg/ha/yr)\*



\*1 kg/ha/yr = 0.892 lbs/ac/yr

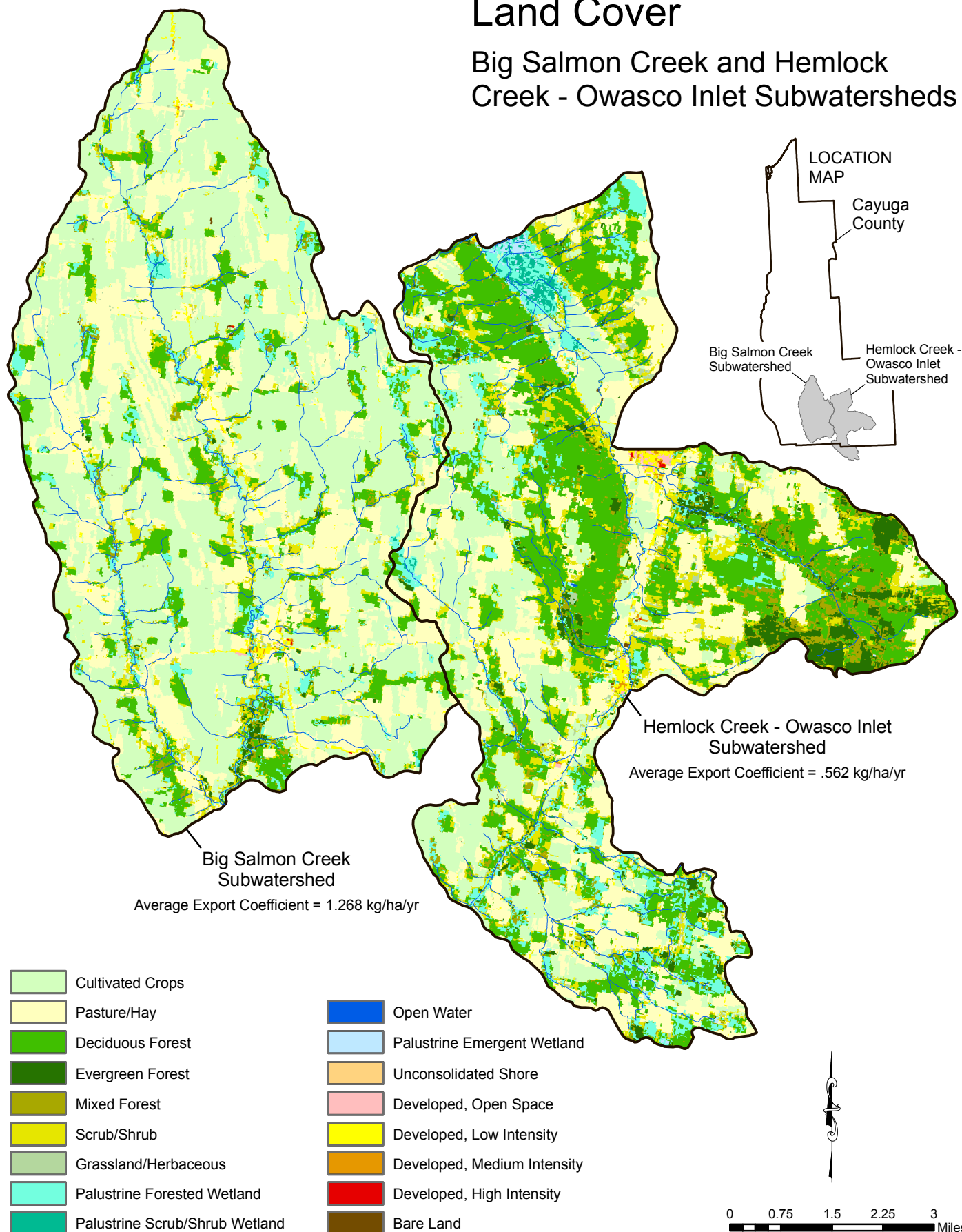


- 1 Eightmile Creek-Frontal Lake Ontario
- 2 Ninemile Creek
- 3 Amherst Island-Frontal Lake Ontario
- 4 Sterling Valley Creek
- 5 Sterling Creek
- 6 Headwaters Sterling Creek
- 7 Ox Creek
- 8 Red Creek
- 9 Muskrat Creek
- 10 Cross Lake-Seneca River
- 11 Howland Island-Seneca River
- 12 Stark Pond - Seneca River
- 13 Skaneateles Creek
- 14 Owasco Outlet
- 15 Cold Spring Brook
- 16 Putnam Brook
- 17 Kipp Island-Seneca River
- 18 Crane Brook
- 19 Demont Creek-Cayuga Lake
- 20 Owasco Lake
- 21 Outlet Skaneateles Lake
- 22 Yawger Creek
- 23 Dutch Hollow Brook
- 24 Grout Brook-Skaneateles Lake
- 25 Red Creek-Cayuga Lake
- 26 Big Salmon Creek
- 27 Mill Creek
- 28 Hemlock Creek-Owasco Inlet
- 29 Paines Creek-Cayuga Lake
- 30 Shelldrake Creek-Cayuga Lake
- 31 Upper Fall Creek
- 32 Lively Run-Cayuga Lake
- 33 Headwaters Owasco Inlet
- 34 Salmon Creek

# APPENDIX 4

## Land Cover

### Big Salmon Creek and Hemlock Creek - Owasco Inlet Subwatersheds



## APPENDIX 5: SEDIMENT AND NUTRIENT MANAGEMENT PRACTICES

*NOTE: This list is not intended to be all-inclusive. Those who may have specialized knowledge of additional practices and their applicability in specific areas should consider them in the evaluation process as necessary. Descriptions of these practices and how they are applied are subject to revision. Refer to the NRCS Field Office Technical Guide, the USEPA NPDES National Menu of Stormwater Best Management Practices and other resources for updates.*

**Waste Management** – practices that contain, transfer, store, treat, and/or land apply wastes.

313 – Waste Storage Facility: A waste storage impoundment made by constructing an embankment and/or excavating a pit or dugout, or by fabricating a structure.

317 – Composting Facility: A structure or device to contain and facilitate the controlled aerobic decomposition of manure or other organic material by micro-organisms into a biologically stable organic material that is suitable for use as a soil amendment.

561 – Heavy Use Area Protection: The stabilization of areas frequently and intensively used by people, animals or vehicles by establishing vegetative cover, by surfacing with suitable materials, and/or by installing needed structures.

629 – Agricultural Waste Treatment: The mechanical, chemical or biological treatment of agricultural waste.

634 – Agricultural Waste Transfer: A system using structures, conduits, or equipment to convey byproducts (wastes) from agricultural operations to points of usage.

635 – Vegetated Agricultural Treatment Area: An area of permanent vegetation used for agricultural wastewater treatment.

656 – Constructed Wetland: An artificial ecosystem with hydrophytic vegetation for agricultural water treatment.

**Soil Management** – practices applied on lands that help to improve the soil and keep the soil in place.

328 – Conservation Crop Rotation (w/Residue and Tillage Management Practices): Growing crops in a planned sequence on the same field.

330 – Contour Farming: Using ridges and furrows formed by tillage, planting and other farming operations to change the direction of runoff from directly downslope to around the hill slope.

340 – Cover Crop: Crops including grasses, legumes and forbs for seasonal cover and other conservation purposes.

484 – Mulching: Application of a protective cover of plant residues or other suitable material not produced on the site to the soil surface.

528 – Prescribed Grazing: Managing the harvest of vegetation with grazing and/or browsing animals.

585 – Strip Cropping: Growing planned rotations of row crops, forages, small grains, or fallow in a systematic arrangement of equal width strips across a field.

600 – Terrace: An earth embankment, or a combination ridge and channel, constructed across the field slope.

Eco-Friendly Lawn and Landscape Care: Use of Lawn and Landscape maintenance methods that minimize phosphorus loading such as aeration, selecting plants with low irrigation requirements, mowing high, and improving soil with organic amendments.

**Runoff Management** – practices that capture and transport clean surface runoff in order to prevent it from contacting and transporting sediment and nutrients.

362 – Diversion: A channel generally constructed across the slope with a supporting ridge on the lower side.

412 – Grassed Waterway: A shaped or graded channel that is established with suitable vegetation to carry surface water at a non-erosive velocity to a stable outlet.

558 – Roof Runoff Structure: Structures that collect, control, and transport precipitation from roofs.

606 – Subsurface Drain: A conduit, such as corrugated plastic tubing, tile, or pipe, installed beneath the ground surface to collect and/or convey drainage water.

607 – Surface Drain – Field Ditch: A graded ditch for collecting excess water in a field.

638 – Water and Sediment Control Basin (WASCOB): An earth embankment or a combination ridge and channel constructed across the slope of minor watercourses to form a sediment trap and water detention basin with a stable outlet.

656 – Constructed Wetland: An artificial ecosystem with hydrophytic vegetation for stormwater treatment.

**Nutrient Management** – practices that balance the nutrient needs of the crops and other plantings with inputs (manure and fertilizer). These nutrients are handled and applied in a way that will minimize losses to the environment.

590 – Nutrient Management: Managing the amount, source, placement, form and timing of the application of plant nutrients and soil amendments.

592 – Feed Management: Managing the quantity of available nutrients fed to livestock and poultry for their intended purpose.



**Water Resource Protection** – practices applied in or adjacent to a waterway

326 – Clearing and Snagging: Removal of vegetation along the bank (clearing) and/or selective removal of snags, drifts, or other obstructions (snagging) from natural or improved channels and streams.

390 – Riparian Herbaceous Cover: Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, established or managed as the dominant vegetation in the transitional zone between upland and aquatic habitats.

391 – Riparian Forest Buffer: An area predominantly trees and/or shrubs located adjacent to and up-gradient from watercourses or water bodies.

393 – Filter Strip: A strip or area of herbaceous vegetation that removes contaminants from overland flow.

575 - Animal Trails and Walkways: Established lanes or travel ways that facilitate animal movement, includes stream crossings.

**Stormwater** – erosion and sediment control practices associated with development. Includes temporary and permanent practices.

Biotechnical Slope Protection: Combines structural measures (stone) with woody plants to stabilize critical areas, such as streambanks or roadside slopes.

Critical Area Planting: Establishing grasses (possibly with forbs or shrubs) to provide vegetative cover on disturbed, denuded slopes subject to erosion.

Riprap Slope Protection: A layer of stone designed to protect and stabilize areas subject to erosion.

Structural Streambank Protection: Stabilization of eroding streambanks by the use of designed structural measures; such as riprap, gabions, precast concrete wall units, and grid pavers.

Retaining Wall: A structural wall constructed and located to prevent soil movement.

Surface Roughening: Increasing the relief of a bare soil surface with horizontal grooves by either stair-stepping (running parallel to the contour of the land) or using construction equipment to track the surface.

Temporary Access Waterway Crossing: Provide a safe, stable way for construction vehicle traffic to cross a watercourse.

Compost Filter Berms and Socks: A compost filter berm is a dike of compost or a compost product that is placed perpendicular to sheet flow runoff to control erosion in disturbed areas and retain sediment. A compost filter sock is a type of contained compost filter berm.

Filter Berm: A temporary ridge made up of loose gravel, stone, or crushed rock that slows and filters flow and diverts it from an open traffic area.

Stabilized Construction Entrance and Washing Station: A stabilized construction site entrance to remove mud and sediment from vehicles and reduce soil transport off site. Consists of a pad of crushed stone underlain with geotextile. Washing stations may also help to remove sediment from vehicles before they leave the site.

Sediment Trap, Sediment Basin, and Retention Basin (Wet Pond): Captures or slows stormwater runoff before it leaves a site to allow sediment to settle.

Silt Fence: Temporary fencing that retains soil on disturbed land.

Pipe Slope Drain: A flexible conduit for stormwater that extends the length of a disturbed slope to divert the flow and serve as a temporary outlet.

Check Dam: Small, temporary structures constructed across a swale or channel to slow the velocity of concentrated water flows.

Fiber Roll: A coir (coconut fiber), straw, or excelsior woven roll encased in netting of jute, nylon, or burlap. Dissipates energy along streambanks, channels, and bodies of water and reduces sheet flow on slopes.

Infiltration Basin and Infiltration Trench: Shallow impoundment or trench which is designed to infiltrate stormwater into the soil.

Permeable, Pervious, or Porous Pavement: Pavement with joints or void space allowing stormwater to drain through it.

Bioretention (Rain Garden): Landscaping features adapted to providing on-site treatment of stormwater runoff.

Rain Barrel, Planter, and Dry Well: Structures that store or infiltrate stormwater, often from rooftops.

## **APPENDIX 6: EVALUATION CRITERIA**

### **Potential Positive Impact on Nutrient Load Reduction**

The overall relevance or applicability of the practice as a phosphorus loading reduction strategy.

### **Measurability of Impact on Nutrient Loading**

The precision and accuracy with which phosphorus loading reductions resulting from the practice can be measured.

### **Potential to Avoid Negative Impacts**

The extent to which the practice would prevent harm to social, economic and environmental systems.

### **Potential for Acceptance/Buy-In by Stakeholders**

The extent to which the practice could be expected to be embraced by those whose participation is critical to its implementation.

### **Potential for Acceptance by the General Public**

The extent to which the practice could be expected to be embraced by the general community.

### **Compatibility with Current On-Site Physical Systems**

The applicability of the practice in the specific areas where phosphorus loading reduction is most necessary.

### **Compatibility with Currently Successful Management Practices**

The extent to which the practice complements or enhances phosphorus loading reduction strategies already being implemented.

### **Compatibility with Existing Plans**

The extent to which the practice is consistent with the goals, objectives and strategies of locally adopted conservation and development plans.

### **Availability of Financial and Other Required Resources**

The extent to which funding, materials, equipment, labor and technical expertise is available to implement the practice.

### **Potential Benefits Versus Cost**

The expected return on investment in terms of the amount of phosphorus loading reduction expected per dollar spent.

### **Short Term Effectiveness Versus Need for Long Term Implementation**

The extent to which the practice is expected to have the desired effect over a period of one to three years instead of requiring a longer period of implementation.

**Sustainability of Successful Implementation**

The likelihood that the practice can be continued in the manner desired over the time period required for it to be effective.

Note: In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.

PRACTICE: \_\_\_\_\_

APPENDIX 7: MANAGEMENT PRACTICE RELEVANCE MATRIX  
Landscape Types

Ranking/Rating Criteria	Agricultural					Woodland		Public ROW		Developed			Wetlands		Urban/Recreational Grasses			Mines		Water		
	Farmstead	Cropland	Pasture	Orchard	Vineyard	Shrub	Mature	Ditches	Transport -ation	High	Medium	Low	Wooded	Non- Wooded	Parks	Golf Courses	Lawns	Strip	Quarries	Ponds	Streams	Lakes
Potential Positive Impact on Nutrient Load Reduction																						
Potential to Avoid Negative Impacts																						
Short Term Effectiveness Versus Need for Long Term Implementation																						
Potential for Acceptance/Buy-In by Stakeholders																						
Sustainability of Successful Implementation																						
Potential Benefits Versus Cost																						
Availability of Financial and Other Required Resources																						
Compatibility with Currently Successful Management Practices																						
Measurability of Impact on Nutrient Loading																						
Compatibility with Current On-Site Physical Systems																						
Potential for Acceptance by the General Public																						
Compatibility with Existing Plans																						

Note: In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.

## APPENDIX 8: EVALUATION CRITERIA WEIGHTS

CRITERIA	WEIGHTS
<b>Compatibility with Existing Plans</b>	1.00
<b>Potential for Acceptance by the General Public</b>	1.04
<b>Compatibility with Current On-Site Physical Systems</b>	1.75
<b>Measurability of Impact on Nutrient Loading</b>	1.99
<b>Compatibility with Currently Successful Management Practices</b>	2.15
<b>Availability of Financial and Other Required Resources</b>	2.19
<b>Potential Benefits vs. Cost</b>	2.30
<b>Sustainability of Successful Implementation</b>	2.41
<b>Potential for Acceptance/Buy-In from Stakeholders</b>	2.42
<b>Short-Term Effectiveness vs. Need for Long-Term Implementation</b>	2.64
<b>Potential to Avoid Negative Impacts</b>	3.12
<b>Potential Positive Impact on Nutrient Load Reduction</b>	4.39

The figure above reflects the consensus of the WQMA Sediment and Nutrient Reduction Work Group. The numbers in the weights column indicate the relative importance that this group placed on the criteria to the left of the number. Thus a P reduction technique that has a “Potential Positive Impact on Nutrient Load Reduction” is 4.39 times more important to the group than a P reduction technique that has “Compatibility with Existing Plans”.

## APPENDIX 9: MANAGEMENT PRACTICE EVALUATION MATRIX

PROJECT: \_\_\_\_\_

Ranking/Rating Criteria	Practice: Landscape Type:	Practice: Landscape Type:	Practice: Landscape Type:	Practice: Landscape Type:
Potential Positive Impact on Nutrient Load Reduction Weight: 4.39				
Potential to Avoid Negative Impacts Weight: 3.12				
Short Term Effectiveness Versus Need for Long Term Implementation Weight: 2.64				
Potential for Acceptance/Buy-In by Stakeholders Weight: 2.42				
Sustainability of Successful Implementation Weight: 2.41				
Potential Benefits Versus Cost Weight: 2.30				
Availability of Financial and Other Required Resources Weight: 2.19				
Compatibility with Currently Successful Management Practices Weight: 2.15				
Measurability of Impact on Nutrient Loading Weight: 1.99				
Compatibility with Current On-Site Physical Systems Weight: 1.75				
Potential for Acceptance by the General Public Weight: 1.04				
Compatibility with Existing Plans Weight: 1.00				
<b>Total:</b>				

APPENDIX 10: EXAMPLE  
MANAGEMENT PRACTICE RELEVANCE MATRIX  
Landscape Types

Ranking/Rating Criteria	Agricultural					Woodland		Public ROW		Developed			Wetlands		Urban/Recreational Grasses			Mines		Water		
	Farmstead	Cropland	Pasture	Orchard	Vineyard	Shrub	Mature	Ditches	Transport -ation	High	Medium	Low	Wooded	Non- Wooded	Parks	Golf Courses	Lawns	Strip	Quarries	Ponds	Streams	Lakes
Potential Positive Impact on Nutrient Load Reduction											√											
Potential to Avoid Negative Impacts											√											
Short Term Effectiveness Versus Need for Long Term Implementation																						
Potential for Acceptance/Buy-In by Stakeholders											√											
Sustainability of Successful Implementation											√											
Potential Benefits Versus Cost											√											
Availability of Financial and Other Required Resources											√											
Compatibility with Currently Successful Management Practices											√											
Measurability of Impact on Nutrient Loading																						
Compatibility with Current On-Site Physical Systems																						
Potential for Acceptance by the General Public											√											
Compatibility with Existing Plans																						

Note: In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.



APPENDIX 10: EXAMPLE  
MANAGEMENT PRACTICE RELEVANCE MATRIX  
Landscape Types

Ranking/Rating Criteria	Agricultural					Woodland		Public ROW		Developed			Wetlands		Urban/Recreational Grasses			Mines		Water		
	Farmstead	Cropland	Pasture	Orchard	Vineyard	Shrub	Mature	Ditches	Transport -ation	High	Medium	Low	Wooded	Non- Wooded	Parks	Golf Courses	Lawns	Strip	Quarries	Ponds	Streams	Lakes
Potential Positive Impact on Nutrient Load Reduction											√											
Potential to Avoid Negative Impacts											√											
Short Term Effectiveness Versus Need for Long Term Implementation																						
Potential for Acceptance/Buy-In by Stakeholders																						
Sustainability of Successful Implementation																						
Potential Benefits Versus Cost																						
Availability of Financial and Other Required Resources																						
Compatibility with Currently Successful Management Practices											√											
Measurability of Impact on Nutrient Loading																						
Compatibility with Current On-Site Physical Systems											√											
Potential for Acceptance by the General Public											√											
Compatibility with Existing Plans																						

Note: In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.

APPENDIX 10: EXAMPLE  
MANAGEMENT PRACTICE RELEVANCE MATRIX  
Landscape Types

Ranking/Rating Criteria	Agricultural					Woodland		Public ROW		Developed			Wetlands		Urban/Recreational Grasses			Mines		Water		
	Farmstead	Cropland	Pasture	Orchard	Vineyard	Shrub	Mature	Ditches	Transport -ation	High	Medium	Low	Wooded	Non- Wooded	Parks	Golf Courses	Lawns	Strip	Quarries	Ponds	Streams	Lakes
Potential Positive Impact on Nutrient Load Reduction	√																					
Potential to Avoid Negative Impacts	√																					
Short Term Effectiveness Versus Need for Long Term Implementation	√																					
Potential for Acceptance/Buy-In by Stakeholders	√																					
Sustainability of Successful Implementation	√																					
Potential Benefits Versus Cost	√																					
Availability of Financial and Other Required Resources																						
Compatibility with Currently Successful Management Practices	√																					
Measurability of Impact on Nutrient Loading																						
Compatibility with Current On-Site Physical Systems	√																					
Potential for Acceptance by the General Public	√																					
Compatibility with Existing Plans																						

Note: In most cases, the criteria will be used to evaluate practices to be applied on a single project site or on various sites in a project area within a single subwatershed. In cases when projects may include work in several subwatersheds, the criteria are not intended to be used in selecting which subwatersheds are more important. The WQMA recommends focusing sediment and nutrient reduction activities in the subwatersheds generally described in Strategy #1.

**APPENDIX 10: EXAMPLE  
MANAGEMENT PRACTICE EVALUATION MATRIX**

**PROJECT:** Residential Stormwater Management

<b>Ranking/Rating Criteria</b>	<i>Practice: Rain Gardens Landscape Type: Medium Density Developed</i>	<i>Practice: Porous Pavement Landscape Type: Medium Density Developed</i>	<i>Practice: Rain Barrel, Planter and Dry Well Landscape Type: Agricultural Farmstead</i>	<i>Practice: Landscape Type:</i>
Potential Positive Impact on Nutrient Load Reduction Weight: 4.39	4.39	4.39	4.39	
Potential to Avoid Negative Impacts Weight: 3.12	3.12	3.12	3.12	
Short Term Effectiveness Versus Need for Long Term Implementation Weight: 2.64			2.64	
Potential for Acceptance/Buy-In by Stakeholders Weight: 2.42	2.42		2.42	
Sustainability of Successful Implementation Weight: 2.41	2.41		2.41	
Potential Benefits Versus Cost Weight: 2.30	2.30		2.30	
Availability of Financial and Other Required Resources Weight: 2.19	2.19			
Compatibility with Currently Successful Management Practices Weight: 2.15	2.15	2.15	2.15	
Measurability of Impact on Nutrient Loading Weight: 1.99				
Compatibility with Current On-Site Physical Systems Weight: 1.75		1.75	1.75	
Potential for Acceptance by the General Public Weight: 1.04	1.04	1.04	1.04	
Compatibility with Existing Plans Weight: 1.00				
<b>Total:</b>	20.02	12.45	22.22	

## **WQMA STRATEGY INVASIVE SPECIES WORKING GROUP**

April 4, 2013

A key mission of the Cayuga County WQMA is to support and undertake activities aimed at slowing the spread and manage the impacts of invasive species, especially invasive aquatic species, in Cayuga County.

These activities will focus on four strategic areas:

- Prevention of Future Invasions
- Education
- Stakeholder cooperation
- Mitigation and control

### **PREVENTION OF FUTURE INVASIONS**

**Goal:** Collect information on possible future invasive species, make predictions about their potential spread into Cayuga County and act accordingly.

**Objective:** Research the characteristics of invasive species that may threaten Cayuga County and assess the risks they represent.

- Strategy: Review available studies and reports of federal and state agencies and other organizations and compile a list of species ranked according to the risks they represent based on:
  - How directly their attributes correlate with invasiveness;
  - The vulnerability of existing populations and ecological communities to their invasion; and
  - The severity of the biological and economic consequences that could result from their spread.
- CCE, Planning, FLI, SWCD

**Objective:** Prevent the introduction of future invasive species into Cayuga County.

- Strategy: Identify specific pathways by which future invasive species may enter Cayuga County and formulate intervention activities addressing each one.
  - CCE, Planning, FLI, SWCD, CNYRPDB

### **EDUCATION:**

**Goal:** Establish a coordinated effective invasive species education program utilizing existing resources and frameworks and develop new program components where necessary.

**Objective:** Support and encourage Cayuga County residents to take advantage of opportunities to learn about the prevention and management of invasive species.

- Strategy: Identify, promote and publicize training programs conducted in Cayuga County and neighboring counties.
  - CCE, Planning, FLI, SWCD, CLWN, CNYRPDB

**Objective:** Provide education and training programs to Cayuga County residents about the prevention and management of invasive species.

- Strategy: Develop an education and training program for invasive species in Cayuga County by utilizing programs, such as the Weeds Watch Out! Program, the Finger Lakes Institute Watercraft Steward Program, the Finger Lakes Partnership for Regional Invasive Species Management and the New York State Sea Grant.
  - CCE, Planning, FLI
- Strategy: Train the public in invasive species prevention and management at watershed association meetings.
  - CCE, CLWN, DLA, LCA, OWLA, SLA, SWCD
- Strategy: Train the general public in invasive species prevention and management at invasive species workshops.
  - CCE, Planning, FLI, SWCD, CLWN
- Strategy: Update and maintain the Cayuga County WQMA website and the Weeds Watch Out! Website to include information and links to new invasive species information and educational programs.
  - CCE, Planning, FLI

**Objective:** Improve and expand communication programs supporting invasive species education.

- Strategy: Prepare and publish two Eco-Talk articles per year on invasive species.
  - CCE
- Strategy: Identify gaps in existing communication programs and modify or revise them accordingly.
  - CCE, Planning
- Strategy: Update communication initiatives and materials regularly and make them available to a wide audience.
  - CCE, Planning, Parks, CLWN, DLA, LCA, OWLA, SLA, SWCD, FLI, CNYRPDB
- Strategy: Provide educational materials (signage, brochures, etc) to companies who sell and/or repair boats; companies who sell personal watercraft and boating/water recreation equipment including docks and lifts; fishing equipment suppliers and fishing tournament sponsors; and marinas.
  - CCE, Planning, Parks, CLWN, OWLA, SWCD, FLI, CNYRPDB

## **STAKEHOLDER COOPERATION:**

**Goal:** Build effective partnerships with individuals, organizations and agencies whose participation and cooperation are critical to slowing spread and managing the impacts of invasive species.

**Objective:** Develop processes to provide advice and counsel on invasive species to stakeholders.

Strategy: Act as a liaison by attending at least two Cayuga County Legislative meetings per year.

- WQMA chair or designee

**Objective:** Promote cooperation among the stakeholders and partners.

Strategy: Identify opportunities to co-sponsor efforts of other stakeholders and partners in their efforts to slow the spread and manage the impacts of invasive species.

- CCE, Planning, SWCD, CLWN

Strategy: Invite other stakeholders and partners to activities sponsored by the WQMA and its members and partners.

- WQMA members and partners

## **MITIGATION AND CONTROL:**

**Goal:** Work to identify and place resources in the hands of groups or organizations that will perform effective invasive mitigation and control.

**Objective:** Search for resources to assist in the mitigation and control of invasive species.

Strategy: Search and apply for funds from grant programs, private organizations and the government to fund effective programs.

- SWCD, Planning, OWLA

Strategy: Assist organizations by helping them find volunteers and other personnel to assist with programs.

- CCE, SWCD, CLWN

**Objective:** Work to control the spread of invasive aquatic species in Cayuga County waterbodies.

Strategy: Support existing aquatic invasive plant species control programs including the aquatic vegetation harvesting and hand harvesting of water chestnut and European frogbit.

- SWCD, CCE, DLA, LCA, CLWN

Strategy: Develop new strategies to address new infestations as they become evident.

- SWCD, Planning, Health, CLWN

Strategy: Support efforts to control the Asian clam population including assisting with the lowering of Owasco Lake in the winter to kill Asian clam in the Emerson Park area.

- City of Auburn, Health, Planning

Strategy: Support and assist in the establishment of boat cleaning and boat inspection practices.

- Parks, Planning, CCE, FLI, SWCD, CLWN

**Objective:** Support establishment and enforcement of new laws that help prevent the spread of invasive species in Cayuga County.

Strategy: Monitor developments at the State level for creating new regulations on invasive species and review and comment on proposed regulations.

- Planning, Owasco, CNYRPDB

Strategy: Propose own new regulations to address areas that State law does not address.

- Owasco, Planning

**Objective:** Utilize data that is collected and analyzed to inform the formulation of recommendations and allocation of resources.

Strategy: Summarize and disseminate results of data collection and analysis to the organizations working on implementing various strategies of this plan.

- CCE, Planning, OWLA, FLI, CLWN, SWCD

## **COLIFORM BACTERIA WORKING GROUP**

**Objective** To reduce the fecal coliform concentration in Owasco Lake and Duck Lake to no more than 200 fecal coliform colonies per 100 ml.

These two waterbodies were selected because there are current data available. In addition, Little Sodus Bay, on the PWL due to bacteria concerns, was not chosen due to its ongoing sewer installation project.

### **Strategies**

#### **1. Septic Systems**

- a. Maintain current septic system inspection program - CCHD
- b. Encourage the watershed inspector to visit properties in Tompkins County in search of problem septic systems – Auburn & Owasco
- c. Require system review and/or upgrade on home improvement projects on lakefront property (Owasco Lake) when the number of bedrooms is not increased - CCHD
- d. Investigate the feasibility of implementing a rental law to require rental units to register so the watershed inspector can inspect the properties more frequently – Auburn & Owasco, Planning
- e. Pass a law that residents must connect to the public sewer if it is available at the time of a property transfer - Owasco
- f. Provide education regarding septic system maintenance (such as CCE folders, magnets, brochures (to be handed out at time of inspection) – CCHD, Auburn & Owasco (WIP)
- g. Provide education to CEO's regarding contacting the Health Department before the issuance of building permits – CCHD
- h. Encourage the inspector to deliver "Welcome packages" to new homeowners about proper septic system maintenance – Auburn & Owasco

#### **2. Waterfowl**

- a. Utilize USDA to remove geese from property at Emerson Park as long as program is in place - Parks
- b. Plant shrubs or install other barriers to make habitat at Emerson Park less inviting – Parks, CNYRPDB
- c. Encourage property owners to utilize USDA to remove geese from their own property – OWLA, Duck Lake Association
- d. Encourage elected officials to allow nuisance permits for seagulls - Parks
- e. Purchase radio controlled eagle to scare waterfowl - Parks



- f. Implement campaign to discourage feeding of waterfowl - Parks, Duck Lake Association
  - g. Work with Dave Figura of the Post Standard and the editor of the Citizen to write articles encouraging hunting since there is a longer hunting season - Parks
- 3. Stormwater
  - a. Stencil storm drains—Auburn, Owasco, CNYRPDB
  - b. Encourage municipalities to adopt steep slope ordinances - Planning
  - c. Encourage rain barrels and rain gardens (Create a Rain Gardens for dummies brochure.)— CCE
  - d. Create a rain garden using the template created by CCE - Parks
  - e. Encourage municipalities to adopt stormwater regulations - Planning
  - f. Encourage municipalities to implement catch basin maintenance programs - Planning
  - g. Encourage municipalities to install socks in catch basins - Planning
  - h. Encourage the use of permeable pavement – Planning
  - i. Investigate which County properties might be good locations for permeable pavements based upon soils – Soil and Water
  - j. Dredge retention pond at Emerson Park - Parks
- 4. Yard Waste
  - a. Provide education regarding leaving clippings in place, proper handling of yard waste -CCE
  - b. Work with Human Service Coalition to create fundraising opportunities – Youth raking leaves for donations -CCE
- 5. Pet waste
  - a. Encourage local law in Owasco, Fleming, Moravia on picking up dog waste on sidewalks and roads - Planning
  - b. Educate on proper disposal of dog waste - CCE
  - c. Provide pet waste collection stations – Parks, Duck Lake Association
  - d. Install signage at Emerson Park that it is a violation to leave dog waste - Parks
- 6. Agriculture
  - a. Overspreading is a concern, especially in certain places
    - i. Educate the farmer, and the person who drives the tractor - CCE
    - ii. Educate farmers and planners on numbered streams – S&W
    - iii. Encourage the use of model leases which specifies spreading conditions that are allowed - CCE
    - iv. Create a relationship network between farmers who have excess manure and crop farmers/ gardeners who may need fertilizer - CCE
  - b. Reduce the spreading of manure on frozen ground, or during rainy season
    - i. Provide education CCE & S&W
  - c. Install buffers along watercourses

- i. Seek grants to cover costs of buffers – S&W
  - ii. Investigate the feasibility of providing tax breaks on farmers who maintain buffers – Planning
  - iii. Provide Incentives – S&W
  - iv. Conservation Easements, Farmland Trust - Planning
  - v. Encourage/require buffers on properties that receive County or State funding – Planning & S&W
- d. Cows in streams
  - i. Identify farms where this is a concern – Auburn & Owasco (WIP) and S&W
  - ii. Provide funding for fencing and alternative water source – S&W
- e. Educate farmer, including employees actually driving the tractor regarding water quality, animal health and impact on milk production
  - i. Empire Farm Days - CCE
  - ii. Include water quality information in Tractor Safety Classes - CCE
  - iii. Equipment Dealership (i.e. cow mattresses) -CCE
  - iv. Vets - CCE
  - v. Ag Planners – S&W
  - vi. Information during Clean Sweep events - CCE
- f. Encourage cover crops, especially in areas with steep slopes and highly erodible soils
  - i. Educate on the positive benefits (prepare cost/benefit information) – S&W
  - ii. Obtain grants – S&W & OWLA
- g. Encourage Manure Injection – S&W
- h. Reach out to the non-CAFO farmers to improve their practices – S&W and CCE
- i. Encourage (seek grants) farmers to install digesters – S&W

**Attachment 7:**  
**Final priorities for 2013**



## **Cayuga County Water Quality Management Agency**

### **2013 Priorities**

**Approved June 6, 2013**

#### Coliform Bacteria Working Group

1. Investigate the feasibility of implementing a rental law to require rental units on lakefront property to register so the watershed inspector can inspect the properties more frequently.
2. Encourage municipalities to adopt steep slope ordinances, storm water regulations, and catch basin maintenance programs.
3. Provide education to residents and lawn care companies regarding proper handling of yard waste.
4. Educate farmers and operators regarding the implication of overspreading.
5. Seek grants to cover the cost of installing best management practices along watercourses and/or storm ditches.

#### Sediment and Nutrient Reduction Working Group

1. Create additional educational materials including a user's guide to assist in the use of the sediment and nutrient reduction practice evaluation methodology created by the Working Group.
2. Specify sub-basins in which to focus sediment and nutrient reduction activities based on the priority waterbodies list and the Working Group's map of areas having the highest relative potential for phosphorus loading based on their land cover characteristics.
3. Review the priorities of the other working groups' and identify the ones that are the most closely related and synergistic.
4. Identify sediment and nutrient reduction strategies that also address priorities of the other working groups; recommend three to five strategies in several geographical areas.

#### Invasive Species Working Group

1. Draft a final revised version of an invasive species transport law for adoption by Cayuga County Legislators.
2. Provide educational materials to companies who sell or repair boats; companies that sell personal watercraft and boating/water recreation equipment including docks and lifts; fishing equipment suppliers; fishing tournament sponsors, marinas, and boat launches.
3. Conduct Asian clam diving surveys in Owasco Lake and possibly Cayuga Lake.
4. Invite other stakeholders and partners to activities sponsored by the WQMA and its members and partners including Owasco Lake Day, invasive species workshops, and watershed steward events.
5. Chairman of the WQMA attend at least two Cayuga County Legislative meetings this year.