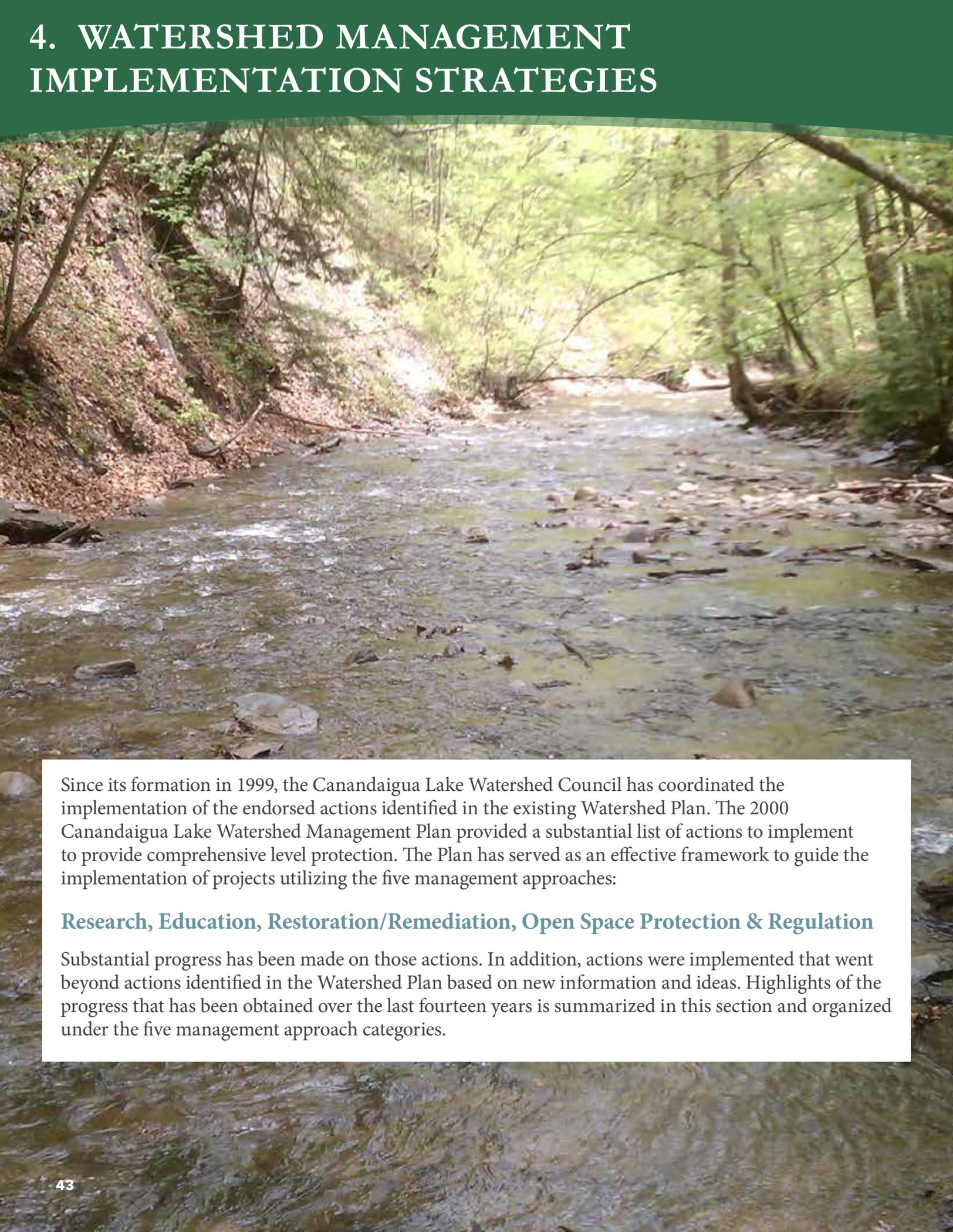


## 4. WATERSHED MANAGEMENT IMPLEMENTATION STRATEGIES



Since its formation in 1999, the Canandaigua Lake Watershed Council has coordinated the implementation of the endorsed actions identified in the existing Watershed Plan. The 2000 Canandaigua Lake Watershed Management Plan provided a substantial list of actions to implement to provide comprehensive level protection. The Plan has served as an effective framework to guide the implementation of projects utilizing the five management approaches:

### **Research, Education, Restoration/Remediation, Open Space Protection & Regulation**

Substantial progress has been made on those actions. In addition, actions were implemented that went beyond actions identified in the Watershed Plan based on new information and ideas. Highlights of the progress that has been obtained over the last fourteen years is summarized in this section and organized under the five management approach categories.

# PROGRESS SUMMARY

## RESEARCH

Research is the foundation for watershed management. It provides insight on existing conditions in the watershed and helps evaluate the effectiveness of management practices.

- 1997-2012: Monitored 55 storm events in 17 tributaries and completed direct drainage studies on subwatersheds 22, 33 and 34. Since 2001, Watershed Manager has collected tributary samples and assisted on lake sampling. Partners included: SUNY Brockport (tributary sampling program from 1997-2000), FLCC- Bruce Gilman tributary chloride sampling (1996- present), Watershed Association and Watershed Inspector.
- Conducted stressed stream analysis on several streams including Sucker Brook, Fall Brook, and Vine Valley. Also conduct visual inspections of watersheds during storm events. Partners included: SUNY Brockport, FLCC, Watershed Association and Watershed Inspector.
- Watershed Council completed Boat Carrying Capacity Study for Canandaigua Lake that reviewed the current peak boat usage on the lake and developed recommendations based on four different methodologies.
- Dr. Bruce Gilman of FLCC implements the Lake Monitoring program (1996-present). Watershed Council provides funding and assists in the implementation of the Lake Monitoring program.



Bruce Gilman of FLCC monitoring the lake water quality.

- Watershed Council obtained funding to complete a map of the City Storm Sewer System including the drainage areas that influence each outlet. Partnered with City to complete project.
- Watershed Council obtained funding, hired an RIT graduate student and provides coordination for the Natural Capital Study. Partners include Watershed Association and Dr. Bruce Gilman of FLCC.
- Land cover mapping of the entire watershed utilizing the Natural Heritage Classification System. Partners: FLCC (Bruce Gilman), County Planning, RIT interns, Watershed Council and FLOWPA.
- Watershed Council obtained grant funding for the 2006 LiDAR contour mapping of the Yates County portion of the watershed to match the Ontario County mapping.
- Watershed Council funded and assisted Bruce Gilman in completing a macrophyte study- started initial investigation at potential Hydrilla Hotspots (boat launches and marinas).
- Watershed Council provided substantial assistance on Water Supply Study as part of the City Water Supply Permit- Completed Mass Balance Model/Report, three year Canandaigua Outlet monitoring and report, along with assisting DEC on completing Part III of the EAF.
- Watershed Council partnered with IAGT to complete non-point source pollution model through IAGT.



Counting Quagga and Zebra Mussels by DEC, Dr. Gilman, and the Watershed Council.

## EDUCATION

The success of the watershed program relies on the support of local citizens. Actions by individuals contribute to improved watershed conditions. Therefore, education is a keystone to the watershed program.

- Watershed Council created and installed new watershed boundary signs on local/county and state roads.
- Watershed Association and Council partner on the ongoing storm drain marking program.
- Completed a wide array of educational publications and presentations.
- Watershed Council co-funds the Watershed Education Program with Watershed Association. The Program utilizes two certified teachers to work in three school districts across the watershed to discuss watershed science and how individuals can protect the watershed. The two organizations won the 2011 Friend of Education Award from the Canandaigua City School District.
- Watershed Council co-authored Lawn and Landscape Management Policy with Chris Dorn (City Parks- retired, and Russell Welser CCE) for the City of Canandaigua Parks Department that establishes a model for other municipalities and commercial applicators to follow.

- Watershed Council has conducted presentations at many watershed conferences across the watershed and the state, educating the public on watershed issues and documenting the intermunicipal success of the program.
- Watershed Council developed and installed four educational kiosks around the lake that review the importance of Watershed Management, stormwater impacts and threats, and what individuals can do.
- Watershed Council is currently completing a substantial upgrade to the Watershed Council website to more comprehensively display and interact with the public.

Atwater Meadows Shoreline Planting with Canandaigua Tennis team.



Honduras Exchange Program meeting with the Watershed Program.



Eco School built Onanda Kiosk.

## RESTORATION

Implementation of watershed management practices provides tangible improvements to water quality. It is a goal to maximize restoration efforts and focus on practices that are efficient, effective and provide a public benefit.

- Sucker Brook Dredge Project: removed over 8.4 million pounds of slightly contaminated sediment from a section of Sucker Brook between Parrish Street and 5 and 20 Bypass. Material was brought to landfill and used as daily cover. Watershed Council coordinated the project and partnered with County, Town and City to complete project. Improved water quality and reduced potential upstreaming flooding. Grant funding through DOS.
- Watershed Council hired MRB to complete a comprehensive stormwater model of Sucker Brook Watershed. Partnered with Town, City and School District. Grant funding through DOS.
- Watershed Council designed solution, provided funding and hired contractor to complete 400 foot sod/grassed waterway to minimize massive agricultural field erosion- eliminated 30 tons of erosion each year.



Sucker Brook before (upper left) and after (above) dredging.

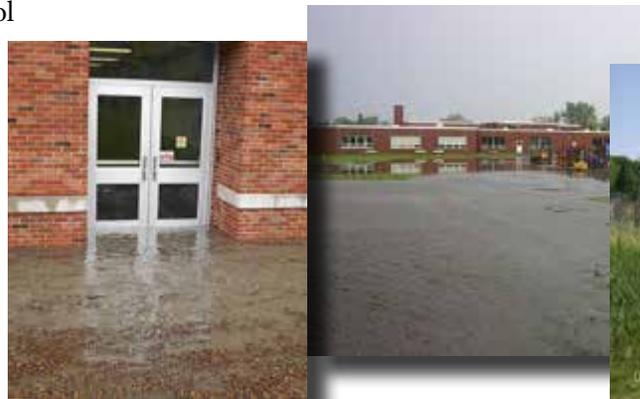


Erosion on a farm field (left)  
Sediment running into the lake (below)



Grassed waterway was installed to prevent erosion and filter runoff (above).

- Created two- acre stormwater wetland on Canandaigua School District property at Pearl St. Stormwater wetlands were created to solve flooding problems at the Primary School (17 classrooms flooded on two occasions). Partnered with Town, County, School and City. Grant funding through DOS. Major cost reductions were achieved through Town, County, and City forces.



Canandaigua School District flooding



Canandaigua School District stormwater wetland

- Town of Canandaigua created the Deuel Road stormwater management facility in partnership with the local farmer and Watershed Council to reduce flood related damage to Deuel Road.
- Watershed Council designed and provided funding for Middlesex Highway Garage bio-retention area in partnership with the Highway Department and Watershed Association.
- Watershed Council authored and administered an EFC green infrastructure grant for the City-owned Antis Street Parking Lot Bio-Retention project. The Watershed Council assisted the City in installing the plantings. The City provided the labor and equipment to complete the project at a much lower cost than if the project was completed by a private contractor.



Deuel Road erosion problems



Middlesex Highway Department Bio-retention Area



Antis Street - before (left) and with a bio-retention project in action (above)

- Watershed Council coordinated Deep Run outlet dredge project between the private landowner, contractor and Ontario County. The project improved flow into the lake. The delta had forced the flow along the public beach and directly at the intake pipe for the Town of Gorham.



Deep Run before dredging with significant sediment deposits at the outlet (left).

- Watershed Council coordinated the Sunnyside Road Drainage Study and Culvert Project - obtained grant funding and permits.
- Watershed Council designed and managed the Deep Run/Gorham Water Treatment Plant stream stabilization project.



Deep Run dredging in progress (below).

- Watershed Council designed and coordinated the Fall Brook/ Canandaigua Country Club stream stabilization project (1,200 feet on both sides). Partnered with Town of Canandaigua Highway Department to complete work.



Fall Brook at the Canandaigua Country Club before (left) and after stabilization (right)

- Watershed Council assisted in a grant applications to obtain \$60,000 for the Village of Naples Sanitary Sewer Study/ Design, partnering with Village and Watershed Commission.
- Watershed Council provided design and permit assistance on several FEMA projects (Bills Road, shoreline stabilization projects, culvert sizing and replacement).
- Creation of Village of Rushville Walking Trail and stream stabilization along West River. Watershed Council assisted in obtaining grant funding and volunteer assistance in trail clearing. Partnered with Gorham, Rushville and Ontario County to complete project.
- Watershed Council partnered with highway departments on numerous road bank stabilization projects.
- YMCA bio-retention facility- Watershed Council obtained grant funding, coordinated efforts and provided the in-kind assistance to work with County, Town and City forces to build the bio-retention area. Substantial cost savings were achieved for the YMCA.



YMCA bio-retention facility

- Menteth Creek/Goodale Road partnership with farmer, NRCS and Fish and Wildlife Service Partners Program to restore 1,000 + feet of stream using logs, vegetation and some stone.
- Watershed Council obtained funding and provided technical assistance for stormwater/ streambank stabilization work at Outhouse Town Park and Civic Center - 1,500 feet of vegetative stream stabilization and two stormwater ponds near Civic Center to solve drainage and parking issues. Partnered with Town, City and Civic Center.
- Watershed Council authored grant application for the Middlesex Salt Storage Barn. Partnered with Yates Soil and Water and Middlesex.
- Watershed Council partnered with landowners to complete Vine Valley Stream stabilization projects at two locations where major erosion was occurring.
- Watershed Council purchased stream arch culverts and currently loans them for use in timber harvesting operations.
- Ontario and Yates County Soil and Water Conservation Districts have been able to bring in over \$2 million over the last 14 years to complete numerous farm level agricultural best management projects to protect water resources. Ontario and Yates County Soil and Water Conservation Districts are considered leaders throughout New York State. Watershed Council provided some limited local cost share funding assistance through the monitoring program and general funding for to help defray the local farmer share and encourage farmer participation.
- Watershed Council obtained \$120,000 grant to assist City of Canandaigua in its purchase of a Street Sweeper.
- Watershed Council obtained funding and has started coordinating work on the Canandaigua Lake Water Trail project. Partners include Ontario County Tourism, Finger Lakes Land Trust, and others.
- Watershed Council worked with several partners to create the Lagoon Park Habitat Restoration Plan. Provided significant planting assistance and applied for two grants to help pay to implement the plan. Partners include: Botanical Society, City, Watershed Association, Soil and Water and FLCC students.



Outhouse Town Park stream stabilization project utilizing willow wattles.



High efficiency Street Sweeper removing collected material from City streets.

- Watershed Council assisted with the Onanda Park/Barnes Gully dredging project and Boat Launch stabilization in partnership with the Town of Canandaigua.



Atwater Meadow Project

- DEC and Trout Unlimited completed substantial stream bank stabilization projects in Naples Creek to promote fish habitat and protect water quality. Watershed Council participated in the Willow Planting Project.



- Watershed Council coordinated the Atwater Meadows Shoreline Stabilization Project where 100 feet of deteriorated wall was falling into the main channel for the nearby townhouse communities. Partnered with Town, City and HS Tennis Team to remove the wall and install a more natural combination of rock and vegetation to stabilize and restore this area.

- Watershed Council partnered with Ontario County Public Works and Highway Department to complete the Grimes Creek/ County Road 36 bank stabilization project (350 feet). Grant funding purchased the stone and plantings that were utilized.



Parrish Street area before



Parrish Street Stabilization

- Kershaw Park Remediation project: Watershed Council provided technical assistance, helped to organize Dr. John Hasselt's water quality analysis and public outreach for the Kershaw Beach remediation project.

- Completed several Sucker Brook stream restoration/stabilization projects in City: north of Parrish Street (400 feet), Ellis Place (250 feet), Gibson Street (100 feet), and West Avenue (250 feet). Watershed Council coordinated the projects, obtained permits and partnered with County, Town and City to complete the projects. Grant funding through DOS.



Streambank before stabilization

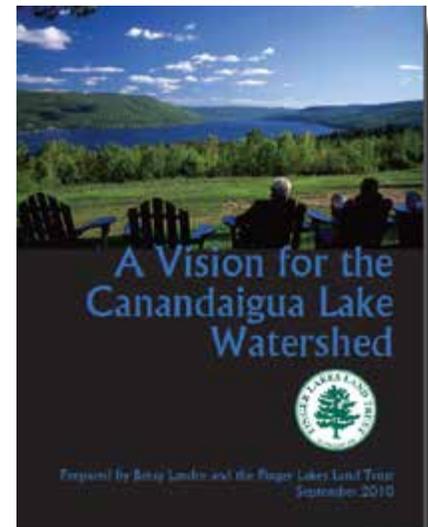


Streambank after stabilization

## OPEN SPACE PROTECTION

Open space is a key component for water quality protection, providing benefits such as flood protection, increased infiltration, water filtering, and reduced erosion.

- Finger Lakes Land Trust developed: “Vision for the Canandaigua Lake Watershed” in 2010 as an open space protection plan for the watershed.
- Finger Lakes Land Trust has acquired numerous properties and conservation easements throughout the watershed totaling close to 900 acres. They have also provided project assistance on numerous projects. Watershed Council and other partners provided seed funding to Finger Lakes Land Trust for open space acquisitions in Gorham, Middlesex and Naples.
- Town of Canandaigua and Town of Gorham have dedicated open space funds to protect high priority lands which have been utilized on several locations.
- Nature Conservancy obtained land adjacent to Hi-Tor (Parrish Flats Road) and transferred it to NYS. They also manage other land within the watershed.



## REGULATION

Local regulations help ensure watershed protection is implemented and enforced. There has been substantial progress in the watershed in the adoption of laws that balance land use and water quality protection.

- Watershed Council provides stormwater development reviews and inspection assistance in various towns in partnership with local Code Enforcement Officers and Watershed Inspector.
- Watershed Council promoted and obtained adoption of enhanced phosphorus treatment requirements in the Town and City of Canandaigua.
- Watershed Council partnered with Ontario County and other entities to assist municipalities in updating Docks and Moorings Law in 2002 and 2010.
- Watershed Council created Land Use Sub-committee that developed model laws for stormwater management, steep slopes and water course protection. Partnered with County Planning and Genesee Finger Lakes Regional Planning Council.
- Watershed Council developed MS4 Notice of Intent programs and provides technical assistance for both the City and Town of Canandaigua to meet and exceed MS4 requirements.
- South Bristol adopted a Steep Slope Law with assistance from the Watershed Council. Town of Middlesex is in the final stages of developing a Steep Slope Law with Watershed Council providing assistance.
- Obtained grant funding and helped to coordinate the work to create a GIS-based Onsite Wastewater System Database for the Watershed Inspector.
- Gorham and South Bristol adopted onsite wastewater system inspections at the time of property deed transfer. Other municipalities are considering the law.



## MOVING FORWARD

The 2014 Watershed Management Plan builds on the knowledge gained and projects completed over the last fourteen years to develop a more comprehensive strategy to protect the lake and its surrounding watershed from existing and emerging threats. The strategies outlined in this update continue the original goals of providing high quality drinking water and recreational enjoyment while protecting the ecological integrity of the lake and its watershed. This updated Plan maintains many of the existing programs and approaches of the existing Plan while supplementing it with new strategies and actions to more comprehensively meet the current and future challenges in the watershed.



## EXISTING AND EMERGING THREATS

In the past decade, numerous emerging threats and trends have created the need to update our watershed management plan in order to properly meet the goals of our watershed strategy, including :

- **Substantial development in the watershed creating increased populations and impermeable surfaces**
- **More intense use of the shoreline area**
- **New invasive species with the potential for additional species such as Hydrilla**
- **Harmful Algal Bloom potential**
- **MS4 regulations**
- **Legacy pollutants at the North end of the lake**
- **Need for more local management of onsite wastewater systems**
- **Changes in our local climate creating more intense rain events, prolonged droughts and other ecosystem impacts**
- **Building on more sensitive/steep slope sites**
- **Increasing boat use of the lake**
- **Increased aquatic vegetation growth**
- **Pharmaceutical/personal care products in wastewater**
- **Shifts in crops grown that allow for more erosion (soybeans and corn) along with changes in agricultural ownership to populations less willing to accept government support**
- **Potential hydrofracking operations in the watershed, water withdrawal supporting hydrofracking elsewhere, use of hydrofracking brine as deicing agent and transport of hydrofracking wastewater on roads.**

These existing and emerging threats and trends have the potential to significantly impact the water quality of Canandaigua Lake by increasing phosphorus and other pollutants of concern in the lake, increased intensity and duration of algae blooms, aquatic weed growth, increased difficulty for filtration of drinking water and potential beach closures.

It is critical for the watershed community to work together to combat these potential future threats that are emerging as water quality trends throughout the Finger Lakes and Great Lakes Regions. We are extremely fortunate to be able to enjoy Canandaigua Lake and all the benefits the lake's healthy ecosystem has to provide. Canandaigua Lake is our community's most important natural resource, one that we need to work together to preserve and protect for us and future generations.

## WATERSHED MANAGEMENT CATEGORIES

Long-term, effective management strategies are outlined in the following section of the Management Plan to achieve watershed protection and water quality goals. Strategies include actions that individuals can take to improve water quality, recommendations for municipalities to adopt and projects that community organizations can collaborate on. Recommendations are based on the following thirteen management categories:

- 4.1 New and Existing Development
- 4.2 Lawn and Landscaping Practices
- 4.3 Municipal Roads and Highway Facilities
- 4.4 Stream and Shoreline Management
- 4.5 Wetlands and Floodplains
- 4.6 Wastewater Management
- 4.7 Agriculture
- 4.8 In-Lake Issues: Invasive Species, Harmful Algal Blooms and Fish Kill Management
- 4.9 Recreation
- 4.10 Lake Level Management
- 4.11 Forestry
- 4.12 Mining and Natural Gas Extraction
- 4.13 Chemical Contamination Prevention



Vine Valley in the fall.

Maintaining and enhancing the high water quality of this watershed requires a multifaceted approach that applies to the entire watershed and the successful implementation of a combination of actions that draw from each of these management categories. No one action alone will protect the Canandaigua Lake watershed. Embedded in each of the management category recommendations are actions that rely on research, restoration/remediation, protection, education and regulation approaches.

At the end of this chapter, a table summarizes each strategy and also provides the following information:

- Management approaches utilized to implement strategy: research, education, restoration/remediation, open space management and regulation
- Timeframe
- Potential Partners
- Cost
- Evaluation Criteria