# Conesus Lake and Watershed Report Card

## Assessment of the Conesus Lake Watershed Management Plan in 2009

*Conesus Lake Watershed Council*

*February 2010*

EcoLogic

## *PURPOSE OF THIS DOCUMENT*

One of the recommendations of the Conesus Lake Watershed Management Plan (CLWMP) is to prepare an annual update summarizing the status of activities in the watershed designed to reduce nonpoint source pollution. In addition, the annual summary provides a forum for tracking conditions in Conesus Lake and highlighting new information.

## *MAJOR ACCOMPLISHMENTS*

Since its formation in 2003, the Conesus Lake Watershed Council has coordinated implementation of the recommendations of the CLWMP. The Watershed Council is an intermunicipal organization with a dual mission: first, to coordinate actions for restoring the health of Conesus Lake and its watershed, and second, to communicate progress to the watershed community and other stakeholders. Restoring the health of the lake and its watershed requires a sustained effort and a focus on many inter-related issues. There was substantial progress in 2009 on several fronts.

- ***Completion of a high resolution bathymetric survey (lake bottom map).*** The depth of Conesus Lake was last mapped in detail in 1939-1940, prior to construction of the outlet dam. An updated bathymetric map was completed by CR Environmental Inc. to provide an accurate estimate of lake volume, indicate changes in depth and habitat conditions and identify regions of sediment deposition.

- ***Update of the lake's phosphorus inputs***, comparing estimates of the annual phosphorus load from external (watershed) and internal (lake bottom sediment) sources.

- ***Stream testing*** to measure the concentration of nutrients and sediments flowing into Conesus Lake. Sampling the agricultural subwatersheds that were part of the USDA-funded program was led by Dr. Joseph Makarewicz of SUNY Brockport; the 2009 data represent a seven year record.

- ***Characterization of the zooplankton community***. Examination of the species composition, relative abundance and size structure of the zooplankton community (tiny aquatic animals that feed on algae) provides a window into the lake's food web and how it is changing.

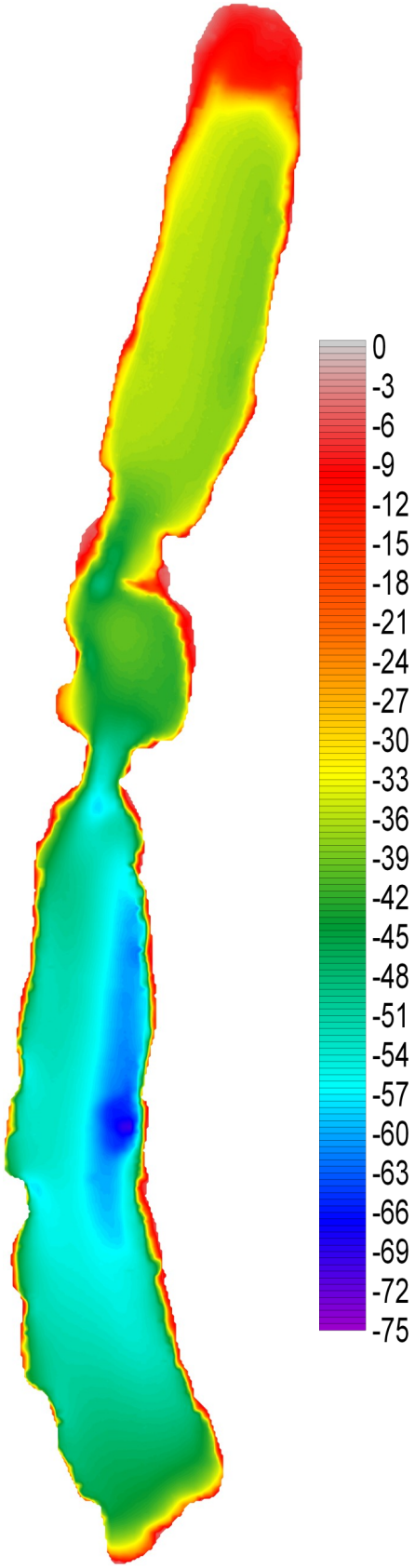
- ***Mapping the abundance and distribution of macrophytes***. Dr. Sid Bosch of SUNY Geneseo continued his long-term sampling and analysis of Conesus Lake's aquatic plant community.

- ***Streambank Remediation***. The Town of Livonia was awarded a grant from the state's Environmental Protection Fund for $358,132 for Phase II of the streambank remediation project.

- ***Public education and outreach***. The Public Education and Outreach Committee prepared a laminated education piece "Your Guide to Conesus Lake" describing homeowner best management practices. Storm water inlets in the Village of Livonia were stenciled to raise awareness of the connections between the streets and the lake.

- ***U. S. Army Corps of Engineers Inspection.*** Personnel from the ACOE toured Conesus Lake and learned of the ongoing efforts to improve water quality and control invasive plant species.

## *FINDINGS OF THE 2009 INVESTIGATIONS : BATHYMETRIC MAP*

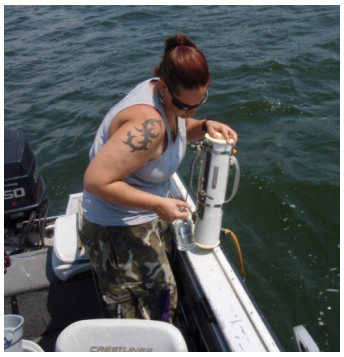



During a week of beautiful October weather, CR Environmental of Falmouth Massachusetts completed a bathymetric survey of Conesus Lake. The process integrated digital GPS technology with a precise depth measurement to create a high resolution map of the lake bottom. A color scale version of the map is displayed, along with the depth scale (in feet).

The bathymetric data acquisition system consisted of a laptop computer running HYPACK hydrographic survey software, a precision single-beam echosounder and a Trimble DGPS. Depth measurements were collected using an ODOM CV-100 precision echosounder equipped with an 8-degree 200-kHz transducer. The echosounder digitized and recorded the lake bottom and exported depth values to HYPACK. The echosounder transducer was mounted to the rail of the survey vessel amidships using a high-strength adjustable boom. The DGPS antenna was attached to the top of the transducer boom.

This bathymetric map allows managers to accurately assess the lake volume at specific depth intervals. Note the relatively shallow northern basin and the large extent of littoral habitat - areas less than 20 feet deep - where light can penetrate to the bottom sediments and support plant growth.

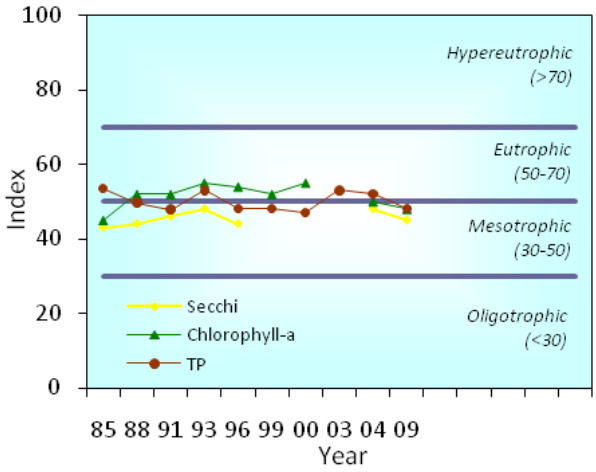
## *FINDINGS OF THE 2009 INVESTIGATIONS : STATUS OF CONESUS LAKE ECOSYSTEM HEALTH*



During the summer of 2009, scientists and students from SUNY Brockport completed a comprehensive "check-up" of the lake's health. Several elements of the lake and watershed were examined: a trophic state assessment, an estimate of the magnitude of internal phosphorus loading (sediment flux), an estimate of external phosphorus loading (from streams), an analysis of trends in water quality, an evaluation of size structure of the zooplankton community, and the continued long-term evaluation of nutrient and soil losses from eight agricultural subwatersheds.

***Trophic State Assessment*** Conesus Lake continues to be in the mesotrophic—eutrophic range, based on measurements of total phosphorus (TP), chlorophyll-a and Secchi disk transparency (an indicator of water clarity), as displayed in the graph below. Profiles of dissolved oxygen concentrations indicate that dissolved oxygen depletion of lake waters below 10 m (about 33 feet) occurs by June. The lake's trophic state has been stable for decades.

***Phosphorus Inputs*** Phosphorus is the limiting nutrient for the growth of plants and algae in Conesus Lake, and efforts to stabilize the lake's trophic state consequently focus on reducing phosphorus inputs. Once in the lake, phosphorus can continue to cycle between the bottom sediments and the overlying waters, complicating efforts to improve water quality by reducing external loading. Phosphorus release from the sediments is significant; estimated to be over 8,000 kg/yr, it is likely equal to or above the external annual input from the watershed.




***Zooplankton community*** The biomass, species composition and size structure of the zooplankton community was consistent with conditions last measured in 1993. Larger zooplankton, notably Daphnids, which are efficient grazers of phytoplankton, comprise only a small fraction of the zooplankton community. In the 1970s, Conesus Lake exhibited markedly clearer water and abundant daphnids. The loss of the larger zooplankton is attributed to the presence of the alewife, a forage fish that has become firmly established in Conesus Lake. Recent efforts to reduce the alewife population by enhanced stocking of walleye have not yet resulted in a resurgence of larger zooplankton.

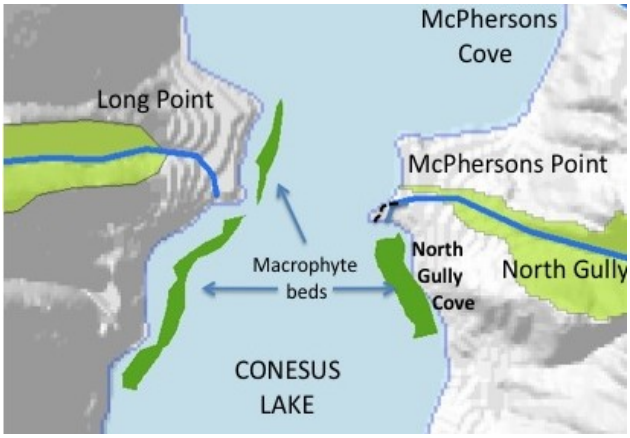
***Trends in water quality*** Overall, the 2009 monitoring program did not detect significant trends in lake water quality conditions, with one important exception. The concentration of sodium in the lake water has increased in recent decades, from approximately 15 mg/l to 25 mg/l; the increase is attributed to application of deicing chemicals to roads in the watershed.

## *FINDINGS OF THE 2009 INVESTIGATIONS : STATUS OF CONESUS LAKE ECOSYSTEM HEALTH*

***Watershed Monitoring*** In 2009, SUNY Brockport scientists collected a seventh consecutive year of data from subwatersheds included in the USDA study. Substantial increases in the concentrations of nutrients and soil particles were measured in 2009; this unexpected result followed several years of a general decrease. Several factors may have contributed to the increase in the concentration of dissolved and particulate material; some are natural (variation in rainfall amount and intensity); others are affected by human actions (changes in land use or management practices). Although the increases observed in the monitored streams in 2009 may be related to changes in management practices, the significant rainfall in the spring and early summer cannot be ruled out as the cause. North McMillan Creek, which was used as the reference watershed throughout the study due to its low impact from human activities, also exhibited an increase in 2009; this result supports the hypothesis that the intense rainfall events led to the increased loss of material from the landscape.

***Macrophyte Beds and Filamentous Algae*** Scientists and students from SUNY Geneseo sampled several macrophyte beds in Conesus Lake during 2009, in an effort to determine whether the northward diversion of North Gully had brought about decreases in the biomass of macrophytes and filamentous algae in North Gully Cove. The study was designed to compare North Gully conditions with reference locations in Conesus Lake nearshore regions in 2009, and also with historic data.

In 2009, macrophyte density and standing crop in North Gully Cove were higher than the average for the years 2000 -2007, indicating that the macrophyte biomass was not affected by the stream diversion. Similarly high abundance of macrophytes were measured in the Sand Point Gully and Sutton Point Gully reference sites, but not in Cottonwood Gully, where macrophyte growth has declined considerably since agricultural management practices were implemented.




However, the percent surface cover of filamentous algae at North Gully Cove was moderate to low relative to algal cover in four reference sites and to the site's historical record (2001-2007). As discussed above, streams in 2009 exhibited elevated concentrations of nutrients and sediment. Therefore the most plausible explanation for the reduced cover of filamentous algae at North Gully Cove in 2009 was the diversion of the tributary runoff into open water and the accompanying reduction in nutrient delivery into the cove.

## *FINDINGS OF THE 2009 INVESTIGATIONS : STATUS OF CONESUS LAKE ECOSYSTEM HEALTH*

***Bacteriological Monitoring*** The Livingston County Department of Health samples nearshore waters at designated bathing beaches in Conesus Lake each summer for the presence of fecal coliform bacteria. This class of bacteria is used to indicate the potential presence of pathogenic (disease-causing) microorganisms. In 2009, samples were collected at three sites: Long Point Beach, Southern Shores Beach and Camp Stella Maris. Results are compared to the state ambient water quality standard for bacteria, which is used by the Department of Environmental Conservation to evaluate water quality and by the Department of Health to evaluate suitability for swimming at designated beaches.

The state's ambient water quality standard for fecal coliform bacteria standard, 200 colony forming units per 100 ml of lake water, is calculated as the geometric average of at least five samples per month. The 2009 results for the three Conesus Lake beaches indicate consistent compliance with the standard.

***Army Corps of Engineers Tour*** As part of an evaluation of the adverse impacts of invasive species throughout the Finger Lakes region, representatives of the Army Corps of Engineers Buffalo district office toured Conesus Lake with Dr. Sid Bosch of SUNY Geneseo, Gene Bolster of the Conesus Lake Association, and Angela Ellis and Heather Ferrero of the Livingston County Planning Department.

***NYSDEC Fisheries Monitoring*** In September 2009, Region 5 biologists conducted a fish stock assessment as part of an evaluation of their walleye management program. Preliminary data describing the length frequency distribution of the important fish species indicate that stocked walleye fingerlings are surviving and recruiting to the fishery quite well, but it's still not apparent whether natural reproduction is taking place. Once the 2009 scales have been aged and all of data have been analyzed, NYSDEC will prepare a comprehensive report on the Conesus Lake fish community from 2000-2009.


## *2009 FOCUS ON PUBLIC INFORMATION*

***Scientific Recognition*** In June, 2009 the Journal of Great Lakes Research published a special issue on Watershed Management and Nearshore Lake Water Quality: The Conesus Lake Watershed Study. This international journal reaches a wide audience of academic scientists, lake managers, researchers and members of the regulatory community. Dr. Makarewicz and Dr. Bosch served as guest editors for the special edition and guided preparation of a series of articles related to the restoration and protection of Conesus Lake, including an analysis of the formation and successes of the Watershed Council. Effectiveness of the agricultural best management practices on reducing inflows of nutrients and sediment are highlighted, as are the impacts of the reduced loads on the nearshore macrophyte beds. Articles are available online at www.sciencedirect.com.

***Your Guide to Conesus Lake*** The Watershed Council's Public Education and Outreach Committee prepared a guide for shoreline and watershed residents highlighting the connections between watershed activities and the quality of the lake water. This laminated document was distributed to shoreline property owners and renters and provides guidance on residential best management practices including lawn care and managing pet waste. Additional information on fishing, boating practices and agency contact phone numbers was included.

Your Guide to
**Preserving Conesus Lake**

The Conesus Lake Watershed Council has produced this guide to provide lake residents and property renters with useful information about "Best Management Practices" that we all must follow if we are to protect and preserve Conesus Lake.

Property owners are encouraged to make this guide available to all of their household members as well as visitors and renters.

Additional copies of this guide, as well as copies of the more comprehensive Conesus Lake Watershed stewardship booklet ("Conesus Lake: Is It Worth Protecting?"), may be obtained at no charge by contacting the Conesus Lake Association or the Livingston County Planning Department. (Please refer to their phone numbers below.)

A great deal of information about the lake and its watershed is also available online. Please visit these websites, developed and updated by Livingston County and the Conesus Lake Association respectively:

**www.livingstoncounty.us/planning.htm**
**www.conesuslake.org**



**Never put anything into the lake that you wouldn't want in your child's next glass of water.**

The same applies to putting anything into creeks, streams, culverts or ditches that eventually run into Conesus Lake. Why? Because our lake is a drinking-water source for more than 20,000 people in our county.

This means:

- No human or pet waste
- No fishing waste
- No hazardous materials (e.g., fertilizers, herbicides, household chemicals, poisons)
- No garbage
- No leaves or grass clippings
- No oil, gas, fuels, paints or solvents

*See the other side of this guide for more useful information.*

**Important Telephone Numbers:**

- All emergency calls: 911
- Conesus Lake Association Office: 585-346-6864
- Conesus Lake Watershed Inspector: 585-243-7280
- Conesus Lake Watershed Manager: 585-519-7509
- Livingston County Planning Department: 585-243-7550
- NYSDEC (for reportable fish kills only): 585-226-5343

**Public Restroom Facilities Around Conesus Lake:**

- Vitale Park, Lakeville (Rts. 15 and 20A, north end of lake)
- Long Point Park, Town of Geneseo (Rt. 256, West Lake Rd.)
- NY State Boat Launch, Town of Livonia (East Lake Rd.)
- NY State Boat Launch (portable toilet only) Town of Conesus (Rt. 256, West Lake Rd.)

***Storm Drain Stenciling Program*** The Conesus Lake Association and the Village of Livonia are co-sponsors of a project to stencil storm drains in the Village of Livonia with the notice "Please Don't Pollute– Drains to Conesus Lake." As his Eagle Scout project, Matt Kelly of Livonia Boy Scout Troop 174 took on the task of managing volunteers and his fellow scouts to stencil the 393 storm drains in the Village. The project was completed in November 2009. Congratulations Matt!

**Please Don't Pollute–**
**Drains to Conesus Lake**

## *CONESUS LAKE WATERSHED MANAGEMENT PLAN IMPLEMENTATION STATUS REPORT—2009 YEAR IN REVIEW*

| # in Plan | Recommendation | Priority | Action Taken |
|---|---|---|---|
| A-1 | Review and amend zoning regulations to improve consistency in near-lake areas. | High | Planning Dept. working with Town of Conesus on zoning update. Technical assistance provided as needed to all watershed towns. We will be working with the four Lake towns on an EPF application in 2010 for the development of consistent land use regulations. |
| A-3 | Develop public education campaigns on BMPs for lake and watershed residents. | Medium | Created a laminated public information piece that was distributed in early May 2009 to approximately 2,000 lake and near-lake (directly uphill from the Lake Roads) residents. |
| B-1 | Secure funding to help mitigate the financial impacts of changes in agricultural practices on the producers. | High | In progress. Agencies will continue these activities annually as part of their existing programs. |
| B-2 | Implement practices that will reduce nonpoint source pollution from farms. | High | • The CLWC sent letters of appreciation to agricultural producers in July 2009.<br>• Agricultural BMPs continue to be implemented by watershed farmers, the Livingston County SWCD, and the USDA NRCS. |
| B-3 | Develop and implement programs and partnerships to facilitate removal of waste materials from farms. | High | There are no existing GLOW programs. GLOW is willing to participate in new program development. |
| B-4 | Develop programs for public education and outreach for both the agricultural and the non-agricultural community. | High | • Public education fact sheet on agriculture in the watershed was completed. An article was published in the Laker News.<br>• Creation of a photo album of before/after agricultural BMP installation is in progress. |
| C-1 | Develop and implement program to restore and stabilize stream banks in the watershed. | High | • The NRCS is working with individual farmers to map streams and focus efforts on watershed areas that are not currently buffered.<br>• Waiting for contract with revised scope from the State for Phase 1. The Town of Livonia was awarded an EPF grant for $358,132 for Phase II of the streambank remediation project. |
| C-3 | Develop public education campaigns on the impact of human activities on the health of the Lake. | Medium | • Worked in partnership with the CLA on a campaign to raise public awareness of connection between stormwater drainage and the health of Conesus Lake.<br>• Recommendation C-3 was adopted by CLWC March 26, 2009. Storm drain stenciling project was completed in November, 2009. |

**Key to Acronyms**

BMPs - Best Management Practices
CLWMP - Conesus Lake Watershed Management Plan
GLOW - Genesee/Livingston/Ontario/Wyoming Counties
OPRHP - Office of Parks, Recreation and Historic Preservation
SWCD - Soil and Water Conservation District
CLWC - Conesus Lake Watershed Council
EPF - Environmental Protection Fund
NRCS - Natural Resource Conservation Service
PRISM - Partnership for Regional Invasive Species Management
USDA - United States Department of Agriculture

## *CONESUS LAKE WATERSHED MANAGEMENT PLAN IMPLEMENTATION STATUS REPORT—2009 YEAR IN REVIEW*

| # in Plan | Recommendation | Priority | Action Taken |
|---|---|---|---|
| D-3 | Municipal Highway Departments should develop a plan, subject to available funding, to remediate ditches in poor condition. | Medium | • Towns are in the process of returning their Memorandum of Agreement for the administration of the EPF road ditch grant.<br>• Work plans were submitted to the State. NYSDOS has approved the work plans. |
| E-5 | Winterize facilities at the State Boat Launch on East Lake Road and at the Town of Geneseo's Long Point Park to permit year-round use of public toilets. | Medium | • Contacted Rich Parker of NYS OPRHP to determine interest in boat launch facility. NYS not interested for boat launch.<br>• Town of Geneseo and Livingston County SWCD worked cooperatively on efforts to winterize the facilities at Long Point Park |
| F-2 | Extend sewer system | Medium | During the first quarter of 2009, hamlets were defined in Census 2010 to assist in public infrastructure extensions. |
| G-1 | Investigate and implement effective methods to control the spread of non-native (exotic) organisms. | High | Livingston County continues to participate in the Finger Lakes PRISM, an information-sharing group that was formally created by New York State to look at the problem of aquatic and terrestrial invasive species on a regional level. |
| G-3 | Initiate effort to determine if alum treatment to control release of phosphorus from deep lake sediments would be effective in Conesus Lake. Proceed with plans for implementation if effectiveness is warranted and monitor for environmental impacts. | High | • CR Environmental completed a bathymetric survey of the lake in mid-October, and produced maps and electronic files.<br>• Presentation by Tom Harvey (Ontario County Planning Department) on Honeoye Lake Year 2 alum treatment was given at the June 26 Technical Committee meeting. |
| G-4 | Initiate effort to determine if increased stocking of walleye fingerlings, or other species, would be an effective biological control in Conesus Lake. | High | • CLA purchased approximately 1,700 walleye fingerlings and NYSDEC stocked 9,000 tiger musky during the third and fourth quarters of 2009.<br>• Zooplankton monitoring was conducted as part of the summer 2009 annual program. |
| H-1 | Conduct an annual monitoring program of Conesus Lake and its watershed. An annual monitoring meeting should be held to coordinate the monitoring program. | High | Meeting to discuss phosphorus loading investigation and zooplankton monitoring was held in Spring 2009. Monitoring started in mid-May, and continued through September 2009. |

**Key to Acronyms**

BMPs - Best Management Practices
CLWMP - Conesus Lake Watershed Management Plan
GLOW - Genesee/Livingston/Ontario/Wyoming Counties
OPRHP - Office of Parks, Recreation and Historic Preservation
SWCD - Soil and Water Conservation District
CLWC - Conesus Lake Watershed Council
EPF - Environmental Protection Fund
NRCS - Natural Resource Conservation Service
PRISM - Partnership for Regional Invasive Species Management
USDA - United States Department of Agriculture

For additional information contact: :
Conesus Lake Watershed Manager
(585) 243-7550 or (585) 519-7509

Conesus Lake Watershed Council
6 Court Street—Room 305
Geneseo, NY 14454
(585) 243-7550
http://www.livingstoncounty.us/conesus.htm

*Prepared by:*

EcoLogic

EcoLogic, LLC
132 1/2 Albany Street
Cazenovia NY 13035
http://www.EcoLogicLLC.com