



# Conesus Lake and Watershed Report Card

Assessment of the Conesus Lake Watershed  
Management Plan in 2011

*Conesus Lake Watershed Council*

*February 2012*

## 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, particularly the ongoing efforts to reduce nonpoint source pollution. This annual summary also 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 (CLWC) 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.

In recognition of these efforts, the CLWC received the Planning Excellence Award from the New York Upstate Chapter of the American Planning Association (APA) for Planning Excellence Implementation. As the APA noted: *“The level of cooperation within and partnerships among the Watershed Management Plan committees and between agencies has been heralded as a successful example of how the process should work.”*

Progress in implementation of the CLWMP continued in 2011. Highlights include:

- **Stream testing** continued for a ninth year, led by Dr. Joseph Makarewicz of SUNY Brockport, to measure the concentration of nutrients and sediments flowing into Conesus Lake from the subwatersheds.
- **Investigation of the relationship between spring runoff and lake water characteristics** was undertaken, led by Dr. Sid Bosch of SUNY Geneseo. The monitoring plan included analysis of metaphyton cover in McPhersons’ Cove, Cottonwood Gully and Sand Point Gully, and measurement of selected water quality parameters at the deepest part of the lake.
- **Public education and outreach activities** were very active in 2011, with educational kiosks, and the high-profile presence of the Conesus Lake Association’s Conesus Stewardship Initiative at local events.



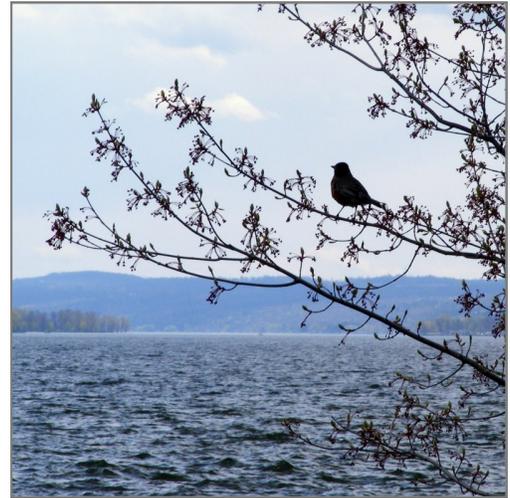
Members present at the APA meeting to accept the award. Pictured from left to right: Heather Ferrero (LCPD), Dr. Liz Moran (EcoLogic, LLC), Penny Trimm (LCPD), Miranda Reid (Conesus Lake Watershed Manager, LCPD), Brenda Donohue (Supervisor, Town of Conesus and Chair, CLWC), Angela Ellis (current Planning Director, LCPD), Mary Underhill (LCPD), David Woods (past Planning Director, LCPD), Darlene Essler (LCPD), and Wayne France (President, Conesus Lake Association).

## ***FINDINGS OF THE 2011 INVESTIGATIONS : WATERSHED MONITORING***

During the spring and summer of 2011, SUNY Brockport scientists completed their ninth consecutive year of water quality monitoring of streams flowing into Conesus Lake through agricultural and/or forested areas. The 2011 monitoring program was designed to contribute to the long-term data record, which documents water quality conditions before and after implementation of agricultural best management practices (BMPs).

### ***2011 Monitoring Program - Objectives***

In 2010, the SUNY Brockport team compared the annual stream nutrient and sediment loading estimates from 2003-2007 to the same loading estimates calculated from the 2008-2010 data. The 2003-2007 loading estimates were calculated from the year-round monitoring effort undertaken as part of the USDA program. The more recent loads were calculated using monitoring data from summer with stream loading estimates calculated from data collected only during summer months. The investigators concluded that summer data do not adequately reflect the large declines in nutrient and sediment loading that resulted from implementing BMPs in agricultural watersheds. The team concluded that it is most important to capture spring conditions, which are typically characterized by higher runoff and precipitation, in order to evaluate the effectiveness of BMPs in keeping soils and nutrients on the landscape. The SUNY team recommended that monitoring in the Conesus Lake watershed begin in March, rather than May, as a means to provide a more robust index for evaluating the effectiveness of BMPs and detecting trends.



*Image courtesy: Livingston County Planning Department.*

As a result of these findings, two objectives were defined for the 2011 monitoring program:

- Change the monitoring of two of the USDA stream stations (Cottonwood Gully and North McMillan Creek) from summer to spring.
- Develop a spring-based Stream Water Quality Assessment Index as a cost-effective means for the County to continue monitoring the performance of the BMPs.

In 2011, stream samples were collected at two former USDA monitoring sites at the base of the Cottonwood Gully and the North McMillan Creek sub-watersheds between March 1 and May 31. No data for four other USDA creeks - Graywood Creek, Long Point Gully, Sutton Point, and Sand Point - were collected in 2011.

### ***Development of a Stream Water Quality Assessment Index***

A major goal of 2011 was to develop a simple, cost-effective assessment tool based on spring, rather than summer data, utilizing the spring 2003 to 2007 USDA program database. Such an assessment tool would support an evaluation of the relative nutrient loading from the Conesus Lake subwatersheds, and how well the BMPs were being maintained.

**FINDINGS OF THE 2011 INVESTIGATIONS :  
WATERSHED MONITORING (CONTINUED)**

The SUNY Brockport team developed a graphical index of stream discharge versus nutrient concentration based on historical spring data. For example, using the USDA pre-BMP implementation data, this approach correlates total phosphorus concentration with stream discharge; as stream discharge increased, phosphorus concentrations also increased. Based on a statistical analysis of these data, a relationship in the form of a regression was plotted, shown as a straight black line in Figure 1. The two curved lines to either side of the black regression line, with lighter-colored shading, represent the 99% confidence interval. Most of the historical data results plot within this 99% confidence interval.

Using this template, the phosphorus results from the 2011 spring sampling - representing the post-BMP implementation conditions - were plotted as black triangles in Figure 1. From a management perspective, consider that points outside of the confidence interval indicate changed conditions. If the data plot within the 99% confidence interval, one may conclude that there was no substantial change from the historic pre-BMP data. In Figure 1, where the stream discharge level is less than 10,000 m<sup>3</sup>/day, the 2011 data do not show much change from historical conditions. However, at higher flows, the data points are distributed primarily in the darker green area of the graphic. This illustrates the positive effects of the BMPs on water quality at higher stream flows, and suggests that the loss of total phosphorus from the Cottonwood Gully watershed is less than that of the pre-BMP period.

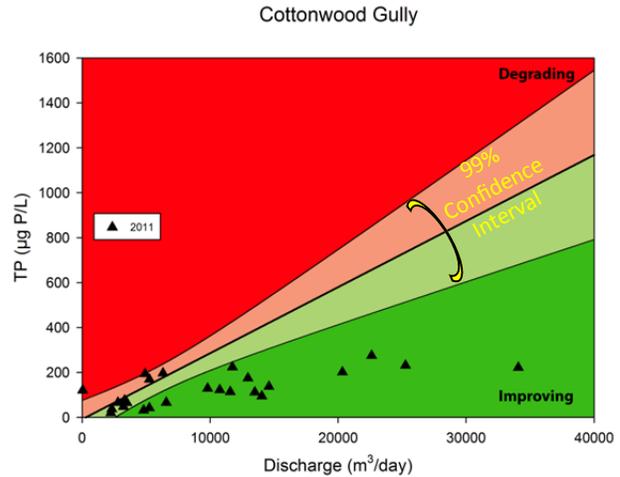


Figure 1. Regression Line and 99% Confidence Interval based on historic spring phosphorus data, with 2011 data plotted as triangles.  
Image courtesy: Makarewicz et al, 2011. SUNY Brockport.

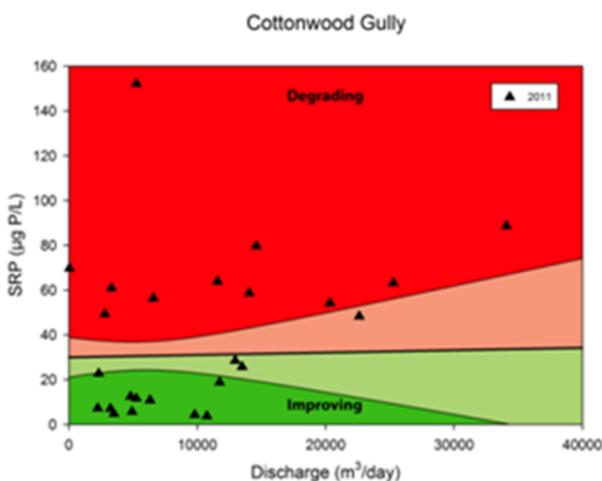


Figure 2. Regression Line and 99% Confidence Interval based on historic spring SRP data, with 2011 data.  
Image courtesy: Makarewicz et al, 2011. SUNY Brockport.

Indices were developed by the SUNY Brockport team for six parameters measured in six watersheds. The six parameters are: total suspended solids (TSS), total phosphorus (TP), soluble reactive phosphorus (SRP), nitrate, total Kjeldahl nitrogen (TKN), and sodium. The six watersheds are: Cottonwood Gully, North McMillan Creek, Graywood Creek, Long Point Gully, Sutton Point, and Sand Point.

This spring-based Stream Water Quality Assessment Index appears to be a viable, cost-effective tool for continued evaluation of the water quality of the USDA streams and performance of the BMPs.

## FINDINGS OF THE 2011 INVESTIGATIONS : WATERSHED MONITORING (CONTINUED)

### Monitoring Trends 2011

The researchers applied the assessment index to determine what the 2011 data indicate about water quality trends in Cottonwood Gully. Overall, water quality conditions have improved. That is, the 2011 data are plotted on the index, the data are in the “green” zone. This result suggests that the improvements in stream water quality observed during and after implementation of the USDA BMPs are being maintained into 2011. There was one exception: soluble reactive phosphorus (SRP). The concentrations of SRP were distributed between the “red” and “green” zones. (Figure 2). This result suggests that the loss of SRP from the watershed during 2011 was frequently greater than measured historically in this subwatershed. If the trend continues, investigations of possible causes— changes in land use, development, or farming practices— is warranted.

The other tributary sampled in 2011 was North McMillan Creek. North McMillan Creek watershed was the control watershed used in the USDA study, as it was the most forested and least agricultural. Overall, water quality was in the “green” zone, with the exception of sodium (Figure 3). Sodium concentrations were distributed in the “red” zone, particularly at higher discharge rates. This may be attributable to deicing salts. The sampling location is near the bridge, where snowmelt and associated salts enter into the creek. The data for North McMillan suggest that application rates and/or the number of applications may have been higher in 2011 than in the 2003 -2007 period.

### Findings and Recommendation - Changing from Summer to Spring Monitoring

If possible, monitoring of the Conesus Lake subwatersheds should continue as a mechanism to evaluate potential effects of changes in land use. Future stream monitoring should focus on the spring period. The Stream Water Quality Assessment Index is an appropriate data visualization tool to differentiate real change from year-to-year variability arising from different streamflow conditions.

At the Conesus Lake Association’s Youth Day at Vitale Park, Barb Rogers (Co-Watershed Inspector) demonstrates the concepts of watershed runoff to children using EnviroScape®, an environmental education model.

*Image courtesy: Livingston County Planning Department.*

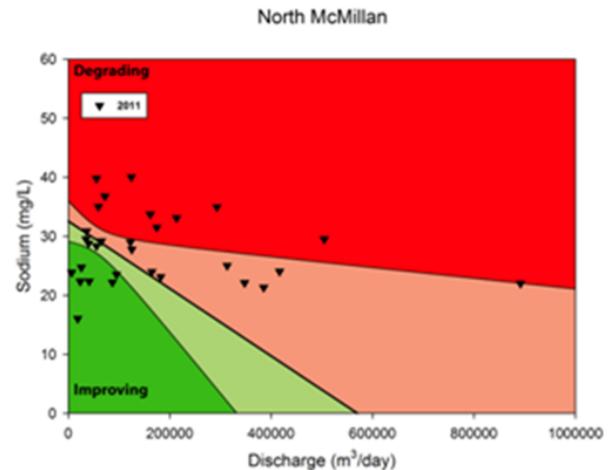


Figure 3. Regression Line and 99% Confidence Interval based on historic spring sodium data, with 2011 data.  
*Image courtesy: Makarewicz et al, 2011. SUNY Brockport.*



## ***FINDINGS OF THE 2011 INVESTIGATIONS: RELATIONSHIP BETWEEN SPRING PRECIPITATION AND LAKE CONDITIONS***

In April and May 2011, the Rochester area experienced the highest rainfall totals in at least 11 years. The Conesus Lake 2011 sampling program included monitoring selected limnological parameters and algal biomass in order to examine the lake's response to the unusually high spring precipitation and runoff. The monitoring plan was designed to meet two objectives:

- First, to assess whether the unusually high spring precipitation and runoff had a discernible effect on the lake's limnological conditions during the early summer period (late June to mid-July).
- Second, to estimate the metaphyton cover in three study areas, McPhersons' Cove, Cottonwood Gully and Sand Point Gully, where baseline conditions were known. The team was interested in determining whether the spring runoff would result in increased biomass of filamentous algae growing in these nearshore areas.



*Image courtesy: Bosch et al, 2011. SUNY Geneseo.*

The SUNY Geneseo team of Isidro Bosch, Grace Savoy-Burke and Emily Van Ness conducted the monitoring program to address these questions.

### ***Did the high precipitation and runoff have a discernible effect on Conesus Lake?***

No. Water column profiles were taken over the deepest parts in the lake's southern basin, and measured for nutrients, chlorophyll-a, water transparency, and other physiochemical characteristics. Comparisons of the 2011 results with historical records for the same time period demonstrated that 2011 was not consistently different from previous years. One possible exception was a bloom of phytoplankton detected on July 19th; on this date, the surface turbidity, and chlorophyll-a levels were unusually high for Conesus Lake, and the Secchi disk transparency was unusually low. Whether this lake-wide bloom was a response to the high springtime rainfall and associated runoff of nutrients and sediment from the watershed could not be ascertained.

### ***Did the runoff result in increased amount of filamentous algae in nearshore areas?***

Yes. Qualitative observations at three study sites along the nearshore in June and July revealed that the areal coverage of filamentous algae was exceedingly high. Macrophyte beds were widely covered with algae and the growth of the pervasive Eurasian watermilfoil may have been suppressed. Because there was no surface macrophyte canopy, the filamentous algal mat remained well below the surface where it could not be measured quantitatively by the surface quadrat method used in previous studies.

### ***Conclusions***

Much of the nutrient supply delivered by the spring runoff was likely intercepted nearshore, where it triggered extensive blooms of filamentous algae. In the open water regions of the lake, nutrient levels were not consistently high and other aspects of the water column ecosystem were within the range measured in previous years.

## 2011 FOCUS ON CONESUS LAKE ECOSYSTEM HEALTH AND PUBLIC OUTREACH EFFORTS

### **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 2011, samples were collected at three sites: Long Point Beach, Southern Shores Beach and Camp Stella Maris. Results are compared to



*Image courtesy: Camp Stella Maris on-line photo gallery.*

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 (cfu/100ml), is calculated as the geometric average of at least five samples per month. The Department of Health collects on average four samples per month. The maximum sample concentration in 2011 was 52 cfu/100ml, therefore results for the three Conesus Lake beaches in 2011 were well below the 200 cfu/100ml standard, indicating consistent compliance.

### **Blue-Green Algae**

An emerging issue in lake management is the development of harmful blooms of cyanobacteria (blue-green algae). A Blue-Green Algae Early Detection and Rapid Response Plan for Conesus Lake was developed in 2011 to improve public understanding of this issue, and to ensure that the state, county and local agencies, including water purveyors, understand their responsibilities and have access to clear and verified data. The CLWC has created an informational brochure for distribution to Lake users in the event of a bloom. The response plan and brochure are available on the County website (<http://www.co.livingston.state.ny.us/planning.htm>).

### **Invasive Species**

Livingston County continues to participate in the Finger Lakes PRISM (Partnership for Regional Invasive Species Management), an information-sharing group created by New York State to foster a regional approach to managing invasive species, both aquatic and terrestrial. In 2011, the Watershed Manager attended workshops on the statewide invasive species mapping database (iMapInvasives), the Hydrilla task force response on Cayuga Lake, and Cornell Cooperative Extension's Invasive Species In-Service. Support continues for the Conesus Lake Association (CLA) Aquatic Invasives Monitoring & Response Program. A meeting was held July 27, 2011 to discuss an action plan for monitoring and reporting two aquatic invasives (Asian Clam and Water Chestnut). The CLA conducted a volunteer diving survey for Asian Clams at the north end of the Lake in September. Good news- no Asian Clams were found.



*Image courtesy: Conesus Lake Association*

## 2011 FOCUS ON CONESUS LAKE ECOSYSTEM HEALTH AND PUBLIC OUTREACH EFFORTS

### Public education kiosks

The construction of the Vitale Park kiosk structure was completed in 2011. Another similar educational kiosk has been planned for Long Point Park, with completion in summer 2012. Educational content for the kiosk displays was developed by the Livingston County Planning Department and the CLWC Public Education and Outreach Committee.

Example of educational information available at kiosks.  
Image courtesy: Livingston County Planning Department



Jim Damon, a Livonia Eagle Scout (left) and a local contractor (right) construct the public education kiosk at Vitale Park.  
Image courtesy: Livingston County Planning Department.

### Conesus Campaign

Support continues to the Conesus Lake Association's Conesus Campaign to educate lakeside and watershed residents on lake-friendly best management practices. During 2011, a *Conesus Stewardship Initiative (CSI) Booth* was staffed at the Chip Holt Center/CLA Youth Day, Geneseo Rotary Summer Festival, CLA Arts and Craft show, the Livonia Autumn in the Village festival and the Fiddlers Picnic at Long Point. Forty "Welcome to the Lake" kits have been personally delivered to new lake property owners. The "Lake Friendly Vendor" program has signed up 11 vendors, and signage is being developed for Vendors that do not have a storefront - such as lawn care services - to expand the program.



In addition to these activities, articles on the CSI programs were included in the Finger Lakes Institute on-line magazine "Happenings" (<http://flhappenings.wordpress.com/2011/06/29/conesus2011/>) and in the Livingston County News.



## **CONESUS LAKE WATERSHED MANAGEMENT PLAN**

### **IMPLEMENTATION STATUS REPORT—2011 YEAR IN REVIEW**

# in Plan	Recommendation	Priority	Action Taken
A-1	Review and amend zoning regulations to improve consistency in near-lake areas.	High	<ul style="list-style-type: none"> <li>• The Planning Department continued working with the Town of Conesus on their zoning update. Technical assistance was provided as needed to all watershed towns and villages regarding zoning and watershed issues.</li> </ul>
A-3	Develop public education campaigns on BMPs for lake and watershed residents.	Medium	<ul style="list-style-type: none"> <li>• Construction of the Vitale Park kiosk structure is almost complete. Preliminary plans for content for the Vitale Park Kiosk were discussed at the PE&amp;O Meeting on July 19 and presented at the August 12th Watershed Council Meeting. Content has been finalized and printed.</li> <li>• The Planning Department, PE&amp;O Committee and Environmental Management Council co-sponsored a Homeowner's Emerald Ash Borer (EAB) educational workshop for Livingston County residents, held at Long Point Park on June 4.</li> <li>• A Planning Department website is in the preliminary planning phase. This website will be the up-to-date source of public education and outreach information.</li> <li>• The Geneseo Town Board approved the PE&amp;O Committee to work on a educational kiosk for Long Point Park. A contract was authorized between the Town of Geneseo and the Planning Department for the construction of the kiosk, which will be complete by August 1, 2012.</li> </ul>
B-1	Secure funding to help mitigate the financial impacts of changes in agricultural practices on the producers.	High	<ul style="list-style-type: none"> <li>• In progress. Agencies will continue to use existing funding sources and look for new funding sources for agricultural BMPs annually as part of their existing programs.</li> </ul>
B-2	Implement practices that will reduce non-point source pollution from farms.	High	<ul style="list-style-type: none"> <li>• Three grass waterways (totaling ~5450 feet in length) were installed on watershed farms to address severe gully erosion. Seventy-five acres of cover crops were also installed.</li> <li>• Agricultural BMPs continue to be implemented by watershed farmers, the Livingston County SWCD, and the USDA NRCS.</li> </ul>
C-1	Develop and implement program to restore and stabilize stream banks in the watershed.	High	<ul style="list-style-type: none"> <li>• Streambank buffer initiative In progress. Agencies continue annually to focus efforts on watershed areas that are not currently buffered as part of their existing programs.</li> <li>• Assistance to Towns of Conesus and Livonia with EPF streambank remediation grant (Phases I and II) is ongoing. The Towns of Livonia and Conesus approved a draft contract. When an executed contract is received from the Department of State, an RFP and a letter to land-owners will be sent.</li> </ul>

#### **Key to Acronyms:**

BMPs - Best Management Practices  
 NRCS - Natural Resource Conservation Service  
 RFP - Request for Proposals  
 USDA - United States Department of Agriculture

EPF - Environmental Protection Fund  
 PE&O - Public Education and Outreach  
 SWCD - Soil and Water Conservation District

**CONESUS LAKE WATERSHED MANAGEMENT PLAN  
IMPLEMENTATION STATUS REPORT—2011 YEAR IN REVIEW**

# in Plan	Recommendation	Priority	Action Taken
C-3	Develop public education campaigns on the impact of human activities on the health of the Lake.	Medium	<ul style="list-style-type: none"> <li>• Support continues to the Conesus Lake Association's Conesus Campaign to educate lakeside and watershed residents on lake-friendly best management practices.</li> <li>• A Conesus Stewardship Initiative (CSI) Booth was staffed at the Chip Holt Center/CLA Youth Day, Geneseo Rotary Summer Festival, CLA Arts and Craft show, the Livonia Autumn in the Village festival and the Fiddlers Picnic at Long Point.</li> <li>• "Welcome to the Lake" kits have been personally delivered to 40 new lake owners.</li> <li>• The "Lake Friendly Vendor" program has signed up 11 vendors. Currently developing signage for Vendors with no storefront (e.g.: lawn care) to expand program.</li> <li>• Articles on CSI programs were included in the Finger Lakes Institute July "Happenings" online magazine and the Livingston County News.</li> </ul>
D-3	Municipal Highway Departments should develop a plan, subject to available funding, to remediate ditches in poor condition.	Medium	<ul style="list-style-type: none"> <li>• EPF Road Ditch Grant: Administer and close out EPF road ditch grant; final payment request was sent to the State in June.</li> </ul>
G-1	Investigate and implement effective methods to control the spread of non-native (exotic) organisms.	High	<ul style="list-style-type: none"> <li>• Livingston County continues to participate in the Finger Lakes PRISM, an information-sharing group formally created by New York State to look regionally at the problem of aquatic and terrestrial invasive species. The Watershed Manager attended the iMAPInvasives Program workshop, the Cayuga Lake Hydrilla workshop, and the Cornell Cooperative Extension's Invasive Species In-Service.</li> <li>• Support continues for the Conesus Lake Association's Aquatic Invasives Monitoring &amp; Response Program. A meeting was held on July 27 to discuss an action plan for monitoring and reporting new aquatic invasives (Asian Clam and Water Chestnut). The CLA conducted a diving survey for Asian Clams at the northern end of the lake in September, and no Asian Clams were found.</li> </ul>

On Sunday, September 18, a survey for Asian clams was conducted by volunteer divers in the cove area at Vitale Park. Fortunately, no Asian clams were found. From left to right the divers are Rob Hudak, Jim Feuerstein, Mike Saviola, and Christy Tyler. Mike organized the project.

*Image courtesy: Conesus Lake Association.*



**Key to Acronyms:**

CLA - Conesus Lake Association

EPF - Environmental Protection Fund

iMAPInvasives- an on-line, GIS-based, all-taxa invasive species mapping tool (<http://www.imapinvasives.org/index.html>)

CSI - Conesus Stewardship Initiative

PRISM - Partnership for Regional Invasive Species Management



**CONESUS LAKE WATERSHED MANAGEMENT PLAN**  
**IMPLEMENTATION STATUS REPORT—2011 YEAR IN REVIEW**

# in Plan	Recommendation	Priority	Action Taken
G-2	Develop and implement a program for cleaning accumulated aquatic plants and algae along the shoreline of Conesus Lake.	High	<ul style="list-style-type: none"> <li>Created a Blue-Green Algae Early Detection and Rapid Response Plan, which was approved at the August 12th CLWC Meeting.</li> <li>To provide proactive public education and outreach content to inform Lake Users about blue-green algae, a tri-fold informational brochure was created and distributed. Website content is being created.</li> </ul>
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	Continued following the success of the Honeoye Lake project. Maintain contact with NYS DEC on State position on alum treatment on NYS lakes.
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	The CLA, working with FLCC, stocked about 200, ten inch fingerlings into the lake in October. DEC 2011 stocking programs for Conesus Lake did not include walleye.
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 annual monitoring was held in February. Watershed stream monitoring began in March. SUNY Brockport monitored Cottonwood & North McMillan Gully Creeks for event/non-event samples. SUNY Geneseo began monitoring the Lake in late June. Livingston County Department of Health continued beach monitoring over the summer. Monitoring was completed, and written reports finalized.
H-2	Prepare and distribute an annual Conesus Lake and Watershed Report Card.	High	2010 Report Card completed and presented to the CLWC.

**Key to Acronyms:**

CLA - Conesus Lake Association  
 FLCC - Finger Lakes Community College  
 SUNY - State University of New York

CLWC - Conesus Lake Watershed Council  
 NYS DEC - New York State Dept. of Environmental Conservation

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