



The Lake Matters

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Aeration Now Expanding to West Side

The lake is getting deeper! Aeration is working to restore the depth of Little Lake.

In July of 2012 our first aeration system--the only one in the state of Vermont--went into operation. It covered a small area on the east side of Little Lake. After a couple of years, the state granted us a permit to expand the system from 9 to 13 diffusers. Over the four seasons, the aerated zone has developed an average of four feet of new depth as the infused oxygen allows the natural bacteria to decompose the sediment. We have also observed a side benefit, the reduction of some milfoil in a large area adjacent to the aeration zone.

With the success of this process, we were able to gain a permit to again expand the aerate to a larger portion of the lake. So this year, we are moving into the second phase, aerating a large area on the west side of the lake.

The map below illustrates where the compressor and 14 new diffusers will be located along the west side of the lake. We expect to see a similar improvement in depth over this area, especially necessary in the most northwestern area which has suffered very bad shallowing over recent years.



The proposed west side aeration system design. North Street and Clayton Tract are shown on the left.

Our careful monitoring of the water quality has shown an increase in clarity and more abundant fish activity in the area where increased oxygen attracts them.

We hope to have the new system installed and running by mid-June. The installation work will all be done by Bob Short, Fran Gilman, and other volunteers, all of whom are donating their labor.

Aeration is used in waterbodies world wide. We have learned that combining aeration with the introduction of additional enzymes--the kind that naturally exist in the water--can expedite and accelerate the decomposition process. Currently we are conducting an experiment to test this.

Two Seminars focus on Lake Management

LAKE RESTORATION SEMINAR

A Seminar on Lake Restoration on June 4th at Castleton University promises to be a great opportunity to learn about new technologies and share experiences and perspectives on the entire subject of lake health.

Experts from the northeast US will be presenting. Lake association members and the general public are invited to attend. There will be no charge for admission. The Seminar is being produced by The Coalition of Vermont Lakes, Inc. of which LSCCF is an active member.

This **First Annual Lake Restoration Seminar** will be held Saturday, June 4, 9 AM to 1 PM, in Room 122, Jeffords Auditorium, Castleton University

Agenda

Welcome President of The Coalition of Vermont Lakes, Bill Steinmetz

State of Vermont DEC's Programs Manager Lakes and Ponds Management and Protection Program, Dr. Perry Thomas

Treatment of Invasive Species President of SOLitude, Mark Bellaud

Lake Restoration through Aeration Director of Clean-Flo, Inc., Brian Kling

Inversion Oxygenation and Bio-augmentation Effects on Eurasian Watermilfoil Densities Water Resources Director Restorative Lake Sciences, PhD candidate Jennifer Jermalowicz-Jones.

Lake Mapping and Biomass Surveying Technologies Executive Director Lake George Association, C. Walter Lender

Open Forum

Closing Remarks

AERATION SEMINAR

On February 13, the LSCCF hosted a seminar on the effects of aeration in reduction of sediment and Eurasian watermilfoil at the Wells Town Hall. The session was attended by Vermont DEC officials, LSCCF Directors, aeration expert Brian Kling, local citizens, and

other lake associations (along with LSCCF, Bomoseen, Dunmore and Hortonia were represented). Representing the Vermont DEC were officials, Perry Thomas (Lakes and Ponds Program Manager), Ethan Swift (Watershed Coordinator), and Misha Cetner (Aquatic Nuisance Control). Brian Kling is a professional engineer working with Clean-Flo International, Inc., a Pennsylvania-based company that specializes in natural methods of improving water quality and lake restoration.

To start off the meeting, an overview of results of aeration to date on Lake St. Catherine was provided by Bill Steinmetz with help from David Emmons, Bob Short, Fran Gilman and Joel Pliner. The history of the lake was emphasized along with the lessons learned along the way. A highlight of this opening was the presentation of data and photographic evidence of the changes in the lake, showing the amazing results of increased depth of almost 4 feet to soft bottom resulting from less than four seasons of aeration.

Brian Kling presented the benefits of aeration through a process called bioremediation—the use of aeration with the presence of enzymes. He described how milfoil has been significantly reduced using bioremediation. This is being studied by Jennifer Jones, a Michigan-based limnologist. She theorized that the reduction of milfoil is due to the reduction of ammonia in the muck, a compound of which milfoil is particularly fond.

After a question and answer period, a lakeshore 'engaging kit' was introduced by Perry Thomas of the VT DEC Lakes and Ponds Program. She explained how lake shores can be restored to a healthy balance. Significantly, she mentioned that the first step in this restoration process was the removal of muck.

A "tactical basin planning process" was introduced by Ethan Swift, VT DEC. He mentioned this process in general and the manner in which it has been applied to Sucker Brook that feeds into Lake Bomoseen.

The VT DEC representatives pointed out that aeration is still being explored in Vermont and is not yet an approved treatment method

Following the session, several attendees visited the ongoing aeration/enzyme experiment at the Wells Village School (across the street from the Wells Town Hall).

Hydraulic Dredging Project Facing Some Obstacles

The northwest corner of Little Lake has suffered the greatest degradation. It has become so shallow that actual islands of muck are forming with plants growing on them. Navigation in that area is virtually impossible. This area is essentially filling in and slowly becoming land, with sections having only a few inches of depth.



There's almost no open water in the northwest corner of Little Lake

Because of the severity of the conditions there, we have been pursuing a method of restoration that would act more quickly and effectively than aeration. It's called hydraulic dredging.

Since receiving a permit from the Vermont Department of Environmental Conservation, Lakes and Ponds Division, for a hydraulic dredging project in 2013, we have carefully explored the details of implementing the approved dredging project for a portion of the northwest corner of Little Lake. But as we have learned more about the implementation, the complexity of the dredging approach has become increasingly apparent.

While it was our intention to rent equipment and conduct the operation ourselves with volunteer labor from Directors and other members, we have come upon unforeseen hurdles.

The financial requirements for dredging are one of the major challenges. And as we consider this project, the other technical needs lead us to believe that subcontracting this project to a construction contractor may be our best option. The reasons for this include the insurance challenge, the size and complexity of the equipment involved, and the access and egress matters.

We are currently experiencing difficulty getting adequate insurance for the hydraulic dredge equipment that we wish to rent. The replacement cost new of the hydraulic dredge is approximately \$150,000. Our existing carrier is unwilling to issue this as a rider to our current policy, and we are exploring other insurance options including entering the insurance pool. Typically, obtaining insurance through the insurance pool is more expensive. We should know the actual insurance cost in the near future.

The hydraulic dredge available to us is a large piece of equipment weighing nearly 9 tons. It has a complex hydraulic system for the harvest bar and propulsion but appears to be well-maintained. However, placing this equipment in the lake and dealing with any operation problems would be a significant challenge for our volunteer team. Placing the dredge in the lake will require a large lifting crane and the right access location. The only location we are aware of is DEC's Fish & Wildlife boat ramp near the bridge. Typically, DEC Fish & Wildlife do not allow the loading of commercial equipment at their boat ramps. We have asked the Lakes and Ponds Program to request a waiver of this exclusion. We are waiting their response to this request. Until we receive it we are unable to plan the remainder of this project.

We will continue to explore this important option and report back to our membership on our progress. The good news is there are seven more years in our existing permit, so we have sufficient time to solve the various problems and implement hydraulic dredging, as appropriate, in the northwest corner of Little Lake.

Thanks to Wells Voters for LSCCF Support

At the annual Town Meeting on March 1 the voters of Wells said “Yes” to both of the LSCCF items, providing a total of \$30,000 to be used in continuing our lake restoration process.

We thank the people of Wells for their continued support and their faith in our efforts to bring the lake back to its previous beauty and to restore the accustomed uses of the past.

The positive vote followed the town meeting on February 29 at which LSCCF members and other residents had a chance to share comments and questions about the condition of the lake and possible treatments available. Representing the LSCCF were Directors Joel Pliner, Bob Short, and Bill Frye. LSCCF President Bill Steinmetz remarked, *“We do this work together ‘for the sake of the lake’ and for future generations that deserve to be blessed by this amazing natural / God-given resource. We so appreciate your vote of approval and your encouragement to move forward—which we will do!”*

The two items petitioned by the LSCCF were the customary request for \$10,000 and a one-time item for \$20,000 to expand the aeration system which has been successfully deepening the east side of Little Lake for over three years.

The LSCCF will be moving forward with both the aeration expansion as well as a hydraulic dredging project in the northwest area of Little Lake.



What Happened to Hydro-raking?

In 2015, to the great disappointment of many of our members, our hydro-raking management was dealt a lethal blow by the state.

Each year as a service to our members, we arrange for hydro-raking to be done at the waterfronts of those who request the service. We

sent in our annual application in January 22, 2015. On January 26 ANR received our application for a permit to hydro-rake 11 properties during the spring/summer of 2015. Anticipating approval (as has been the case for many years) we arranged for the state to do its inspections of the sites early in the spring, and arranged with a contractor to begin the hydro-raking by mid-June, assuming the permit would be issued.

The agency did the inspections on June 18, but no permit was issued subsequently. On June 24 we received a temporary notification that the approval of the permit would be unlikely, since the inspections of the hydro-rake locations did not prove the use of a hydro-rake was needed. We notified all of the 11 hydro-rake applicants, and some of them complained to the agency with explanations telling why the hydro-raking was absolutely essential to their areas. These complaints were answered with polite but inconclusive language, leaving the individuals frustrated. The agency’s formal response was actually very long in coming, not arriving until October 29, 2015, long after the season for lake use was over. Their decision was to **deny permission to all eleven of the applicants.**



These lakeshore owners now seem to have no avenue of opportunity to keep their waterfronts clean and navigable.

A detailed explanation of the state’s response can be found on our web site at www.lakematters.org.

LSCCF AND WELLS VILLAGE SCHOOL CONDUCT ENZYME EXPERIMENT

The Lake Saint Catherine Conservation Fund and the sixth grade class at the Wells Village School are conducting an experiment in lake restoration. Our successful use of aeration on the east side of Little Lake has produced about four feet of new depth in the treated area by enabling the reduction of sediment. The experiment conducted with the Wells Village School is testing the application of various enzymes that might accelerate this lake restoration process.

Sixth grade teacher Barbara Pennington is looking forward to her class's participation. The students monitor the results of aeration as it is diffused into seven tanks of water and sediment from the lake. Various enzymes have been introduced to the tanks, and the pupils regularly measure and monitor the temperature and increased depth over time. The students are learning to record data, graph the data, and compare the results of the experimental tanks with a control tank of lake water. The students will use this experience to further understand the scientific method which has helped us understand so much of our natural environment.



Bill Steinmetz explains the experiment to the students

The Lakes and Ponds division of the Vermont Department of Environmental Conservation is participating in the ongoing LSCCF lake restoration program and the experiment at the Wells Village School. With our extension of the aeration program to the west side of Little Lake this year, we are hoping the results of the experiment at the Wells Village School will illustrate methods to further enhance this lake restoration process.

Early in the program, Conservation Fund President Bill Steinmetz briefed these junior limnologists (lake scientists) on the lake restoration work and the role of the experiment.

The students, working with their teacher, Barbara Pennington, will continue to keep records during the next six months as we quantify the effects of aeration and enzyme combinations on un-decomposed lake sludge. As the photos show, they are a committed and serious group of young scientists.



Seven Wells sixth graders are ready for the study

As an adjunct to the in-school activities, there will also be a field trip during which students will actually get out on the lake and observe conditions and see some of the equipment and methods of monitoring used by the LSCCF.

The President's Perspective...

I continue to be asked regularly by our members and my neighbors some form of, "What have you done for me lately?" The question is a real one and a fair one. The answer is, "We are implementing more lake restoration projects than ever before and they are working!" Here's what I mean specifically ...

Our east side aeration project has now operated for four seasons. We have experienced an average increase of 1 foot per season for a total of almost 4 feet additional depth to the soft bottom of Little Lake. This success has been confirmed by DEC representatives.

Based upon this success, we have purchased the equipment necessary for the west side aeration project. This equipment should be installed before mid-June and begin operation immediately. We anticipate that we will experience similar positive results on the east side of Little Lake. We will monitor the results carefully and hope to see a systemic effect upon the entire Little Lake as oxygen levels raise.

The success of applying aeration for lake restoration has been noted by other lakes in Vermont. Working through The Coalition of Vermont Lakes (a 501 c 3 non-profit corporation), Lake Dunmore and Lake Bomoseen now also expect to implement aeration projects. These projects and the aeration approach to Lake restoration will be a feature of the Lake Restoration Seminar on June 4.

We provide a leadership role for The Coalition of Vermont Lakes. Serving as president of that nonprofit, I have encouraged further exploration of non-toxic lake restoration methods. The result of this encouragement is the first lake restoration seminar to be held at Castleton University on June 4, starting at 9 am. The seminar will cover various lake restoration methods and will include representatives of Lake restoration contractors and the state of Vermont DEC. All members of the conservation fund are most welcome to attend. There is no fee for attendance as expenses have been covered by your membership in the Conservation Fund.

In previous years, we had an extensive and expensive lake quality monitoring program with

phosphorus, chlorophyll and pH regularly monitored. This year we are monitoring dissolved oxygen, temperature and soft bottom depth measurement only. This is because the state of Vermont DEC has confirmed that there are "no negative environmental impacts" from the lake aeration method. This summer we will augment our monitoring by continuing our radar mapping of the soft and hard bottom of the lake. This method will eventually allow us to accurately estimate biomass in all of Lake Saint Catherine.

We continue to hold a permit to perform a hydraulic dredging project in the northwest corner of Little Lake. The separate article on this project explains the status of this project. While the project is larger and more complex than we originally expected, we remain optimistic that we can implement this dredging project within the next several years.



We will continue to work for you, our members and neighbors and we will advocate for a healthy and sustainable Lake Saint Catherine that is restored to the beautiful accustomed use we all know is possible.

I want to thank my fellow Directors for their hard work this year. We have an amazing and dedicated team and I am proud of them. If you have a chance, express your thanks also. We don't need it to do the work, but your appreciation makes the load a little lighter.

Thanks to all members and the voters in the Town of Wells for your support over the years. We particularly appreciate the positive vote from the town of Wells voters for a one time allocation of \$20,000 to fund the West side aeration project. Keep your membership active as it is working. And keep those questions coming. Your questions are fair questions, and they keep us accountable and "on our toes."

God bless, PB (aka Bill Steinmetz)

Annual Meeting

Dear members:

Our annual meeting will be held on May 28 at 10:00 AM at the Wells Village School. Please try to attend. We have items to vote on and are looking forward to sharing all that is happening with our members. See you there!

It's been an interesting and sometimes challenging year for the LSCCF...great progress with aerations...disappointing decree from ANR about hydro-raking...planning expansion of aeration...dealing with hydraulic dredging details...working with school kids...holding and planning seminars...it's always rewarding and always challenging. The Board of Directors thanks you all for your loyal and steadfast sponsorship.



Renew your membership!

The deadline for dues for 2016 was January 1. Most of our members have already signed up for this year, and have generously accompanied their \$50 dues with tax-deductible contributions. Any amount in addition to the dues is IRS tax-deductible. Regular membership dues are \$50 (Silver level). We designate participation levels above \$50 as Gold (\$100) and Platinum (\$150+). There is also a Commercial Level of \$300.



**Lake St. Catherine
Conservation Fund, Inc.**
Wells & Poultney, Vermont

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