



Cranberry Lake

Lake Management Program

This program was developed and is maintained and managed by the Cranberry Lake Community Club on behalf of and for the full benefit of all members of the Cranberry Lake Community

Overview

The Cranberry Lake Community Club is committed to ensuring our lake is properly managed and maintain by providing the necessary funds and resources to oversee the daily operational needs of the lake. We are a member of COLA in coordination with other lakes and are the liaison with State and Town (Byram) governments. These strong relationships have allowed us to pursue grants from the State and local (Byram) governments for things such as weed harvesting and receive permits to control the geese population.

Our Lake Management Program consists of but not limited to the following:

- On-going Aquatic Vegetation Control, Water testing and Shoreline Management
- Provide public information & awareness
 - bulletins and write ups on feeding wildlife
 - recommended use of fertilizer
- Educational programs that our vendor conducted regularly for our members
- Boating Safety Courses where we invite outside community members
- Coordination with state on the health and condition of the Dam
- Coordination with state on shoreline earth embankment. We have a court assisted document that the State should abide by regarding the make-up and appearance of the earthen “dam”
- Posting of State approved lake regulations
 - speed
 - direction
 - closeness to shore
- Working with Byram on Storm drain run off into the lake
- Providing access to the lake to obtain water for Fire Department use
- Swimming Safety
- Lake Security

Aquatic Vegetation Control

The CLCC Executive Board appoints members to participate in a Lake Management Committee who are held responsible for reviewing qualified contractors/consultants who would partner with this committee to manage our overall aquatic vegetation concerns (lake weeds, water quality, shoreline etc.). It is in turn the responsibility of this committee to present and recommend their suggestions on which contractor/consultants would best fit the needs of the lake. This review takes place every 3 years upon renewal of the agreement.

It is also the responsibility of this committee to maintain a weekly review of the quality of our in-flight program which includes supervising the activities of our chosen contractors/consultants as well as any other activities necessary to maintain the quality of the lake for recreational uses.

To summarize our current agreement; under the supervision of a CLCC Lake Management multi-member committee we outsource our Aquatic Vegetation Control (AVC) to ***Aquatic Technologies, Inc.*** Our AVC program, therefore, consists of a multi-year agreement with Aquatic Technologies that our CLCC Lake Management Committee would have reviewed and approved. In addition to our vegetation control; we execute a scheduled drawdown of the lake every third year.

Note: Approval of the drawdowns are memorialized in the minutes of the Board of Governors.

**Aquatic Technologies, Inc.
P.O. Box 769
Branchville, NJ 07826
Tel: 973-773-9567 – Fax: 973-948-7118**

www.aquatechnj.com

**Lake Management Consultants
Experts in Aquatic Vegetation Control**

Cranberry Lake winter drawdown

Aquatic Technologies, Inc. recommends a winter lake level drawdown for Cranberry Lake. Lake level drawdowns are conducted at many of our north eastern client's lakes for a variety of reasons. The purposes may include protection of the shoreline from the erosion effects of high water, control of aquatic weeds, reducing the adverse effects of winter ice on the shoreline and shorefront structures and for providing water storage capacity to mitigate flooding.

Protection of the Shoreline

Shoreline erosion is a natural continuous process. The force of water and soil saturation gradually washes land area into the lake. High water conditions in combination with heavy winds cause erosion of the shoreline above the normal water line. Drawdowns lower the water level so that the erosive forces of waves are acting below the normal shoreline. Drawdowns also provide vertical space so that if water levels rise as a result of high runoff, they come up to normal levels rather than above normal levels, as would be the case if the waterbody were kept full.

Aquatic Weed Control

Cranberry Lake may benefit with reduction of nuisance aquatic vegetation from results of a winter drawdown. This would allow us to reduce the number of herbicides used in the Spring. Eurasian Milfoil is a significant issue in Cranberry Lake and is a species that can be affected by winter drawdown. With the ever-changing weather patterns in the north east over the past decade, it is difficult to predict how much of a winter "freeze" we get, but chances are it may occur. The effectiveness of drawdowns is dependent upon a deep frost and dewatering of the sediments. These conditions may not occur with heavy snow or mild rainy winters.

Reducing Ice Damage

Lake ice can reach a thickness of two feet or more. The force of massive ice is exerted in three ways. Under the warming spring sun, as the lake ice expands, it can exert 2,000 or more pounds of force per square inch on anything in its path including docks, walls, and the natural shoreline. Ice berms are evident around the shorelines of many lakes. Should lake levels fluctuate when the ice is frozen onto an object, that object will be moved accordingly up or down. As the near shore areas thaw in the spring, the ice sheet is driven by the wind onto the shore. Drawdowns are effective at transferring the location at which these forces are exerted away from the natural shoreline and structures built there.

ENVIRONMENTAL Fact Sheet



29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

Lake Drawdown for Aquatic Plant Control

Lake level drawdown and the subsequent exposure of sediments to prolonged freezing and/or drying is an inexpensive means of aquatic weed control. Drawdowns serve to stress plants and could physically remove them from their habitat. Low water levels will expose the plants to desiccation and could ultimately affect plant vascular structure, thereby rendering the plant incapable of nutrient transport and function. This can temporarily reduce plant density for an undetermined period of time. While being an economical means of plant control, lake drawdown is also rather unpredictable, and may cause some species to actually increase in abundance, or not affect some target species at all. Further, draining the water from an aquatic system can be detrimental to nontarget organisms.

Factors Necessary to Increase Potential for Drawdown Success

Several factors are necessary to increase the potential for drawdown success. The amount and degree of the drawdown are probably the foremost important factors to consider. Most importantly, the capability to draw down the lake to a level suitable to maximize the exposed littoral zone is necessary.

Typical fall/winter drawdowns are usually conducted in New Hampshire from October through early spring. The length of winter drawdown is based on ice and snow cover, water uses, and expected water renewal rates. It is imperative that the water level be brought down slowly, in order to allow for aquatic fauna to adapt to the changing water levels. It is also important that the lake be brought back to normal full-lake levels before the summer season begins for a variety of reasons, including ecological, recreational, aesthetic, and for keeping terrestrial species from encroaching on the lake bed. Water level fluctuations should always be coordinated through the DES Dam Bureau in consultation with the DES Biology Section

Fall/winter drawdowns can be beneficial in that some desiccation takes place as the waterbody is dewatering, but thorough freezing of the plants and the lake sediments is the key. Freezing of the plants damages the structure and integrity of the vegetative material. Freezing of the lake sediments will impact rooting systems and rhizomes, both by freeze damage, scouring, and subsequent uplifting of the rooting systems. Scouring action of ice moving over the exposed lakebed will force tubers and rooting systems

Confidential

Do not duplicate or distribute without written permission from CLCC Executive Board

from the substrate. When the water level is again raised, these anchoring plant structures will often float downstream and discharge through the lake basin, or they can be hand-removed as they float around.

Adverse Impacts of Drawdown

Though drawdowns may be a relatively low-cost technique to reduce the abundance of some littoral zone aquatic macrophytes, there may be several unanticipated problems associated with drawdowns. Algal or cyanobacteria blooms may follow a drawdown. Cyanobacteria blooms may be toxic, while an increase of green filamentous algae may decrease aesthetic values of the waterbody. Planktonic blooms of cyanobacteria typically turn the water a bluish or greenish color, while filamentous algae blooms form large green billowing masses in the shallows. Other algae may also bloom causing taste and or odor problems. Algal blooms are caused by nutrient release from decaying plants. Large amounts of aquatic plants and organisms that succumb to the drawdown begin to decay shortly after drawdown but nutrient release to the waterbody may not occur until full-pond level is achieved. Nutrients released from decayed material will quickly be utilized by algae and cyanobacteria, leading to increased cell production. Waterbodies, particularly shallow system, tend to maintain a balance between macrophyte and algal growth. Once plant populations diminish, the degree of nutrient competition in the waterbody favors increased algal populations due to their ability to quickly uptake available nutrients. Shallow lakes have shown shifts from clear, plant dominated conditions to turbid, algal dominated systems following a drawdown. Aquatic food web changes may result in shifts in plant and animal structure due to drawdown.

Impacts to organisms lower in the food web (plants, algae and insects) will have negative impacts on those organisms higher in the aquatic food web (fish, animals and waterfowl). Oxygen concentrations throughout the water column may be impacted by the drawdown. As bacteria further decompose the accumulated detritus, they create an oxygen demand to the water. During summer stratification, hypolimnetic oxygen levels and even mid-thermocline oxygen levels may be dramatically reduced, resulting in large-scale fish kills.

The difficulty of achieving complete sediment dewatering in target areas of the waterbody is also a potential problem. Physical constraints due to dam construction, underground springs, weather conditions and inflowing water may limit the degree of drawdown, lessening the expected range of impacts to the littoral zone.

Changes in the bottom sediment may also occur as a result of drawdown. Softer sediments may become compacted or frozen segments that are now lighter than water could loosen and float around in large masses or as floating islands in the waterbody, only to settle once again in a new location. Several notable drawdowns resulted in the formation of floating islands that settled at the public access, blocking all ingress and egress. These are extremely difficult to move or remove, and a Wetlands Permit would be necessary for any removal activities. Impacts and even mortality to aquatic animal species is a big risk during drawdown. The impacts may result from leaving animals

stranded 'in the dry' as a result of drawdown, or could involve more complex impacts that result from modifications in the food chain or various stressors associated with the drawdown. Many organisms that make their home in the aquatic environment, including fish, frogs, salamanders, turtles, aquatic insect larvae, mussels, and others can all feel the impacts of drawdown. Agile and faster moving organisms (like fish) may be able to move upstream or downstream to other unimpacted habitats; still, these fish may be confined to smaller, shallower areas where they become easy prey to consumers or suffer from oxygen deprivation. The Fish and Game Department, in cooperation with DES, has documented changes in the fishery over time in one lake that was the focus of a study on drawdowns. Slower moving, more sedentary organisms have a greater risk to negative impacts. Freshwater mussels, snails, insects, and crayfish may not be able to find suitable habitat, and may succumb to the drawdown. In a long-term study of deep drawdown on one lake in New Hampshire, DES measured significant shifts in macroinvertebrate populations from non-drawdown to post-drawdown years.

Finally, there may also be a long-term change in plant species composition from "drawdown susceptible" plants to "drawdown-resistant" plants. Several studies show that annual drawdowns can actually influence the growth of these resistant plant species. A study of lake drawdown conducted by Dennis Cooke (1980) found that various aquatic plants responded differently to drawdown. Summary of Winter Drawdown Study Findings (Cooke, 1980)

Decrease in Abundance Increase in Abundance No Change

Water shield (*Brasenia*) Bulrush (*Scirpus*) Bladderwort (*Utricularia*)
Pondweed (*Potamogeton*) Arrowhead (*Sagittaria*) Bur-reed (*Sparganium*)
Yellow water lily (*Nuphar*) 3-way sedge (*Dulichium*) Tape grass (*Vallisneria*)
White water lily (*Nymphaea*)
Spike rush (*Eleocharis*)
Water milfoil (*Myriophyllum spp*)
Pickerelweed (*Pontedaria*)

Summary

Water level drawdown may be an effective technique for at least the short-term control of susceptible aquatic plants, and can be accomplished at low costs without the introduction of chemicals or machinery. However, this technique may or may not affect target species with a predictable outcome, it requires careful identification of the target plants before drawdown to avoid rapid establishment of resistant species, and it could have long-lasting effects on non-target biota like freshwater mussels, macroinvertebrate populations, the fishery, and other organisms.

Boating Safety

The New Jersey Department of Environmental Protection is responsible for providing all of the lake markings and the Marine Police are responsible for policing the lake and handing our citations when necessary.

Safe Boating Aids to Navigation

Understanding the special markers and signage is important, as these will identify safe waters, convey important information to boat operators, and assist in navigation.

Controlled Area

A white buoy or sign with an orange circle and black lettering indicates a controlled or restricted area on the water. The most common controlled area within our lake is 'Slow-No Wake' speeds. 'Slow-No Wake' means operating your boat at the slowest possible speed necessary to maintain steerage, but not greater than five miles-per-hour.



Danger

A white buoy or sign with an orange diamond warns watercraft operators of dangerous rocks or underwater structures. The source of the danger will also be lettered in black.

Rocks are abundant in Cranberry Lake, please use caution when traveling in the lake. *Not all rock hazards are marked due to changing water levels.*



Water Hazards

Some remnants of the lake's history can still be seen today and can be considered water hazards. Use caution when entering and leaving the old lake because some old concrete piers are located just below the water surface depending on the current lake levels.

Dead heads, a partially submerged log or trunk, can be found anywhere in the lake and can cause damage to boats, motors and most importantly skiers. Always be scanning the water for any hazards around you and report them immediately.

Swimming Safety

Cranberry Lake offers two beaches (Clubhouse Beach and Roses Beach) for the enjoyment of our members. Swimming is possible at both beaches as well as off of one of our many floating docks throughout the lake. We ensure proper "No Swimming" signage is placed in and around the lake where appropriate.

Through our Executive Board appointed Water Supervisor; we ensure that our swimmers are safe by providing certified Lifeguards at both our beaches. The lifeguards are on duty at the Clubhouse Beach and Rose's Beach. Hours of operations can be found on both the printed calendar as well as the website. Lifeguards are also on duty at all club events that involve members bathing in the water.

Lake Security

The CLCC Executive Board is committed to ensuring our community is kept safe as possible by appointing a security officer for the lake who are responsible for communicating new security measures to the community as well as being the single point of contact if there is ever a need to report any suspicious activity.

Shoreline Maintenance

The CLCC Executive Board is committed to ensuring the lake shorelines are maintained and safe for our community members. We manage and maintain the boat ramp in Cabin Springs allowing our community members a much safer and easier way to launch and remove their boats each year as opposed to doing so at the state ramp. We

maintain and are responsible for the several community bulkheads and docks around the lake.

Some recent years club led maintenance initiatives include:

- Funded and led the effort to fix the beach erosion problem at Rose's Beach.
- The Cabin Springs boat ramp is scheduled for repair during the next drawdown.
- Funded and led the effort to replace the seawall in Cabin Springs about 8 years ago.
- Funded and led the effort to replenish the sand at the Clubhouse Beach, Roses Beach and Weaver House Cove Beach.
- The seawall at the club is going to need a major repair or replacement very soon. (It has a few very large cracks.)

Some future club maintenance initiatives include:

- The Cabin Springs boat ramp is scheduled for repair during the next drawdown.
- The seawall at the club is scheduled for major repair or replacement. (Timeline TBD)