

Friends of Leverett Pond
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Ms. Miho Connolly
Administrator
Leverett Conservation Commission
PO Box 300, 9 Montague Road
Leverett, MA 01054

Annual Proposal 2018
Leverett Pond Weed Management Project, Leverett, Massachusetts
DEP Permit 200-0166 (exp 9/29/2018)
Year #8

Dear Miho and LCC members,

The Friends of Leverett Pond (FLP) in the spirit of integrated pest management practices, propose to conduct nuisance aquatic weed management for 2018, as outlined in our permit application for Wetlands Protection Act Permit 200-0166, as extended in 2017. This is the eighth year of our project. FLP is also beginning a study of weed management progress, recommended by the Leverett Conservation Commission (LCC) in 2017. As outlined in the Order of Conditions for DEP Permit 200-0166, all applications or use of mechanical equipment will require the prior annual approval of the LCC before such actions may occur. For that reason, this proposal details our plans for 2018. For your convenience, I have attached a copy of our annual report for 2017 submitted to you in December 2017.

Summary 2017 Nuisance Weed Management.

2017 Herbicide Treatment. As a part of its weed management plan to control the invasive species variable and Eurasian watermilfoil (*Myriophyllum heterophyllum* and *M. spicatum*), curly-leaf Pondweed (*Potamogeton crispus*) and swollen bladderwort (*Utricularia inflata*), in Year #7 (2017) of DEP Permit 200-0166, the FLP through its licensed contractor Solitude Lake Management, Inc. (SOL) continued herbicide treatment. In 2017, it was decided to conduct two treatments, rather than one targeting both species. One in May to treat curly-leaf pondweed (with Diquat) before it propagated, and a second in June to treat milfoil (originally planned to use Renovate Max-G, but switched to Diquat for the second treatment) during its flowering season. The treatments took place on May 16, 2017, and June 23, 2017. The reason for the herbicide change was the beneficial effects of Diquat on milfoil observed in the first treatment.

Under DEP permit 200-0166 and *License to Apply Chemicals for Control of Nuisance Aquatic Vegetation* (Lic.# 17228) from the DEP Bureau of Resource Protection, Worcester, Massachusetts, the herbicide application was conducted as proposed. In past years the herbicide Aquathol K was used to control curly-leaf pondweed. Because the pondweed was resilient in response to Aquathol K, SOL recommended Diquat as a more aggressive and species-specific herbicide to control the curly leaf pondweed. This chemical is permitted by DEP.

The herbicide used on May 16, 2017 was Diquat mixed for curly leaf pondweed and milfoil. Copper sulfate was used as an algaecide to prevent an algal bloom following the herbicide application. Copper also helps in controlling bladderwort. Swollen Bladderwort was extremely aggressive in 2017. The results of the first treatment were so successful in controlling the pondweed and milfoil, it was decided to treat with Diquat again in the second treatment. The proposed Renovate Max G, was not used in the June treatment. The second treatment also was successful. At the end of the season some re-growth of milfoil was observed, but little curly-leaf pond weed was observed. There was some limited effect on bladderwort (which erupted in July). FLP will survey again in April. To effectively treat bladderwort, the Diquat mix must be somewhat stronger. The FLP plans to target bladderwort in 2018 as well as milfoil and curly-leaf pondweed.

Because milfoil can spread from broken fragments of the plant, the herbicide application was made using a shallow draft airboat. This minimized the threat of spreading the plant to other areas from propellers. The Diquat herbicide was applied using underwater hoses.

Areas that were treated extended from immediately offshore in indicated areas (see attached figure) generally within 30 feet from the shoreline. Wildlife safe zones were avoided.

Increased and active use of the town right-of-way was especially noticeable. Many people were observed taking advantage of the clear water, picnic table (recently donated by FLP) and boat launch throughout the summer and fall, including kayakers, picnickers, and classes from Leverett Elementary School and UMASS. Additionally, the second picnic table donated by FLP and located on the island at the north end of the pond was used by pondshore dwellers and pond visitors alike.

Pond Chemistry. On July 20, 2017, the pond was tested for residual Diquat by MicroBac of Dayville, CT and was determined to be essentially non-detectable. The residual Diquat was <0.400 ug/l. A reading below 20.00 ug/L is considered safe. Thus, residual Diquat was shown to be essentially non-detectable 4 weeks after application.

Hydro-Rake Treatment. By 5 weeks following the herbicide application, there was very little to no milfoil in the treated areas. Thus, it was considered that the use of a hydro rake (in treated areas only) would not result in the spread of milfoil. From July 27 through August 1, 2017, SOL conducted weed removal with a hydro-rake with great success. *Experimentation of repeated raking in small areas of high infestation continues to be very successful. In areas of high infestation the rake would go over the area repeatedly.*

By the end of the season (November) there was little to no re-growth in these areas. This is a highly successful technique of milfoil control in small areas.

Weed piles were placed on shore as far from the water as possible, placed on plastic tarps, and left to dry. Some piles were covered to speed drying. As in earlier years, removal of piles from the waterfront was accomplished in several ways. The Town of Leverett Highway Department moved the pile to the landfill. Some landowners used contractors to remove the piles off-site to the contractor's "stump dump" or compost piles. Some used contractors to move the piles 100 feet or more from the pond and within their own property. In several cases piles were removed by hand, using 5-gallon buckets to haul the weeds up the slope to a wheel barrow and then removed to the area 100 feet or more from the lakeshore.

Results of Hand Pulling. FLP continues to use hand-pulling as a clean-up tool.

Results of Benthic Barrier use. As an alternative to herbicide treatment and mechanical raking, four landowners continue to experiment with benthic barriers (approximately 12 by 24 feet in size). The cloth is placed on the bottom where herbicide treatment and hydro-raking had occurred. Milfoil did not grow through the barrier. Thus far the results are successful, but the barriers require maintenance.

Proposal for 2018 Herbicide Treatment. In discussion with SOL, proposed weed management for 2018 is the same as in 2017. Methods for management of nuisance aquatic vegetation in Leverett Pond are outlined in the Order of Conditions for Wetlands Protection Act Permit 200-0166, and will be followed by the FLP in 2018. In Year #8 of its continuing weed management plan, the FLP proposes continued treatment in two treatments. One in May to treat curly-leaf pondweed (with Diquat) before it propagates as well as bladderwort, and a second in June to treat milfoil and bladderwort. Diquat and accompanying copper sulfate will be mixed to affect bladderwort as well as the other two species.

The time of application will coincide with the peak growth of the plants. SOL has noted that for milfoil peak growth is the most effective time to apply the chemical to achieve maximum impact to the plants. The best time to treat curly-leaf pondweed is before the plant drops its nut-like turion (in the Spring) (see below). If upon inspection prior to treatment, substantial milfoil re-growth occurs and the infestation extends farther out from shore, those areas will be treated with the herbicide as well. Because the shallow area is immediately adjacent to the deeper areas where only a trace of milfoil remains, the slight down-slope drift from the near shore areas into this zone will be beneficial in controlling any remnant plants in those areas.

The total area of proposed treatment in the approximately 102-acre pond, is approximately 8 acres. A map of treatment areas is provided with this proposal.

Testing for chemical residuals will be conducted within 4-6 weeks of the chemical application. Tests will be analyzed by Microbac, Inc.

Brightly colored precautionary signage will be posted around the pond, at all road entrances, at the right-of-way, and at waterfronts and other areas of known pond use, prior to the herbicide application. In 2017, FLP posted 40 signs. Landowners and known pond users will be notified. An FLP member will accompany the airboat at a distance to warn off anyone entering the Pond during the day of application.

The FLP is working with SOL to determine whether or not alternative chemicals currently being researched may be beneficial. If appropriate, and licensed by DEP, these herbicides could be substituted. Any substituted chemicals must be on the DEP's list of approved chemicals, and will be covered under the 2018 DEP license. Should there be a substitution, FLP will notify the LCC in the December 2018 annual report, and will provide evidence of the state approval for their use in the 2017 *License to Apply Chemicals for Control of Nuisance Aquatic Vegetation* from DEP.

Because *milfoil* can spread from broken fragments of the plant, the herbicide application(s) will be made using a shallow draft airboat. This will minimize the threat of spreading the plant to other areas. Diquat and copper sulphate are in liquid form, and will be applied by hose suspended underwater to avoid spraying the shoreline.

Prior to treatment, SOL and FLP will inspect the pond and finalize the treatment areas. It is proposed that the treatment will take place in May and June 2018 to coincide with peak curly-leaf pondweed, bladderwort and milfoil plant growth.

Prior to the application, SOL (or other licensed applicator) will obtain a *License to Apply Chemicals for Control of Nuisance Aquatic Vegetation*, from the Massachusetts Department of Environmental Protection, Bureau of Resource Protection. Copies will be provided to the LCC with the annual report in December 2018.

Hand-pulling and raking (possibly SCUBA in some areas) and "touch-up" applications of herbicide are proposed, as needed, as a follow-up to eliminate or retard re-growth of Milfoil, bladderwort and/or Curly-leaf Pondweed.

Proposal for 2018 Hydro-Raking. Provided that milfoil (a cloning plant) is adequately reduced from the previous year's application, or reduced during 4-6 weeks following the 2018 herbicide application, hydro-raking is planned in selected treated areas. Hydro-raking will remove roots and place them on the shore, where they will be allowed to dry for approximately 30 days as required under the Order of Conditions. Once dry, they will be removed away from the pond, to a non-wetland location. The Hydro-rake may also remove occasional floating root mats following the chemical application (should they occur), and will mechanically remove water shield and other floating-leaf vegetation in limited areas adjacent to the town right-of-way, and waterfronts. The raking will follow the stipulations in the Order of Conditions. At the town right-of-way, the rake also will clear vegetation at the inlet of the small stream containing the Fire Department's hydrant intake.

Proposal for Other Methods. The FLP continues to research alternatives to herbicide treatment. Following herbicide treatment and hydro-raking, we proposed to continue experimentation with geo-textile fabric. At present there are four barriers in use around the pond, and their

effectiveness is good. This is done on a limited basis as a non-herbicide method to further restrict re-growth in small areas.

Hand-pulling of weeds is proposed as is SCUBA hand-pulling if warranted.

FLP is now owner of the dam at the northeast end of the Pond, and is working feverishly to raise funds to replace it. A new dam will contain a valve that will permit limited drawdown (under appropriate permits). This will help to control some invasive species including milfoil and curly-leaf pondweed.

Proposal for Testing Areas. At the request of the LCC, FLP is proposing to survey selected areas on an annual basis. The areas will be chosen on their treatment characteristics: 1) Areas treated only with herbicides; 2) areas treated with both herbicides and hydro-rake; 3) areas not treated. Each area will be surveyed prior to treatment, and in the fall (October). This will provide information about how effective the methods are from beginning to end of season, and from year to year. Locations will be identified visually and with GPS. Each area will include be approximately 4x4m. Where possible, residual plants will be identified visually. If necessary, an “aqua scope” or drag rake will be used. It is anticipated that these areas are shallow enough to permit visual identification. The survey will be conducted by FLP members who are competent in weed identification. The test areas include the following: Town right-of-way (has had mechanical treatment [M] and herbicide treatment [H]; Church property (H and M); Steven Freedman (H only); Thiebe (H only – area of very high infestation, one M); Mulholland (H and M); Hankinson (H&M); Thomas (H and 2 M); Dover (H and M); Northwest Cove (H and M); Ruben (H only); Roberts (no direct treatment); Area near dam (no treatment); Pond center (no treatment). FLP invites LCC comments and recommendations. Others may be added.

Reporting of Results. The FLP will supply the LCC with a report of results in the Annual Report of December 2018. After this eighth year, the FLP will evaluate progress, report to the LCC, and propose continued *best management practices*.

If you require additional information, you can reach me at home (413-548-9161) or cell: (413-531-2730). I will provide you with a hard-copy of this proposal at the Town Hall. My E-Mail address is mulholland@anthro.umass.edu.

Sincerely,

Mitchell T. Mulholland
VP of Aquatic Weed Management
Friends of Leverett Pond

Attachments: Map of treatment areas
2017 Annual Report