

Minutes of Wayland SWQC 19 December, 2012 Meeting

Prepared by Bob Goldsmith

Present: Toni Moores, Bob Goldsmith, Lin Bradford, Mike Lowery, Tom Largy

1. The meeting came to order at 7:30 PM.
2. Minutes of the previous meeting were approved 4-0
3. Public Comment. None
4. Dudley Pond (milfoil control)
 - a. Mike will revise the RFP for herbicide spot treatment, for 2013, and send to ACT and Lycott. (2012 RFP and one proposal appended) Both will be invited to meet with the committee to discuss alternatives for long term weed control.
 - b. The final invoices for hand pulling have been submitted to the DPA for their cost share payment.
 - c. Toni's report (appended) for sampling of the water column on Nov. 11th was discussed. The pond is the same as last year, low to moderate mesotrophic. The committee discussed the meaning of no measurable phosphorus level, and what this might suggest for future nutrient control
5. Heard Pond.(water chestnut control)
 - a. The committee voted 5-0 to issue a contract for water chestnut harvesting in fall, 2013, contingent on approval of funding. The contract value will be below \$5,000.
6. North Pond.(milfoil control)
 - a. The grant application for a cost-shared program among DCR, Framingham and Wayland has been submitted to DCR (appended). The proposal had been approved 5-0.
 - b. Mike has prepared a lake-wide management plan (appended) and will work with the several involved towns, DCR and Lake Cochituate Management Council to attempt to develop funding for a comprehensive, long term weed control program.
7. OML Complaint
 - a. The committee discussed the complaint and the following two actions will be taken.
 - b. Bob will amend minutes which Mr. Harris included in his complaint that the reason for Toni's remote participation by telephone was not identified. [The minutes have since been so amended and submitted to the Town for posting.]
 - c. The committee voted 5-0 to request time to meet with the BOS to address the time lost by committee volunteers, money spent by the Town by legal counsel to date, and money to be spent by the AG's office and Town Counsel in processing Mr. Harris' complaint. The committee believes all elements of his complaint have been addressed and the complaint should be withdrawn.
8. Winter Moth Caterpillar Infestation
 - a. Bob described the impending major winter moth caterpillar infestation this spring and that many homeowners will be spraying trees to control the caterpillars. For homes near surface waters, this could have an adverse environmental impact.

- b. Bob has raised this issue with Brian Monahan and requested that ConCom issue a Town-wide directive on what insecticides would be permitted and guidelines for their application. If ConCom does not do so, Bob felt that homeowners would spray trees in any case, and that the Town needs to address the impact of doing so.
 - c. Bob will conduct an internet search to obtain information of environmental impact of the alternative herbicides that might be used, with a focus on impact on aquatic species.
9. The next meeting is scheduled for Tuesday, Jan. 8th. Henceforth, the committee will meet the second Tuesday of each month.
 10. Lin's wife's (Joan) provided Christmas packages of goodies, which were distributed to all, with much appreciation expressed.
 11. The committee voted 5-0 to adjourn at about 9:30 PM.



Partnerships Matching Funds Program Fiscal Year 2013 APPLICATION

Please complete and return

Please Print or Type in All Sections

PARTNER INFORMATION

Name: Wayland Surface Water Quality Committee & Framingham Conservation Commission

Name of Primary Contact Person Mike Lowery

Street 120 Lakeshore Drive

2nd Street _____

City Wayland Zip Code 01778

Home Number 508-653-3450 Cell Number 508-397-8828 (preferred)

Business Number 508-370-4500 Fax 508-370-4509

(Email Addresses) lowery.mike@gmail.com

PARK AND/OR FACILITY INFORMATION

Name of DCR Park/Facility where project is proposed	<u>Cochituate State Park (North Pond)</u>
Location of Park/Facility (Town or City)	<u>Wayland/Natick/Framingham, MA</u>

PROPOSED PROJECT INFORMATION	
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<p>Brief Description of Project If more than one, please list in order of priority. Please attach any additional information if available (e.g., photos, maps, design drawings) to assist in evaluation of application.</p>	<ol style="list-style-type: none"> 1) Diver/DASH harvest milfoil boat channel between Middle Pond, Snake Brook Cove, and North Pond to reduce fragments entering North Pond. Then buoying the boat channel. 2) Redeploy milfoil barrier net at entrance to North Pond. 3) Spot treat up to 15 acres of re-infestations using approved herbicides. 4) Hand-pull milfoil in less densely infested areas and funds permitting remove root crowns in areas where herbicide has been used.
<p>Budget Estimate for Project Please attach any additional budget information.</p>	<p>\$24,000</p>
<p>Amount of Funds you will Contribute to the Project (\$)</p>	<p>\$4,000 – Wayland \$4,000 -- Framingham</p>



Partnerships Matching Funds Program Fiscal Year 2013 APPLICATION

Amount of Matching Funds Requested (\$) (Note: DCR will consider a 2:1 match on contributions of up to and including \$25,000. and a 1:1 match on those of more than \$25,000.)	\$16,000
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PROPOSED PROJECT CATEGORY					
Project Category	CONSTRUCTION		LANDSCAPING		OTHER Miffoil Control – Habitat Preservation

PERMITTING			
	YES DCR has Orders of Conditions for chemical treatment from Wayland, Framingham Wayland Surface Water Quality Committee will obtain the necessary Negative Determinations of Applicability and/or Orders of Condition from the Natick Conservation Commission. DCR has Orders of Conditions for mechanical treatment from Wayland, Framingham, and Natick		
Permit Required			
If a Permit is required – have you fundraised for the over bidding?	NO - Work performed will be limited to budget.		

BIDDING			
	YES		Separate RFPs and bids for DASH work and herbicide treatment. State-approved vendors (DASH): - Aquatic Vision LLC - N.E. Milfoil - A.B. Aquatics State-approved vendors (herbicide spot treatment): Lycott Environmental Aquatic Control
Bidding Required			
If your organization has an existing relationship with a Vendor for this project already, are you aware if they are they are on the State’s Approved Vendor List?			No existing relationship. Net Deployment: DCR, Lakes & Ponds with WSWQC support Plant Surveys/Treatment area & method selection: DCR, Lakes & Ponds



			<p>DASH/hand-pulling: New England Milfoil 391 Center Conway Road Brownfield, ME 04010 NEMilfoil@gmail.com</p> <p>Aquatic Vision, LLC Mr. Ted Fiust 28 Village Road Sudbury, MA 01776 tedfiust@gmail.com 508-380-7286</p> <p>Bob Patterson, AB Aquatics, Inc. 17 Chase Is. Atkinson, NH 03811 INFO@ABAquatics.com 603-475-1503</p> <p>SPOT TREATMENT (only two licensed vendors):</p> <p>Lycott Environmental 600 Charlton St. Southbridge, MA 01550 info@lycott.com 508-765-0101</p> <p>Aquatic Control 11 John Road Sutton, MA 01590 GNSmith@AquaticControlTech.com 508-865-1000</p> <p>And any other vendors in these categories deemed appropriate by the DCR.</p>
<p>Check that you understand that DCR will manage the process established by the OSD regarding fair and competitive procurements (per Ch. 149 or Ch. 30)</p>	<p>✓</p>		
<p>If the Bid comes in higher than anticipated do you agree to assume up to 50% or more of the overage?</p>			<p>Understood. Spot treatment budget will be controlled by not-to-exceed bids where the vendor's response will be a price/acre treated plus mobilization fee.</p>

RIBBON CUTTING EVENT

<p>Are you anticipating a Ribbon Cutting event If YES, please review the Program Standards section on Ribbon Cutting.</p>	<p>YES</p>		
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AGENCY CONTACT HISTORY	
Please list all DCR staff with whom you have communicated regarding this proposed project.	TOM FLANNERY, ANNE CARROLL, TIM MURPHY, SUSAN HAMILTON, KATHRYN GARCIA
ADDITIONAL PARTNERS	
Please list any additional partners and their anticipated participation.	Wayland Recreation Dept. – barrier net cleaning materials WHS service volunteers – barrier net cleaning labor ,fragment patrol Natick Conservation & Lake Cochituate Watershed Council – project coordination with other invasive control projects.
PRIOR PARTNER INFORMATION	
Please list prior projects funded through the Partnerships Matching Funds Program.	FY2009 – COCHITUATE STATE PARK – NORTH POND FY2010 – COCHITUATE STATE PARK – NORTH POND FY2011 – COCHITUATE STATE PARK – NORTH POND FY2012 – COCHITUATE STATE PARK – NORTH POND
ADDITIONAL INFORMATION	
Please list information not included above.	Please see the following project description. Support letters to follow from: <ul style="list-style-type: none"> • Natick Conservation Commission • Cochituate State Park Advisory Committee • Friends of Cochituate State Park • Lake Cochituate Watershed Council • Wayland-Weston Rowing Association

Battling Milfoil in North Pond of Lake Cochituate – Cochituate State Park

Lake Cochituate is a 614 acre lake at the center of the most heavily-used state parks in the Boston metropolitan area. North Pond is the most northerly of its three major ponds, near DCR's main boat launch. It is a popular destination for fishermen and non-motorized craft. Framingham and Wayland both have town beaches on North Pond shoreline leased from the DCR.

Lake Cochituate is the low point in the topography of the combined Framingham, Natick and Wayland watershed. As a result the water that collects in the Lake flows from south to the north, from Fisk Pond, through South Pond, through Carling Pond, through Middle Pond, through Snake Brook Cove, into North Pond, over two dams and subsequently into the Sudbury River.

All ponds of Lake Cochituate bear the toll of heavy surrounding uses – all three ponds are classified by MA DEP as category 5 (most-impaired, and requiring a TMDL management plan). All three ponds suffer from high nutrient loads, setting the stage for invasive plants like Eurasian water milfoil.

Lake Cochituate's milfoil epidemic is believed to have started in South Pond or Fisk Pond. One of the major milfoil propagation methods is plant fragments which are moved by the wind, current, animals, or by hitching a ride on a boat or trailer.



Figure 1: August 2008 -North Pond Outlet Cove Milfoil

In 2008 the North Pond was nearly fully colonized at depths and locations that supported milfoil growth.

HISTORY: 2009 Treatment Program a Success

In 2009 the DCR, under the leadership of Tom Flannery and in partnership with Wayland and Framingham, successfully suppressed the milfoil using a combination of chemical treatment around the littoral zone, and creation of a boat channel with diver-assisted suction harvesting (DASH). Both activities were positively noted in the press:

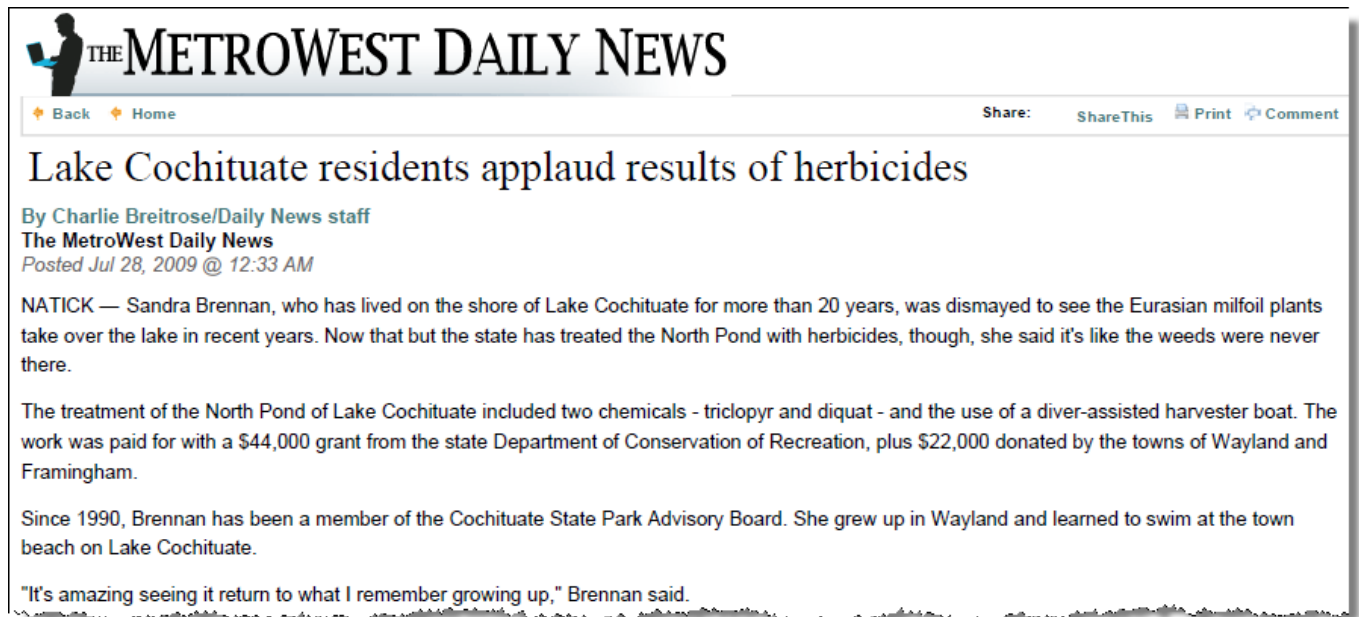


Figure 2: 2009 MetroWest Daily News Articles

HISTORY: 2009 herbicide treatment - 2010 management program

In 2009, WSWQC spearheaded a partnership and permitting process which led to dramatic success with a triclopyr and diquat treatment in North Pond. In 2010 the DCR/Framingham/Wayland partnership continued with a planned program including:

- Re-clearing weeds from the channel between the DCR boat launch, through Snake Brook Cove, and into North Pond.
- A barrier net, hand-fitted by WSWQC with groins to catch milfoil fragments
- Spot herbicide treatment where required. (hand-pulling was actually employed)

HISTORY: 2011 successful management program

The 2011 DCR/Framingham/Wayland partnership continued with a planned program including:

- Re-clearing weeds from the channel between the DCR boat launch, through Snake Brook Cove, and into North Pond, widening the channel.
- A barrier net, hand-fitted by WSWQC with groins to catch milfoil fragments
- Spot herbicide treatment along a portion of the Wayland shore, and near the outlet in Framingham.

The program itself was successful, but our secondary goal of evaluating the efficacy of post-herbicide hand-pulling after herbicide was not attained because the milfoil dropped too soon. We have learned that the hand-pulling must be done within 48 hours after a diquat treatment.

We did a better job in 2011 of keeping the barrier net cleared, and keeping better records of material removed. Over 750 gallon of milfoil fragments were caught before they could take root in North Pond.

HISTORY: 2012 successful management program

In 2012 fragment inflow lessened and DCR/Wayland/Framingham again kept North Pond milfoil-free for recreational purposes. As milfoil in South and Middle Ponds became worse, North Pond continued a successful management story.

RELATED: 2011/2012 Generic Order of Conditions enables abutters to contract hand-pulling.

DCR and the three towns' Conservation Administrators and the Wayland Surface Water Quality Committee worked cooperatively to develop a permitting and management system which enabled abutters to contract for hand pulling under a "generic order of conditions" granted to the Lake Cochituate Watershed Council.

In 2011 this program enabled abutters for the first time to pay for removal of milfoil from abutting shorefront.

In 2012 this program installed $\frac{3}{4}$ of an acre of benthic matting in an area of Middle Pond characterized by heavy milfoil growth and high boat traffic.

Both programs operate at no cost to the DCR or the towns.

Members of the Wayland Surface Water Quality Committees participated in the development and management of this effort.

This 2013 grant application would continue this successful partnership and keep milfoil from returning to the North Pond of Lake Cochituate.

This project will:

**Preserve DCR's investment in a milfoil-free North Pond in Cochituate State Park, Serve the public's interest in usable recreational areas, and
Protect habitats of native plant and animal species.**

Regulating North Pond of Lake Cochituate – Three Towns

Addressing invasive weeds is complex because North Pond falls under the Wetlands Protection Act jurisdiction of the Conservation Commissions of Natick, Framingham, and Wayland.

Lake Cochituate is owned by the Commonwealth of Massachusetts, which leases lands to Wayland, Natick, and Framingham for Town beaches.

There is a public boat launch for non-motorized craft. This launch is the access to the lake for the Wayland/Weston crew team.

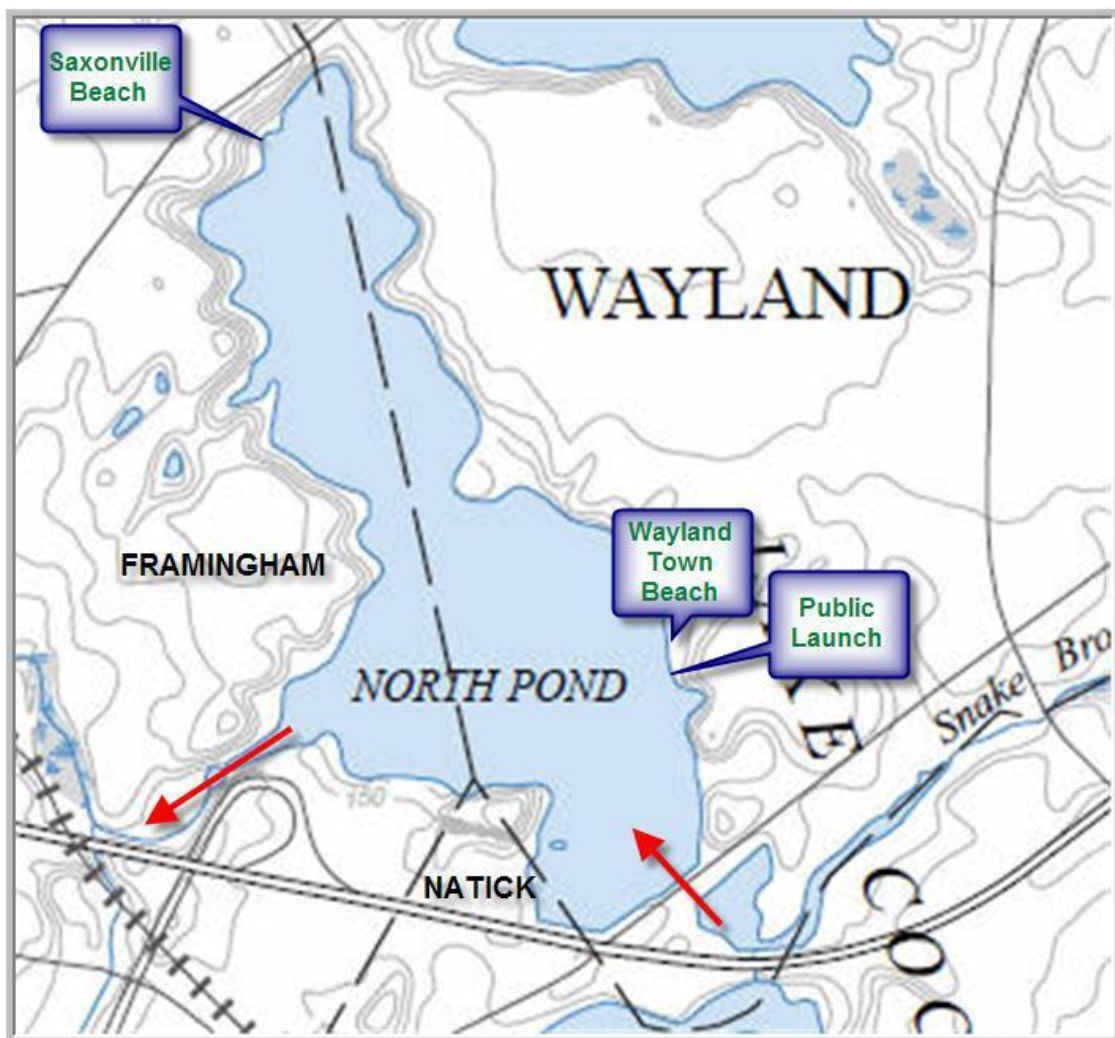


Figure 5: Lake Cochituate North Pond in Natick, Framingham, and Wayland

Red arrows indicate direction of water flow.

Regulating North Pond of Lake Cochituate – A part of Cochituate State Park

North Pond and the green shaded areas surrounding are part of Cochituate State Park, administered by the Massachusetts Department of Conservation and Recreation (DCR).

The DCR acts as the owner and steward of the park, and all activities in the park are subject to their approval, regulation, and monitoring.

The DCR administers the public/private partnership grants program which provides matching funds for betterment projects within State Parks.

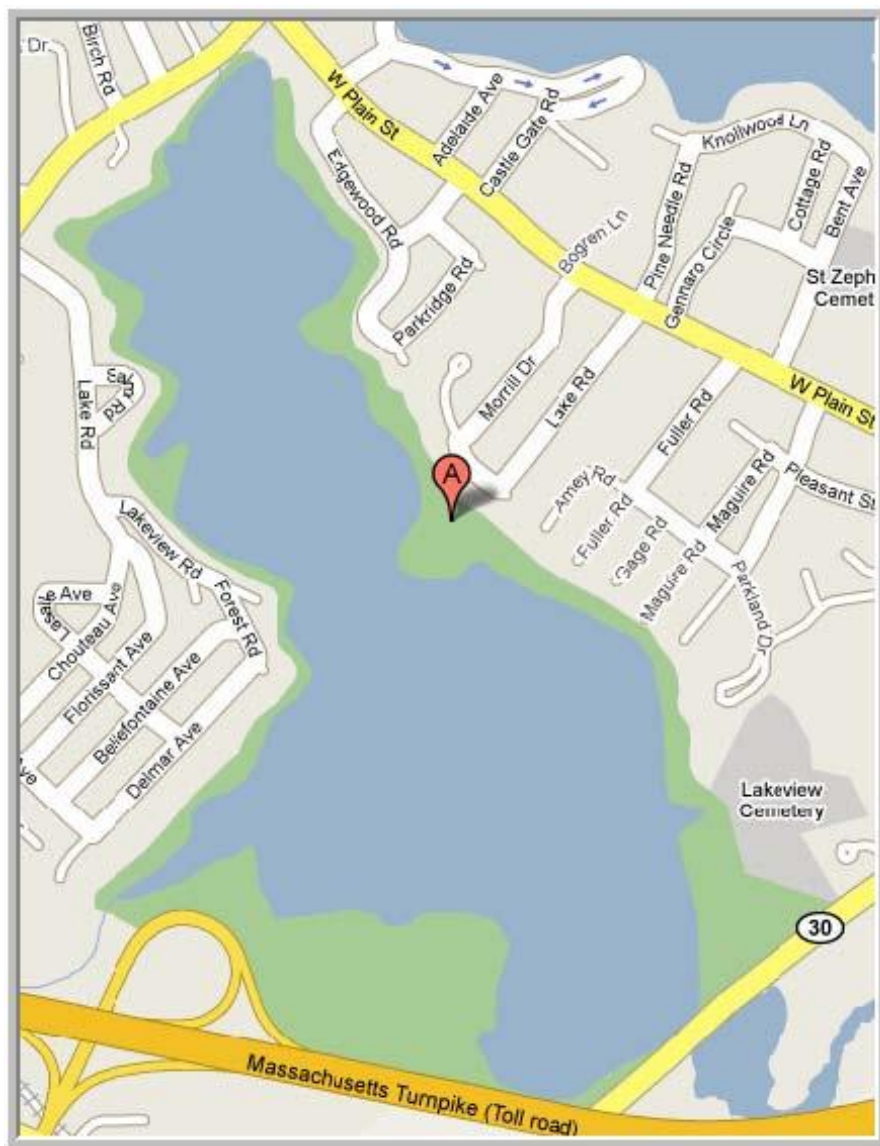


Figure 6: North Pond portion of Cochituate State Park.

Role of Wayland Surface Water Quality Committee -- Achieving Consensus

WSWQC is a volunteer board, appointed by Wayland's Board of Selectmen to manage Wayland's surface water resources.

WSWQC helped organize an ad-hoc group in March 2008 with representatives of DCR, Natick Conservation, Framingham Conservation, and abutters and users to build a consensus for a Lake Cochituate milfoil control and specifically a plan for North Pond which could be agreed by all.

We believe that the concerns of all Towns, the DCR, abutters groups, and environmental action groups can be balanced in a program of spot treatment and follow-up hand-pulling in 2013 and beyond.

This collaboration has led to a lake-wide watershed consensus which and helped achieve compromise on how to manage the Lake Cochituate system.

Equally as important as the project results in the lake, has been this revival of compromise and consensus-building. WSWQC is proud of the role it has played in these improving relationships, and we hope to facilitate the next level of collaboration: a lake-wide, multi-year management plan as described on page 11.

Community Support:

This partnership grant application is supported by:

- Wayland-Weston Rowing Association
- Friends of Cochituate State Park
- Town of Wayland Recreation Department
- Cochituate State Park Advisory Committee
- Natick Conservation Commission
- Lake Cochituate Watershed Council

Letters of support will be provided separately.

This grant application is being submitted jointly by the Towns of Wayland and Framingham.

2013 Proposed Management Methods:

1. **Inspection & Surveying** – WSWQC and DCR will inspect the boat channel and the littoral zone to identify re-growth of milfoil.
2. **Barrier net** to block incoming fragments – we will re-establish the successful barrier net used in 2009, with its added groins. Fragments will be removed weekly.
3. **Boat Channel** – we will use diver assisted suction harvesting (DASH) and diver hand pulling, as we did in 2009 and 2010, 2011, and 2012 to create a clear passage between Middle Pond, the DCR boat launch, through Snake Brook Cove, and into North Pond. Each year this channel has become wider – lessening milfoil fragmentation which might otherwise occur.
4. **Re-infestation removal** – where surveying reveals re-infestation, we will use diver hand pulling, DASH, or spot treatment with triclopyr if possible or diquat dibromide as dictated by conditions, at DCR’s discretion as guided by the GEIR.
5. **Hand-pulling marked areas** – In contrast to prior years when contractors made a limited number of visits at times, and were responsible for both locating and removing the weed, we propose this year to use volunteer or summer-help surface workers to mark plants – then contacting one of the hand pulling contractors to remove the weeds.
6. **Root crown removal** – funds permitting, if herbicide treatments are used, we will follow up with hand-pulling of root crowns – a technique which has been successful in nearby Dudley Pond.

Herbicide contractor will be responsible for:

- Abutter notification
- Herbicide application
- Pre-treatment survey
- Water sampling for residue monitoring
- One post treatment inspection
- End-of-season project completion report

Hand-pulling contractor(s) will be responsible for

- Scheduling visits near times requested by surface workers
- Reporting gallons of plants removed by location and date.
- Delivery of removed plants to DCR-designated area near shore

DASH contractor will be responsible for:

- Barrier net installation assistance
- Hand-pulling
 - marking areas being worked,
 - recording gallons removed, hours required by area
 - delivery of removed plants to DCR-designated area near shore

2013 Spot treatment: After a Spring survey, we will determine which areas should be spot treated, if any. In 2009, Framingham requested that only diquat dibromide be used in the areas indicate in blue:



BLUE indicates areas where diquat treatment may be needed

Figure 7: Potential Diquat Treatment Areas

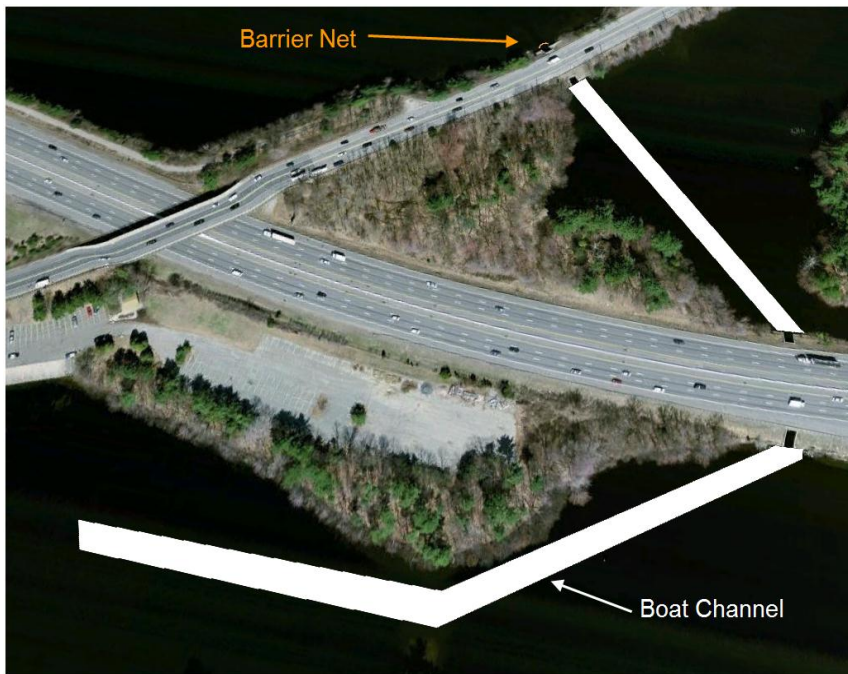


Figure 8: Boat Channel and Barrier Net

Mechanical Control Areas:

Herbicide will not be applied adjacent to land in the Town of Natick, nor in the Snake Brook Cove area.

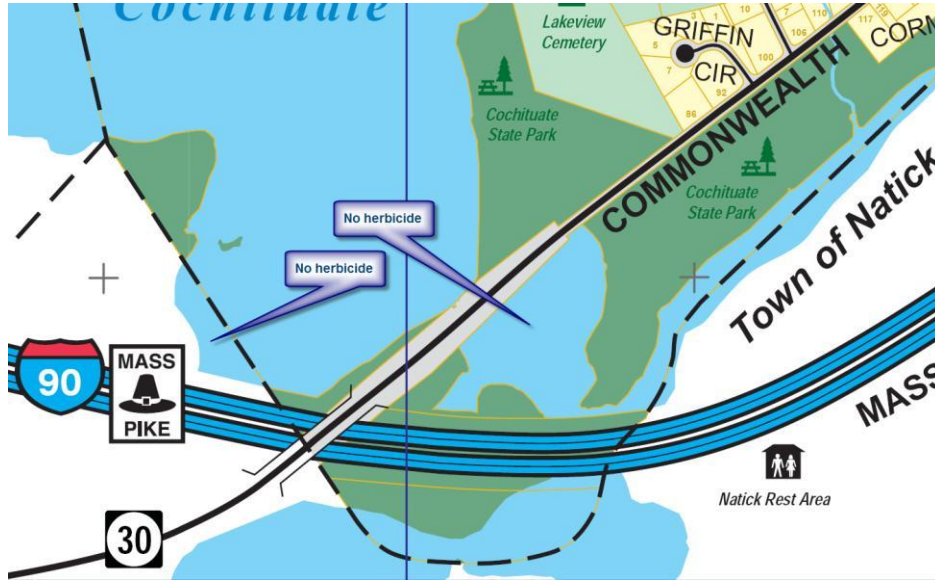


Figure 9: No Herbicide Areas

- Suction harvesting (aka DASH) diver-assisted hand-pulling is used on some lakes to control and reduce infestations; these techniques are significantly more costly per acre, and can take longer periods to attain control. These techniques are best used on smaller areas and where there are sensitive resources to protect, or used after an herbicide treatment to remove root crowns in order to reduce long term regrowth.
- We will use DASH and diver hand pulling to re-create and enlarge a one-acre channel from the DCR Boat Launch in Middle Pond, through Snake Brook Cove to keep boat lanes clear, and reduce fragments entering North Pond.
- We will use hand-pulling to remove root crowns in spot treated areas.
- We will use barrier nets to block incoming fragments.

VISION STATEMENT: Lake-wide Coordination– Milfoil Anywhere is Milfoil Everywhere

Over the last four years, the DCR and the towns around Lake Cochituate, and volunteer organizations like the Lake Cochituate Watershed Council have made progress with their projects, and proving the costs and utility of various techniques. We have learned together and accommodated each other under DCR's leadership.

Despite individual successful projects – ***Cochituate State Park needs a multi-year, lake-wide management plan to control nutrients and invasive species in the whole lake.*** Some years ago consensus seemed unattainable – and the lake suffered. Today, no one disagrees that we need a plan. Everyone now understands better the costs, sensitivities, and range of applicability of different management techniques.

Lake Cochituate is not a one-size-fits-all problem. Different locals have different needs and uses. Town wells must be protected, beaches must be ready for the public, individuals and neighborhoods are willing to kick in to clear their abutting areas. Politically, a whole lake treatment may never be possible – nor is 100% removal by hand pulling and matting a cost-feasible whole-lake alternative.

We won't fix it with one method – and we won't fix it in one year. But it CAN be fixed.

Wayland met this seeming stalemate with the dual goals of near-complete control of invasives and herbicide minimization. All Wayland's ponds (including North Pond) have invasives under control using a variety of techniques. Herbicide may be used to regain control, thereafter mechanical methods are employed if possible.

A consensus can and must be made on how herbicides could be used and minimized. That consensus must be embodied in a lake-wide plan which fits existing programs into a long term solution. One likely consensus approach is using a limno curtain around a shoreline area to limit herbicide spread, use a fast-acting herbicide, hand-pull the root crowns – and then move to the next area. Limno curtains are not cheap – but are reusable. They are a capital cost.

It can't be done in one year. We have to start somewhere: In the South Pond where the flow of water starts. In 5-7 years we can have the lake back.

Controlling nutrients is a key element – if we feed them, they will come. It's a three-part strategy: Whack em', Yank 'em and Starve 'em. Septic and stormwater runoff improvements will be required.

We hope that all our efforts in all the ponds can be subsumed into a long-term, consensus-driven lake management program involving all towns, DCR, LCWC and other interest and user groups. It's feasible now; we can do it.

It's one lake.

Permitting:

Framingham has issued an Order of Conditions to DCR allowing spot herbicide treatment in North Pond. DCR has received clarification from Framingham Conservation Commission that triclopyr is within the scope of the existing Order of Conditions. Framingham requested in 2009 that diquat dibromide be used at the northernmost tip of the pond. Some areas under Framingham’s jurisdiction may require treatment in 2013.

The Wayland Conservation Commission has authorized a North Pond management program with components of spot treatment, hand-pulling, and physical barriers.

The Town of Natick has a very small portion of land abutting the State’s land on North Pond of Lake Cochituate. Depending on where DCR determines spot treatment is necessary, a Negative Determination of Applicability or an Order of Conditions will be required from the Natick Conservation Commission.

The Wayland Surface Water Quality Committee will obtain the necessary permitting from the Town of Natick, with the authorization of DCR, the land owner.

Using Barrier nets to control milfoil fragments flowing into North Pond

Before 2009, floating fragment barriers were placed across the Lake Cochituate culverts passing under the Mass Turnpike and Route 30 to limit the flow of milfoil fragments from entering North Pond.



Figure 10: Pre-2009 Damaged Milfoil Fragment Barrier – when barriers blocked access.

Pre-2009 uses of fragment barriers were not successful, because they *blocked* traffic between ponds; they became quickly clogged, and were damaged by canoes, kayaks, and perhaps by other boats going over the top.

Full barriers were difficult for DCR staff to keep unloaded both because of the large volume of dammed fragments and the water flow rate.

In 2009, 2010, 2011, and 2012 a fragment barrier was used which did *not* block boat traffic. The barrier was cleaned regularly by contractors and volunteers. Boaters were able to navigate the barrier successfully.

The barrier does not catch all the fragments, and requires periodic cleaning, maintenance and occasional repositioning.

2009, 2010, 2011, 2012 Fragment Barriers Successful

For spot treatment of milfoil to be successful in North Pond, and if boat traffic between the Ponds must be allowed to continue, incoming fragments had to be blocked.

Our 2009, 2010, 2011, and 2012 projects placed a milfoil barrier at the entrance to North Pond. Early in the season it was enhanced by adding perpendicular groins on its inside curve to successfully block the milfoil's escape due to wind or wave conditions.

The milfoil fragments were removed from the barriers by hand. Barrier cleanings were performed by a WSWQC member. In 2010 DCR Lakes and Ponds divers installed the barrier net with better anchoring. When the net was removed in the fall, anchors remained for reattachment in 2011.



Figure 11: 2009 Milfoil Fragment Barriers with attached fragment-catching groins

We observed fewer incoming fragments in 2011 and 2012, perhaps due to the full connection of our DASH channel with the area cleared around the DCR boat launch – boaters had no milfoil to cross in order to reach North Pond.

In 2011 over 750 gallons of milfoil fragments were removed, we noted considerably less incoming fragments in 2012 – and had to clear the net less often. Fragments seemed lower and longer.

Likely factors in 2012 reduced fragment flow include: widening of the channel from the DCR boat launch, and the benthic barrier mats deployed by the Lake Cochituate Watershed Council in Pond.

2013 Barrier Positioning

In 2012 the shore edge barrier was positioned a few feet away from the outflow edge of the culvert. This reduced its effectiveness somewhat. In 2013 we would like to see the barrier very close to the outflow edge of the culvert. In this way the 'hook' in the barrier will have a better chance of catching fragments because it would be more centered on the water inflow.

Informing the public of barriers

Most boaters have become accustomed to the barriers. The park does have new boater each year – in 2013 the groins were damaged and repaired one time. If desired, WSWQC will prepare a handout for boaters.

2013 Fragment Removal from Barriers

Fragments will be removed on a periodic basis by a contractor and on as as-needed basis by WSWQC inspection and volunteers. Fragments will be disposed of on land in an appropriate location determined by DCR. Fragment removal and barrier maintenance will be done via boat.

Barrier Installation / Removal times

The fragment barriers will again be installed early in the spring and should stay in place until the mid-October.

Planned Treatment Budget:

DASH/diver hand pulling – 1.2 acre boat channel	\$10,600 contracted*
Pre & Post Season Weed Survey	\$0 WSWQC/DCR*
Installation/removal of barrier net	\$1,000 contracted
Barrier net cleanouts – scheduled – 12 weeks	\$1,200 contracted
Barrier net inspection and cleaning as needed	\$0 volunteer
Weed spotting & marking*	\$1200 summer job
Spot herbicide treatment or spot hand pulling	\$10,000 contracted
 	<hr/>
TOTAL	\$24,000

◇ Less labor may be required to create the channel in 2013 than prior years because the channel has been pulled for three years. If diver hours remain after creating the channel, they will be used to widen the channel.

◇ Pre and Post Season Weed Surveys can be done by DCR and WSWQC instead of paying a contractor to evaluate himself. Surveys are expensive and for our purposes can be done by WSWQC and DCR. We would rather see contractor efforts focused on weed removal.

◇ Weed spotting – To improve cost efficiency, we propose that volunteers or surface workers identify milfoil areas with marker buoys and that divers are then called to work those specific areas.

Cost Sharing:

Framingham and Wayland will provide \$4,000 each, \$8000 in total.
DCR is requested to provide \$16,000

Potential Carry Over to 2014:

This proposal is our best estimate of what will be required for 2013 – but until spring 2013 we will not be able to estimate the areas of re-infestation with any certainty.

For this reason we ask that if funds remain at the end of the 2013 season, they be carried forward into the 2014 season for the same purposes.

APPENDIX A: Wayland-Weston Crew course

The nationally recognized Wayland-Weston Crew has invested substantial monies in facilities, and uses the 1500 meter course below:



Figure 11: Wayland Weston Crew course.

Lake Cochituate Whole Lake Long-Term Management Plan

Vision Statement:

Over the last four years, the DCR, the towns around Lake Cochituate and volunteer organizations like the Lake Cochituate Watershed Council have made progress with lake management projects, and proving the costs and utility of various techniques. We have learned together and accommodated each other under DCR's leadership. These projects however have not focused on the lake as a whole.

Despite individual successful projects – ***Cochituate State Park needs a multi-year, lake-wide management plan to control nutrients and invasive species in the whole lake.*** Some years ago consensus seemed unattainable – and the lake suffered. Today, no one disagrees that we need a plan. Portions of the lake are overrun by invasive weeds. Everyone now better understands the costs, sensitivities, and range of applicability of different management techniques.

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It can't be done in one year. We have to start somewhere: In the South Pond where the flow of water starts. In 5-7 years we can have the lake back.

Controlling nutrients is a key element – if we feed them, they will come. It's a three-part strategy: Whack em', Yank 'em and Starve 'em. Septic and stormwater runoff improvements will be required.

We hope that all our efforts in all the ponds can be subsumed into a long-term, consensus-driven lake management program involving all towns, DCR, LCWC and other interest and user groups. It's feasible now; we can do it.

It's one lake.

2013 Season – Suggested Program

Likely DCR Partnership Grant Programs:

- Wayland / Framingham – DASH channel DCR boat launch to North Pond, fragment barrier net, hand-pulling (or diquat with hand-pulling root crowns)
- Natick – DASH DCR beach & boat launch

LCWC abutter programs:

- Offer hand-pulling or benthic matting (24 mats?) to abutters
- Redeploy remaining (24?) benthic mats to area most likely to reduce fragmentation

Regain Control – Pegan Cove

- Limno curtain (see end-note) ⁱ Pegan cove, use diquat (fast acting), diver's to remove root crowns. 50 acre project - barrier purchase cost (1500 linear feet, 10-20 feet deep) \$25,000; barrier installation/removal cost \$7500. Encourage NCC to acquire the barrier, and apply for DCR Partnership Matching Grant for the materials & labor. Subsequent years hand pulling.

Nutrient Control & Monitoring

- Simplified Spring/Fall survey in South Pond
- Inventory of all outfalls in South Pond – size, jurisdiction, treatment type, estimated flows, meets current standards?, one round first flush test for nutrients
Report to NCC/DCR/public

Education/Outreach

- Develop website for inventory of technical data & reports
- Use Facebook page to keep 'news' flow of program
- Organize one neighborhood/abutter hand-pulling event
- Organize volunteer support for weed monitoring, mapping & reporting in South Pond

Advancing Concensus

- Begin development of a 'zoning' map to encourage the right management methods used in the right places under the right conditions. Collaborate with NCC, DCR, LCWC. Map could be revised as new technologies/methods are tested, conditions change, permitting changes, and funding changes.

Long Term Guidelines & Methodology: Suppression & Removal

1. DASH to be used around the wells - ongoing basis. (Including “super-dash” - first mechanically harvesting thickly infested areas (w/ appropriate fragment control) and then using suction harvesting and hand pulling techniques to get the rest of the plants). This saves money and diver time in highly infested but sensitive areas.
2. Moving South to North (with a multi-year approach) - spot treatment (smaller areas than NP) done at different times (to lessen chance of drift)

Management in the spot-treated areas by non-chemical methods so long as #stems is below a threshold (as suggested by DEP)

3. Spot treatment in NP (and other areas of the Lake designated as a safe distance from wellhead protection zones) of any areas which come back in 2012 - 2017
4. Herbicide treatment (diquat) in PC (Pegan Cove) and CP (Carling Pond) if satisfactory means can be developed to prevent its spread (limno curtain) toward the Natick wells, followed up by yearly non-chemical (mechanical) strategies to retain control.
5. *In general, LCWC, supports mechanical controls such as DASH, hand-pulling, benthic matting) to reduce and maintain suppression of aquatic weeds in the short and long term, recognizing that when none of these will work, herbicides will be discussed as a alternative. Or on rare occasions it may be necessary to use herbicides to gain control, and then mechanical controls (DASH, hand-pulling, benthic matting) to maintain suppression of aquatic weeds in the long term). LCWC strongly opposes the use of herbicides and chemicals near wellheads and in APZ (aquifer protection zones).*
6. Develop a Lake map which could establish “Zones” where Diver / Dash / Benthic Matting / Barrier Nets would be appropriate, and other zones where herbicides might make sense.
7. Further study needed on the interplay of aquatic plants. Does the (*Potamogeton crispus aka curlyleaf pondweed*) help retard the spread of EWM (Eurasian Water Milfoil)? Or is the patamogeton also a nuisance plant that needs control. There are over 100 different forms of potamageton, 5 – 8 of which are listed in LC.

Methods: Limiting Invasives Spread

1. At N and S sides of all choke points (in/out of SB (Snake Brook), KT (Keyhole Tunnel), etc.): Barrier Nets - cleaned as needed by volunteers (effective in NP). *DCR has reservations regarding impediments to navigation.*
2. As weed is brought under control, boat inspections or washing at public boat launch (perhaps staffed at first with a paid DCR employee and then supplemented with volunteers)
3. Possible early mechanical harvesting in SP where water ski course runs. *(MPL disagrees)*
4. Enforcement of distance from shore rules (with highly visible channel markers. And signs in English and Spanish)
5. DASH channel through Snake Brook Cove connected to DASH-ed area at DCR beach & boat launch.
6. A full barrier net between FP (Fisk Pond) and SP. FP is a source of concern, not simply water chestnut, but many pollutants (phosphorous and nitrogen) cascading down Course Brook (CB) and Beaver Dam Brooks (BDB).

The filter dam between FP and SP is no longer functioning the way it was designed. It had been built to reduce the flow of phosphates and nitrogen into SP, but it will need to be substantially repaired to achieve those goals.

Investigate if any of the GM remediation funds might be used to reconstruct the filter dam.

7. Investigate fragment 'harvesting' -- Could one or two boats drag a net, perhaps in the evening, gathering fragments on some schedule?

Potential Resources:

1. Encourage abutters to hire approved LCWC contractors to DASH, hand-pull, or benthic mat their own areas.
2. Use 501c3's to raise funds for invasive control.
3. Raising boat user and dock fees (e.g., to finance boat inspections and a washing station)
4. Enable volunteers to perform tasks such as monitoring and surveying for which DCR cannot afford to staff, stenciling catch basins.
5. ConComs - encourage consider supporting a stormwater utility which has proven very effective in communities like Reading and Newton. A stormwater utility (with an annual fee typically keyed to a resident or business' paved surfaces) can provide consistent funding and incentives to citizens to improve and mitigate stormwater impacts.
6. DCR Partnership Programs & Conservation Trust Fund
7. Natick Conservation – Conservation Trust
8. MassHighway – encourage upgrade of all current stormwater outfalls to current standards
9. Lobby legislature to return DCR-collected fees to DCR, and use a surcharge on boat stickers to fund invasive species control.

Long Term Goals - Monitoring & Management

1. Simplified Spring survey (where are we), and Fall survey (what did we accomplish)
2. Inventory of all outfalls & their nutrient contribution after rain events (available for Wayland). Include Sherborn, Ashland, Framingham, and Natick in this inventory.
3. Annual mapping of invasive weeds so we understand the dynamics of spread and progress over time.¹
4. Inventory of the age and pump-out status of all septic systems within 250' of LC
5. Inventory of all runoff sources to assure compliance with BMPs
Reference: MAPC Report of Lake Cochituate non-point sources.²
6. Monitoring and testing of sub-watersheds emptying into LC (particularly Beaver Dam Brook, Course Brook, Pegan Brook, and Snake Brook) at least twice per year measuring “first flush” data (the first inch of a rainstorm).
7. Developing at least half a dozen rain gardens along Beaver Dam Brook at the low end of parking lots or large paved surfaces (e.g., Snow’s Garage, Roche Bros., Mary Dennison Park)

¹ (We do have the 19 Page ACT Report from 2011), which I’ll reference here and add to our final proposal). It was prepared by Marc Ballard and Erika Haug. Such a report helps inform our whole lake approach

² MAPC [2004 Lake Cochituate Nonpoint Source Water Quality Plan](#) (Ashland, Framingham, Natick, Sherborn, and Wayland)

APPENDIX A: The Lake Cochituate Watershed Council

The Lake Cochituate Watershed Council is a non-profit 501(c)(3), volunteer corporation which seeks to improve the health of Lake Cochituate and its watershed.

LCWC:

- Promotes and monitors all aspects of watershed health
- Seeks to build multi-town, multi-group consensus of plans for DCR consideration
- Seeks support from ConComs, DCR, individuals, businesses and other sources.
- Operates programs to
 - Allow abutters to pay for invasive plant removal on shorelines
 - Limit milfoil fragment creation by deploying benthic bottom mats where invasives are near high boat traffic channels.
- Sponsors educational programs for watershed health
 - annual Symposium
 - outreach to homeowners re earth-friendly lawn care,
 - storm water strategies
- Develops volunteer opportunities for citizens to help
 - clean-up the Lake,
 - build rain gardens,
 - remove invasive aquatic species,
 - monitor fragment control and water quality.
- Builds consensus among towns and governmental organizations for non-point source nutrient and pollution controls.
- Works collaboratively with others in advisory, educational, and stewardship roles to heal the Lake and its watershed.

APPENDIX B: Abbreviation Key

APZ	Aquifer Protection Zone
BDB	Beaver Dam Brook
CB	Course Brook
ConCom	Conservation Commissions
CSPAC	Cochituate State Park Advisory Committee
DASH	Diver-Assisted Suction Harvesting –a pontoon boat & pumps to help divers send milfoil to the surface
DCR	Department of Conservation and Recreation
DEP	Department of Environmental Protection
diquat	chemical name for diquat dibromide, contact herbicide, single year - SePro brand name Littora
DP	Dudley Pond
DPA	Dudley Pond Association
EWM	Eurasian Water Milfoil
fluridone	chemical name for systemic herbicide, SePro brand name: Sonar (several formulations)
GEIR	DCR's "Generic Environmental Impact Review" – lake management bible
KT	Keyhole Tunnel
LC	Lake Cochituate
L&P	DCR Lakes and Ponds group
LCWC	Lake Cochituate Watershed Council
MP	Middle Pond
NOI	Notice of Intent – project description under the WPA submitted to a conservation commission.
Practical Guide	DCR's Practical Guide to Lake Management
PC	Pegan Cove
RDA	Request for Determination of Applicability – project description asking a ConCom if WPA applies
SB	Snake Brook
SP	South Pond
triclopyr	chemical name for a systemic (multi-year) aquatic herbicide – SePro brand name: Renovate
WPA	Wetlands Protection Act – Mass Law governing Wetlands management, administered by ConComs
WSWQC	Wayland Surface Water Quality Committee
WWRC	Wayland- Weston Rowing Club

i Email Mark Bellaud to Mike Lowery re limno curtained Pegan Cove project

Mike,

Using a limno-curtain to isolate the treatment areas would help limit dissipation and will significantly reduce the amount of herbicide that would be required. Purchasing, installing and maintaining the curtains are another story. We did perform a similar limno-barrier Renovate OTF treatment on a 15-acre section of Lake Luzerne in the Adirondack Park in NY this past year (the first aquatic herbicide treatment performed in the Adirondack Park!). There were several state protected RTE aquatic plant species in the lake, so maximizing selectivity was a primary objective. We ended up calculating the dose to achieve 300 ppb concentration within the treatment area, which translated into an application rate of approximately 0.75 ppm. Complete control of milfoil was achieved with excellent selectivity. We may want to be slightly higher to insure complete milfoil control, so maybe targeting treatment area concentration of 350-400 ppb would be appropriate.

Looking at the areas you mapped out I come up with the following ballpark estimates:

- 30 acre area in Pegan Cove - apply 3000 lbs of OTF; chemical cost \$10,200; application cost \$3500; barrier purchase cost (500 linear feet, 10 feet deep) \$7,500; barrier installation/removal cost \$2500; TOTAL ESTIMATE \$23,700 (\$790/ac)
- 10 acre area at mouth PLUS 30 acre area in Pegan Cove (40 ac total) - apply 4000 lbs of OTF; chemical cost \$13,600; application cost \$5000; barrier purchase cost (750 linear feet, 10 feet deep) \$11,250; barrier installation/removal cost \$3750; TOTAL ESTIMATE \$33,600 (\$840/ac)
- 50 acre area leading to mouth PLUS 10 acre area at mouth PLUS 30 acre area in Pegan Cove (90 ac total) - apply 11,400 lbs of OTF; chemical cost \$39,100; application cost \$10,000; barrier purchase cost (1500 linear feet, 10-20 feet deep) \$25,000; barrier installation/removal cost \$7500; TOTAL ESTIMATE \$81,600 (\$906/ac)

Obviously the cost goes up with the greater barrier lengths that are required. I'm assuming barrier purchase prices of \$15-\$20 per linear foot depending on depth. Limno-barrier purchase could probably be researched/shopped to find a better price. Installation and removal costs are also estimates based on anticipated labor needs. Chemical costs are based on 2010 pricing and would need to be fine-tuned once we have better acreage & volume estimates for the areas in question.

The total cost would probably be lower without the limno-barriers, but more chemical would be needed and it may not be approved because of the wells. Another potential drawback of using limno-barriers is determining how long they need to stay up. As you know, the tricopyr concentrations will linger for a long time. They were able to pull the Luzerne barriers after the concentrations dropped to 50 ppb which took about 5 weeks. If you need to wait until it's non-detect, the barriers might be up all summer.

I hope this helps. It's certainly feasible and would probably work quite well, but I'm sure it won't be easy.

Marc

DRAFT
November 11, 2012 Report
Dudley Pond Water Quality Sampling Program
Author - Toni Moores

This document is part of an ongoing Surface Water Quality Committee (SWQC) water quality sampling program initiated for Dudley Pond. The objectives of the Program are to gather Dudley Pond water quality data that will be used to:

- Compare to similar water quality data gathered in the past at Dudley Pond.
- Track the trophic index of Dudley Pond during the spring, summer and fall of each year.

Summary

- On November 11, 2012 water quality data was gathered at three sample points and at three depths at each sample point.
- Water quality parameters such as, pH, oxidation – reduction potential (ORP), dissolved oxygen (DO), dissolved oxygen % saturation and temperature were measured at three depths at each of the three sample points by SWQC members using a YSI Multimeter. Water and Secchi depths were measured at each of the three sample points.
- Samples were gathered by SWQC members and analyzed by Nashoba Analytical LLC.
- The upper portion of the water column appeared to be well mixed at all sample points
- The trophic state of Dudley Pond was found to be low to mid mesotrophic at the points sampled, based on the Carlson Trophic State Index (TSI), which was a function of Secchi depth and Chlorophyll a measurements as phosphorus was not found in any of the samples. The average TSI range for the three sample points was found to be 42 - 46.
- Historical Dudley Pond water quality data for November does not exist prior to 2011, so when water quality data for November 11, 2012 is compared to data from November 13, 2011 the data are remarkably similar. No phosphorus was measured during sampling done in November 2011 or 2012. It is not clear whether this typical of late season water quality or the result of recent regulations prohibiting phosphorus in detergents. Although no measurable phosphorus is positive, it is thought that no phosphorus in November water samples is probably typical for this late in the season because there is little phosphorus present from landscape fertilizer runoff and most of the soluble phosphorus found in the summer is tied up in biomass that has died and is beginning its fall-winter decomposition cycle.

Background

Historically Dudley Pond has been sampled most frequently at the “deep hole” (Sample Point 25) on Dudley Pond. In order to have data sets that are comparable to historical data, samples were gathered at locations 24, 25 and 27 as indicated in Figure 1. Two of these sample locations correspond to the sample locations used in the Larkin (1978) and IEP (1983) reports. Line-of-site intersections were used to locate sampling points.

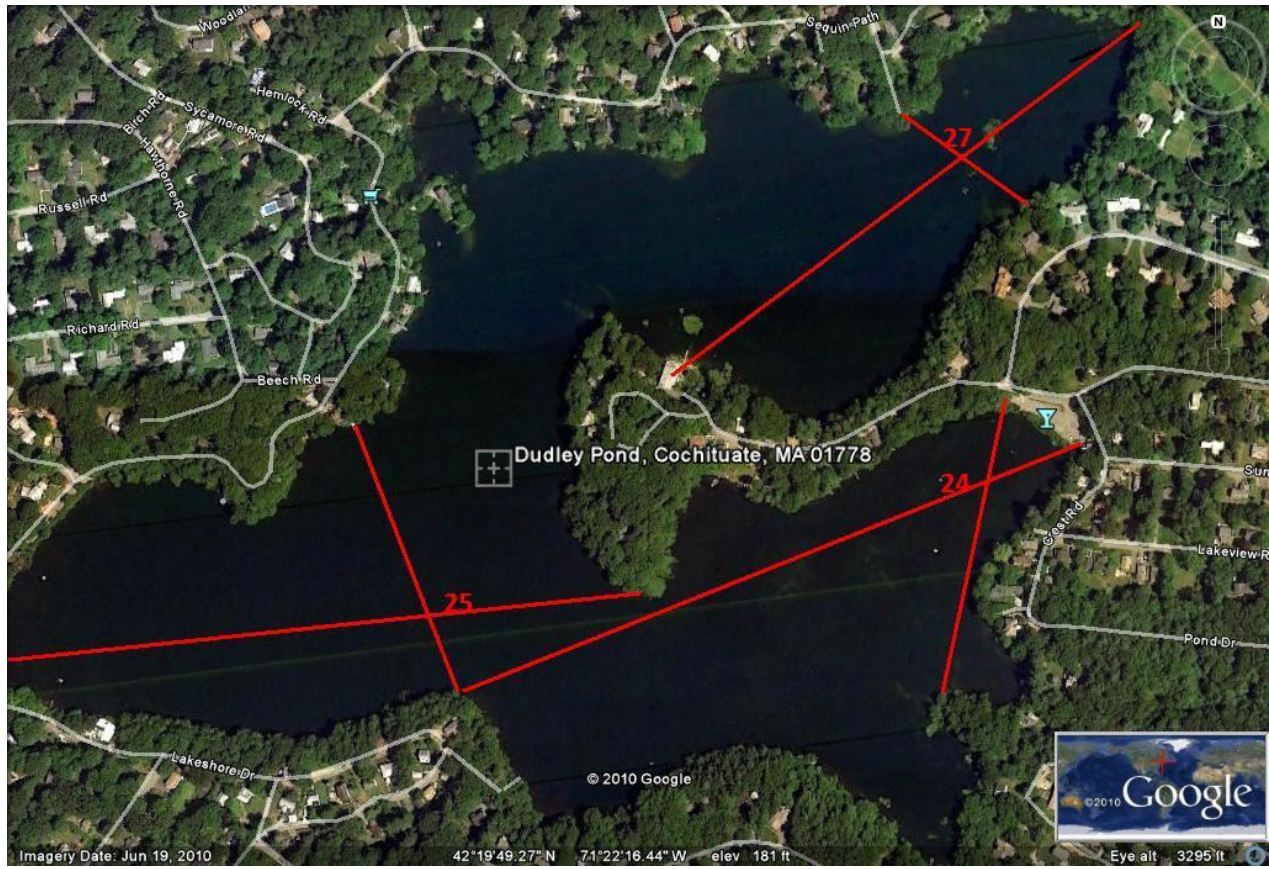


Figure 1 – Dudley Pond Sampling Points

Sample Point 24 is located at the intersection of the lines-of-site between Rocky Point – Bayfield Rd and Mansion Beach – “The Chat”. Sample Point 25 is located at the intersection of the lines-of-site between Mansion Beach –Southern point of the Dudley Rd. peninsula and Lowery’s dock – Williams Point. Sample Point 27 is located at the intersection of the lines-of-site between the Dudley Pond outlet – 107 Dudley Rd. and the foot of Maiden Lane – the 20” outfall adjacent 27 Bayfield Rd.

Methods

Samples were gathered at depths of one foot (Top), at mid depth (Middle) and one foot off the bottom (Bottom) at Sample Points 24, 25 and 27. A water sampler as shown at <http://www.aquaticceco.com/subcategories/2912/Water-Sampler?green=12823266105> with a sample volume of 1.0 – 1.5 liters was used to gather samples at various depths. Samples and data were/are to be gathered during March, August and November each year, in an attempt to understand seasonal variations.

Sample Handling - Multiple sample catches at each depth were composited from the sampler into a one gallon container in order to get the volume of sample needed for the various analyses. The one gallon container was mixed and aliquots were poured into sample bottles provided by the analytical laboratory. The labels on the sample containers were filled out. One of the sample bottles contained sulfuric acid necessary to “fix”(preserve) the sample for total phosphorus (TP) analysis. All of the

samples were stored in a cooler containing ice and delivered with chain of custody documents to the analytical laboratory the day after the samples were gathered.

Sample Analyses - A SWQC owned YSI 556 Multimeter was used to measure the following parameters at the same time that the samples are collected.

Date
Time
Weather
Barometric Pressure
Location
Depth
pH
ORP
Dissolved Oxygen
Dissolved Oxygen % Saturation
Temperature
Secchi Depth (<http://water.epa.gov/type/rs/monitoring/155.cfm>)

Nashoba Analytical, LLC was used to perform analyses of samples from Sample Points 24, 25 and 27. Analyses were performed by Nashoba Analytical, LLC for the following parameters.

Total Phosphorus, ppm (as P) (Soluble + Insoluble)
Orthophosphate, ppm (as P) (Soluble)
Ammonia, ppm (as N)
Nitrate/Nitrite, ppm (as N)
Total Nitrogen, ppm (as N)
Chlorophyll *a*, ug/l (ppb)

Carlson Trophic State Index – TP concentrations, Chlorophyll *a* and Secchi depths were used to plot the Carlson Trophic State Index (TSI) for the three sample points in Dudley Pond. Since the Secchi Depths for Sample Points 24 and 27 were greater than the depth of the water, it was assumed that the Secchi Depths for all of the sample points were the same as Sample Point 25. In order to obtain an average TP concentration for each sample point the three Total Phosphorus concentrations for the sample point were averaged. In order to obtain an average Chlorophyll *a* concentrations for each sample location, the average of the chlorophyll *a* concentration at each sample point was calculated using the average of the chlorophyll *a* concentrations at the three depths. (see http://www.aslo.org/lo/toc/vol_22/issue_2/0361.pdf for information re Carlson Trophic State index)

Results

The results of the November 11, 2012 sampling are shown in Figure 2. The analytical data was plotted to determine the TSI and is shown in Figure 3.


Date / Time:	11 11 12		12:20 PM								
Samplers:	Mike	Toni									
Weather:	65 F, Partly Cloudy, Wind 5 - 10 MPH										
Barometric Pressure:											
	SP 24-top	SP24-mid	SP24-bot	SP 25-top	SP25-mid	SP25-bot	SP27-top	SP27-mid	SP27-bot		
Depth (ft)	1'	3'	5'	1'	12'	24'	1'	3'	5'		
pH	7.56	7.56	7.58	7.79	7.82	7.81	7.71	7.75	7.99		
ORP	121.7	120.3	118	98.2	96	92	102.7	102.8	93.7		
DO	11.74	11.82	11.92	12.8	11.2	10.2	11.5	11.66	13.29		
DO%	101	100.4	101.7	105	94.3	85.4	97.6	99.1	110		
Temp	8.35	8.28	8.24	8.54	7.99	7.89	8.31	8.18	7.87		
Secchi Depth	5' 5" Btm			12' 1"			5' 4"				
Total Phosphorus (as P)	ND	ND	ND	ND	ND	ND	ND	ND	ND		
OrthoPhosphate (as P)	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Ammonia (as N)	ND	ND	ND	ND	ND	ND	ND	ND	ND		
Nitrate/Nitrite (as N)	0.11 mg/l	0.1 mg/l	0.09 mg/l	ND	ND	ND	ND	ND	ND		
Total Nitrogen (as N)	0.91 mg/l	0.82 mg/l	0.86 mg/l	0.81 mg/l	0.75 mg/l	0.79 mg/l	0.65 mg/l	0.68 mg/l	0.84 mg/l		
Chlorophyll a	3.55 ug/l	4.28 ug/l	4.53 ug/l	4.14 ug/l	3.61 ug/l	2.19 ug/l	3.24 ug/l	3.27 ug/l	6.48 ug/l		

Figure 2 – November 11, 2012 Dudley Pond Water Quality Data

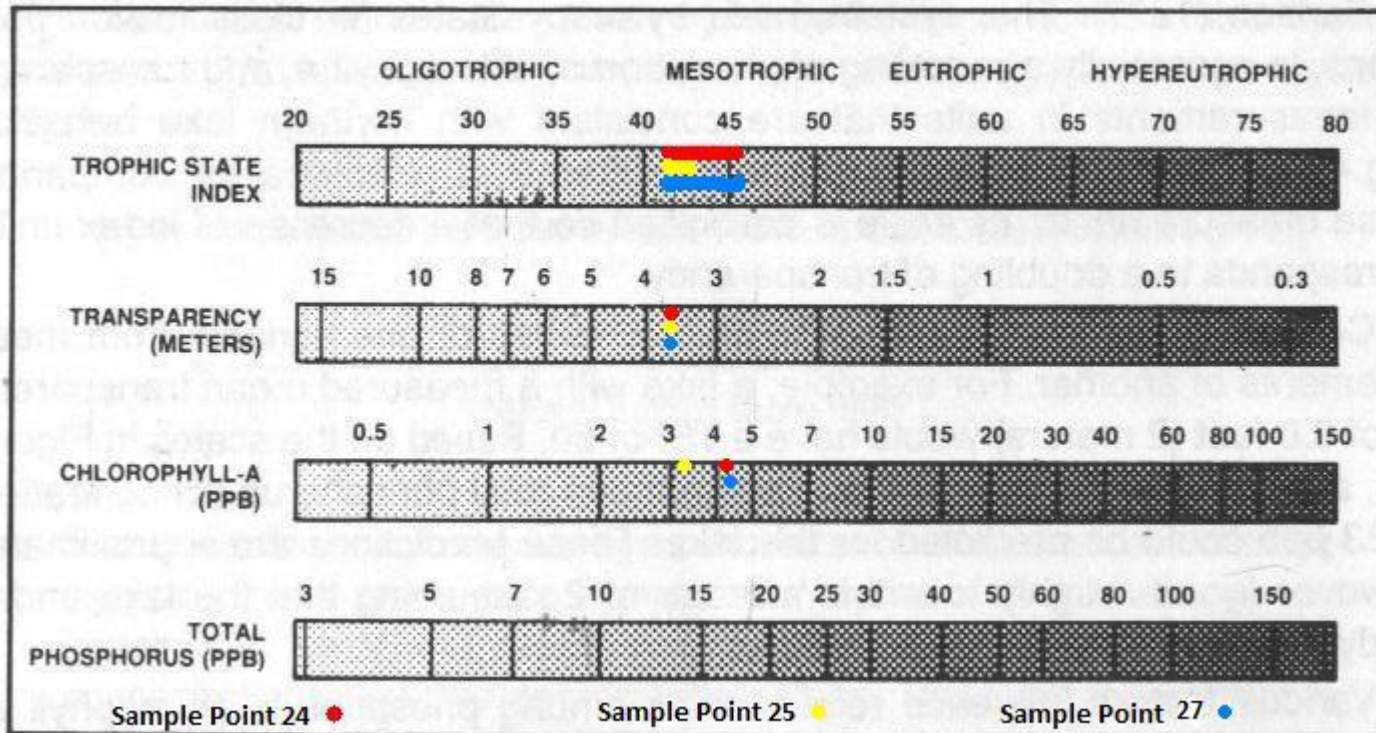


Figure 3 – Carlson Trophic State Index Results for November 11, 2012, Sample Points 24, 25 & 27

Discussion

YSI Measurements - Measurements taken with the YSI 556 Multimeter varied from location to location and by depth.

- pH – The pH for all three sample points ranged from 7.56 to 7.99, without much variation from top to bottom, which indicates fairly good mixing within the water column. Higher pH values at the bottom for Sample Points 24 and 27 indicate the presence of some benthic photosynthesis, which is supported by the higher chlorophyll a values at the bottom of Sample Points 24 and 27 as well as relatively high Secchi depth readings and DO measurements.
- ORP – The ORP values ranged from +121 to + 92, without much variation with depth, indicating relatively good mixing.
- DO and DO Percent Saturation – DO percent saturation measurements ranged from 105 % to 85.4%. DO and DO Percent Saturation measurements indicate photosynthesis occurring primarily at the bottom of Sample Points 24 and 27. DO and DO Percent Saturation decrease with depth at Sample Point 25, which is pretty typical of depths that are significantly deeper than Secchi depths.
- Temperature – The temperature variations was 7.87 to 8.54 C, with bottom temperatures slightly lower than surface temperatures. The lack of temperature variation from top to bottom at each sample point indicates vertical mixing in the water column, which suggests that this sampling date was probably close to the fall turnover of the Pond.

Secchi Depths – Secchi depths (a measure of color, turbidity and suspended solids, such as algae) on November 11, 2012 was 12.08' (3.66 m). Accurate Secchi depths at Sample Points 24 and 27 could not be obtained because the bottom was clearly visible implying the Secchi depth was greater than the bottom depth. Therefore it has been assumed that the Secchi depths at Sample Points 24 and 27 were similar to that at Sample Point 25, which was 12.08 feet (3.66 m).

Phosphorus Concentrations – There was no phosphorus found at any of the sample points at any depths.

Nitrogen Compounds – Nitrate concentrations ranged from 0.11 mg/l to 0.09 mg/l and were found at all depths at Sample Point 24 only. The lack of ammonia and the presence of nitrate indicate that nitrification had occurred at Sample Point 24. It is not clear why nitrate was not found at Sample Points 25 and 27. Total nitrogen ranged from 0.91 mg/l to 0.65 mg/l and was measured at all sample points and at all depths. Total Nitrogen is the sum of nitrate-nitrogen (NO₃-N), nitrite-nitrogen (NO₂-N), ammonia-nitrogen (NH₃-N) and organically bonded nitrogen. As there was no nitrate, nitrite or ammonia present at Sample Points 25 and 27, the total nitrogen concentrations are most likely organic nitrogen from suspended organic materials such as algae or weed fragments. The relatively small range in concentrations of nitrogen compounds top to bottom at all sample points also indicates relatively good mixing.

Alpha Chlorophyll (Chlorophyll a) – On November 11, 2012 Chlorophyll a, a measure of algae concentration, generally increased with depth at all sample points, except Sample Point 25 and ranged from 2.19 ug/l (ppb) to 6.48 ug/l (ppb). The lower Chlorophyll a found at the bottom of Sample Point 25 may be due to the fact that there is very little sunlight or algae present at a depth of 24 feet. The relatively high Chlorophyll a found at the bottom of Sample Point 27 may be due to benthic photosynthesis occurring.

Carlson Trophic State Index – As Dudley Pond is primarily used for recreational purposes a TSI less than 50 is tolerable and less than 40 would be great. The TSI on November 11, 2012 for the three sample points ranged from 42 to 46 indicating that the Dudley Pond trophic index was low to mid mesotrophic range. For the November 11, 2012 the TSI was based on Secchi and Chlorophyll a measurements, since there was no phosphorus contained in any of the samples gathered. Since the Secchi measurement was the same for all three sample points, the Chlorophyll a measurements determined the range in TSI. Sample Points 24 and 24 had comparable average Chlorophyll a values and Sample Point 25 had a lower average Chlorophyll a value due to the lower concentration of Chlorophyll a at the bottom of Sample Point 25. The higher Chlorophyll a values at the bottom of Sample Points 24 and 27 are thought to be due to benthic photosynthesis occurring when compared to the bottom of Sample Point 25 where there is essentially no sunlight and therefore very little or no photosynthesis occurring.

Data Trends - The following comparisons are for data from the fall sampling for November 2011 and 2012. No historical late season water quality data has been found for Dudley Pond from the years preceding 2011.

Secchi Data – The Secchi depth measurement for November 13, 2011 was 11.25 feet versus 12.08 feet in 2012. Greater Secchi depths indicate better visibility and therefore better water quality.

Total P Data – Higher Total P concentrations indicate poorer water quality because P is a nutrient that stimulates the growth of algae and weeds. No phosphorus was found in samples gathered in November 2011 or in November 2012.

Chlorophyll a Data - Higher concentrations of Chlorophyll a indicate higher algae concentrations and poorer water quality. In November 2011 chlorophyll a ranged from 2.6 to 4.6 ug/l (ppb) and in November 2012 chlorophyll a from 2.19 to 6.48 ug/l (ppb).

TSI Data – The TSI range for November 2011 was 41 – 44 and the TSI range for November 2012 was 42 – 46, which, given the inaccuracy of the measurements, are about the same TSI values.



Town of Wayland Massachusetts

May 27, 2012

Wayland Surface Water Quality Committee
Town of Wayland
41 Cochituate Road
Wayland, MA 01778

Subject: Request for Quotation
Spot Treatment using Renovate OTF™ in Dudley Pond, Wayland, MA

Gentlemen:

This letter is a request for quotation from the Wayland Surface Water Quality Committee, Town of Wayland for a spot treatment of approximately 2, 5, or 10 acres of Dudley Pond using the aquatic herbicide triclopyr, trade name Renovate OTF™.

Background:

Dudley Pond is an 86 acre water body, entirely within the Town of Wayland. It is within the Zone II well-recharge area of Wayland's Happy Hollow wells. Most of Dudley Pond is 4-8' deep, with the exception of the 'deep hole' – see Dudley Pond Bathymetry at the end of this document. The pond is surrounded by roughly 120 homes, with private septic systems. There are four main outfall pipes and one stream leading into the pond. It has a 335 acre watershed and a 1.5 year hydraulic residence time.

Dudley Pond has a persistent and aggressive infestation of Eurasian Water Milfoil. Over the last 20 years, the pond has been treated with fluridone four times. The pond was last treated with fluridone by Aquatic Control Technologies in 2008 for a 120 day period at an average 12ppb concentration over that period. Eighteen acres were spot treated with triclopyr (Renovate OTF™) by Aquatic Control Technologies in 2010.

The Wayland Surface Water Quality Committee has undertaken a significant hand-pulling program to remove EWF by the roots.

<i>Year</i>	<i>#plants</i>	<i>Comments</i>
2008	6,000	post fluridone treatment
2009	18,200	7000 survivor, 11,200 new – no herbicide use
2010	6,145	most after triclopyr spot treatment
2011	10,485	no herbicide use
2012 *	2,317	(thus far)

* 4/26-5/28

We are actively working to institute a long-term nutrient reduction program and to use spot treatment and hand-pulling to lessen the herbicide requirement to control this infestation.

Request for Quotation:

We would like your price quotation for a June or July spot treatment; area size and date to be determined by visual inspection of actively growing EWM, and further described below:

You would be required to provide:

- A pre-treatment inspection of the areas, as required by the Order of Conditions including on-site meeting with the Conservation Administrator or designee.
- Herbicide, labor and services for treating a 2 acre, a 5 acre, or a 10 acre area.
- 100 laser-printed 8 ½ x 11 warning signs on colored stock detailing the treatment dates and limitations, suitable for outdoor posting by staple gun.
- Preparation and filing of the DEP License to Apply Chemicals.
- Provision of supplies and analytical services necessary to establish concentrations at the end of the treatment period (triggering removal of sandbags at the outflow)
- A season-end report for inclusion with our annual report to the Wayland Conservation Commission under the Order of Conditions.
- A guarantee of 98% biomass reduction in treated areas through the end 2012 season.

To be provided by the WSWQC:

- Sandbagging the Dudley Pond outlet weir during the treatment period, and monitoring.
- Posting of the warning signs as required by the Order of Conditions
- Filing the year-end report described by the Order of Conditions
- Day-of-treatment measuring of dissolved oxygen, pH, and water temperature as required by MGL Ch 131 Section 40 Condition 29.

- 45 day post-treatment measuring of dissolved oxygen, pH, and water temperature as required by MGL Ch 131 Section 40 Condition 32.

We understand that scheduling your facilities may not enable you to guarantee us a response time, but we would appreciate your advising us how much time we should allow for you to schedule the treatment.

Attached is the 2008 Order of Conditions (DEP 322-698) for this proposed spot treatment.

Please address any questions to lowery.mike@gmail.com (questions and our answers will be shared with all potential suppliers.)

We look forward to receiving your response. Please send one copy of your response in PDF form by email to: lowery.mike@gmail.com, and Wayland.SWQC@gmail.com; and one copy in printed form to:

Wayland Surface Water Quality Committee
Attn: Dudley Pond RFP Response
Wayland Town Building
41 Cochituate Road
Wayland, MA 01778-2614

Your response should anticipate compliance with

- Terms and Conditions required by the Town of Wayland, including a 10% hold back for delivery of final report.
- The Order of Conditions and any amendments thereto as issued by the Wayland Conservation Commission.

We request your response by emailed prior to June 8th. If we elect to use herbicide in 2012, the decision will likely be made in July. We will keep you informed.

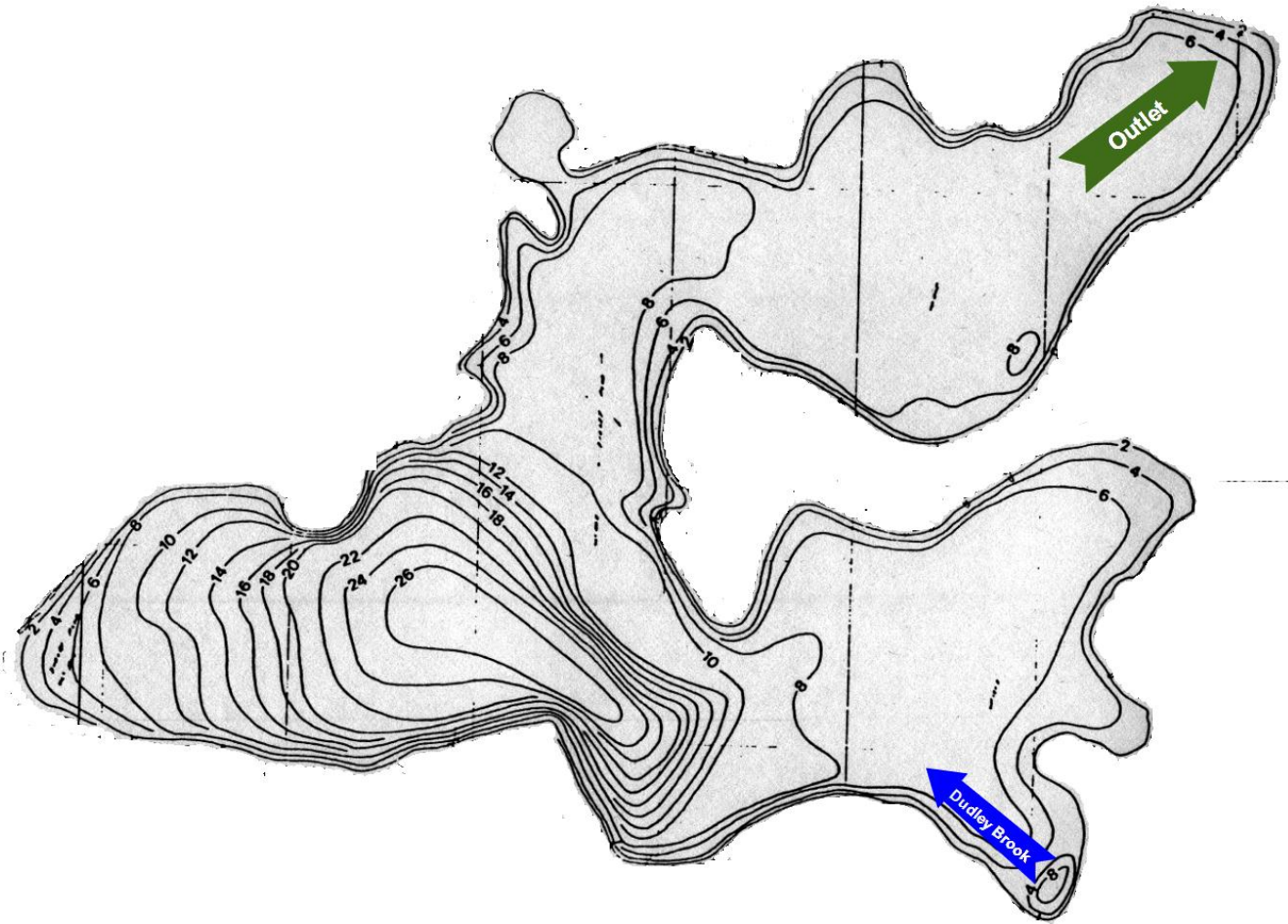
Very truly yours,



Michael P. Lowery
Project Manager, Dudley Pond
Wayland Surface Water Quality Committee

cc: WSWQC members
Dudley Pond Association
Brian Monahan, Wayland Conservation Commission
Frederic E. Turkington Jr., Wayland Town Administrator

Dudley Pond Bathymetry



June 6, 2012

Wayland Surface Water Quality Committee
Attn: Dudley Pond RFP Response
Wayland Town Building
41 Cochituate Road
Wayland, MA 01778-2614

Re: 2012 Proposal for Spot-Treatment using Renovate OTF™ in Dudley Pond, Wayland, MA

Gentlemen:

Please accept this as our Proposal for a Renovate OTF spot-treatment in Dudley Pond during the 2012 season. As the Wayland Surface Water Quality Committee knows, we are very familiar with the current conditions at Dudley Pond having conducted the Renovate OTF spot-treatment program in 2010 and numerous Sonar (fluridone) herbicide treatment programs in prior years. Our proposed scope of services and cost estimate follows.

SCOPE OF SERVICES

The following Scope of Services is for the requested spot-treatment with Renovate OTF (active ingredient triclopyr) to control Eurasian watermilfoil (*Myriophyllum spicatum*). It attempts to address all of the specific requests and conditions listed in the Request for Proposal.

Permitting: Aquatic Control will prepare and file an application for a DEP License to Apply Chemicals. Treatment will also be conducted in accordance with the Order of Conditions and the Wayland Chapter 194 Permit. Aquatic Control will assist WSWQC with compliance of these conditions.

Surveys and Reporting: Prior to and following treatment, Aquatic Control will survey the designated treatment area to visually document the aquatic plant species present and the control/impact seen following treatment. Surveys will be performed from a boat using a throw-rake, an underwater camera system and visual observation. These surveys will be coordinated with the WSWQC and the Conservation Administrator to comply with the required on-site meetings. The treatment area boundaries (pre-treatment) and location of any surviving EWM (post-treatment) will be recorded using a GPS unit and data will be mapped using ArcView GIS software.

Following the post-treatment survey, Aquatic Control will prepare and submit a written report that provides a) a description of the treatment, b) plant response observed, and c) on-going management options and recommendations to control EWM and other invasive aquatic plants.

Notifications: Prior to treatment, Aquatic Control will provide the WSWQC with 100 laser-printed 8 ½ x 11 warning signs on colored stock that detail the treatment date and water use restrictions to be imposed following treatment. A notification of treatment suitable for public dissemination will also be prepared and provided if requested.

Herbicide Treatment: Renovate OTF (triclopyr granular) will be applied to the designated and agreed upon treatment areas. The granular product will be applied using a calibrated spreader or eductor distribution system. Either Gerald Smith or Marc Bellaud will be present to perform and oversee the treatment. An airboat equipped with the proper application equipment will be used for the treatment. A Differential/WAAS GPS system will also be used for real-time

navigation during the treatment and to insure that the herbicide is applied within the designated treatment areas.

The application rate of Renovate OTF will be agreed to with the WSWQC in advance of the treatment. In 2010, when approximately 18 acres were treated, the application rate ranged from 215-240 pounds per acre. This translated to 2.0-2.25 ppm concentration of triclopyr based on the bottom 4 feet of the water column. We have found these application rates to be effective for spot-treatments, based on our previous treatment work at Dudley Pond and on numerous other lakes in Vermont and New York. Applying lower concentrations may sacrifice treatment efficacy. Higher application rates may also be necessary if small areas are designated for treatment to help overcome the effects of dilution. We have found that minimum treatment areas of 2 acres or more (depending on configuration) are necessary to insure effective control. During the 2010 treatment, enough of the pond was treated to result in a lake-wide triclopyr concentration of >200 ppb, which may have yielded a lake-wide lethal dose. If less area is to be treated in 2012, higher application rates are recommended.

Treatment will be scheduled and performed on a date mutually agreed to by the WSWQC and Aquatic Control. A mid-week treatment between mid-June and mid-July is anticipated. We understand that the actual date of treatment will be determined by visual inspection of actively growing EWM. We further understand that WSWQC will be responsible for the tasks listed in the RFP.

Herbicide Residue Monitoring:

Aquatic Control will provide the WSWQC with sample bottles, chain of custody forms and instructions for the collection and shipment of samples to SePRO for their FasTEST immunoassay procedure. WSWQC will be responsible for sample collection and shipping to SePRO via overnight delivery. Analytical costs will be billed through Aquatic Control's existing account with SePRO. The Town would be charged SePRO's list price for these services.

Tentative Schedule of Performance:

Task	Estimated Date of Completion
Permitting & Planning	June 2012
Pre-treatment survey	June 2012
Herbicide treatment	June – July 2012
Post-treatment survey	July – September 2012
Year-End Reporting	October 2012

COST AND PAYMENT SCHEDULE

Costs shown below are inclusive of all tasks described above in the Scope of Services.

- Prepare and file DEP License to Apply Chemicals\$100
- Pre-treatment survey, on-site meeting, prepare final treatment map and treatment plan.....\$750
- Post-treatment survey and year-end report.....\$500
- FasTEST analytical cost (laboratory services) \$100/sample

- Base cost for equipment mobilization, application equipment, and labor\$1,500
- Per acre treatment cost – assumes application of 240 pounds of Renovate OTF per acre..... \$925/acre
- Additional Renovate OTF herbicide cost\$3.85/pound
- Example treatment cost to treat 2 acres at 240 lbs/acre\$3,350
- Example treatment cost to treat 5 acres at 240 lbs/acre\$6,125
- Example treatment cost to treat 10 acres at 240 lbs/acre.....\$10,750

Our requested payment schedule is that 90% of the final agreed upon contract amount will be billed following treatment. The balance of 10% will be billed following submission of the year-end report. Payment is due within 30 days of receipt of an invoice, unless alternate arrangements are agreed to in advance.

STATEMENT OF GUARANTEE

Where the Renovate OTF application rates are not yet agreed upon with WSWQC, we cannot guarantee 98% EWM biomass reduction in treated areas through the end of the 2012 season. If the recommended application rate of 240 lbs/acre (2.25 ppm in bottom 4 feet) is performed, it is possible that >98% control will be achieved, but in order to guarantee 98% EWM biomass reduction through the end of the year sufficient funds would be needed to allow for higher concentrations to be applied or for a follow-up application to be performed. In fact, recent experiences and studies have shown that follow-up treatments, rather than higher application rates, may be the most effective way to attain >98% control. Based on current aquatic treatment technology, the Renovate OTF herbicide may not be completely lethal to the EWM root crowns, and there may be viable green shoots evident by late summer as the plants try to recover. Short of budgeting for a second treatment, achieving greater than an 80% EWM biomass reduction would be more in-line with standard industry practices for this type of spot-treatment program and is a level that we can guarantee.

We are confident that the proposed treatment program will result in excellent control of milfoil. Should you have any questions regarding our Proposal, please feel free to contact either Marc Bellaud or me.

Sincerely,

AQUATIC CONTROL TECHNOLOGY, INC.



Gerald N. Smith
President/Aquatic Biologist