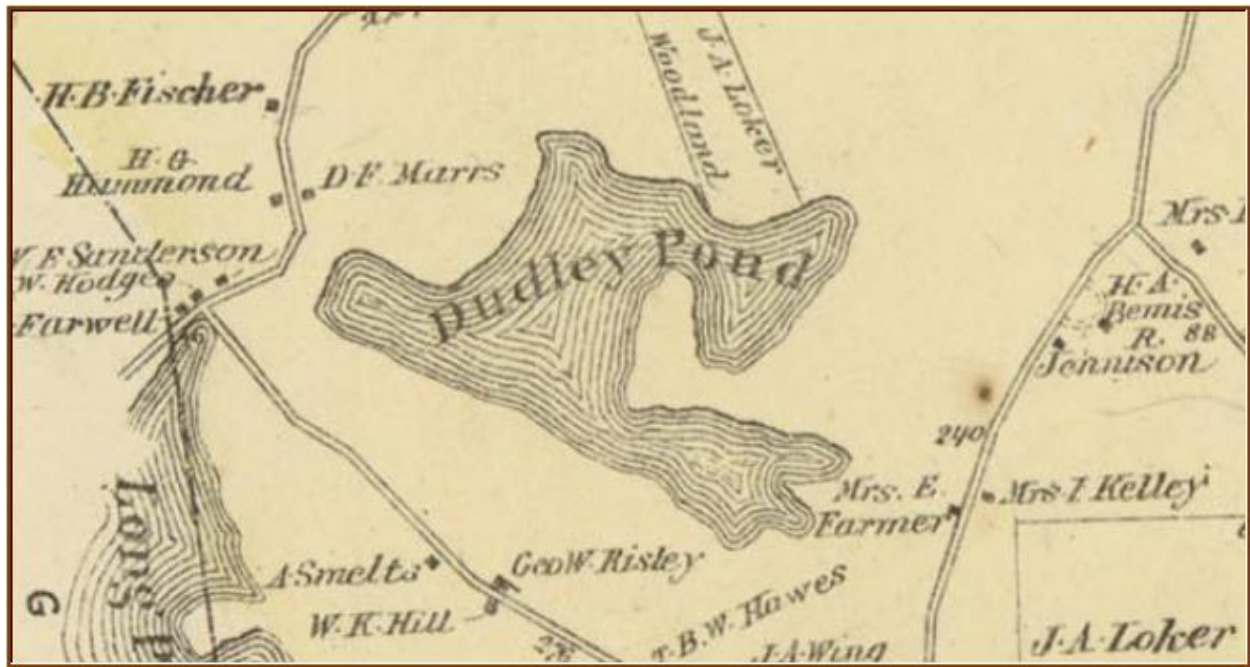


From 1875 F.W.Beers map of Wayland, including Dudley Pond



http://www.wayland.ma.us/surveying/images/wayland1875_A.pdf

Fall 2007 Quarterly Harvesting Report to Wayland Conservation Commission (DEP 322-676)

From: the Dudley Pond Association

SUMMARY: Over 30 tons of Eurasian Milfoil was removed from Dudley Pond from July to September by large scale mechanical harvesting and shoreline mechanically-assisted cutting. Experimental circulator evaluation areas were harvested as well as major portions of the Pond. Relief for recreational purposes extended for six weeks – Milfoil has re-grown and is again choking the Pond.

Mike Lowery
10/14/2007

Contents

Report Purpose: from the Order of Conditions:	3
Project Scope & Funding:.....	3
INITIAL CONDITIONS – Infestation Survey:	4
PRIMARY GOAL	5
Mechanical Harvesting:.....	5
Aiding TOW/SWQC Circulator Experiment	5
SECONDARY GOALS.....	6
Mechanical Harvesting:.....	6
Harvest additional areas	6
Avoid native species.....	6
Shoreline Harvesting:.....	6
Harvest difficult areas	6
PROJECT ACTIVITIES – SUMMER 2007:.....	7
Summary:.....	7
The first phase of mechanical harvesting	8
The second phase of mechanical harvesting	9
Shoreline Harvesting.....	10
LESSONS LEARNED:	11
CONSIDERATIONS FOR THE FUTURE:.....	11
EQUIPMENT USED:.....	12
Shoreline Harvesting Equipment: Jenson Lake Mower	12
H7-400 Mechanical Harvester operated by ACT:	12
PHOTOS:.....	13
Highway department loading dumpster.....	13
Volunteers: One Day’s mound – Chateau Parking Lot - Jamie Pierce, Brian Cichella.....	14
It’s not easy being green – Robin Hood Rd – Mike Lowery	14
STOCKING POINT Mansion Beach after harvesting: 7/15/2007	15
STOCKING POINT Robin Hood Road before harvesting: 7/12/2007	16
STOCKING POINT Robin Hood Road after harvesting: 7/21/2007	17
STOCKING POINT Chateau landing before harvesting: 7/15/2007.....	18
STOCKING POINT Chateau landing after harvesting: 7/19/2007.....	19



Report Purpose: from the Order of Conditions:

The applicant shall provide quarterly written reports to the Conservation Commission detailing what efforts have been done during the past quarter, as well as the results of these efforts, both positive and negative. Reports are to be submitted by the end of each harvesting period. The report shall include the dates of the harvesting, an estimate of the amount of material removed, photographs of the restored stockpiling location and other supporting documentation. This report shall be submitted not more than 35 days after the harvesting is completed.

Project Scope & Funding:

On June 15, 2007 the Dudley Pond association received a 3-year order of conditions from the Wayland Conservation Commission for the mechanical harvesting and hand-pulling of Eurasian Milfoil from Dudley Pond.

The project was funded by a \$25,000 grant from the Commonwealth, obtained by the DPA with the assistance of Representative Susan Pope. Expenditures were as follows:

\$8,250.00	Aquatic Control Technology Invoice # 11564, 7/11/2007, for mechanical harvesting from 7/2 – 7/10/07 (Phase 1)
\$ 288.44	Town of Wayland Highway Department, 7/18/2007, for employee overtime for backhoe operators from 7/2 – 7/7/2007 (Phase 1)
\$8,925.00	Aquatic Control Technology Invoice # 11630, 7/31/2007, for mechanical harvesting from 7/24 – 7/30/07 (Phase 2)
\$1,240.00	Aquatic Vision LLC, 7/21/2007, for infestation mapping and harvesting (Phase 2)
\$1,520.00	Aquatic Vision LLC, 7/27/2007, for harvesting (Phase 2)
\$4,416.00	Aquatic Vision LLC, 8/16/2007, for harvesting (Phase 2)
\$ 266.22	Town of Wayland Highway Department, 9/26/2007, for employee overtime for backhoe operators from 7/23 – 7/30/2007 (Phase 2)
\$ 94.34	Tools for loading weeds and containing floating fragments (3 pitchforks and 1 leaf rake)

\$25,000.00	Total grant finds spent



PRIMARY GOAL

Mechanical Harvesting:

Aiding TOW/SWQC Circulator Experiment: In the spring of 2007, the Town of Wayland's Surface Water Quality Committee purchased three SunGo Pond Circulators for an 18-month test that will evaluate the circulators effectiveness in controlling non-native milfoil in Dudley Pond. The circulators were intended to continually distribute oxygen through the water column and increase the oxidation rate of ammonia, thereby reportedly reducing its availability to the milfoil plants which rely on ammonia for their proliferation.

The SWQC planned an experiment to compare the circulator areas to the control area – and the DPA agreed to use its funds to support the experiment by harvesting to create identical initial conditions in the circulator and the control areas.

The circulator manufacturer recommended that milfoil within the test sites be cut and collected to give circulators a “jump-start”. It was hoped that cutting and removal of vegetation around the circulators would increase local circulation and oxygen distribution thereby increasing the effects of the circulators, and quickening their ability to alter the water chemistry in the area.

Uniform cutting around the circulators and in a control area assists the evaluation of the circulators by providing starting homogeneous plant depth below the water surface. This allows plant growth measurements in circulator and control areas to be compared.

Initially only one week of harvesting was planned.



SECONDARY GOALS

Mechanical Harvesting:

Harvest additional areas: Allowing the harvester to continue cutting while travelling to and from the planned areas enabled us to harvest significant portions of the Mansion Beach (western) arm and middle portions of the Pond during the first week of cutting.

After the first week of harvesting, we had created a disparity – other areas of the Pond were still heavily infested.

DPA took advantage of a five-day time-slot which ACT had originally planned for SWQC's harvesting of Heard Pond (but which had been delayed for a public comment period). The focus of the second week was on the Eastern arms of the pond which had not been harvested.

By focusing on the most invested areas, and optimizing the paths of the harvester, forty-eight tons of milfoil were removed from the Eastern arms (the Outlet, the Chateau) of the Pond.

Avoid native species: Mechanical harvesting can be selective only by controlling the area and the depth of cut. Fortunately, Eurasian Milfoil grows toward the surface while most native species grow close to the bottom of the pond. Mr. Gerald Smith, president of ACT was on hand shortly after mechanical harvesting begun. He counseled the operator of the equipment to cut about 12" or more above the bottom of the pond, to avoid cutting native plants.

Shoreline Harvesting:

Harvest difficult areas: To enable the large harvester to work efficiently, we employed a small boat-mounted, battery-operated cutter, the Jenson Lake Mower, and hand-collection to focus on shallow and difficult to reach areas.

Target areas for shoreline-water harvesting included the most heavily-used public access points for boating, fishing and swimming.



PROJECT ACTIVITIES – SUMMER 2007:

Summary:

Activity	Time Period	Goals	Harvesting Results
Mechanical Harvesting – Contractor: Aquatic Control Technologies (ACT)	7/2 – 7/10	Clear 10 acres surrounding circulators and circulator control areas – provide a defined starting point for SWQC experiment.	20 acres harvested 14,760 lbs removed – Mansion Beach Arm
Mechanical Harvesting - ACT	7/12-7/13	Give relief to other areas of the Pond not covered by initial harvesting	19 acres harvested 15,840 lbs removed North Arm / Outlet
Mechanical Harvesting – ACT	7/16 – 7/18	Give relief to other areas of the Pond not covered by initial harvesting	17 acres in South arm, 4 acres in West arm 32,800 lbs removed South Arm / Chateau
“Shoreline Harvesting” - hand removal using boat-mounted, battery-operated cutter	7/15 - 8/15	Clear public access areas and shoreline areas inaccessible or impractical for efficient cutting by mechanical harvester.	Most Included in totals above. Unmeasured amounts after 7/18

Michael Lowery was the Project Manager for the Dudley Pond Association. He was responsible for meeting with the Conservation Commission for all aspects of the approval process, coordinating the various contractors and Town resources, and for on-site oversight during the large-scale mechanical harvesting by ACT. Additional volunteer support was supplied by members of the DPA, who manually moved the harvested milfoil from the water’s edge to dry land, in preparation for loading into the dumpster by backhoe.

Approximately 200 man-hours of volunteer time were donated by DPA members during the Project.



The first phase of mechanical harvesting took place from July 2, 2007 to July 10, 2007. An area of 3 acres around each Circulator was harvested, and an additional 2-acre “control area” was harvested as part of the larger Circulator test project (Total 11 acres).

Large scale harvesting was contracted to Aquatic Control Technologies (ACT) for 5 days, using their H7-400 harvester. The Town provided a dumpster and backhoe operator. Additional manual assistance was provided by DPA volunteers. DPA paid overtime to Town employees.

Stocking was at Mansion Beach. The dumpster was loaded directly from the water’s edge by a small backhoe from the Highway Department.

As the harvester travelled to and from the Mansion Beach area, it was able to cut significant portions of the Mansion Beach arm and middle areas of the pond:



Area harvested: 20 acres

Stocking: Mansion Beach

Circulator areas in white circles, control area in white trapezoid.



Fall 2007 Quarterly Harvesting Report to Wayland Conservation Commission (DEP 322-676)

The second phase of mechanical harvesting began July 16, 2007 and was completed August 16, 2007. Large-scale harvesting in deeper water was contracted to ACT using their H7-400 harvester for an additional five day period.

Care was taken to avoid harvesting in locations involved in the weevils study (dark green). The white elbow line is the off-loading channel approved by Judy Currier and DEP to avoid milfoil experimental areas.

July 12-13 the North arm was harvested. Material was stocked at Robin Hood Road and pitch-forked into dumpsters by volunteers.

July 16-18 the South (Chateau) arm was harvested. Material was pitch-forked by volunteers from the shoreline to the surface of the Chateau parking lot, and then loaded by backhoe into the dumpster.

The South arm was by far the most heavily infested, and harvesting did not cover all areas.



Area harvested: 40 acres

Unload channel: white elbow line

Stocking Points: Robin Hood Rd, Chateau Ramp

Weevils areas: Dark Green

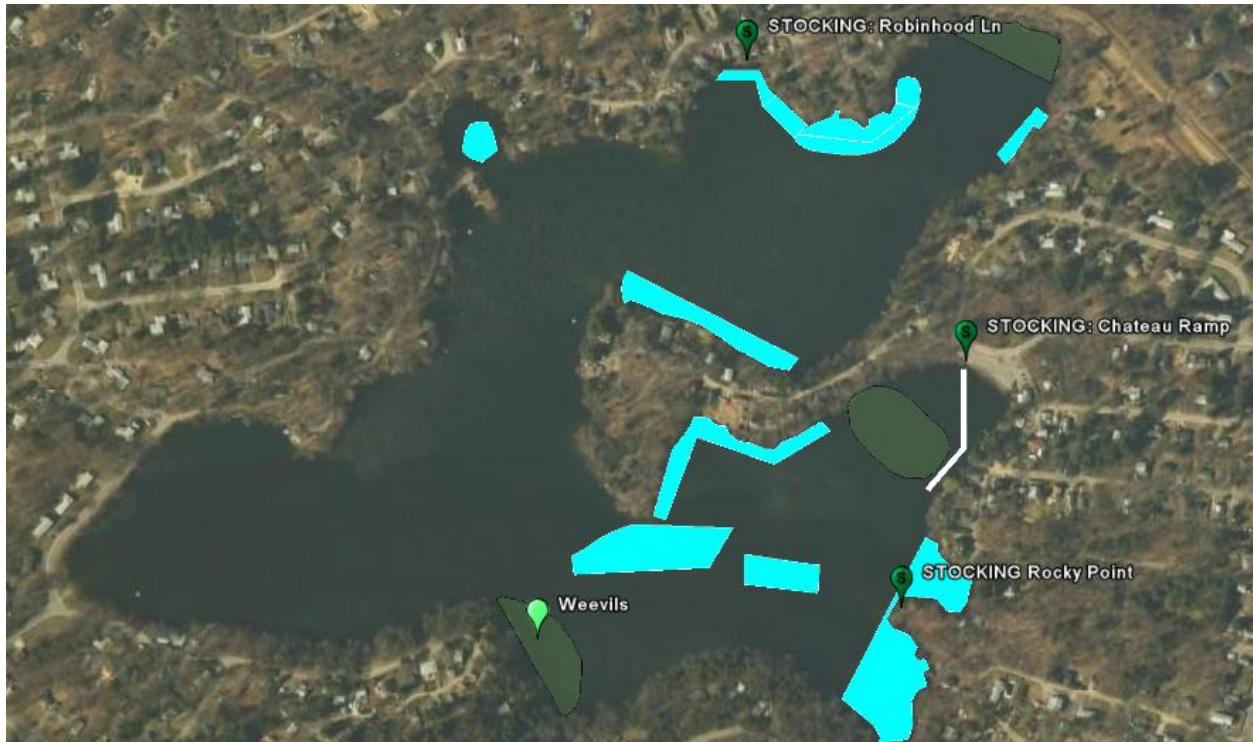


Fall 2007 Quarterly Harvesting Report to Wayland Conservation Commission (DEP 322-676)

Shoreline Harvesting took place primarily during ACT's mechanical harvesting, using the same unloading points. After completion of mechanical harvesting some additional shoreline harvesting took place using Rocky Point as the unloading point.

Collection of cut material was the most time-consuming part of the process.

Shoreline harvesting was difficult in many areas due to debris (sticks, logs, etc) at the bottom of the pond. The cutter would be jammed by the debris and require minor repair. Re-growth of milfoil in shoreline areas occurred in 3-4 weeks because the milfoil was closer to the surface.



Area harvested: 8.5 acres

Unload channel: white elbow line

Stocking Points: Robin Hood Rd, Chateau Ram, Rocky Point

Weevils areas: Dark Green



LESSONS LEARNED:

- **Two weeks is not enough – it would take at least three weeks to fully harvest the pond at the infestation levels which existed.**
- **One harvest is not enough.** It took 6-8 weeks for the milfoil to come back. **Two or three mechanical harvests per season are required for harvesting to be an effective control.** This is beyond the financial and volunteer capabilities of the DPA.
- The south east (Chateau) arm is the most heavily infested.
- Pitch-forking the weed to where it could be loaded into dumpsters was a Herculean effort for volunteers. If harvesting is the long-run control solution, a mechanized conveyor would be required.
- Additional fragment-control in harvested areas is needed to prevent fragments from accumulating on the shore. Many homeowners reported having to pick up cut material after the harvesters had finished. Others have reported that they believe harvesting has spread milfoil into other areas not previously infested.
- Some areas were off-limits because we had to avoid areas where the weevil experiments were sited. This made harvesting difficult and kept some shore line homeowners hostage to the weevils experiment.
- Containment barriers (nets, hay bales) at the shoreline are not as important as fragment control from the harvester itself. Future Orders of Conditions for mechanical harvesting of Eurasian Milfoil should require fragment control measures outside the containment barriers. (This may be less true for harvesting water chestnuts.)

CONSIDERATIONS FOR THE FUTURE:

- If the Conservation Commission does not permit the use of herbicides, mechanical harvesting may be the only guaranteed-to-work method to control Eurasian Milfoil in Dudley Pond.
- It may be cheaper to purchase a harvester than pay a contractor. Milfoil problems also exist in the North Pond of Lake Cochituate, and harvesting water chestnuts may again be required in Heard Pond.

