

Lake Arrowhead Club

2009 Lakes Committee

Lakes' Status Report

2010 Planned Activities

Your Lakes Committee would like to present our activities and accomplishments for this year, and our plans for next year:

Highlights

- Successfully completed Great Bay and Lake Arrowhead water level lowering and refilling over the winter and spring of 2009.
- Completed biannual professional dam inspection; minor repairs identified and completed.
- Revised Lake Arrowhead Dam Emergency Action Plan.
- Received US-DFW Riparian Zone Restoration grant of plants; constructed rain gardens and planted plants in storm water runoff locations.
- Successfully applied SONAR® to Great Bay to control Cabomba infestation.
- Bay of Deep Water suffered an infestation of Duckweed in late July; Sonar® is planned for spring of 2010.
- Lake Arrowhead suffered several algae blooms over the spring and late summer. Alum and dye application are planned for next season, and hydro raking of two coves is planned for the fall of 2010, if Easement Budget funds allow.
- Developed a 6-year Lake Management Plan that addresses lake maintenance and major hydro raking projects for all 4 lakes. Plan will be funded by both the Easement Budget and the Lake Restoration Fund. Plan Budget highlights are presented at the end of this report.
- Prepared and presented Fair Share to LAC membership in March, and to Lake Arrowhead neighborhood at 4 meetings in November. With LAC Board, revised LAC By-Laws and LAC Rules and Regulations to include Easement Members and LAC members.
- Measured Total Phosphates in May and August this season, in Lake Arrowhead, Great Bay and Bay of Deep Water. Bay of Deep Water and Great Bay continue to be above the NJ-DEP standard for lakes of their type. The results are specified in the body of the report and graphed at the end of the report.
- The Lakes Chair participated in a 2 day course entitled Lake Management and Restoration, given by Rutgers University Continuing Education, and covering lake ecology and technical aspects of lake management.

Detailed Report

General – All Lakes

- Held (and continue to hold) open Lakes Committee meetings once per month (currently on 2nd Wednesday) throughout the year.
- Continued with Aquatic Technology Inc., as the chemical applicator company for aquatic plant management. Obtained seasonal, rather than per treatment, contract for algaecide applications. Company did 15 essentially biweekly inspections of the lakes from the end of April until the end of September, and consulted with Lake Chair about chemical applications. The spring algae treatments were

delayed due to new EPA regulations concerning chemical applications in lake waters.

- The Lakes Chair participated in a 2-day course entitled Lake Management and Restoration, given by Rutgers University Continuing Education and taught by Dr. Stephen Souza, President of Princeton Hydro. The course provided an introduction to lake ecology and covered all the technical aspects of the major means used to manage and restore lakes including hydro-raking / dredging, aeration, chemical weed/algae control, alum treatments, and biomanipulation.
- In the spring, LAC received the riparian zone restoration grant from US DFW, for ½ acre of native plants that were planted in storm water discharge routes to three lakes. A small, dedicated group of volunteers constructed rain gardens and planted the plants in various locations around the lakes. These plants will serve to filter storm water run-off, to remove the nutrients, prior to providing water to our lakes.
- Represented LAC at NJ COLA meetings in April and September.
- Published 2 community education flyers on responsible lakeside residency, rain gardens and native plants. Flyers published on website for future reference.
- Authored LAC Newsletter Lakes blurbs.
- Obtained discounted rate for phosphate-free fertilizer from Anchor Hardware.
- In the spring of 2009, the biannual inspection of the Lake Arrowhead dam was performed by a professional engineering firm. Minor repairs were recommended and completed.
- In addition to the dam inspection, the Dam Emergency Action Plan was revised to include changed responsible persons for dam operations.
- Developed a 6-year Lake Management Plan for the care and hydro raking of all four of the Lake Arrowhead lakes. The plan will be funded both by the Easement Budget, and by the Lake Restoration Fund. A brief overview of the plan budget is provided at the end of this report.

Fair Share

- Presented Fair Share concept to LAC membership in March, and received nearly unanimous membership approval to pursue this option.
- Researched over 50 property title chains in support of the implementation of Fair Share.
- With the LAC Board, revised LAC By-laws and Rules and Regulations to accommodate Easement and LAC membership rights, obligation and privileges.
- With the LAC Board, obtained LAC membership approval of revised By-laws in September, and sent them to Eileen Born, of Dolan and Dolan, for attorney review. Received comments back before open meeting in January.
- With the LAC Board, prepared and presented 4 neighborhood information presentations on Fair Share in November.

Bay of Deep Waters

2009 Accomplishments:

- A duckweed infestation started around the end of July, and manual removal of a portion of it by several LAC and non-LAC volunteers was tried over two

weekends in mid August. The effort was only marginally successful for the lake, although multiple wheelbarrows of duckweed were removed.

- Algaecide applied 7 times (April 29, May 6, 13, 26; July 2, August 13; September 28).
- Testing of total phosphates (TP) was done 2 times during summer:
May: 0.11; August: 0.08; mg/l as P
Both results are over the NJ-DEP Standard of 0.05 mg/l as P for Total Phosphates for this type of lake.
- US-DFW plants were planted near the exit of the storm water runoff pipe at the north end of BDW.

2010 Objectives:

- Treat with herbicide Sonar[®] for duckweed infestation at a cost of \$2700, funded by the Easement Budget.
- Continue application of algaecide as required; funded by the Easement Budget.
- Continue TP testing as required; funded by individual donation.

2011 Objective:

- Hydro-rake Bay of Deep Waters in fall of 2011. Funded by Easement Budget and Lake Restoration Fund.

Great Bay

2009 Accomplishments:

- Refilled Great Bay in winter and spring of 2009.
- The Lake Restoration Fund provided \$5723 for three applications of Sonar[®] (May 6, 26, June 4) in Great Bay. The herbicide was very effective, controlling the Cabomba infestation in that water body.
- Algaecide was applied 7 times (April 29, May 6, 13, 26, June 4, July 2 and August 13).
- Tested Total Phosphates (TP) twice over the summer:
April: 0.04; August: 0.06. mg/l as P
The August result is over the NJ-DEP standard of 0.05 mg/l as P, for Total Phosphates, for this type of lake.
- A rain garden was constructed in the spring, by a small group of dedicated volunteers, near the Route 46 storm drain exit, uphill from the Great Bay lagoon. The rain garden will absorb nutrients from the storm water runoff before the water enters the lake. The plants for the rain garden were obtained from the grant from US DFW.
- Additional plants from the same US DFW grant were planted in the storm water runoff stream paralleling Ridgewood Pkwy near Rte 46.

2010 Objectives:

- Continue TP testing as required; funded by individual donation.
- Continue application of algaecide as required; funded by Easement Budget

2013 and 2015 Objective:

- Hydro-rake lagoon (2013) and north cove (2015). Funded by Easement Budget and Lake Restoration Fund

Lake Arrowhead / Rt 46 Pond**2009 Accomplishments:**

- Refilled Lake Arrowhead over the winter and spring of 2009.
- Applied blue dye in mid-May to limit algae growth; funded by LAC Auxiliary.
- Applied algaecide 15 times (April 29, May 6, 13, 26, June 4, 24, July 2, 9, 20, 27, August 13, 18, 28, 31 and September 28)
- Tested total phosphates (TP) twice over the summer:
May 0.02; August: 0.03 mg/l as P
- Plants obtained from grants from US DFW were planted near north boat dock cove.
- Measured and began planning for replacement of swim lane dock turning boards.

2010 Objectives:

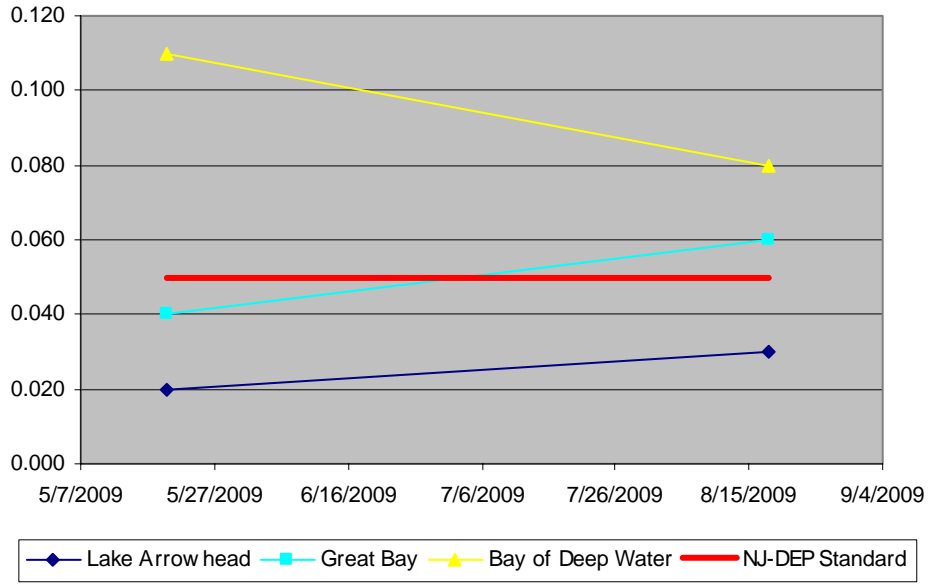
- Removal and replacement of old dock and turning boards to commence in February. To be funded by LAC Auxiliary and individual donations.
- Application of blue dye to lake to limit algae growth at a cost of \$2250 from the Easement Budget.
- Alum will be applied to lake to limit algae growth, at a cost of \$3300 from the Easement Budget.
- If Easement Budget funds are available, hydro raking of the north boat dock cove and the Great Bay sluiceway cove of Lake Arrowhead will be done in fall of 2010. We estimate that this will cost \$12,650, with \$7500 from the Easement budget and the remainder from the Lake Restoration Fund.
- Continued TP testing as required; funded by individual donation.
- Continued application of algaecide as required; funded by Easement Budget.

2012 and 2014 Objective:

- Hydro rake northeast cove and southwest boat dock cove (2012) and Route 46 Pond (2014). Funded by Easement Budget and Lake Restoration Fund.

The Lakes Chair would like to thank the members of the Lakes Committee for their thoughtful discussions and active participation in lake care activities this year. The Chair would also like to thank the LAC Board of Trustee for their assistance with the revision of the By-laws and Rules and Regulations, and the Lake Arrowhead community residents (both LAC members and non-members) for their help, and for their donations of time and money in the beginning of the ongoing effort to help restore our lakes.

2009 Total Phosphate Levels



Six Year Lake Care Budget Summary

Annual Maintenance & H-R Project Proposed 6 Year Lake Care Budget

| Year | Maint. (all FS) | Hydro Rake Proj. | H-R Cost (EB 7.5K+LRF) | Total |
|-------|--------------------|---|---------------------------|-----------|
| 2010 | \$13,895 | LA SE Sluiceway cove LA NW Dock cove | \$12,650 | \$26,545 |
| 2011 | \$13,495 | Bay of Deep Waters | \$14,250 | \$27,745 |
| 2012 | \$13,764 | LA NE cove LA SW boat launch | \$10,250 | \$24,014 |
| 2013 | \$14,040 | Great Bay lagoon | \$11,850 | \$25,890 |
| 2014 | \$14,321 | Rte 46 Pond | \$4,650 | \$18,971 |
| 2015 | \$14,607 | North Great Bay | \$7,850 | \$22,457 |
| Total | \$84,121 | | \$61,500 | \$145,621 |