

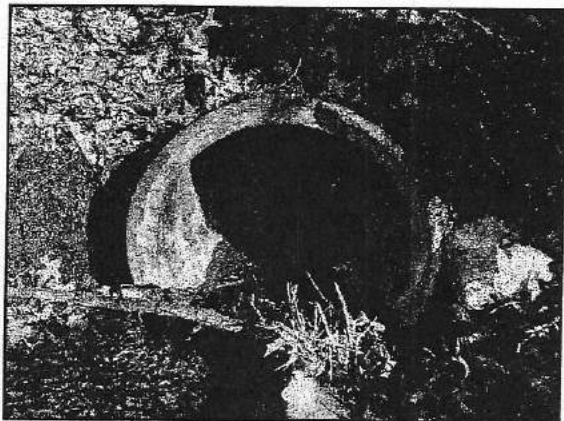
2003



Watershed Survey Report And Action Plan

LAKE BOON
Hudson & Stow, MA

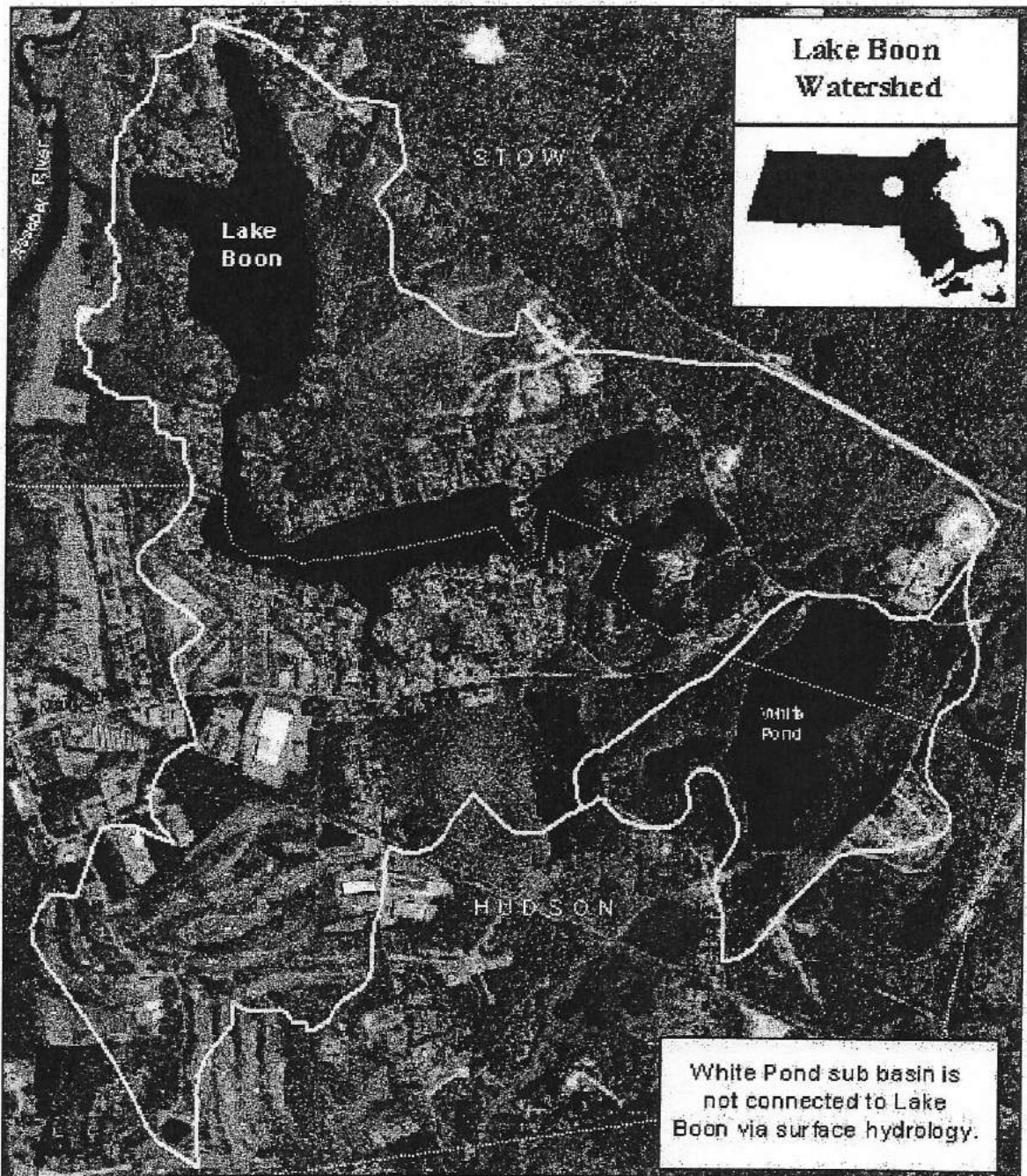
May 2003



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CONSERVATION

Lake Boon Watershed Survey Team

*IN COOPERATION WITH THE MASSACHUSETTS RIVERWAYS PROGRAMS
DEPARTMENT OF FISHERIES, WILDLIFE & ENVIRONMENTAL LAW ENFORCEMENT
LAKE/WATERSHED STEWARDSHIP PROGRAM*



Lake Boon Watershed

White Pond sub basin is not connected to Lake Boon via surface hydrology.

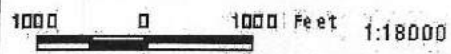
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DATA SOURCES:
 TOWN'S: Derived at MassGIS from available base data points of the USGS 1:25,000-scale quadrangle.

COLOR OR TOPOG. TOPOGRAPHY: Aerial photography taken during April 2001.

WATERSHED BOUNDARIES: Automated by the Riverways Program using the MassGIS Database and Watershed Definition tool.

This map was produced by the Riverways Programs - February 2003 - 617-626-1540



MA Towns Watershed map

Bill Romney, Governor
 Elin Roy Herbolster,
 Secretary of Environmental Affairs
 David M. Peters, Commissioner



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I. INTRODUCTION

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Steering Committee – Mike Busch (Stow Recreation), Barbara Clancy, Grace Desjardin, Roger Duchesneau, David Gray, Rich Gelpke (Hudson Planning Board), Kathleen Farrell (Stow Selectman), Mike Fleming (EOEA - SuAsCo Watershed Team Leader), Don Hawkes (Lake Boon Association), Lori Hawkes, Alan Kattelle, Ellen Kisslinger, Tony Marques (Hudson DPW), Katey Quinn (Senator Pam Resor's Office), David Siewierski, Georgie Smith, Mary Trio, Conray Wharff (Lake Boon Commission)

Mapping Sub-Group: *Rich Gelpke, Don Hawkes, Roger Duchesneau, Lori Hawkes, Barbara Clancy, Chris Carney (Coordinator)*

Advisors: *Chris Carney (Coordinator) and Joan Kimball (Program Director) Massachusetts Department of Fisheries, Wildlife and Environmental Law Enforcement, Riverways Program, Lake/Watershed Stewardship Program*

Sponsors & Coordinators

- *Lake Boon Association, 9 Dawes Road, Stow, MA 01775
Donald Hawkes, President*
- *Lake Boon Commission, 34 Pine Point Road, Stow, MA 01775
John (JT) Toole, Chairman*

Pictures on the cover page (clockwise from the top): Lyndsey Hawkes, team member of 2002 Lake Boon Association roadside cleanup crew, poses with trash collected around Lake Boon; erosion north of Stow Town Beach; foam at Charter Oak Country Club golf course pipe outlet leading to Lake Boon via tributary

II. EXECUTIVE SUMMARY

Introduction

For many years, Lake Boon residents have been concerned about the spread of invasive aquatic plants through the second, third, and fourth basins of the lake. This concern has led to several studies and attempts at remediation.

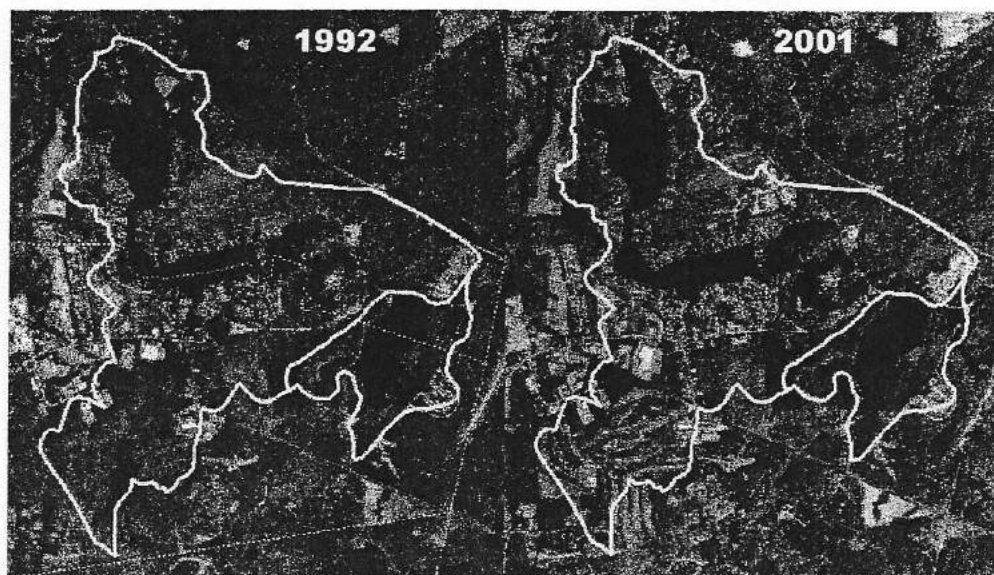
In addition to recommending methods for controlling vegetation, however, these studies have also noted the need to protect the lake from degradation by reducing the amount of nutrients going into the water via non-point sources, most importantly storm run-off and septic inputs. As a result, lake residents have become more aware of the effects of non-point source pollution on the overall water quality of the lake. They have begun the work of identifying the various ways that pollutants, particularly phosphorus, enter Lake Boon. They have also begun to work on projects to help limit nutrient loading.

This watershed survey is an important step in this process of identifying and correcting non-point source problems in the watershed. It may be less technical than previous studies, but it is grounded in its volunteers' first-hand knowledge of their lake and community. These volunteers were trained to spot and report non-point source problems. From their reports, they then proposed and prioritized a list of remediation projects, taking into consideration community values and resources. The result is a very focused, pragmatic look at problems in the watershed, and a "to-do" list of short and long-term actions, generated by community volunteers who now have a stake in seeing that they are implemented.

Description of the watershed

Lake Boon is approximately 163 acres with a maximum depth of 23 to 25 feet and an average depth of 10.7 feet. For the purposes of this survey, we used maps that estimated the watershed at 1076 acres; this is the area most likely to have direct surface run-off connection with Lake Boon, as opposed to only a groundwater connection. It should be noted, however, that nearly every study of the lake has drawn its own conclusions about Lake Boon's watershed boundaries.

The water flow into the lake comes from three sources: surface water (2.48cfs), groundwater (0.91cfs) and direct precipitation (3.95cfs). A report by the Department of Environmental Protection in 1999 reported the following land uses for Lake Boon's watershed: Forest 54%, Residential 23%, Water 15% and Other 8%. Since 1999, development of wooded areas has continued as seen in the images below.



The lake and its watershed are a great source of recreational enjoyment for the communities of Hudson and Stow, providing activities such as swimming, fishing and boating, as well as the annual Water Carnival, Walkathons, clambakes, outdoor movies, soccer, and Tae Kwan Do camp to name just a few. As well as being aesthetically pleasing, both the lake and its watershed provide a wonderful habitat for wildlife including waterfowl, muskrat, beavers, mink, fish, and amphibians. The lake and watershed support a variety of plant communities.

Lakefront property has a high market value, especially compared to similarly-sized homes and house lots elsewhere in Stow and Hudson, leading to higher assessments and property tax revenues for the towns. Therefore, it is in the economic interest of the towns to protect and maintain the health and natural beauty of the lake. Stow and Hudson have recognized the value of investing in lake preservation, and have traditionally supported residents' efforts to study their lake, to control aquatic vegetation, and to educate residents about how to take care of their property in a lake-friendly way.

Relevant Studies

Forty years have passed since the first of many studies were conducted on Lake Boon and its watershed evaluating various in-lake management techniques and the long-term management of the water body. The list of studies is as follows and has been an invaluable resource for this report:

1. Lake Boon Weed Study Committee appointed by Selectmen of Hudson and Stow (1963)
2. Metropolitan Area Planning Council (MAPC) 1978
3. Boons Pond, Diagnostic/Feasibility Study undertaken by the Department of Environmental Quality Engineering (DEQE) Division of Water Pollution Control (DWPC) prepared by Notimi and Morrison in April 1979 –July 1980
4. Diagnostic/Feasibility Study Lake Boon in 1987 undertaken by Camp Dresser & McKee in association with IEP, Inc.
5. A Nutrient and Limnological Investigation of Lake Boon undertaken by Environmental Science Services, Inc. in 1999.
6. Lake Boon, (Boons Pond) Hudson and Stow, MA. (MA 82011) TMDL, Sept. 22, 1999 to present.
7. Lake Boon Wildlife Habitat Study 2000 undertaken by Environmental Science Services, Inc., in 2000.
8. Lake-Level Drawdown Study undertaken by Lycott Environmental, Inc. in 2000-2001.
9. Lake-Level Drawdown Well Impact Report undertaken by Lycott Environmental, in 2000-2001.

Nonpoint source pollution and phosphorus loading

Lake Boon faces two problems that compromise its wildlife habitat, recreational aspects, market value, natural beauty and overall wellbeing:

1. Nuisance non-native aquatic vegetation
2. Excessive levels of phosphorus.

Our survey focused on the 2nd problem, as well as other pollutants that enter the lake from nonpoint source (NPS) pollution.

"NPS pollution is caused by rainfall or snowmelt moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even our underground sources of drinking water. These pollutants include:

- Excess fertilizers, herbicides, and insecticides from agricultural lands and residential areas;
- Oil, grease, and toxic chemicals from urban runoff and energy production;
- Sediment from improperly managed construction sites, crop and forest lands, sand from winter road treatment, and eroding stream banks;
- Salt from irrigation practices and acid drainage from abandoned mines;
- Bacteria and nutrients from livestock, pet wastes, and faulty septic systems (including groundwater contributions);

Atmospheric deposition and hydro-modification are also sources of nonpoint source pollution.”

(Obviously, not all of these sources are factors in the Lake Boon watershed, but some were noted by surveyors, particularly the possible overuse of fertilizer, sediment from construction and winter road sanding and pet waste).

An additional source of nutrients to bottom sediments can come from the annual die-off of in-lake aquatic vegetation.

The Lake Boon Association and Commission have addressed non-point source pollution in the Lake Boon Watershed / In-lake Management Plan written by the Lake Boon Association and adopted by vote of the Lake Boon Commission on May 1, 2002. The plan's goals are to:

- a. Reduce excess phosphates¹ from entering the Lake from the watershed, with the goal of improving water quality and protecting future water quality.
- b. Curtail excessive sediment, nutrient and related pollutant inputs associated with storm events, thereby improving aquatic conditions and maintaining acceptable water quality.

The primary goal of the watershed management plan currently being drafted by Lycott Environmental, Inc. as part of the 2002 Lake and Pond grant is to reduce the phosphorus loading to Lake Boon by approximately 112 kg per year (366 kg/yr. less 254 kg/yr), as recommended by the lake's Total Maximum Daily Load study.

From TMDL to Watershed Survey

Lake Boon's invasive plant problem earned it a place on the federal 303(d) list, a list of water bodies that for various reasons do not meet water quality standards for their expected uses. Lake Boon is rated Class B for fishing and contact recreation, and so large, dense growths of plants compromised lake use, habitat quality and safety. Because Lake Boon was on the 303(d) list, the Department of Environmental Management prepared a Total Maximum Daily Load study for it. This study determined the pollutant causing the lake to fail water quality standards—the phosphorus that feeds the aquatic plants. It looked at land use in the watershed and determined the annual phosphorus load from each category of use. Then it looked at typical, healthy concentrations for in-lake total phosphorus. These vary with each ecoregion. Using various estimates for Lake Boon's ecoregion, DEP chose a target in-lake total phosphorus concentration of 20 parts-per-billion. To reach that concentration, DEP set a goal of a reduction in annual phosphorus loading to Lake Boon from the current estimate of 366 kilograms per year to 254 kilograms per year.²

The draft TMDL was presented at a public meeting in December 2001, to solicit public comment and public participation prior to finalizing the report. Dr. Mark Mattson from DEP's Division of Watershed Management, and Mike Fleming, the Watershed Initiative team leader for the SuAsCo watershed, recommended that lake residents conduct a nonpoint source pollution watershed survey under the guidance of the Department of Fisheries, Wildlife, and Environmental Law Enforcement's Riverways Program as presented by Chris Carney. The Lake Boon Association and Lake Boon Commission applied to the Riverways program for technical assistance,

¹ Inorganic phosphate can come from weathering of rocks or it can be added in the form of fertilizer. Burning of organic (plant and animal) matter can also release phosphates. Plants use the phosphates to grow, and animals that eat plants consume the phosphates in the plants. When animals and plants die, they are ultimately decomposed into inorganic matter (this is the *detritus food chain*).

² There is no loading capacity per se for nuisance aquatic plants, so Lake Boon's TMDL was expressed in terms of annual loading for phosphorus because the growth of phytoplankton and macrophytes responds to changes in annual rather than daily loadings of nutrients. For Massachusetts water quality standards, there is no generic numerical standard for phosphorus content in fresh water. Typical, healthy concentration for in-lake total phosphorus concentration varies for each ecoregion.

To read the full water quality standards for Massachusetts go to DEP's web site at <http://www.state.ma.us/dep/bwp/iww/files/314cmr4.htm>.

To see Lake Boon's TMDL go to <http://www.state.ma.us/dep/brp/wm/files/lakeboon.pdf>

and Lake Boon was selected in 2002 as one of ten watersheds in Massachusetts to participate in this pilot program.

Riverways' Lake/Watershed Survey Program helps residents find root causes of water quality problems, and support grassroots planning and implementation of actions that help restore lake water quality and improve watershed management. The program trains citizens to conduct visual watershed surveys of lakes and tributaries and facilitates planning meetings to develop action plans that address problems identified in the survey.

Organizing the Survey

In October 2002, an initial meeting was held in Stow to plan and organize the Watershed Survey program. A Steering Committee meeting was held for further planning in November 2002. A sub-group of the Steering Committee met in November 2002 to divide the lakeshore area of the watershed into 10 survey sections. These are recorded on a Mass GIS map of Lake Boon.

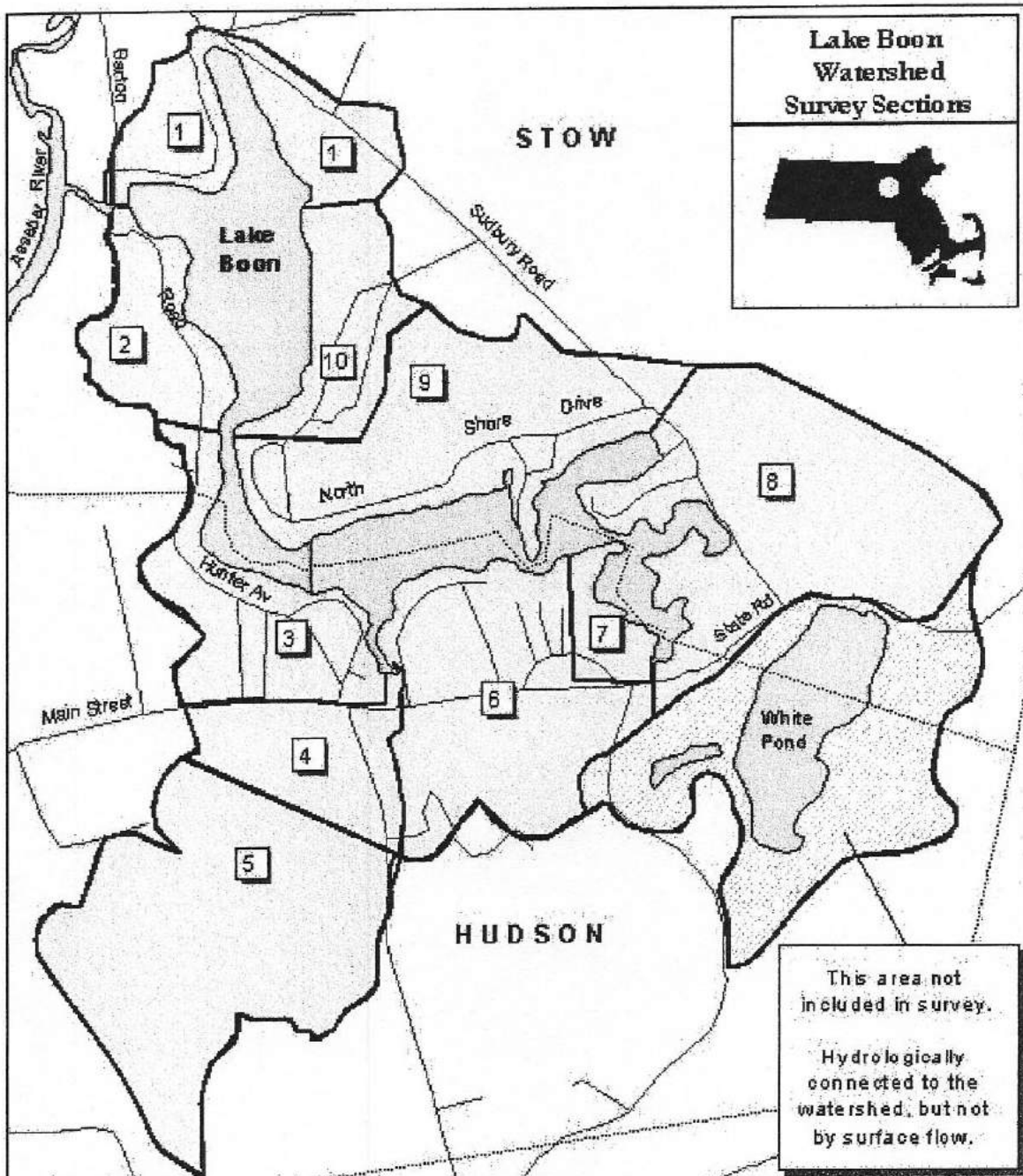
The ten survey sections are as follows: (See map on Page 2)

1. North end of 1st basin, Boon's Hill, Town Beach, Pine Point to Dam
2. From the dam on Barton Road to 200 Barton Road
3. From 200 Barton Road to Main St. to Monahan's Cove
4. Lower end of tributary, industrial park
5. Upper end of tributary, golf course
6. From Monahan's Cove, Lakeside Ave to 16 Gately Ave (including Sudbury State Forest, Main St. Hudson)
7. From 16 Gately Ave to the Hudson/Stow town line, Main St.
8. From Hudson/Stow town line, Main St. to 10 North Shore Drive (3rd & 4th Basins and Sudbury State Forest, Sudbury Rd., Stow)
9. From North Shore Drive to Hale Rd. to 34 Davis Rd. and Wildlife Woods (North side of 3rd Basin and East side of 2nd Basin)
10. East side of 1st Basin (From 34 Davis to Town Beach)

A training workshop was held in November 2002 for volunteers to learn how to conduct a visual survey of the watershed landscape, stream corridors and the shoreline of Lake Boon including land uses and habitat value. Surveyors received instruction on identifying actual visible and suspected potential problems and recording information about erosion problems, stormwater/road runoff, land disturbances, and other probable sources of nutrient source pollutants adversely affecting water quality.

The survey was then conducted over several weeks following the workshop. In addition to problems noted, each team's report included any asset points; protected land, open space, and natural settings where wildlife is able to survive undisturbed.

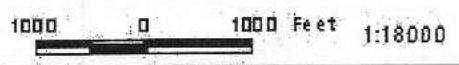
Two more meetings were held – one in December 2002 and the other in January 2003, to identify both short and long-term action items that address the liabilities and assets of the survey findings. In addition, volunteers met in May, 2003, to review a draft of the report and to see an audio-visual presentation developed by Richard Gelpke and David Gray to help present findings to various town boards. Also, after completion of the Lake Boon Watershed Survey and Action Planning process, Don Hawkes stepped down as president of the Lake Boon Association; vice president John Toole has assumed the role of acting president.



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DATA SOURCES:
 TOWN'S: Digitized at MASC from state based 1:25,000 scale sheets of the USGS 1:25,000-scale grid sheets.
 ROAD: Highway Dept. Major Roads from the 1:100,000-scale MND Road layer, individual numbered routes and collector roads.
 HYDROGRAPHY: Sources of hydrography varies, 1:25,000 USGS D.C., 1:100,000 USGS D.C., and 1:25,000 USGS topographic maps were used.
 WATERSHED BOUNDARIES: Automated by the Riverways Program using the MASC 6 DataView and Watershed Delineation tool.

This map was produced by the Riverways Programs - February 2003 - 617-625-1543



Roads and Highways

- Interstate
- U.S. Federal
- State
- Major Road - Collector

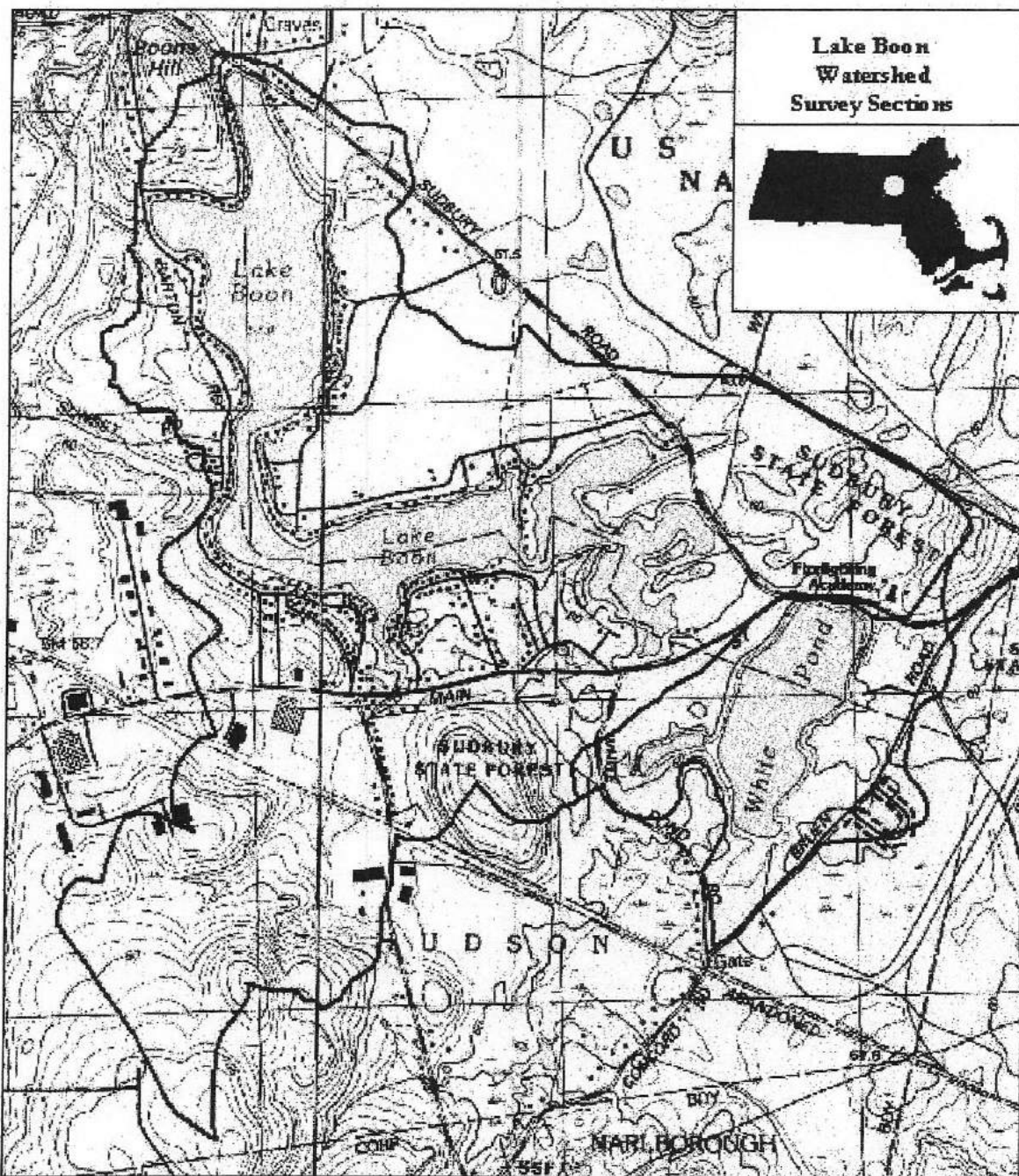
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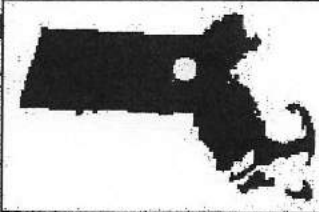
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Lake Boon Watershed Survey Sections



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DATA SOURCES:
 TOWN'S: Original of MassGIS 5-Items table based from prints of the USGS 1:25,000-scale quad sheets.
 Mass. Highway Dept. Major Roads from the 1:100,000-scale MHD Roads layer. Includes all numbered routes and toll roads.
HYDROGRAPHY: Source of hydrography varies: 1:25,000 USGS DLG, 1:100,000 USGS DLG, and 1:25,000 USGS Topographic maps as a used.
WATERSHED BOUNDARIES: Automated by the Riverways Program using the MassGIS DataViewer and Watershed Definition tool.

This map was produced by the Riverways Program - March 2003 - 617-626-1540

500 0 500 1000 Feet

1:19000



Roads and Highways
 --- Interstate
 --- U.S. Federal
 --- State
 --- Major Road - Collector

▭ watershed area

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 Secretary of Environmental Affairs
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III. RESULTS OF SHORELINE SURVEY

A. DETRIMENTS:

1. Erosion

- **Shoreline Sections:** 1, 2, 8 & 9
- **Observation:** Extensive erosion resulting from inadequate retaining walls and lack of proper vegetation on private property, as well as abusive recreational activity from foot traffic, dirt bikes, ATVs, snowmobiles, motorboats, etc. on lake and the town beach areas
- **Proposal:**
 - a. Prevent further erosion of lake banks by adding heavy guardrails to prevent dirt bikes and snow mobile access.
 - b. Plant ground cover and buffer vegetation (planting of poison ivy was suggested).
 - c. Take down tree swings.
 - d. Inform homeowners regarding appropriate design, construction, and maintenance of retaining walls to minimize run-off and erosion (raised lip along edge to divert rainfall; contours to dissipate boat wake energy, etc.). Provide information to homeowners about the importance of retaining or re-planting trees, shrubs, and groundcovers on shorelines for erosion control. Educate lake users about concerns regarding high motor boat use causing significant erosive damage (wake boarding, water and jet skiing)

2. Lawn fertilizers

- **Sections:** 1, 2, 3, 6, 9 & 10
- **Observation:** Lush green grass identified throughout the watershed. Possible over treatment and or use of phosphates questioned.
- **Proposal:** Implement Education and Outreach programs per Action Plan

3. Foam

- **Sections:** 2, 3, 4 & 5
- **Observation:** Foam discovered in the stream annexing the golf course and industrial area that empties into the Lake. (Investigation has shown this is probably from soaps, usually related to vehicles being washed upstream.)
- **Proposal:**
 - a. Recruit a neighbor along the tributary to watch for recurrence of the foam.
 - b. Monitor stream quality related to golf course and industrial area runoff.
 - c. Collaborate with both sources to influence maintenance and management practices.
 - d. Riverways will request access of information from MA DEP regarding several water quality problems found on the major tributary from the golf course.

4. Road runoff

- **Sections:** 1, 2, 4 & 8
- **Observation:** Reports indicate that there is absence of barrier protection from road oil, sand and salt from entering streams.
- **Proposal:** Perform re-grading or curbing of streets to eliminate direct runoff into watershed and lake

5. Clogged catch basins/drains

- **Sections:** 2, 3, 4 & 9
- **Observation:** Accumulation of leaves and debris is blocking flow of stream. Area #3 report indicates major concern regarding overflow of clogged drain basin going directly into lake. All catch basins on Kane's Beach filled and blocked with leaves.
- **Proposal:** Contact town highway departments to clean basins and drains earlier and more frequently, (Early spring street sweeping would most likely address this problem.)

6. Trash

- **Sections:** All
- **Observation:** Moderate amounts of trash along roads adjacent to Lake, including a leftover black plastic containment barrier along the shoreline near the beach.
- **Proposal:**
 - a. Continue LBA annual roadside cleanup project

b. Contact Stow Recreation Dept. to remove black plastic

7. **Pet waste**

- **Sections:** All
- **Observation:** Most noted area of concentrated amount of pet waste found in Section 9 "Dog Beach". All areas are of concern for nominal amounts and in particular on the frozen lake ice during the winter months.
- **Proposal:** Place reminder signs at various locations for dog owners to pick up after their animals, i.e., "dog beach", playground, entrance to Pine Bluffs soccer field, future Kiosks, etc.

8. **Direct pipelines**

- **Section:** 3
- **Observation:** One pipe drains directly into the lake carrying road runoff
- **Proposal:** This is being addressed by the S319 grant task for the installation of catch basins

B. ASSETS:

1. **Protected natural wildlife refuge**

- **Sections:** 7, 8, & 10
- **Observation:**
 1. Areas 7 & 8 - Wooded areas and a marshy small island provide shelter and nesting habitat for several varieties of birds and fish. Land has had little change in many years. There is little motorized activity.
 2. Area 10 is a model example of providing little threat to the ecology of the area with its dirt roads, undeveloped forest, and soil retention attributed to small shrubs and tree roots.
- **Proposal:**
 - a. Protect third and fourth basins (Areas 7 & 8) of Lake Boon for habitat.
 - b. Limit boat traffic and boat speed in these basins for all motorized watercraft, including jet skis. If pending legislation passes, investigate options provided by home-rule bill to set limits on jet ski traffic on the lake.

C. OTHER RECOMMENDATIONS

1. Submit final survey reports to the Stow Highway Department, the Hudson Department of Public Works, the Hudson and Stow Conservation Commissions and Boards of Health; the MA Dept. of Environmental Protection, the Lake Boon Commission and Association

The Team recommends that these issues be addressed and eventually resolved through diligent participation by every State and Local Board, Commission, Department, Association and concerned citizen interested in protecting the future of Lake Boon.

IV. Narrative Descriptions of Sections Surveyed –

Survey Section: Number 1, North End

Survey Date: 11/23/2002

Surveyors: John Toole, David Gray and Mike Busch

Today's weather: Partly Cloudy

Weather over past 24-48 hours: Raining

The area we surveyed is mostly residential with hard breakwalls and undercut banks consisting of sand and sparsely rooted vegetation. Sudbury Road borders a small section and this area is graded towards the lake (photo A)

The Town Beach and areas on both sides are subject to high usage during the year. Climbing, swinging from trees, swimming, sledding, snowmobiles and dirt bikes are common during the year at these beaches.

A long season of high motor boat use, wake boarding, and water and jet skiing have caused significant erosion in other areas around the lake.

There is a strong growth of Red Bamboo just north of the Town Beach going up to the beach.

Survey Section: Section 2 - From the Dam to 200 Barton Rd., Stow, MA

Survey Date: 11/29/2002

Surveyors: Barbara Supeno and Barbara Ernst, 210 Barton Rd. 978-568-1073

Today's weather: Damp, rainy, cold

Weather over past 24-48 hours: Damp, rainy, cold

From the dam to approximately 126 Barton Rd. there is a moderate slope down to the waters edge. From 126 to 150 the slope is mostly flat w/ most lawns coming to the waters edge. From 152 to 176 the slope is steep and there are signs of erosion and runoff. From 178 to 200 the slope is moderate again with mostly natural shrubs and vegetation to the shore. (Note exceptions and specifics on the attached detail sheets.)

Items I/150, K/138, O/126 and S/171 all have lush fertilized lawns. Item L/136 may have a possible lush lawn lakeside only. Item H/152 has been under construction for approximately 1 year (2 floor addition) w/out containment barriers. It is finished mostly on the outside except for painting but more outside work may start up again in the spring. Item P/120 is currently under major construction since 8/2002 and it appears that there are no containment barriers. There are 4 large rusted metal drums at C/178, approx. 10' - 15' from the shore on a very steep slope. The contents are unknown but may pose a danger to the lake if they rupture, leak, etc. It is possible that the contents may be oil, gas, transmission fluids, etc from a motor boat because there are large plastic jugs near by with those contents in them apparently.

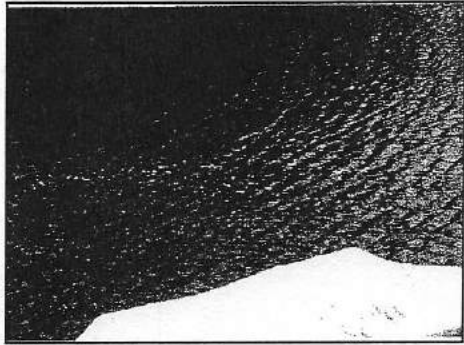
Most houses have some kind of retaining walls either cement, stone or wood. Most of these retaining walls are flat and have no edges to catch runoff from rain, lawns and septic/sewage overflows. There is erosion in the steepest sloped areas and several houses have pumps from the lake for watering, etc. The sedimentation is mostly sand with silt and rotting leaves, plants, etc. We observed large clumps of leaves that had been blown into the lake from properties along the lake. Note: It is against the lake guidelines to dump anything including leaves into the lake. We observed a strong dead fish smell on the water at the narrows at approximately 200/194 Barton Rd. The water in our observed area was mostly clear w/a brown shading/tinge to it.

There is one catch basin on the lake side of Barton Rd at approximately 184 Barton Rd. See attached map. Catch basin labeled CB in red on map. The catch basin appears to be full of leaves. The road is sanded for ice/snow conditions during the winter months. The sand sweeping trucks do not clean up the winter's sand until later in the spring when significant amounts have runoff into the lake. The lake roads should be the first roads to have sand removed at the first break of spring in order to reduce the sedimentation build up in the lake and the additional phosphorous load they add to the water which contributes to accelerated cultural eutrophication (filling in) of the lake.

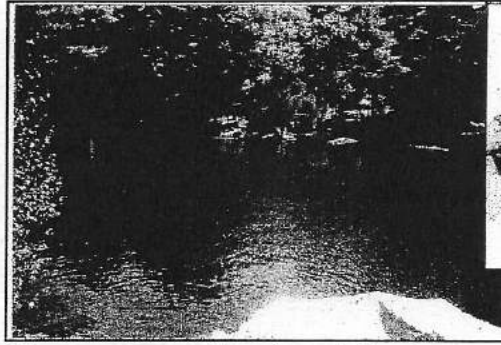
Note: We had also observed in September/October 2002 large masses of dead and live weeds migrating from the 3rd and 4th overflow flood basins through the narrows and into the 1st basin. This was a result of the 6/6/2002

herbicide application to Lake Boon. There were approximately 30+ large weed masses with dead and live weeds (mostly Cabomba/Fanwort) observed during day hours with additional masses during evening hours as well. Note also that the first basin, the narrows and the majority of the 2nd basins do not have these weeds growing as they are considerably deeper (10' to 30') than the 2' to 8' deep 3rd and 4th overflow flood basins. The concern is that these weed masses will contribute to the shallowing of the 1st basin depth and may also create new growths of these weeds in the 1st and 2nd basins and the narrows where there was no weed growth before. This would further exacerbate weed proliferation throughout the lake and further accelerate the culturally induced eutrophication process.

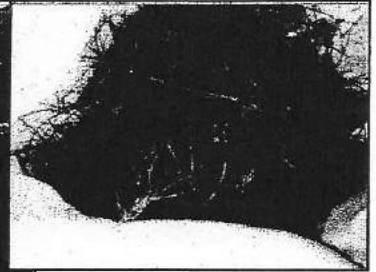
Note: We had also observed larger amounts of foaming in the waters of the first basin and the narrows after the 6/2002 herbicide application to the lake.



Foam in lake, Section 2



Plant masses traveling through Sec 2



Close-up of plant mass

Survey Section: Section 3

Survey Date: 11/24/2002

Surveyors: Larry Bourgeois and John McGrath

Today's weather: Sunny

Weather over past 24-48 hours: Cold & clear

Road Tour

We surveyed the area between the Inlet at Monahan's Cove and the end of the Narrows. The water in the Cove is shallow with at least one foot of silt on the bottom. A few tires and car parts litter the end of the Cove, but this litter isn't substantial.

There is heavy tree coverage around the Cove, but many of these trees may be cut down in the future. We noted the smell of decaying leaves when traveling through the cove. A fallen tree was seen across the Inlet stream and some foreign fauna was noted here.

The inlet flows under Main Street where slight amounts of foam were noted. Proctor Lane has good vegetation for run-off, but the locals have asked to have all of these trees cut down. The Conservation Commission is in the process of evaluating this request.

At the end of Worcester Ave. are two clogged drain basins. Any overflow will run directly into Lake Boon. See pictures attached.

All the catch basins on Kane's Beach are filled and blocked with leaves. Several other catch basins are hidden beneath piles of leaves.

There is no ridge at top of Farrar's Boat Ramp to stop drainage from the street from going into the lake. Home made catch basin flows directly to the lake via a six inch pipe.

As we were exiting the cove, we noticed cement walls between the land and water. Several hoses were noted here. It is very probable that these hoses are connected to Wells.

After the walls we noted an area of trees that drape over the water (fish hideouts) From here to the end of the narrows we saw a blend of beaches and stone walls. Several hoses were noted along this route but all appear to be associated with wells.

Moderate amounts of trash were found around the lake, including three tires.

The only notable feature was an open six inch pipe that was seen at the end of the Narrows. This pipe appears to be coming from a homemade catch basin.

Survey Section: Section 4

Survey Date: 11/26/2002

Surveyors: Mary Matthews & Mary Trio

Today's weather: sunny

Weather over past 24-48 hours: rainy & wet

We surveyed from lower Main Street and the stream that runs parallel to Parmenter Road.

This stream cuts through a wooded area approximately $\frac{1}{4}$ of a mile from the homes on Parmenter Road. The stream is approximately two feet across and 5 inches deep. The stream water appears clear except for areas where natural dams have slowed the water flow. In these areas, brown and white sudsy scum was present.

To the left of the stream, single-family homes can be seen on the horizon. The homes are approximately $\frac{1}{4}$ mile away from the stream. The land between the homes and the stream is undeveloped.

To the right of the stream is an Industrial Park. We did see a concrete slab with a pipe that appeared to drain directly from the Industrial Park. We could not get close because of fallen trees and marsh that was blocking any visible drainage from the pipe. The Industrial Park was approximately $\frac{1}{8}$ mile from the stream. The park is fenced off and the land between it and the stream is heavily wooded.

To the south and at the end of the area we surveyed, there is a golf course and an abandoned railroad track. A drain pipe coming from the golf course was found. Water appeared to be coming from the golf course into the stream.

The thickest amount of scum accumulated in natural dams about 10 feet from the golf course drain.

Survey Section: Section 5

Survey Date: 11/26/2002

Surveyors: Barbara Clancy & Lori Hawkes

Today's weather: clear

Weather over past 24-48 hours: cloudy

Charter Oak Country Club (Golf Course):

Lori and I couldn't get the run of the golf course, so we were given a tour by Scott Reynolds, the groundskeeper. However, we got to see most of the course downhill of the clubhouse, and most of the streams and wet areas that drain off the course.

We entered via the service road off of Brent Drive (on maps this is called Redwood Drive). The road is new and in good condition. There are curbs along the edge of the road, and clean catch basins. The road crosses what Scott described as a seasonal stream or wet area, over a bridge (A). There are catch basins by the roadside on either side of the bridge. There was a good amount of clear water in this area, which was flowing downhill.

We followed a paved path away from the main road, alongside this wet area. The path drains to a short grassed swale. We then came to another area that Scott described as a seasonal stream. This was wet in places, with rills in the leaf cover. It ran through a strip of natural vegetation (oak trees and shrubs). (B).

Most of the seasonal wet areas and the main tributary are surrounded by some kind of natural buffer, either woods or natural grass/weeds, but in two areas the fairways cross the stream and the grass has been cut to the water's edge. One stretch is about 20' long, and the other is about 70'. (C) According to Scott, they have no plans to let the grass grow here.

The golf course is irrigated from a man-made pond (D), and from wells; they supplement this with town water if they have to. According to Scott they are managing the golf course according to guidelines developed by the New York Audubon Society, and they do not fertilize within 75 feet of natural areas. However, we did notice fertilizer had been spread on hillsides above the tributary where there's no buffer between the grass and the water.

We saw no bare dirt, or construction areas. The grass, of course, is very lush.

Some of the questions we had were:

- 1) Are all the wet areas naturally occurring or are they the result of sloping the land to create the fairways on the golf course? Or are there wet areas because of more intense runoff from the cleared areas? On the topographic maps, the brook is more clearly defined than it is on the golf course itself.
- 2) What kinds of fertilizers are being used on the golf course and what is the downstream impact as far as extra nutrients in the stream?

- 3) Historically, did the stream dry up in summer as much as it does now, and what is the impact on the wildlife in the area?

The water in the tributary at the culvert under the railroad track (E) was clear, and there was a small amount of foam (about three cupfuls). We couldn't determine whether it was natural or not—we broke it up with a stick but it didn't dissolve much. It was a beige-white color. The bank around the culvert is stable but a big trench has been dug or has eroded alongside the stream.

Industrial Areas:

There are three large paved areas at the end of Brent Drive. Barbara Clancy inspected them on Sunday, December 1.

Two paved areas are located at SF Medical, at the end of Brent Drive. One is the parking lot for the facility and the other is parking for tractor trailers from the Great Dane facility across the street. There are about twenty trailers parked there.

The parking areas slope toward the woods between the parking areas and the railroad track (F). There is one catch basin, which had water in it, but was not full, located at the end of the SF parking area. The pavement in the SF area is a little broken up. There are steep slopes at the edge of the parking lots but they are wooded and there were no rills or gullies.

There is a wide path that runs from the edge of the parking lot down to the railroad tracks. People have been riding dirt bikes along here, and along the railroad tracks, but they seem to be staying on the path. There are also two in-ground cement cisterns on the path with manhole covers (G and H). Could these be for septic systems?

The Great Dane yard is about an acre, and paved, but slopes back toward Brent Drive and out of the watershed.

Residential

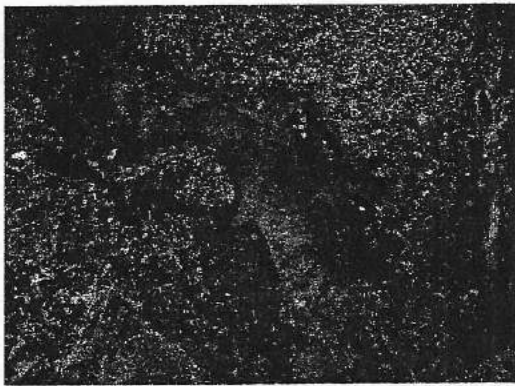
The residential part of this section is composed of one large privately owned piece of property at the far southwest corner (I). It's mostly either woods or meadows. There's some tree-cutting going on, but on a flat area well away from any running water.

Survey Section: 6 - From Monohan's Cove, Lakeside Ave to 15 Gately Ave

Survey Date: 16-Nov-2002

Surveyors: Dave Andrews, Dick Gelpke

Weather: Overcast, some drizzle. After some rain.



We started our survey at the intersection of Main St. and Lakeside Ave. Some pictures taken along this survey are referred to in this narrative. A feed estuary 3 or 4 feet wide and a few inches deep runs under Main St. and along the West side of Lakeside, behind the residential properties, on its way to the lake. This was flowing, although it was clear that the water had often been higher. There is no drainage control or buffer where Main St crosses the estuary. Any snow plowed from the street or heavy street runoff lands directly in the estuary. (pictures 01, 02, 03, 04, 05, 06)

Further down lakeside from the intersection, 100 ft or so, the second property (#8) provides another easy runoff route into the estuary.

The driveway ends in into about 10 feet of grass lawn before abutting the estuary in a gentle down slope from the road. (picture 07) The bank on the other side of the estuary is steep and approx. 15 feet high. The road has a low spot here and a storm drain into a sump. The sump was not full, although I have seen it overflowing in moderate rain. There is evidence of heavy flow from the street, onto the lawn mentioned, and on into the estuary, although not badly eroded. (picture 08)

Proceeding down Lakeside Ave., the residences are densely grouped, (picture 13) with lawns abutting the lake either in retaining walls or grassy beaches. (pictures 10, 11, 14). Also, see all pics from water) No smell of failing septic systems. However, evidence of uncurbed pets abounds. (picture 12) As we approach the end of Lakeside, we

descend a short, steep hill to intersect Gately Ave. The map shows Gately going from the lake, through this intersection and proceeding East (right). However, the way east from the intersection is apparently lawn, so the road was never completed. (picture 20) The left turn becomes a boat launch ramp. The pavement stops 15 feet or so short of the lake, with un-vegetated ground covering the last of this. Street runoff from hill we just descended on Lakeside is channeled down this ramp to the lake. (pics 15,16) The surrounding lawns and driveways also slope down to this spot to drain, unbuffered, into the lake.



Survey Section: 7

Survey Date: 11/24/2002

Surveyors: A. Kattelle, E. Kisslinger, D. Belanger

Today's Weather: Clear with temperatures 45-50 degrees, calm

Weather over past 24-48 hours: Yesterday we had some rain but relatively calm with temperatures in the mid-40's

We surveyed the area from 16 Gately Ave. to the Hudson/Stow Town Line on Main Street, Hudson. Because most of the area is owned by A. Kattelle, we were able to walk freely through the property along the shoreline. Most of the area has woods coming right up to the shoreline. There is not a lot of grass or under growth. We observed that there is a very moderate slope without any evidence of run-off or erosion.

The residences on the property had lawns, but they didn't appear to be treated with fertilizers.

There are plans underway from the State to construct a vegetated swale near the Hudson-Stow Town Line. This has been designed to include a sump to collect solids. The sump will be drained from the bottom in order to permit removal of road oil before water drains back into the lake.

No real problem areas identified along the shoreline.

Survey Section: 8

Survey Date: 11/15/02

Surveyors: Don Ball, Don and Lori Hawkes

Today's Weather: Clear, sunny, 60°, light breeze

Weather over past 2 - 5 days: Heavy rain at times until clear yesterday

The area was surveyed by both land and water. The survey included the east shorelines of the 3rd and 4th Basins from 10 North Shore Drive, Stow to the Stow/Hudson Town Line. The roads included Sudbury Rd., Hallock Point Rd. and Lower Main Street.

Land Use:

- 90 % = **Open Space:** 100% undeveloped and forested
- 5% = **Residential:** 100% 1/2-1 acre lots (95% year-round homes, 5% seasonal)
- 5% = **Roads:** 80% paved, 20% dirt

Problems: There were three problems noted during survey:

1. Road runoff at the Sudbury Rd. public access (boat launch site)
2. Road runoff from the end of Dawes Rd. down the right of way into the lake
3. Variable-leaf Milfoil was found in the 4th Basin nearest the Town Line area

Assets:

1. Habitat: The entire 3rd and 4th Basin area is an excellent habitat for wildlife, scenic views, and quiet recreational activities, such as fishing, canoeing and bird watching to name a few.

2. Public Access: The public boat launch provides sufficient access for type of craft conducive to recreational activities desired by the habitat and its environment and allows for public funding.

3. Marshy Island: For many years, the small "floating" island in the 3rd Basin has been a nesting area to Red-winged Blackbirds, reptiles and amphibians, as well as providing good fishing grounds for Great Blue Herons. The "island" once stretched nearly the length of Hallock Pt. Road – starting across from the 1st house and ending at the point. Old aerial photos show it as filling almost ¼ of the entire 3rd Basin. Erosion has taken its toll over the years and the vegetation seen above the water has now shrunk to less than 500 sq. ft. total.

Summary: The 3rd and 4th Basins are an important area to Lake Boon as they are the last locations on the lake for substantial wildlife breeding and observation. The land surrounding these Basins has not been developed enough nor have there been a large number of boats and/or high-speed boating activities to disturb the ecology. (Note: Although swans are seen swimming in Lake Boon, they do not find any areas in the lake suitable for nesting.) Nuisance aquatic vegetation has in the past and will again in the future jeopardize the ecology and upset the balance of nature if not curtailed.

Goals:

1. Protect the 3rd and 4th Basins from increased development, nuisance aquatic vegetation and human activities detrimental to the current habitat and ecology by:
 - a. Preventing increased and/or high speed boating by:
 - i. Keeping the public access "as is" to discourage larger and/or more boats from entering the lake.
 - ii. Changing LBC by-laws to add 3rd and 4th Basins to "No Wake" zone at all times
 - iii. Add floating signs to warn of sensitive habitat area and no wake zone buoys
 - b. Installing Wood Duck boxes to encourage nesting of Wood Ducks as was done years ago
 - c. Working with current land-owners to minimize adverse effects on habitat that future development may incur
 - d. Continuing efforts toward achieving in-lake management goals by implementing well-established, scientifically-proven, safe and effective methods to achieve them

Survey Section: 9

Survey Date: 11/23/2002

Surveyor: Roger Duchesneau

Today's Weather: Cloudy and cold

Weather over past 24-48 hours: Raining

The area surveyed included Davis, North Shore, and Hale Road from the Myle's property on Basin One to Sudbury Road. Wildlife Woods was excluded. The shoreline of this area was also surveyed. The following was observed.

1. There are two places with direct street run-off and signs of small erosion: one at the end of Davis and the other on the peninsula off of Hale. This is marked on the map with the letter E.
2. Two piles of compost (leaves) at the waters edge. These are marked on the map. Both compost piles are on the peninsula off of Hale Rd.
3. Four homes with lush lawns right up to the water's edge and others away from the edge. This area is marked on the map with the letter L.
4. The shoreline in Basin Two is eroding from motor boat waves; residents have constructed walls of some sort (stone, cement, wood, etc.) to try to control this. It has been an ongoing struggle requiring frequent maintenance of the walls that do exist. Where any type of walling is absent there is erosion with undercut trees.
5. Basin Three does not have the same level of boat activity as Basin Two and has fewer walls constructed and little erosion.
6. There are some large areas on the peninsula and Basin Three with overhanging low branches which makes for good habitat for wildlife

Survey Section: 10 – East side of first basin

Survey Date: 11/30/2002

Surveyor: David Siewierski

Today's weather: Clear, calm, and cool

Weather over past 24-48 hours: Clear

The area surveyed is the east side of the first basin from the Town Beach to the beginning of the narrows. I observed the following during my survey.

- A. The soil along this area is held back by small shrubs and tree roots. The grade is very steep on the first half of the beach area. Sticks and mud could be seen on the lake bottom when standing a few feet from the shoreline.
- B. One half of the area closest to the beach has many homes closer to the shore. Some of these homes have sandy beachfronts and some have retaining walls.
- C. No visible major runoff into the lake was noted at this time.
- D. Inland has almost all dirt roads and driveways. Much of the land contains undeveloped forest.

V. Action Plan

Lake Boon Watershed Action Plan

RECOMMENDATIONS FOR ACTION

Based on the November 2002 Watershed Survey of the Lake Boon Watershed
and the December 2002 / January 2003 Action Planning Meetings

I. EDUCATION & OUTREACH

Goal: Expand awareness of Lake Watershed ecology and educate watershed residents, businesses and municipalities about watershed-friendly management.

Reporting:

Request information from Hudson and Stow about road de-icing practices (amount of salt, sand used in sensitive watershed areas, use of alternatives, etc.) and report to residents. *Dick Gelpke and Lori Hawkes have written letters.*

Short Term Actions:

Homeowner Education Efforts

Plan and develop education and outreach programs to inform residents of the common household and landscaping sources of nutrients and other nonpoint pollutants to Lake Boon. Introduce residents to simple and inexpensive steps they can take to reduce impacts from their home and lawn.

Possible topics include:

- Fertilizer use – using only the necessary amounts, choosing low or no-phosphorous brands.
- Lists of local home and garden centers that sell low- or no-phosphorus brands of lawn fertilizer.
- Having lawns tested prior to applying any fertilizers to determine its nutrient needs.
- Pet waste – proper disposal to avoid nutrient and bacteria problems.
- General lawn care – disposal of cuttings, reduction of nutrients from lawn clippings and chemicals used
- Information on simple, affordable BMPs for homeowners (rain barrels, vegetated buffers, lip edges for walls, low phosphorous, organic detergents & fertilizers, etc. – name brands and means to purchase them)

Possible projects include:

- Demonstration w/ speakers from environmentally friendly landscape architects or suppliers of low-nutrient, organic fertilizer.
- Purchasing environmentally-friendly lawn care products in bulk and supplying to watershed homeowners at discounted prices in cooperation with large landholders (i.e., Charter Oaks golf course, Stow Recreation). *David Siewierski will work to line up a local store to carry low-P fertilizer.*
- Writing a bylaw to restrict use of high-phosphorous fertilizers in sensitive watershed areas.
- Best lawn-care management contests – prizes for best management, signs saying "This lawn is saving Lake Boon."
- Erecting "pooper scooper" informational signs/flyers at appropriate sites.

Long Term Actions:

Establish regular communication with lake groups and large landholders regarding land use and maintenance, with the hope of being a positive influence on their activities that could impact water quality.

II. STORMWATER RUNOFF – ROADS & TOWN LANDS

Goal: To reduce nonpoint source pollution in stormwater pollution from roads and town lands.

Reporting:

1. To the Departments of Public Works (both towns) - Send an annual letter requesting change to street-sweeping schedule- sweeping needs to happen earlier in the schedule to prevent sand and salt from washing into the lake. *Dick Gelpke and Lori Hawkes have written letters.*
2. To the Stow Recreation Department - Request that serious erosion problems around the Town Beach be addressed. *Mike Busch (Stow Rec) will contact Middlesex Conservation District and National Resources Conservation Services (NRCS) for assistance with erosion control. In addition, erosion control is a goal of the recently-formed Joint Committee on the town beach area.*
 - a) Section 1 – road damage above the beach
 - b) Steep hillsides north and south of the beach are eroding – stabilize shoreline and hillside
Section 10 – erosion problems at the “dog beach”
 - c) Cut down rope swings and prevent future swings being reattached

Short Term Action:

1. Stormwater Management – Road runoff & Catch Basins

- a) Work with Stow and Hudson Departments of Public Works to improve stormwater management in the watershed.
- b) Stow Highway Dept. – Clogged catch basins in Sections 2 and 3 need to be cleaned.
- c) Departments of Public Works (both towns) – continue work to improve timing and frequency of street cleanings and stormdrain maintenance in sensitive areas.
- d) Work with Stow and Hudson Depts. of Public Works to minimize salt & sand usage

2. Stormwater Management - Best Management Practices (BMPs)

Work with municipal, business and other partners to plan development of Best Management Practices to abate stormwater pollution. Surveyors chose several locations where structural BMPs are needed:

- a) Section 4 & 5 - There is no barrier to prevent or slow runoff from entering the stream at both Main Street and Parmenter Street stream crossings.
- b) Section 5 – Buffer needed between road and lake at sites found along Gately and Lakeside with direct runoff to lake via eroded paths of bare earth.
- c) Section 9 – Erosion problem at direct runoff from streets in two locations - end of Davis, peninsula where road turns – Hale Road

Long Term Action:

1. Town Beach Area

- a) Address stormwater runoff and eroding shorelines around the Town Beach.
- b) Divert and buffer stormwater runoff from Sudbury Road in Section 1 at the north end of the lake– use vegetated buffers, curbing and possibly re-grading of Sudbury Road.
- c) Address eroding shorelines, demonstrating innovative stabilization techniques that can be adapted by homeowners on individual parcels. Possible techniques would include planting

vegetation to stabilize bank, use of rails and water bars, and effectively discouraging recreation on steep slopes. May include selective pruning, for instance, to discourage use of trees for tree swings on steep, unstable banks.

- d) Section 8 – Eroding soil at the Sudbury Road public access – install erosion controls.

2. Dam at Barton Road

Divert stormwater runoff from Barton Road to vegetated area downhill (and downstream) of the dam.

III. RESIDENTIAL – NONPOINT SOURCE POLLUTION

Goal: To reduce nonpoint source pollution in stormwater pollution from residential lands.

Reporting Issues:

To the Stow Conservation Commission - Request erosion controls at construction sites. Section 2 – Erosion controls absent / failing at construction sites on Barton Road. *Dick Gelpke & Lori Hawkes will write letters.*

Short Term Action:

Roof Runoff

Roof runoff from many homes is directed via gutters and pipes directly to the lake. Work to devise solution to this widespread source of direct runoff from a large area of impervious surface. Also, add shoreline retaining wall lip edges to divert runoff from entering the lake and allow greater infiltration. Possible solutions include researching grant money for structural BMPs such as purchasing or subsidising part of the cost of rain barrels for residents, construction of rain gardens to handle roof drainage.

Long Term Action:

Work with residents to maximize infiltration of stormwater on site, and to buffer what runoff does enter the lake, within the limits of space and cost for each homeowner. Much of this will be done in concert with education programs proposed above.

IV. COMMERCIAL – NONPOINT SOURCE POLLUTION

Goal: To reduce nonpoint source pollution and stormwater pollution from commercial areas.

Reporting Issues & Immediate Actions:

To the Hudson Conservation Commission & Board of Health

- a) Section 5 - Concerns of water quality impacts to tributary from the golf course.
- Golf course is supposed to be monitoring the tributary - get monitoring data from golf course
 - See that orders of conditions regarding impacts to the tributary are being enforced.
 - Follow up on monitoring to ensure that schedule is followed.
- b) Section 4 & 5 - Investigate stormwater impacts to tributary from the Industrial Area
Dick Gelpke & Lori Hawkes will write letters.

Long Term Action:

There have been some impacts from the construction and upkeep of the Golf Course to both the tributary and Lake Boon. Collaborate to influence maintenance and management practices.

V. WATER QUALITY

Short Term Action:

Water Quality Monitoring Program

Residents are currently developing a water quality monitoring study design; the tributary is a priority monitoring site and sampling will be done there as often as financial and volunteer resources permit. Several water quality problems were found on the major tributary from the golf course.

- a) Add sites on tributary to storm drain monitoring program for 319 Project, if resources and volunteers are available. Sites should include areas downstream from the golf course, at the side tributary from the industrial park, at the road crossings, and at the mouth at the lake.
- b) Unnatural scum / foam was found in the tributary in sections 4 & 5. Investigation has shown this is probably from soaps, usually related to vehicles being washed upstream. Recruit a neighbor along the tributary to watch for recurrence of the foam.
- c) The golf course is supposed to have filed records of its groundwater testing with Massachusetts Department of Environmental Protection. Hudson Con Com requires annual reporting to evaluate potential impacts to surface and groundwater quality per Water Quality Monitoring Program prepared in March 1999. Action: Request LBC to seek a copy of the report from Hudson Con Com and make it available to LBA and other interested parties on an annual basis as it becomes available. *Jennifer Burke, Board coordinator for the Town of Hudson, has copies of the groundwater testing that has occurred. Records are brief - the course is no longer pumping at some of the wells and so there are fewer records.*

VI. HABITAT AND WILDLIFE

Reporting Issues:

Draft letter to LBC requesting bylaw change to create "no wake" zone in 3rd and 4th basins.

Long Term Action:

- **Habitat Preservation** – Protect third and fourth basins of Lake Boon for habitat. Limit boat and jet ski traffic and speed in these basins. Identify and prioritize undeveloped lots for permanent protection.
- **Shoreline Protection** – Sections of the shoreline of the lake are undercut and eroding, with some area of high concern. Work with towns and homeowners to stabilize the most serious erosion sites, and encourage stabilization at all identified locations. Use combination of structural materials and live vegetation to encourage habitat along with stabilization.

VII. CLEANUPS

Short Term Action:

Lake Boon Association already conducts an annual roadside clean up. Add the tributary in Section 5 to next year's cleanup map.

VI. Meeting Notes

Lake Boon Watershed Survey Steering Committee Meeting

Stow Town Building

Thursday, October 24, 2002 7 PM

Meeting notes

Present:

Don Hawkes, President, Lake Boon Association (LBA); Barbara Clancy, LBA; Dick Gelpke, Hudson Planning Board; Conray Wharff, Lake Boon Commission (LBC); Tony Marques, Hudson DPW; Katey Quinn, Sen. Pam Resor's Office; Kathleen Farrell, Stow Selectman; Roger Duchesneau, LBA; Mike Fleming, EOE - SuAsCo Watershed Team Leader; Chris Carney, Coordinator, Lake/Watershed Stewardship Program

Meeting Dates:

- A subgroup of the steering committee will meet at 10 AM on Tuesday, November 5 to divide up the watershed and draw the survey sections.
- The Watershed Survey Training Workshop will be at 7:30 PM on Thursday, November 14 at the Stow Town Building.
- Trained survey volunteers will conduct their surveys during the weekend of November 16-17.
- Steering committee members, invited town officials, and volunteer surveyors return for an Action Planning meeting at a date to be set at the Training Workshop. Possible dates are Thursday, December 5 and Thursday, December 12.

Outreach

We need to coordinate efforts to inform the general public about the survey, recruit volunteers to participate, and notify landowners along the tributary that volunteers wish to access the stream corridors, walking on private property in the process.

- Barbara Clancy and Lori Hawkes will organize publicity through the newspapers and flier drops around the lake.
- Barbara will see that invitations will be sent to abutters along the tributary, including contacting staff at the golf course.
- Barbara will contact the police departments of both communities to inform them of the planned survey.
- Barbara will contact JT Toole to book a room for the watershed survey training workshop.
- Don Hawkes will contact Hudson community cable access to post a notice on their rolling bulletin and to request a camera person record the training workshop.
- Chris Carney will forward examples of invitation letters and fliers used by previous survey groups.

Lake Boon Background discussed at the meeting:

Lake Boon has one of the most densely developed shorelines of any lake in Massachusetts. Watershed land area back from the shoreline is less developed - any impacts are likely to be related to road conditions. There are large numbers of powerboats in use on the lake. There are two minor tributaries: one from the state forest with no development, the other drains land that includes a golf course, an industrial park and several residences.

The town beach property has several problems: erosion issues bad enough that some trees have fallen into the lake, large yard waste piles, much fertilizer spread on the soccer fields.

The 319 Grant for the Lake Boon Watershed work on installing leaching storm drains around the lake to handle stormwater runoff. Each unit will have infiltration systems and hooded catch basins. Twenty sites have been identified in Hudson and four or five in Stow.

Both towns have lot maps in GIS format, which will allow us to provide for highly detailed maps for the volunteer surveyors.

Private roads in poor condition are a problem around the lake. Hudson has money to go in and do safety maintenance when needed. Stow has a pool of \$10,000 annually to maintain private roads.

All homes around the lake are on private septic systems, in some cases homes are still attached to cesspools.

Planning and organizing the Lake Watershed Survey and follow-up Action Planning Workshops

A subgroup of the Steering Committee will meet to divide the watershed into survey sections. Dick Gelpke will gather GIS maps for both communities to use in the mapping process. Letter-size maps will be produced for each survey section and brought to the training workshop.

Chris will facilitate a training workshop for volunteer surveyors. This meeting lasts about two hours and has two parts. The first half is an interactive slide show that introduces participants to some basic watershed ecology principles and nonpoint source pollution concepts as well as a question-by-question overview of the survey data collection forms. For the second half of the meeting we will be matching up surveyors with their sections and coordinating who is surveying where and when, and set dates to have survey forms returned and to hold the Action Planning meeting.

Surveyors will return the survey forms to Chris, who will type up priority sheets that will be used in the Action Planning Meeting. At the Action Planning meeting, which will be on either Dec 5 or 12, we will go through the survey section-by-section discussing problems and assets found and proposing action to address the larger priorities. This plan forms the core of a final report that can be used as a planning document to inform authorities of the work done by the group and again support or funding for needed projects.

**Lake Boon Watershed Survey
Action Plan Implementation Meeting
February 13, 2003 – Stow Town Hall**

Meeting Notes

Present: Lori Hawkes, David Siewierski, Ellen Kisslinger, Mary Trio, Alan Kattelle, David Gray, Georgie Smith, Mike Busch, Grace Desjardin, Barbara Clancy, Dick Gelpke, Chris Carney.

Additions to and Implementation of the Action Plan

Note: Many corrections are made in the plan itself and not mentioned in these notes.

Dick Gelpke and Lori Hawkes offered to write letters and make phone calls for the reporting issues in Hudson and Stow, respectively.

Education and Outreach

1. Many of the short term action items will be covered through activities under the DEM Lakes and Ponds grant. This will include:
 - a new educational Lake Boon brochure that includes much of the information outlined in the action plan. This brochure will also have phone numbers and websites of contacts with some of this information, such as contacts for soil testing.
 - a new Watershed Management Plan
2. Dick Gelpke and Lori Hawkes will contact the towns to request information on road de-icing and will share their findings with residents.
3. David Siewierski will work on lining up a local store to provide low or no phosphorous fertilizer. LBA will work with the store to line up customers in return.
4. Establish regular communication with lake group and large landholders. Establish regular communication between lake group and community officials.
5. Perhaps create a town bylaw requiring low or no P fertilizer be used in sensitive watershed areas.

Stormwater Runoff – Roads and Town Lands

Dick – go through Middlesex Conservation District and NRCS for assistance w erosion control. Mike Busch will contact these groups for assistance on Stow Recreation lands.

Mike Busch – Recreation Commission uses Chemlawn/TruGreen for lime and aeration on the town fields. Will look into soil testing, would be willing to be a customer for the zero phosphorous fertilizer if appropriate. Proposes that a member of the recreation board go to occasional, appropriate LBA meetings, and vice versa.

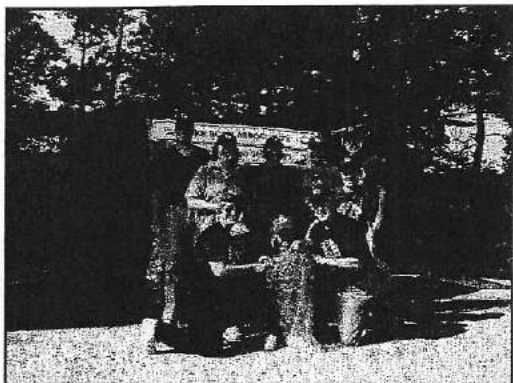
Who should get copies of the report?

Chris will get and estimate from the printer when the report is completed. We will prioritize among these suggested groups to decide who gets a paper copy, who gets a CD, and who gets a copy of the introduction / executive summary:

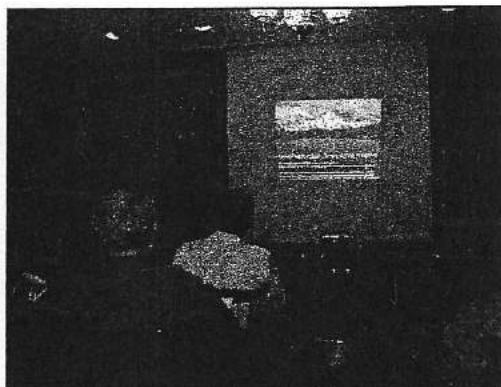
LBC, LBA, Stow Recreation Commission, Stow Highway Department, Hudson Public Works, Charter Oaks golf courses, Organization for the Assabet River (OAR), Master Planning Commissions for both towns, Conservation Commissions (both towns), Select Boards (both towns), SuAsCo Community Council, Oxbow, Hudson Planning, COLAP

Management of building at 529 Main St – lower Main St), Riverways (DFWELE), DEP.

VII. Photographs



October 2002 - LBA Roadside Cleanup Team

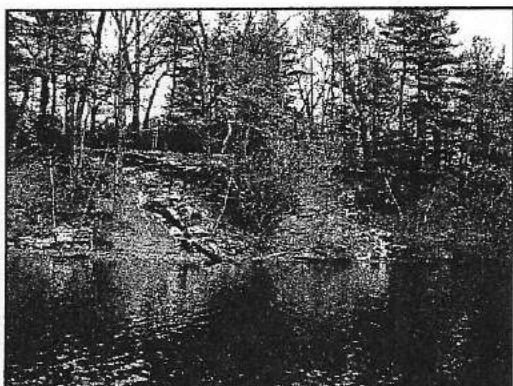


November 2002 - Training Workshop

NOVEMBER 2002 SURVEY PICTURES

DETRIMENTS

Section 1 - Stow Town Beach Area



Erosion north of Town beach -
Remains of rope swing at site



Black plastic along shoreline north of
Town beach

Section 5 - Golf Course



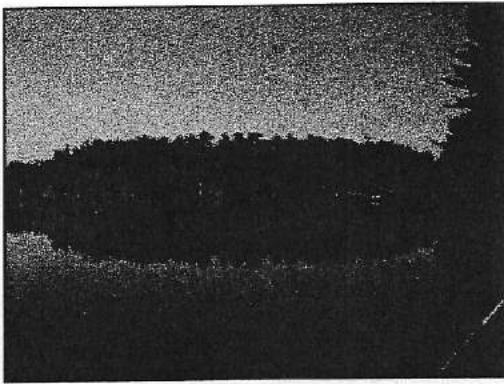
Stream running through Golf Course

Sections 7 & 8 (3rd & 4th Basins)

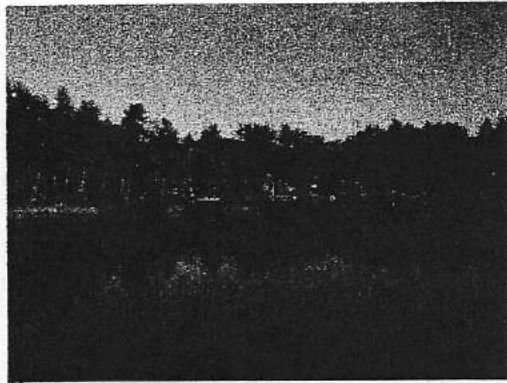


Road Runoff & Erosion - Sudbury Rd. Public Access

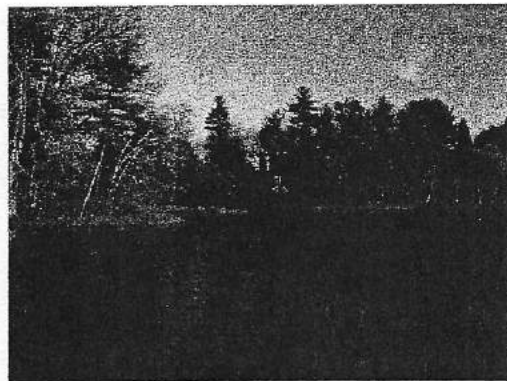
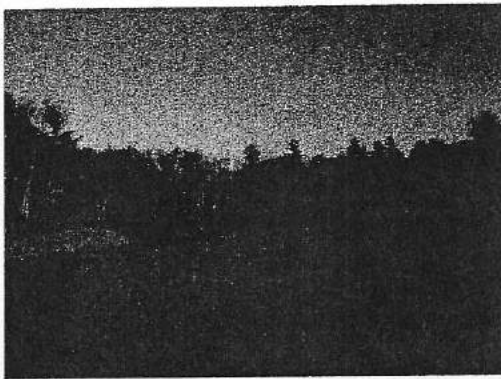
ASSETS



View from 2/1 Narrows toward 3rd Basin
(Floating island to left - 4th Basin to right)



Easterly view in 3rd Basin adjacent to island



4th Basin views

VIII. Data Collection Sheets