Loon Pond Watershed Survey
Acton, Maine
November, 2011

Watershed Survey Volunteers May 2011

Partners:

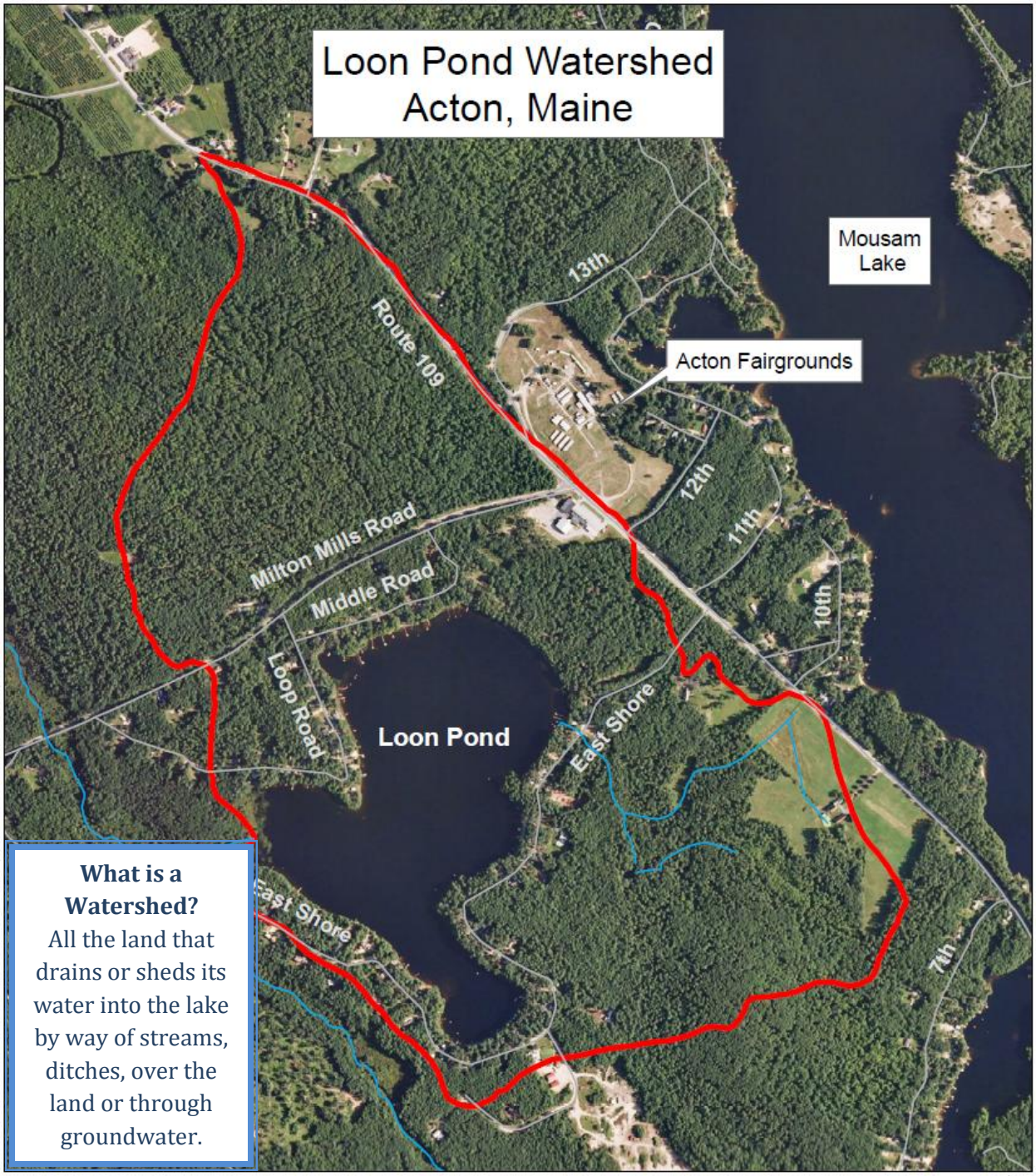
Loon Pond Betterment Association (LPBA)

Maine Department of Environmental Protection (MDEP)

York County Soil and Water Conservation District (YCSWCD)

Prepared by:
York County Soil and Water
Conservation District
11/1/2011

This project was entirely funded by the
Loon Pond Betterment Association


Loon Pond Watershed
Acton, Maine
Mousam Lake
13th
Route 109
Acton Fairgrounds
12th
11th
10th
Milton Mills Road
Middle Road
Loop Road
Loon Pond
East Shore
East Shore
7th
What is a Watershed?
All the land that drains or sheds its water into the lake by way of streams, ditches, over the land or through groundwater.
0
0.5
1
Miles
streams
roads
Loon Pond Watershed
York County
Soil and Water
Conservation District
map created by J. Anderson, 2011
Datum: Maine GIS, ESRI Imagery
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Acknowledgments

The following people and organizations were instrumental in the Loon Pond Watershed Survey Project and deserve special recognition for their efforts:

Pat Bickford	Dick Tetu	Elsie Cebulla	Bob Sawyer
Richard Bickford	Sharon Tetu	Harold Cebulla	Dennis Robert
Cory English	Judy Weber	Mike Avery	Terry Whitman
	Jim Weber	Virginia Avery	

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Joe Anderson	York County Soil and Water Conservation District

Contents

This project was entirely funded by the
Loon Pond Betterment Association through
Membership Dues

Introduction

Why conduct a watershed survey?

Benefits of a watershed survey include:

- Raising public awareness about the need to protect our lake from stormwater runoff and soil erosion problems
- Helping the community understand that pollution problems can be caused by problems beyond the lakefront
- Identifying sources of pollution in a cost-effective way by using volunteers
- Providing landowners with information about how to reduce or eliminate soil erosion problems on their property
- Helping to identify potential projects for future grants

One of the greatest threats to Maine's lakes is stormwater pollution. Stormwater is runoff created by rain and melting snow. The runoff travels across hard and compacted surfaces on its way to lakes, rivers, and streams. Stormwater runoff collects nutrients, sediment and other pollutants like engine oil and antifreeze and carries these into Loon Pond.

The Loon Pond watershed was surveyed in order to document changes to the landscape caused

A great example of how residential properties differ on Loon Pond. Notice the mix of shrubs and ground covers to the house on the right. Next to the stairway, the gutters are connected to a rain barrel which can be used to water their gardens. Recommendations for the house on the left included adding vegetation for a shoreline buffer, installing a stabilized pathway and covering bare soils with erosion control mulch. The Acton-Shapleigh Youth Conservation Corps worked with the landowner on the right to help improve their site (see sign). *photo J.Anderson, 2011*

by stormwater runoff. Through the survey, erosion at homes, on camp roads and culvert crossings were documented. Polluted storm water runoff can have detrimental effects on water quality and the ecosystems around it. The nutrient **phosphorus** attaches to eroded soil and can cause algae blooms that cover the area and suffocate aquatic species like trout by drastically lowering available oxygen in the water. Runoff is also heated by the sun as it makes its way to the pond. This heat raises the temperature of tributaries and streams which can harm native species.

The purpose of the survey was NOT to point fingers at landowners with problem spots, nor was it to seek enforcement action against landowners not in compliance with ordinances. It is the hope that through future efforts, we can work together to solve erosion problems around the lake creating stewards on every road and in every cove. The Loon Pond Betterment Association (LPBA) hopes that you will think about your own property as you read this report, and then try some of the recommended conservation measures.

Everyone has a role to play in lake protection!

What is being done to protect Loon Pond?

Loon Pond is part of the Mousam Lake watershed which includes Square Pond, Goose Pond, Mousam Lake and many smaller streams and tributaries. Due to the high density of housing, their proximity to the shoreline, declining water quality and development pressures within the watershed, Loon Pond is listed by the Maine Department of Environmental Protection (Maine DEP) on the *Maine Nonpoint Source Priority Watersheds List* and *Watersheds Most at Risk from Development*. To address water quality concerns and landowner concerns, the LPBA was formed by Loon Pond shorefront property owners over 30 years ago and their mission is to:

- To promote sociability of the camp owners of Loon Pond, Acton, Maine
- To work for physical betterment in the immediate area for the benefit of the majority of the members
- To provide information to landowners which will benefit the safety and well being of Loon Pond and its residents; not to offer policing and/or enforcement

The LPBA continually monitors, protects, and preserves the lake's water quality along with the surrounding watershed ecosystem in addition to creating and nurturing a community of lake and watershed stewards, occupants, and visitors. The LPBA and its members work with agencies, municipal officials and watershed residents to promote lake protection. Their volunteers have tested water quality in the pond for over 10 years as part of the Maine Volunteer Lake Monitoring Program.

In 2011, the LPBA, The Maine DEP and York County Soil and Water Conservation District worked together to design and carry out an association funded watershed survey. The survey was entirely funded through LPBA dues and volunteer efforts of a number of individuals and organizations. The information collected through this survey will be shared with landowners in the hopes that they can then take measures to fix their erosion problems.

Why should we work to protect Loon Pond?

When combined with many other similar sites throughout a watershed, even erosion from small sources can have a significant impact on lake water quality.

Survey volunteers were vital in providing a snapshot of site conditions around Loon Pond. Most were landowners themselves and all care deeply to protect and preserve Loon Pond for the present and the future.

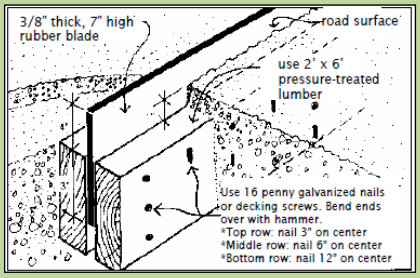
The spirit of the assessment was to work together with landowners toward a common goal of keeping our water clean. Loon Pond holds many special memories with landowners and visitors, and each cares about it in different ways. Additionally, caring for Loon Pond is essential to protecting homeowner investments, town assets and ecosystems that depend on the watershed for survival. Some other reasons include:

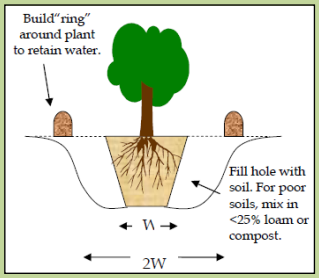
- Loon Pond provides recreational opportunities to local families and visitors from away
- A lake is a dynamic source of habitat for fish, loons and other wildlife.
- A 1996 study by the University of Maine found that for every 3-foot decline in water clarity, property values can drop as much as 20%. Therefore, maintaining a clean, clear lake is crucial to the town's financial viability as well as protecting the investments of property owners
- It is much cheaper, easier, and more practical to maintain and protect a high quality lake than to clean and restore an impaired one. *Prevention is much less expensive than remediation.*

Commonly, erosion sites are fixed with conservation practices called Best Management Practices (BMPs). BMPs are methods to help developed properties function more like natural, undisturbed forest and meadowland. Water that is conveyed to a lake by an undisturbed watershed is usually quite pure, because the watershed's soils and plants act as a natural water purification system. BMPs help developed properties mimic natural conditions, preventing sediment and nutrients from entering our surface waters and filtering runoff water through the

soil. By implementing BMPs, property owners can help protect and enhance the water quality of Loon Pond. Examples of BMPs include adding vegetation to the shoreline buffer, installing drywells and infiltration trenches to intercept roof runoff and using many other simple, low cost and effective measures (see below).

The Maine DEP and Portland Water District developed a series of fact sheets that answer many common how-to questions about conservation practices and includes detailed instructions, diagrams and color photos, installation and maintenance information. Download from: http://www.maine.gov/dep/blwq/docwatershed/materials.htm





The **Acton-Shapleigh Youth Conservation Corps (ASYCC)** is an active conservation partner and operates a program that gives area youth the opportunity to implement environmental solutions and empowers them to become the future stewards of our water resources. Founded in 2001, the ASYCC is committed to protecting the waterways within the Mousam Lake and Square Pond Watershed. The ASYCC provides education, community outreach, courtesy boat inspections, technical assistance and the design and installation of effective erosion control practices to the communities of Acton and Shapleigh. The ASYCC's Technical Director can create a site specific design with Best Management Practices (BMPs) to solve erosion problems while the YCC crew installs the recommendations. The landowner pays for any materials. The program is funded by the towns of Acton and Shapleigh, Mousam Lake Regions Association, Square Pond Improvement Association, State Grants, and private donors.

The Survey Method

The survey was conducted on May 21, 2011 by volunteers with the help of trained technical staff from Maine Department of Environmental Protection (MDEP) and the York County Soil & Water Conservation District (YCSWCD). The LPBA was instrumental in recruiting volunteers, developing mailings and outreach material and assembling tax maps and property listings. Fourteen (14) volunteers were trained in survey techniques during a two hour classroom workshop. Following the classroom training, the volunteers and technical staff spent the remainder of the day documenting erosion on the roads, properties, driveways, and shorelines in their assigned sectors using cameras and standardized forms.

Soils that surround Loon Pond are made up of sand and gravel and erode easily. Bare sites are particularly susceptible to erosion when it rains. Here a pathway can cause significant erosion given the amount of rain collected and the force it generates as it travels down the path. Notice the exposes tree roots which were once covered with soil.

Technical staff conducted follow-up examinations of sites over the following month to verify data accuracy. All information collected was entered into a computerized spreadsheet to create a database of the raw data. This data was standardized, sorted into appropriate categories and prioritized based on rankings of their impact to the lake, technical ability required to fix the problems, and estimated cost of remediation. The documented erosion sites were then plotted on maps using GIS software. A description of sites and associated rankings are discussed in the next section of this report. Maps of the erosion sites are located in Appendix A, and a spreadsheet with data from the documented sites is located in Appendix B. Contact LPBA or YCSWCD for additional site information.

Many sites documented around Loon Pond (over 50%) were connected with inadequate shoreline vegetation. By establishing a buffer of vegetation at the water's edge, not only will stormwater runoff be intercepted from above, the shore will be protected from waves and wind and can offer habitat for birds and fish while still keeping access for boats and swimming.

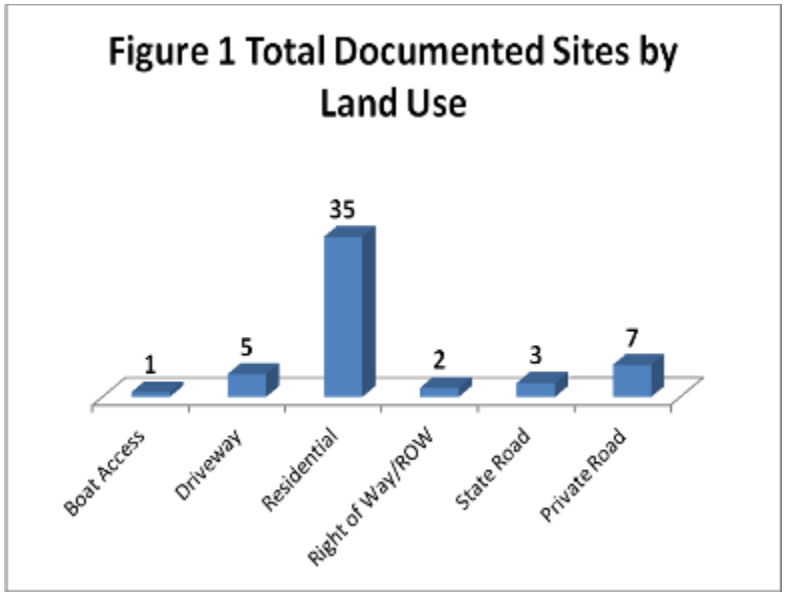
Survey Results Summary

Location of Sites

Through the watershed survey, volunteers and technical staff recorded 53 sites within the Loon Pond watershed that are directly or indirectly jeopardizing the pond's water quality. Documented sites were arranged according to current land use. Six different land uses were identified in the survey. Thus, no *single* source is responsible for pollution of the lake, and all parties need to be involved in protecting the water quality. Every land use has aspects that can be improved and there are numerous resources to aid in this improvement. Town officials, individual landowners, state and local agencies, the LPBA and YCSWCD must all play a role and work together for the benefit of Loon Pond.

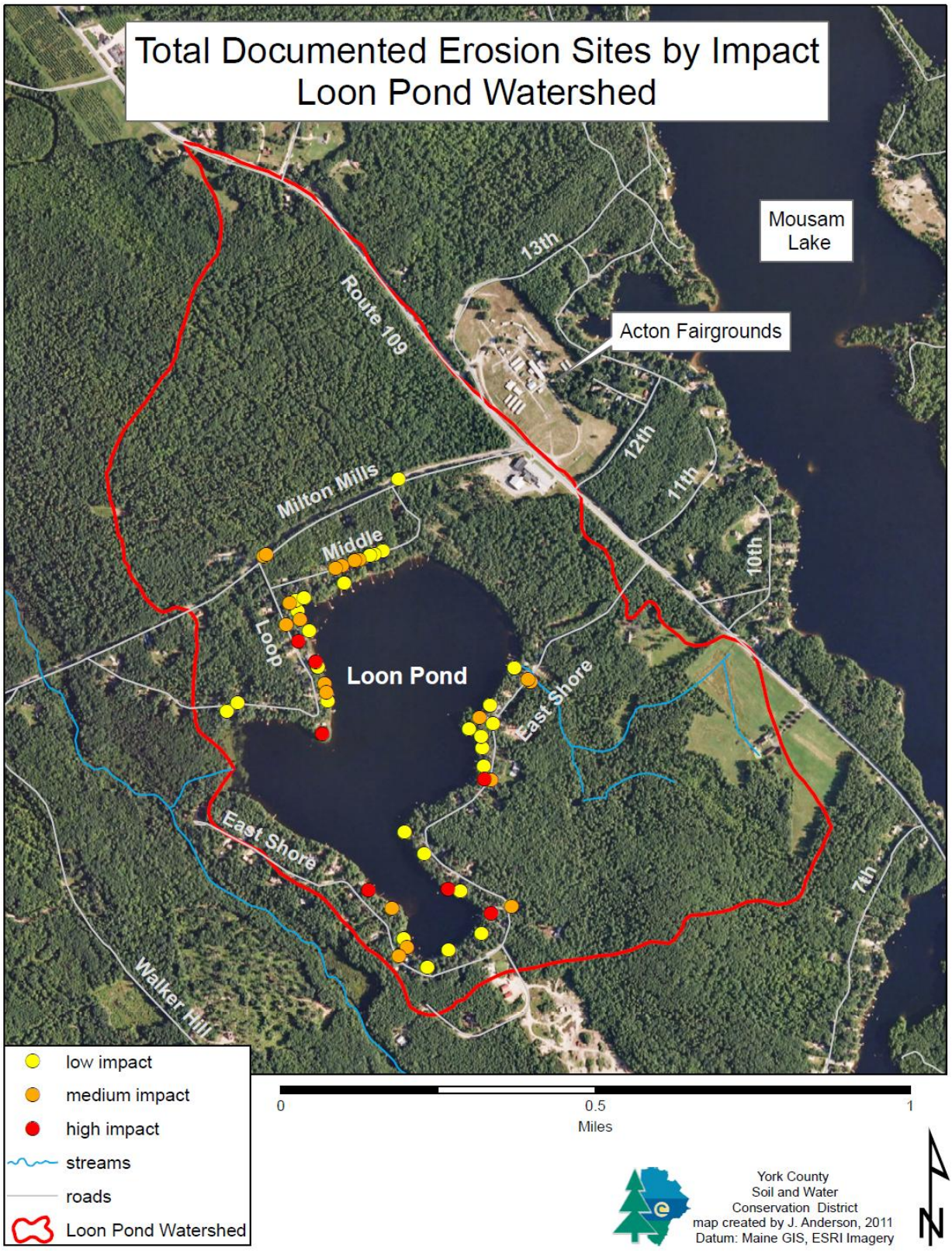
Table 1 Total Documented Sites by Land Use

	Total Sites	% of Total
Boat Access	1	2%
Driveway	5	9%
Residential	35	66%
Right of Way/ROW	2	4%
State Road	3	6%
Private Road	7	13%
Total Sites	**53**	**100%**



- Thirty-five (35) of the identified sites (66%) were found on residential properties. Over half of these sites (27) have a low impact on water quality and will be inexpensive to fix.
- Ten (10) of the sites identified (19%) are associated with roads; town and private. These sites tend to have a more severe impact on the lake with higher associated costs.
- Erosion sites were found throughout the watershed. Though some areas had a higher instance rate than others, all sectors surveyed had multiple sites associated with it.

Figure 2.Overview of Documented Erosion Sites



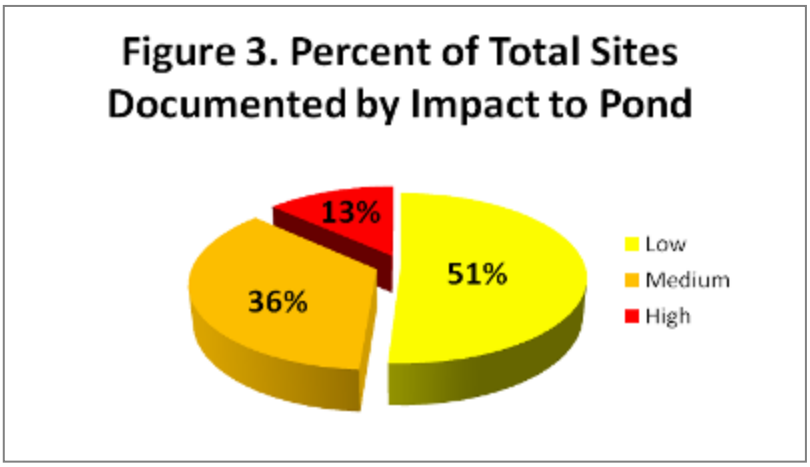
Impact to the Lake

Each site was rated for its potential impact to the lake. Impact was based on slope, soil type, amount of soil eroding, proximity to water, existence of a buffer, and buffer size. Though half of the sites reported were low impact, the cumulative effect of these sites on water quality can result in significant sediment loading to Loon Pond.

- **Low impact**: limited soil transport off site and little or no visible gullies.
- **Medium impact**: some sediment transport off site with noticeable rills in the ground.
- **High impact**: large amount of sediment transported off site with gullies eroded into the ground.

Roads, driveways and culvert crossings can cause significant impacts to water quality. Here the road shoulder and culvert outlet are failing on Milton Mills Road. Sediment can run directly into the stream which reaches Loon Pond less than 200 yards downstream.

Table 2 Sites Documented by Impact to Pond		
	Total Sites	**% of Total**
Low	27	51%
Medium	19	36%
High	7	13%



- Residential properties accounted for 22 of the 27 low impact sites. Nearly all of these sites could be easily and inexpensively corrected by enhancing shoreline buffers.
  - This is an opportunity for outreach, as residents do not consistently apply Best Management Practices (BMPs) or know how to use them on their properties.

- This outreach to individual residential land owners should be the focus of the LPBA and its partners.
- High impact sites were mostly the result of residences (4). The boat launch, a high impact site located off Loop Road (see below), is an area that has seen improvements in the past by the Acton-Shapleigh Youth Conservation Corps (ASYCC) but needs continued maintenance and effort to stabilize it and protect Loon Pond.

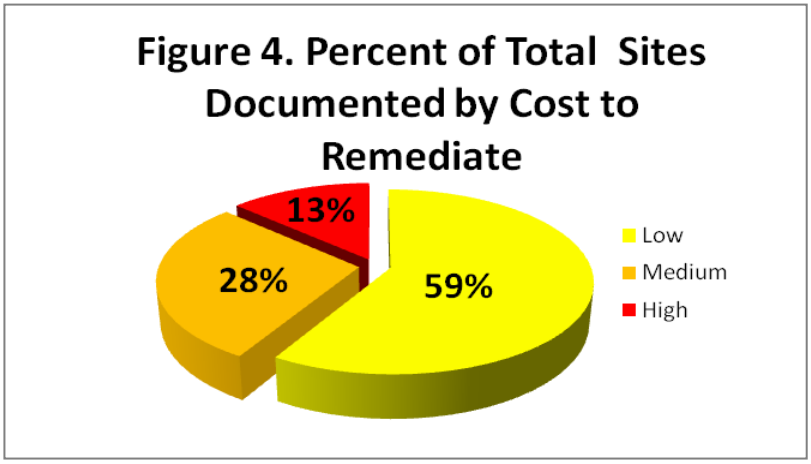
The boat launch located off Loop Road is a high impact due to the amount of stormwater that comes down the road and the bare soil it picks up and deposits directly into Loon Pond. The ASYCC has worked here in past, notice the ditch turnout to the right of surveyor. Sites like these see more concentrated use and constant vehicle traffic which makes it difficult to maintain and expensive for the landowner to keep up.

Estimated Remediation Cost

Recommendations were made for fixing each site and the associated cost of labor and materials was estimated. Most sites were classified as low to medium cost, indicating that the fixes would be affordable for the average landowner.

- **Low cost**: estimated to have labor and materials cost less than $500
- **Medium cost**: estimated to cost between $500 and $2500
- **High cost**: estimated to cost in excess of $2500

Table 3. Sites Documented by Cost to Remediate		
	Total Sites	**% of Total**
Low	31	58%
Medium	15	28%
High	7	13%



- Costs to remediate sites can vary depending on landuse, proximity to the pond and type of impact. Road impacts tend to required technical knowledge and the procedures involved with remediating these sites are more time and resource consuming.
- In some cases, there may be multiple issues with one property requiring a number of BMPs to address the situation.
- Typical residential costs are associated with defining pathways and installing infiltration steps, adding plants to a shoreline buffer and placing rubber razors and waterbars to divert stormwater runoff. When one BMP is installed, the cost can be quite low but when multiple conservations practices are needed, the cost can sometimes be prohibitive.
- A number of approaches can be taken to reduce the cost of implementing such improvements. One way is for the landowner to break the improvements into separate categories such as driveway, roof, shoreline and pathway. By tackling one category at a time, landowners can gradually implement BMPs cost-effectively.

- Always remember to contact the Town of Acton CEO and Maine DEP before removing any vegetation, disturbing soil or construction of any kind within the 250' shoreland zone. Below are some examples of BMPs used to fix erosion issues and add beauty and functionality to a property:

Rain Gardens are natural or dug shallow depressions designed to capture and soak up runoff from your roof, driveway or other impervious areas. They can be planted with beautiful, native plants that add beauty to the landscape while providing habitat and food for birds and butterflies.

Rubber Razors direct water off the driveway or road and into vegetation with rubber razors.

Roof Runoff
Install stone filled trenches along the roof dripline to help catch and infiltrate runoff.

Build a Better Buffer-Soil is the #1 Pollutant of Our Waters

A buffer is an area of land between developed property and the lakeshore where trees, shrubs and ground cover plants are allowed to become established. Buffers help the lake by:

- Filtering sediment and pollutants that could reach the lake
- Providing habitat for birds, fish and other wildlife
- Can also help with privacy and screening
- Protection from wind and weather
- Can be low cost and low maintenance
- Plants should include native species such as:

Echinacea	Fragrant Sumac
Moss Phlox	Wintergreen
Black-eyed Susan	New York aster
Sweet Fern	Bearberry
Bush Honeysuckle	Blueberry

Next Steps - Where Do We Go From Here?

Repairing the problem sites identified in this survey will require efforts by the LPBA, individuals, road associations, and municipal offices.

Loon Pond Betterment Association

- Make available copies of the survey report to property owners, road associations, and towns.
- Apply for grants to help fix erosion problems identified in the survey.
- Continue to increase and empower the association's membership, and provide educational materials and guidance to members of the Loon Pond watershed community.
- Continue to partner with YCSWCD, the Town of Acton and the Acton-Shapleigh Youth Conservation Corps to seek funding and implement projects to protect lake water quality.
- Organize workshops and volunteers to start fixing identified erosion problems and teach citizens how to fix similar problems on their own properties.

Individuals

- Prevent runoff from washing sediment into the lakes. Detain runoff in depressions or divert flow to vegetated areas. Call the York County SWCD or MDEP for assistance.
- Minimize the amount of cleared land and road surfaces on your property. Stop mowing and raking, and let lawn and raked areas revert back to natural plants. Deep shrub and tree roots help hold the shoreline in place and prevent erosion.
- Avoid exposing bare soil. Seed and mulch bare areas.
- Call your Code Enforcement Officer before cutting vegetation within 250 feet of the shore.
- Maintain septic systems properly. Pump septic tanks (every 2 to 3 years for year round residences; 4-5 years if seasonal) and upgrade marginal systems.

Road Associations (or private roads without associations)

- Minimize road runoff by doing regular, comprehensive maintenance. Form a road association if one does not already exist. Call the Maine DEP at 287-3901 for more information.
- Get a copy of "Gravel Road Maintenance Manual – A Guide for Landowners on Camp or Other Gravel Roads." Call the Maine DEP at 822-6300 to order a copy, or download a PDF at http://www.maine.gov/dep/blwq/docwatershed/roads/gravel_road_manual.pdf

Municipal Officials

- Enforce shoreland zoning ordinances to assure full protection of Loon Pond.
- Conduct regular maintenance on town roads in the watershed, and fix town road and private boat launch problems identified in this survey.
- Participate in and support long term watershed management projects.
- Promote sediment and erosion control training and certification for road crews. More information is available from the Maine DEP at: http://www.maine.gov/dep/blwq/training/index.htm

Where Do I Get More Information?

Loon Pond Betterment Association
P.O. Box 47
Acton, ME 04001
http://www.loonpond.org

Officers
Pat Bickford - President
Steve Buyck - Vice President
Jim Weber - Treasurer
Judy Galvin - Secretary
Richard Bickford - Board Member at Large
Virginia Avery - Alternate
Michael Avery - Alternate

Town of Acton, Maine
Ken Paul, Code Enforcement Officer
(207) 637-3566
http://www.limington.net/

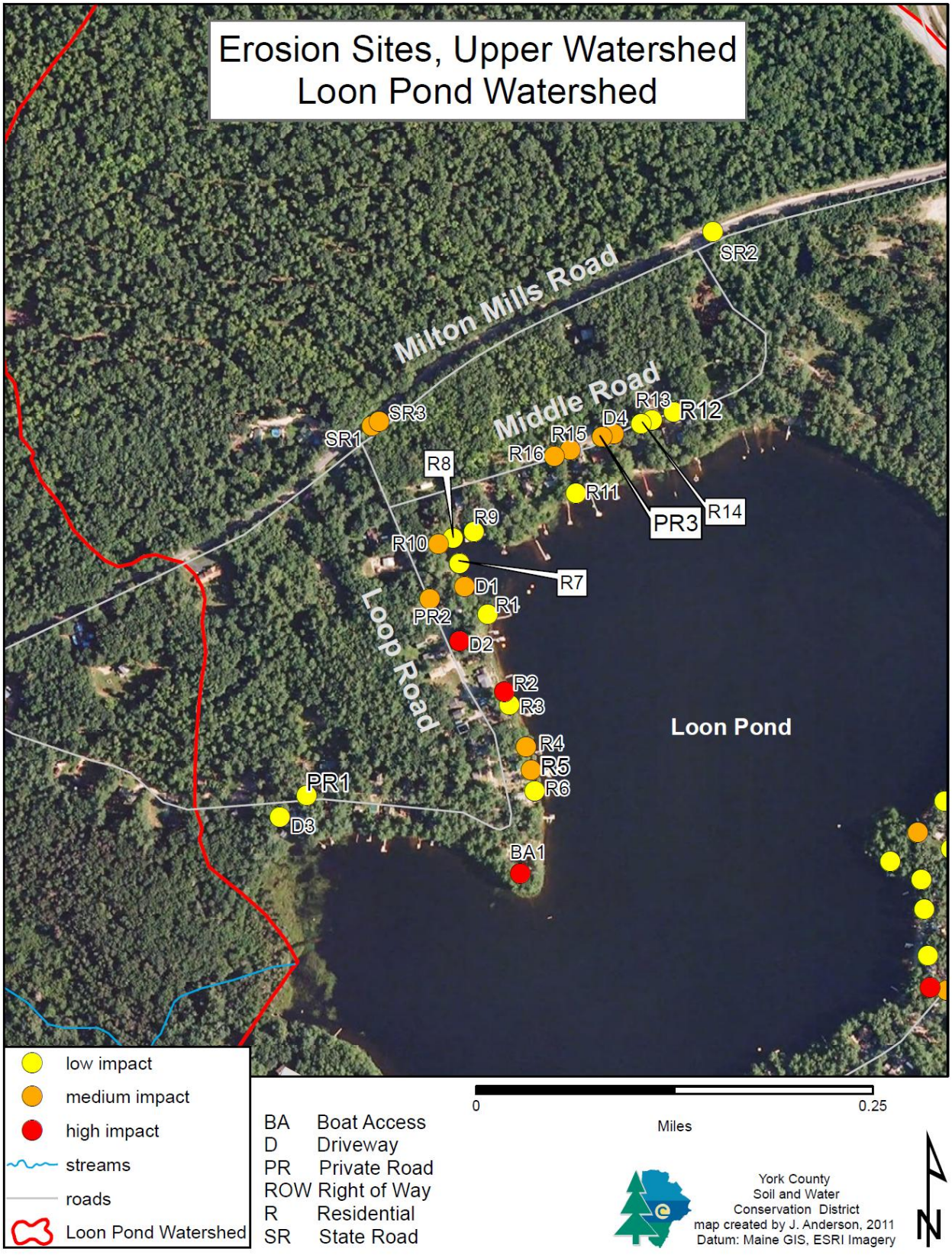
Acton-Shapleigh Youth Conservation Corps
Technical Director
Pat Jackson, Technical Director (207) 608-5491
Technicaldirector@asycc.com
http://www.asycc.com

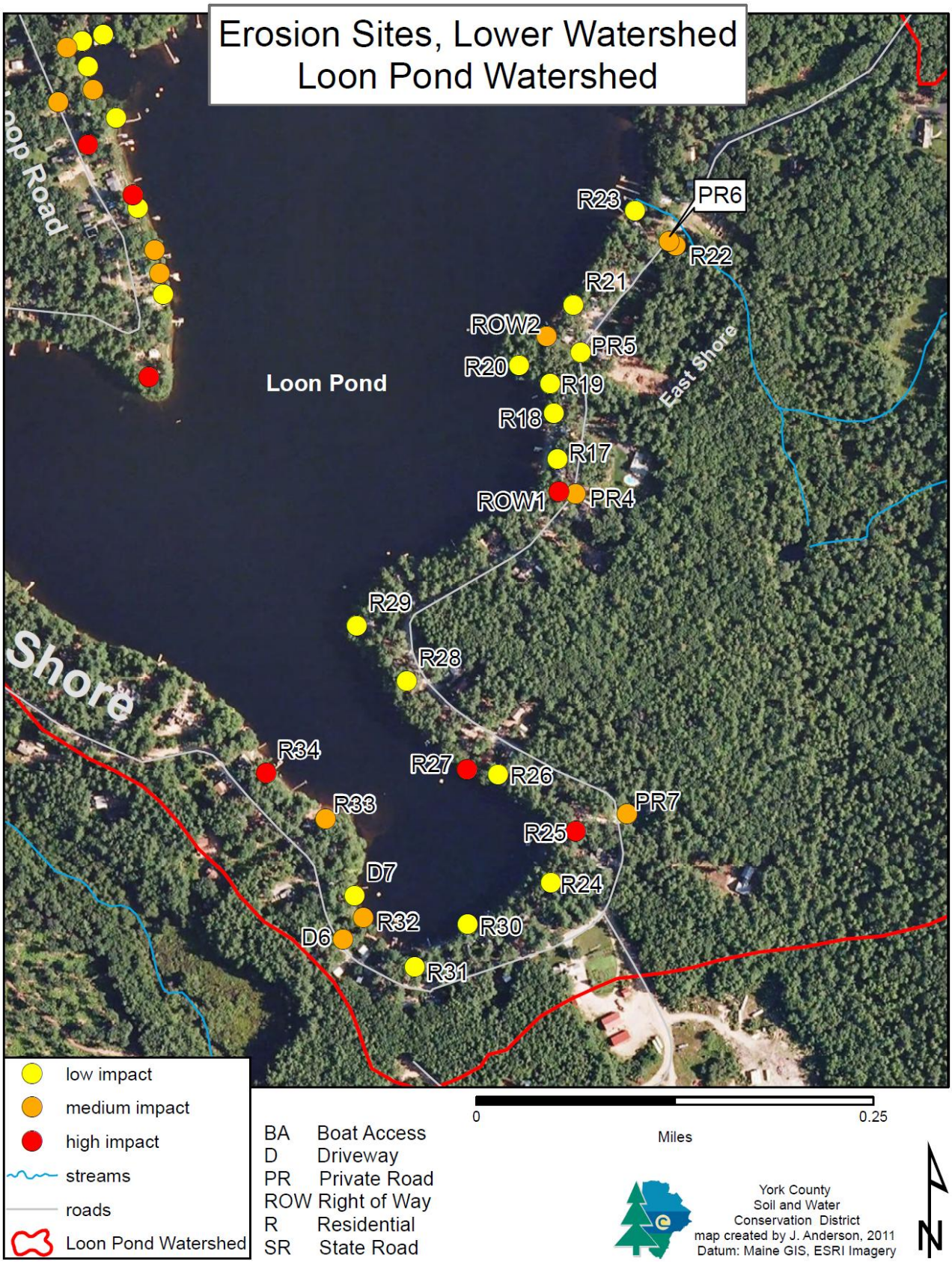
Maine Department of Environmental Protection, Southern Maine Regional Office, Watershed Management Division
Contact Wendy Garland (207) 822-6300
Wendy.Garland@maine.gov
http://www.maine.gov/dep/blwq/

Maine Department of Inland Fisheries and Wildlife
For fishing, wildlife, and conservation officers
Southwestern Division, Contact Scott Lindsay**,** (207) 657-2345 x110 scott.lindsay@maine.gov
www.maine.gov/ifw

York County Soil and Water Conservation District
For technical assistance, grant program information, outreach materials, and permitting contact Joe Anderson, (207) 324-0888 X208, janderson@yorkswcd.org
http://yorkswcd.org/

Appendix A Erosion Sites, Upper and Lower Watersheds




Erosion Sites, Lower Watershed
Loon Pond Watershed
Loon Pond
East Shore
Shore
R23
PR6
R22
R21
ROW2
PR5
R20
R19
R18
R17
ROW1
PR4
R29
R28
R34
R27
R26
R33
PR7
R25
D7
R24
R32
R30
D6
R31
low impact
medium impact
high impact
streams
roads
Loon Pond Watershed
BA Boat Access
D Driveway
PR Private Road
ROW Right of Way
R Residential
SR State Road
0
0.25
Miles
York County
Soil and Water
Conservation District
map created by J. Anderson, 2011
Datum: Maine GIS, ESRI Imagery
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Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
SR1	state road		43.51139	70.8809	entrance loop rd, pole 8	road shoulder erosion, bank failure at ditch	65 ft x 5 ft	stream	armor inlet/outlet, armor ditch with stone	medium	medium	no
D1	driveway	148-027	43.50995	70.8797	63 Loop Rd	surface erosion	75 ft x 8 ft	lake	install rain barrel, mulch/erosion control mix	medium	low	yes
R1	residential	148-029	43.50970	70.8794	73 Loop Rd	surface erosion, bare soil	30 ft x 10 ft	lake	infiltration trench	low	low	yes
D2	driveway	148-030	43.50945	70.87974	77 Loop Rd	surface erosion	30 ft x 50 ft	lake	add new surface material, install detention basin	high	medium	no
R2	residential	148-033	43.50900	70.87917	99 Loop Rd	surface erosion, bare soil, roof runoff erosion, lack of shoreline vegetation, shoreline erosion	100 ft x 50 ft	lake	define foot path, infiltration trench, mulch/erosion control mix, establish buffer, reseed bare soil	high	medium	yes
R3	residential	149-089	43.50888	70.8791	107 Loop Rd	bare soil, roof runoff erosion	50 ft x 50 ft	lake	define foot path, infiltration trench, mulch/erosion control mix, establish buffer	low	low	yes
R4	residential	149-092	43.50850	70.87888	119 Loop Rd	surface erosion, bare soil, lack of shoreline vegetation	30 ft x 10 ft	lake	stabilize foot path, mulch/erosion control mix, add to buffer	medium	low	yes
R5	residential	149-093	43.50829	70.87881	125 Loop Rd	bare soil, inadequate shoreline vegetation	50 ft x 90 ft	lake	infiltration trench, mulch/erosion control mix, establish buffer	medium	low	yes
R6	residential	149-094	43.50810	70.87876	133 Loop Rd	bare soil, lack of shoreline vegetation	30 ft x 10 ft	lake	define foot path, mulch/erosion control mix, add to buffer	low	low	yes
BA1	boat access	149-095	43.50650	70.87898	Boat ramp	surface erosion	150 ft x 22 ft	lake	add new surface material (recycled asphalt), crown	high	high	no

Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
D3	driveway	149-109	43.50781	70.88194	223 Loop Rd	surface erosion	100 ft x 15 ft	vegetation	add new surface material, install runoff diverter: rubber diverter, waterbar	low	low	yes
PR1	private road		43.50801	70.88161	249 Loop 181 Loop Rd Construction	surface erosion	500 ft x 22 ft			low	high	
PR2	private road		43.50983	70.88013	34 Loop to end of road	surface erosion	500 ft x 22 ft		pave	medium	high	no
R7	residential	148-023	43.51016	70.87977	2 Richard Rd	surface erosion, bare soil, lack of shoreline vegetation	3 ft x 100ft	lake	clean out settleing area from road, reset rocks along property line; mulch/erosion control mix, establish butter, plant above sitting area	low	low	yes
R8	residential	148-022	43.51039	70.87985	12 Richard Rd	surface erosion; shoreline undercut, eroding, unstable access, lack of shoreline vegetation	35 ft x 2 ft	lake	establish buffer	low	low	yes
R9	residential	148-021	43.51045	70.87959	20 Richard Rd	undercut and eroding shoreline, lack of shoreline vegetation	35 ft x 2 ft	lake	establish buffer	low	low	yes
R10	residential	148-019	43.51030	70.87973	32 Richard Rd	undercut shoreline, unstable access	100 ft x 5 ft	lake	establish buffer	medium	low	yes
R11	residential	148-018	43.51049	70.87817	137 Middle Rd	surface erosion, inadequate shoreline vegetation	2 ft x 40 ft	lake	establish buffer	low	low	yes
R12	residential	148-013	43.51158	70.877122	91 Middle Rd	bare soil, surface erosion on beach, lack of shoreline vegetation	2 ft x 25 ft	lake	establish buffer, reseed bare soil/thinning grass	low	low	yes

Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
R13	residential	148-012	43.51151	70.877393	83 Middle Rd	surface erosion, bare soil, shoreline erosion, lack of shoreline vegetation	40 ft x 20 ft	lake	mulch/erosion control mix, establish buffer, reseed bare soil/thinning grass	low	low	yes
R14	residential	148-011	43.51147	70.877528	79 Middle Rd	erosion at dock access	6 ft x 4 ft	lake	stone at dock access	low	low	yes
D4	driveway	148-009	43.51137	70.877867	69 Middle Rd	surface erosion	15 ft x 75 ft	lake	install runoff diverters	medium	medium	yes
PR3	private road		43.51134	70.878012	Middle Rd	surface erosion, unstable inlet/outlet, clogged	20 ft x 10 ft	lake	remove clog, install plunge pool, remove plow berms build up	medium	medium	yes
R15	residential	148-005	43.51121	70.878409	53 Middle Rd	surface erosion, bare soil, roof runoff erosion	10 ft x 25 ft	lake	infiltration trench, mulch/erosion control mix, establish buffer	medium	medium	yes
R16	residential	148-002	43.51116	70.878612	37/35 Middle Rd	surface erosion, bare soil, roof runoff erosion	20 ft x 35 ft	lake	infiltration trench, mulch/erosion control mix, establish buffer, rain garden, vegetate shoulder	medium	medium	yes
SR2	state road		43.51323	70.876679	Milton Mills Rd - stream crossing closest to Middle Rd entrance	unstable inlet/outlet, road shoulder erosion	5 ft x 5 ft	lake	armor inlet/outlet,	low	low	yes
SR3	state road		43.51144	70.880811	Milton Mills Rd - stream crossing closest to Loop Rd entrance	unstable inlet/outlet, road shoulder erosion	15 ft x 5 ft	stream	armor inlet/outlet, vegetate and armor shoulder	medium	medium	no
PR4	private road		43.50637	70.87354	between 148-070 (blue house) and 149-071 (green house)	surface & ditch erosion	50 ft x 50 ft	lake	install turnouts	medium	low	no

Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
ROW1	right-of-way		43.50639	70.87375	between 149-071 and 149-073; next to green house	surface erosion, inadequate shoreline vegetation	50 ft x 10 ft	lake	define and stabilize foot path, install runoff diverter	high	low	yes
R17	residential	149-073	43.50668	70.87378	238 East Shore Dr	surface erosion	25 ft x 3 ft	lake	define foot path, install runoff diverter, mulch/erosion control mix,	low	low	
R18	residential	149-076	43.50710	70.87384	218 East Shore Dr	bare soil, soil running over retaining wall	27 ft x 15 ft	lake	install runoff diverters, erosion control mix, infiltration trench behind retaining wall, no raking	low	low	yes
R19	residential	149-078	43.50737	70.87389	204 East Shore Dr.	surface erosion, bare soil, lack of shoreline vegetation		lake	mulch/erosion control mix, establish buffer, infiltration trench, no raking	low	low	yes
PR5	private road		43.50766	70.87352	by right-of-way & slow sign in front of 202 East Shore; pole 19.1	road shoulder erosion, winter sand		lake	install turnouts	low	low	no
ROW2	right-of-way		43.50780	70.87395	right-of-way/road to 198, 200 East Shore (to 149.081)	surface erosion	100 ft x 8 ft	lake	unsure - road much lower than sides. New surface material?, add to buffer	medium	high	no
R20	residential	149-080	43.50753	70.87428	200 East Shore Dr	surface erosion,, bare soil	25 ft x 12 ft	lake	install runoff diverter, establish buffer, no raking	low	low	yes
R21	residential	149-084	43.50809	70.87362	184, 180 East Shore	surface erosion, bare soil	50 ft x 8 ft	lake	mulch/erosion control mix, establish buffer	low	low	yes
R22	residential	243-007	43.50865	70.87236	151 East Shore Dr	surface erosion, bare soil, inadequate shoreline vegetation, undersize	25 ft x 25 ft	stream	establish buffer	medium	low	yes

Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
R23	residential	149-088	43.50896	70.87288	150 East Shore Dr.	undersized culvert, surface erosion, lack of shoreline vegetation	25 ft x 10 ft	lake	enlarge & armor culvert, establish buffer	low	high	yes (buffer)
PR6	private road		43.50869	70.87244	in front of 149-088 (150 E. Shore -gray house with blue shutters)	bare soil, road shoulder erosion, sand and soil moving into drainage grate	25 ft x 10 ft	stream	establish buffer, turnouts, runoff diverters	medium	medium	
R24	residential	152-037	43.50283	70.87374	454 East Shore Dr.	surface erosion	20 ft x 3 ft	lake	infiltration steps, reseed bare soil	low	low	yes
R25	residential	152-039	43.50330	70.87345	422 East Shore Dr.	surface erosion at boat access	50 ft x 10 ft	lake	vegetate shoulder, install turnouts, establish/add to buffer	high	high	no
PR7	private road		43.50347	70.87281	East Shore Dr. across from 417	surface erosion, undersized ditch, road shoulder erosion	50 ft x 3 ft	lake	armor and reshape ditch, install check dams	medium	high	no
R26	residential	149-049	43.50380	70.87443	372 East Shore Dr.	surface erosion	15 ft x 4 ft	lake	define foot path, install runoff diverter, mulch/erosion control mix,	low	low	yes
R27	residential	149-051	43.50384	70.87483	362 East Shore Dr.	surface erosion, bare soil	15 ft x 15 ft	lake	at bottom of pave driveway runoff goes through sand. Use crushed gravel and install infiltration basin at bottom	high	medium	yes
R28	residential	149-057	43.50463	70.8756	336 East Shore Dr.	surface erosion	50 ft x 3 ft	lake	stabilize foot path, mulch/erosion control mix	low	low	yes

Appendix B Survey Spreadsheet Data

Map ID	Land Use	Tax Map Lot	Latitude	Longitude	Location	Type of Problem	Area (ft)	Direct Flow to	Recommendations	Impact	Cost	YCC Project
R29	residential	149-060	43.50452	70.87624	320 East Shore Dr.	surface erosion		lake	retrofit existing steps to infiltrate, stabilize foot path, infiltration steps	low	low	yes
R30	residential	142-031	43.50243	70.87477	498 East Shore Dr.	surface erosion, indadequate shoreline vegetation	15 ft x 3 ft	vegetation	increase height of check dam, add to buffer	low	low	no
R31	residential	152-028	43.50203	70.87542	516 East Shore Dr.	surface erosion, bare soil, roof runoff erosion	45 ft x 3 ft	vegetation	define foot path, drywell/rain barrel/ rain garden, mulch/erosion control mix	low	low	yes
R32	residential	152-023	43.50247	70.87608	544 East Shore Dr.	surface erosion, bare soil, roof runoff erosion			define foot path, stabilize foot path, drywell, mulch/erosion control mix, establish buffer, no raking	medium	medium	yes
D6	driveway	152-023	43.50227	70.87633	544 East Shore Dr.	surface and road shoulder erosion	40 ft x 20 ft		build up driveway, add gravel	medium	medium	yes
D7	driveway	152-021	43.50267	70.87619	558 East Shore Dr.	surface erosion	100 ft x 3 ft	lake	add new surface material (gravel), grade, install detention basins, define foot path	low	medium	yes
R33	residential	152-018	43.50332	70.87666	584 East Shore Dr.	surface erosion, bare soild, lack of shoreline vegetation, shoreline erosion	100 ft x 5 ft	lake	define foot path, mulch/erosion control mix, add to buffer, reseed bare soil	medium	medium	yes
R34	residential	149-044	43.50309	70.87562	590 East Shore Dr.	surface erosion, bare soil, lack of vegetation, unstable access & erosion at shoreline	75 ft x 25 ft	lake	define & stabilize foot path, infilitration steps, mulch/erosion control mix, establish buffer	high	medium	yes