Lake Anasaguntic ook Watershed Survey Report 2019

ACKNOWLEDGMENTS

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

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INTRODUCTION

This report was specifically designed for citizens living in the Lake Anasagunticook Watershed. It provides the results and analysis of a watershed survey conducted during the spring of 2019. In addition, the report includes basic information about how to protect lake water quality. Lake Anasagunticook is also known as Canton Lake but it will be referred to as Lake Anasagunticook in this report.

The Lake Anasagunticook Association, referred to as LAA in this report, takes a pro-active stance in measuring and maintaining water quality. In order to better inform citizens of specific actions that should be pursued and in order to take on larger projects to mitigate/prevent runoff, the LAA took responsibility to organize and execute a watershed survey to assess the soil erosion impacts at Lake Anasagunticook.

The steering committee was fortunate to be supported by an engaged community that recognizes that Lake Anasagunticook is central to the quality of life in its surrounding communities- Canton and Hartford. This survey is one of many steps in protecting the lake for future generations. Special thanks go out to the technical team and community volunteers that participated in the survey, data collection and results reporting.

THREATS TO LAKE WATER QUALITY

What puts water quality at risk? The biggest pollution culprit in Lake Anasagunticook and other Maine lakes is **polluted runoff or nonpoint source (NPS) pollution.** Polluted runoff often comes in the form of storm water runoff from rain and snowmelt. During and after storms and snowmelt, streams and overland flow wash soil and other pollutants into lakes from the surrounding landscape. Nutrients attached to soil particles, such as phosphorus and nitrogen, become stormwater runoff hitch-hikers and can easily be carried to the lake.

POLLUTED RUNOFF
Also called nonpoint source pollution or NPS. Pollution from diffuse, seemingly insignificant sources (such as erosion, roads, septic systems) that, when combined, add up to a significant amount of pollution to a watershed.

In an undeveloped, forested watershed, stormwater runoff is slowed and filtered by tree and shrub roots, understory plants, leaves, and other natural debris on the forest floor. It then soaks into the uneven forest floor and filters through the soil. In a developed watershed, however, stormwater does not always receive the filtering treatment the forest once provided. Runoff shed from impervious surfaces, such as rooftops, compacted soil, and gravel camp roads collects and speeds up, often becoming channelized. The runoff becomes a destructive erosive force as it is greater in both velocity and volume than stormwater in an undeveloped landscape.

Not only is the increase in stormwater volume and velocity problematic in a developed watershed, but also the nutrients and the sediment in the stormwater runoff can be bad news. Large volumes of sediment can settle out in the lake, creating an ideal substrate for nuisance and invasive aquatic plants such as variable-leaf water milfoil. **Phosphorus**, a nutrient that is common on land and in

stormwater runoff, is a primary food for all plants, including **algae**. In natural conditions, the scarcity of phosphorus in a lake limits algae growth. However, when a lake receives extra phosphorus from the watershed, algae growth increases dramatically. Sometimes this growth causes choking blooms, but more often it results in small, insidious changes in water quality that, over time, damage the ecology, aesthetics and economy of lakes.

LAKE ANASAGUNTICOOK WATER QUALITY

Since 1980, water quality data has been regularly collected on Lake Anasagunticook.[1] Currently, there is one Lake Stewards of Maine (LSM)-certified lake monitor, Dr. Thomas Hamilton with a back-up monitor in the works.[2] According to Scott Williams, Executive Director of the LSM, Lake Anasagunticook's water quality is complex. The Maine Department of Environmental Protection (DEP) has previously stated that Lake Anasagunticook's water quality is average for the State of Maine.[3] The lake has had one algae bloom on record and its risk of another bloom is low. For more information visit: https://www.maine.gov/dep/water/lakes/bloomrisk.html.

NPS Priority Watershed
Maine DEP maintains a list of watersheds where water quality is impaired or considered particularly threatened by polluted runoff.

A watershed must be listed as a NPS Priority Watershed in order to be eligible to apply for 319 grant funding under the Clean Water Act. Lake Anasagunticook is on the 2019 NPS Priority list.

Closer inspection of water quality shows that the Total Phosphorus (TP) in Lake Anasagunticook averages 9 parts per billion (ppb). A phosphorus concentration of 15 ppb is often cited as the threshold at which noticeable water quality decline occurs. Additional phosphorus monitoring would be beneficial, as only two phosphorus samples have been collected on the lake in the last 10 years. The historical average water clarity for Lake Anasagunticook is 4.7 meters (m), and the state average is between 5 m and 5.75 m.[4] Lake Anasagunticook has been placed on DEP's list of **Nonpoint Source Priority Watersheds** as a "threatened lake" due to its status as a public water supply. Visit https://www.maine.gov/dep/land/watershed/nps_priority_list/index.html for more information.

WHY SHOULD WE PROTECT THE LAKE FROM POLLUTED RUNOFF?

- The lake contains valuable habitat for fish, birds and other wildlife.

[1] Maine DEP, "Water Quality Summary: Lake Anasagunticook, Canton, Hartford". 2011. Maine DEP, Augusta.
[2] For more information on how to become certified as a Volunteer Lake Monitor, visit the VLMP website at http://www.mainevlmp.org/volunteer-info/water-quality-monitors/training-certification/.
[3] Maine DEP, "Water Quality Summary: Lake Anasagunticook, Canton, Hartford". 2011. Maine DEP, Augusta.
[4] Lake Stewards of Maine, 2017 Report, http://slcoa.org/documents/2017MaineLakesOverview.pdf; www.lakesofmaine.org.

- Lake Anasagunticook provides recreational opportunities to watershed residents and to visitors.
- The lake is the public water supply for Canton Village residents – approximately 80 households
- It is an important contributor to the local economy.
- A 1996 University of Maine study demonstrated that lake water quality affects property values. For every meter (3 ft.) decline in water clarity, shorefront property values can decline as much as 10 to 20 percent! Declining property values affect individual landowners as well as the economics of the entire community.
- Once a lake has declined, it can be difficult and prohibitively expensive to restore.
- Sediment and nutrients that wash into the lake encourage the growth of invasive plants and can cause algae blooms, all of which impact the habitat for fish and other lake species and reduce recreational and aesthetic values.

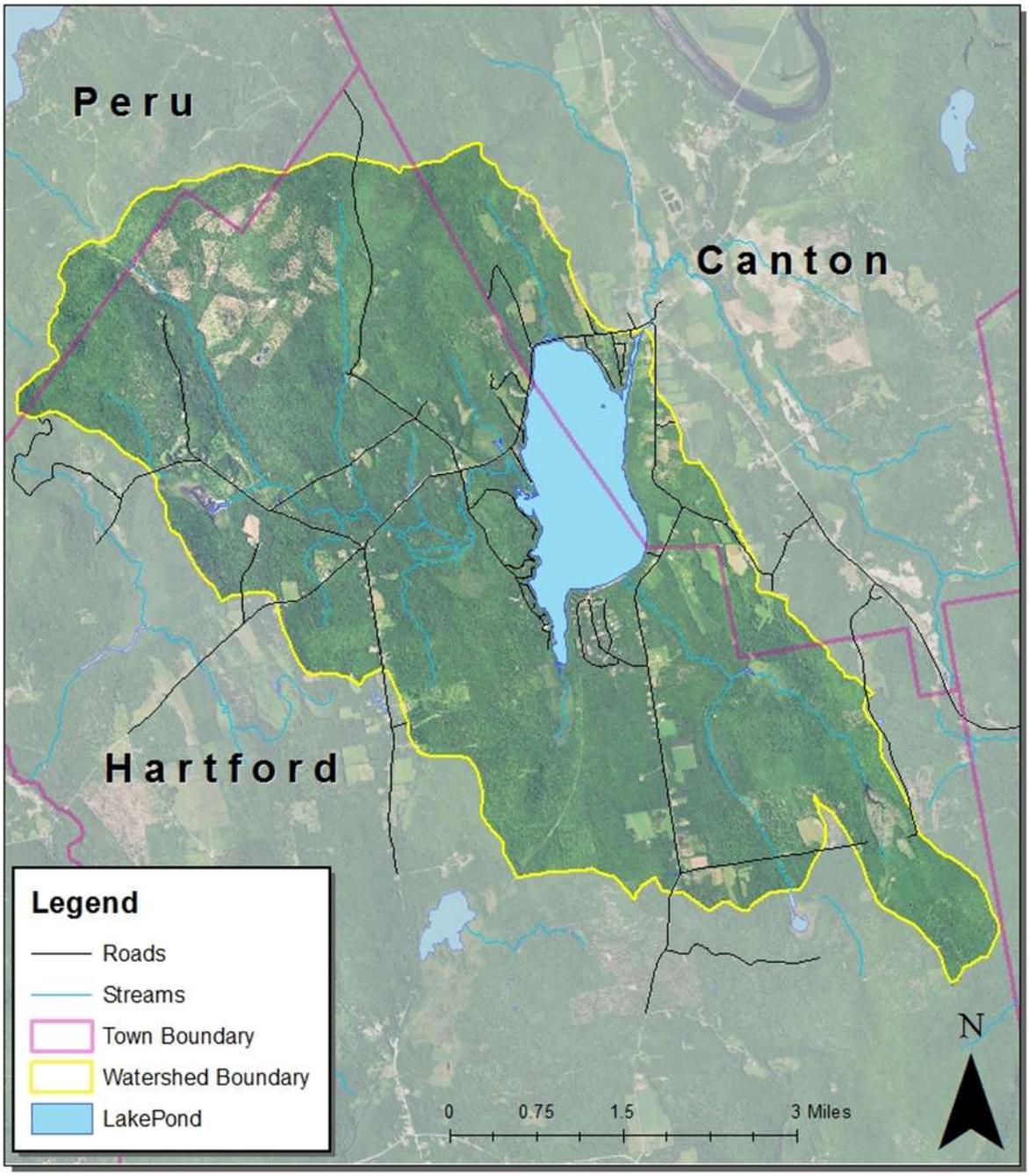
WHAT IS BEING DONE TO PROTECT THE LAKE FROM POLLUTED RUNOFF?

- The steering committee for the Lake Anasagunticook Watershed Survey formed in order to identify soil erosion issues in the watershed, raise funds to conduct a survey, and begin educating users of the lake how to protect it now and for future generations. Volunteer watershed surveys have been found to be one of the most effective ways to protect lake water quality by getting citizens involved in identifying existing and potential sources of polluted runoff.
- It is the hope of the steering committee that through the survey and the creation of the watershed plan, the local community will find the social and financial resources it needs to prevent the degradation of Lake Anasagunticook. The survey is the foundation of an overall watershed plan, which is needed in order to apply for federal funding to remedy some of the issues identified during the survey. Already, the community has secured municipal and private support. Both the financial and community support will need to grow in order for the plan to be put into action.

LAKE ANASAGUNTICOOK WATERSHED

For the purposes of this report, "the watershed" refers to the network of streams, ditches, and land that flow to Lake Anasagunticook (Figure 1). The direct watershed incorporates 13.5 square miles, the majority of which lies in Hartford with significant development in both Canton and Hartford. Sparrow Brook, Thompson Brook, and several unnamed tributaries drain into Lake Anasagunticook. The entire watershed empties into the Androscoggin River through Whitney Brook. The lake surface covers 593 acres and has a perimeter of 6.8 miles. The average depth is 29 ft. and the maximum depth is 54 ft. There is one dam at the Northern outlet of the lake.

Figure 1: Lake Anasagunticook Watershed Map



PURPOSE OF THE WATERSHED SURVEY

The primary purpose of the watershed survey was to:

- Identify and prioritize existing sources of polluted runoff, particularly soil erosion sites, in the Lake Anasagunticook Watershed.
- Raise public awareness about the connection between land use and water quality, and the impact of soil erosion on Lake Anasagunticook.
- Inspire people to become active watershed stewards.
- Provide the basis to obtain additional funds to assist in fixing identified erosion sites.
- Make general recommendations to landowners for fixing erosion problems on their properties.
- Use the information gathered as one component of a long term lake protection strategy.

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. Watersheds are complex and interconnected. While it is important to be accountable for the problems that arise, there is no individual or single entity responsible for the water quality issues of Lake Anasagunticook. Rather it is the accumulation of all inputs, past and present, which are responsible for water quality degradation. It is the hope that through future projects, the steering committee can work together with landowners to solve erosion problems on their properties or help them learn how best to accomplish solutions on their own.
Local citizen participation was essential in completing the watershed survey and will be even more important in upcoming years. With the leadership of the LAA steering committee and assistance from agencies concerned with lake water quality, the opportunities for stewardship are limitless. The LAA steering committee 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!

THE SURVEY METHOD

A watershed survey gives an idea of soil erosion impacts at one point in time. Because the Lake Anasagunticook watershed is constantly changing, identified sites may be fixed before this report is released, and other erosion sites may appear that were not identified in the survey. It is in our interest to treat the survey results as unfinished: a continually updated list where newly identified sites are

added and entries for sites where problems have been addressed are amended.

The survey was conducted by volunteers with the assistance of trained technical staff from the DEP and hired independent consultants. In June 2019, 16 volunteers were instructed in survey techniques after which the volunteers and technical staff spent the remainder of that day documenting erosion on the roads, properties, driveways, and trails in their assigned sectors using cameras, GPS units and standardized forms. The teams worked together, with some follow-up, to complete all designated sectors, putting in more than 175 combined hours.

If soil erosion reaches a stream or ditch that connects with the lake, it is considered a problem site. The distance to the lake does not make a difference. The attached or dissolved phosphorus can eventually reach the lake. According to DEP, the same holds true for erosion that enters wetlands.

Volunteers rated the overall impact of each site using the rating system shown below (Figure 2). Project staff attempted to minimize variance in ratings by carefully reviewing surveyor notes and photos. Follow-up site visits were also conducted for sites where the documentation was insufficient.

Figure 2: Method of Assigning Impact

Circle one choice in each column, add the three selected numbers together, and then circle the site's corresponding impact rating (high, medium, or low).

Type of Erosion	Area	Buffers and Other Filters	IMPACT
Gully - **3**	Large - **3**	No filter, all channelized direct flow into lake or stream – **3**	High: 8-9 pts
Rill - **2**	Medium - **2**	Some buffer or filtering, but visible signs of concentrated flow and/or sediment movement through buffer and into lake - **2**	Med: 6-7 pts
Sheet - **1**	Small - **1**	Significant buffer or filtering* - **1**	Low: 3-5 pts

* Confirm there is likely sediment/runoff delivery. If not, do not write up as a site.

The shoreline development on Lake Anasagunticook is similar to that of the many lakes that have conducted watershed surveys in Maine. However, the Lake Anasagunticook watershed is unique in other ways. There is limited commercial development within the watershed and the lake is used as the drinking water source for the Town of Canton.

The collected data was entered into a computer database to create a spreadsheet, and the documented erosion sites were plotted on maps. The sites were broken out into categories (such as public roads, private roads and private residences) and ranked based on their impact on the lake, the technical ability needed to fix the problem, and the estimated cost of fixing the problem. Recommended fixes for the identified problems were also included.

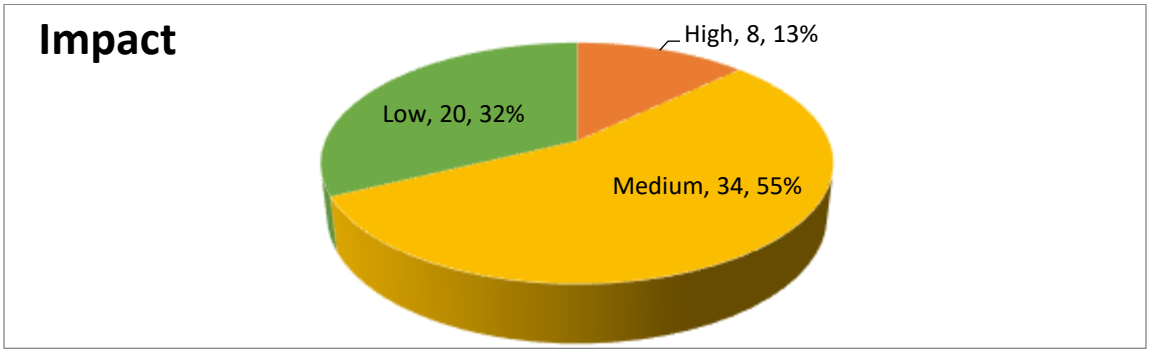
A description of sites and associated rankings are discussed in the next section of this report. Maps

of the erosion sites are located in Appendix A, and a spreadsheet with data from the documented sites is located in Appendix B. Contact the Lake Anasagunticook Association for additional site information.

SUMMARY OF WATERSHED SURVEY FINDINGS

The watershed survey documented 62 problem sites. As previously stated, each site was rated high, medium or low impact based on the type of erosion, the size of the area eroded, and the type of buffering or filtering that the erosion underwent before entering a stream, ditch, or the lake. Of these, 20 sites were rated as low impact, 34 sites as medium impact and 8 as high impact (Figure 3). Overall, 68% of the sites found were rated high or medium impact.

Figure 3: Impact Rating by Number and Percent



LAND USE FINDINGS

While documenting erosion sites, surveyors were also asked to select land use categories associated with each site. The categories of sites identified in the survey included: Town Roads, Residential, Private Roads, State Roads, Beach/Boat Landing and Municipal/Paths. Undeveloped shoreline was linked to a residential property and classified as such. For the purposes of analysis, driveways were included in the total number of residential sites. Each of these categories will be explained in more detail in the subsequent land use sections.

Table 1: Land Use by Impact Rating

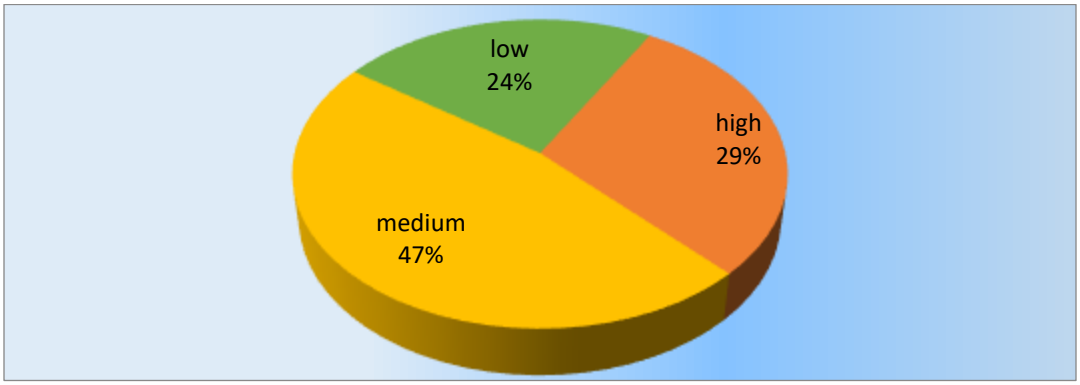
	High	Medium	Low	Total	% of Total
Town Roads	5	8	4	17	**27%**
Residential	1	8	8	17	**27%**
Private Roads	1	5	3	9	**15%**
State Roads	1	7	0	8	**11%**
Beach/Boat Access	1	3	3	7	**11%**
Municipal/Paths	0	2	2	4	**6%**
Total	9	33	20	62	

Although all sites are important in the overall picture of a healthy watershed, Town Roads contributed the most High and Medium Impact sites.

TOWN ROADS

Surveyors identified a total of 17 Town Road sites. The majority of these sites were location in Hartford on Darington Road, Goding Road, and Bryant Drive and near brooks and bridges. In Canton, Bonney Farm Road and Lindley Road had sites identified.

Figure 4 Impact as a Percentage of Total Town Road Sites



This **high** impact town road site has gully erosion, a steep slope and sand flowing directly into the stream. Suggested remediation includes enlarging and lengthening the culvert and cleaning out plunge pool; installing turnouts for ditches; diversion or curb at the culvert and removing grader/plow berms. Paving is scheduled for spring which may help.

This **low** impact town road site had rill surface erosion and rill road shoulder erosion on a moderate slope. Suggested remediation is to armor the inlet/outlet of the culvert and armor ditch with stone.

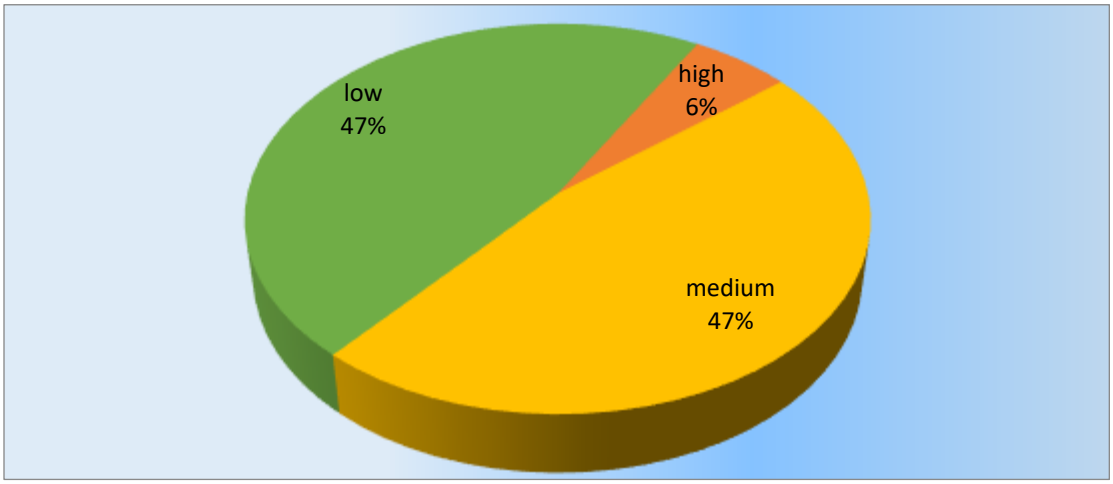
The suggestions for improvements to roads include:

- Repair, replace, armor, and otherwise improve upon culverts.
- Add plunge pools, sediment pools, and catch basins where appropriate.
- Remove grader berms on edges of roads.
- Build up roads and add new surface material.
- Armor ditches with stone.
- Reshape roads and tilt away from waterbodies.
- Remove sand or install diverters to prevent sand from entering water.
- Stabilize road shoulders with compacted gravel or vegetate where possible.
- Employ Maine DEP certified contractors for road work.
- Utilize Maine DEP's guidance documents for forming road associations and road maintenance[5].

RESIDENTIAL

Residential sites (17) include any erosion that occurred on a residential property, including foot paths, driveways, roof runoff, ditches, shoreline erosion, and any other bare soil areas that delivered soil to a surface water body. The majority of residential sites were medium or low impact.

Figure 5: Impact as a Percentage of Total Residential Sites



This **high** impact residential site has gully ditch erosion and bare soil on a moderate slope and flows directly into the lake.

This **low** impact residential site has sheet surface erosion, exposed roots, a steep slope, and flows directly into lake

Suggestions for improvements for residential sites included:

- Establish a vegetative buffer to protect shoreline or other residential areas.
- Add Erosion Control Mix (ECM)[5] to flat bare areas where vegetation does not grow easily.
- Better define or limit footpaths, access to water, and parking areas.
- Line ditches with stone.
- Install drywells at gutter downspouts and infiltration trenches at roof drip line.
- Limit raking of vegetated areas to allow plants and natural duff layer to protect soil.
- Discontinue use of multiple boat or beach access points.
- Properly size, repair and replace culverts.
- Stabilize foot paths
- Install runoff diverters (waterbars) on paths

PRIVATE ROADS

[5] List of ECM suppliers: http://www.maine.gov/dep/land/training/suppliers_mix.pdf ECM fact sheet: http://www.pwd.org/pdf/water_resources/conservation%20fact%20sheets/erosion_control_mix.pdf

Private Roads have many of the same issues as Town Roads though citizens are responsible for maintaining the roads; most are not paved. Nine private road sites were identified in the survey, one high impact, 5 medium, and 3 low impact.

This **high** impact private road has sheet surface erosion, sheet erosion in a ditch, bare soil, and a steep slope directly to the lake

This **low** impact private road has sheet and rill surface erosion and stream flow into the lake

The suggestions for improvements to roads include:

- Repair, replace, armor, and otherwise improve upon culverts.
- Add plunge pools, sediment pools, and catch basins where appropriate.
- Remove grader berms on edges of roads.
- Build up roads and add new surface material where needed
- Armor ditches with stone.
- Reshape roads and tilt away from lake.
- Remove sand from roads near bridge or install diverters to prevent sand from entering water.
- Stabilize road shoulder with compacted gravel or vegetate where possible.
- Have CEO, Civil Engineer or Maine certified contractor oversee the work.

STATE ROADS

State roads have similar issues as other roads already mentioned. Eight state road sites were identified in the survey – one high impact and seven medium impact.

This **high** impact state road has a clogged culvert with an unstable inlet/outlet with a moderate slope and flows to the lake via a stream

This **medium** impact state road has rill surface erosion; rill road shoulder erosion, a flat slope, and flows to the lake via a stream

Remediation for State Roads includes:

- Armor inlet/outlet
- Remove clog in culvert
- Vegetate shoulder of road
- Armor ditch with stone
- Remove debris/sediment
- Other options listed in previous road sections

BEACH/BOAT ACCESS

Canton has a large private beach and a public beach area known as the “road shore” and a public boat launch, both on the Canton section of the lake. With extensive traffic, both people and cars, these locations require vigilance. Seven beach/boat access sites were identified, one of which was high impact and three each that were medium and low impact.

This **high** impact beach/ road shore site has rill and gully surface erosion, rill and gully road shoulder erosion, bare soil, a delta in the lake/stream, winter sand , a lack of shoreline vegetation and a moderate slope with flow directly into the lake

This **low** impact beach/ road shore has sheet surface erosion, bare soil, flat slope, and flows directly into lake

Remediation for Beaches/Boat Landings includes:

- Add gravel, recycled asphalt, or mulch
- Add rubber razor diverters
- Armor inlet/outlet
- Berm/infiltration needed
- Pave
- Vegetate shoulder; use vegetation to establish buffer
- Other remedial actions are recommended for specific circumstances

MUNICIPAL/PATHS

The Canton Water district, a quasi-municipal entity, owns water frontage on the lake and accesses water to be treated for town water customers. There is a former railroad bed used as walking path as well as access to individual lakefront lots. Four municipal/path sites were identified, including two medium and two low impact sites.

This low impact path has sheet surface erosion, inadequate shoreline vegetation, a steep slope, and flow runs directly into the lake

This low impact municipal property has sheet erosion, bare soil, unstable access to shoreline, and a moderate slope that flows directly into the lake

Remediation for paths/municipal sites includes:

- ❖ Create berm on the lake side
- ❖ Use mulch/erosion control mix on slopes and surfaces
- ❖ Stabilize footpath
- ❖ Install runoff diverter (waterbar)
- ❖ Use mulch/erosion control mix to stabilize soil

WHERE DO WE GO FROM HERE?

The Lake Anasagunticook Steering Committee intends to utilize the information from the survey report in creating a watershed plan to be approved by the Maine DEP. This initial plan will include action steps towards:

- Organizing a continuous group effort for watershed protection and plan implementation.
- Fundraising for remediation projects.
- Applying for Federal 319 grant funding under the Clean Water Act to help carry out the plan.
- Continuous monitoring and updating of a database of survey sites.
- Expanding outreach and education efforts.

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CONSERVATION PRACTICES FOR HOMEOWNERS

After reading this report, you probably have a general idea about how to make your property more lake-friendly. However, making the leap from concept to construction may be a challenge.

The Maine DEP and Portland Water District produced a series of 24 fact sheets that answer many common how-to questions. The fact sheets profile common conservation practices that homeowners can use to protect water quality and include detailed instructions, diagrams and color photos about installation and maintenance. The series includes the following:

Construction BMPs
Dripline Trench
Drywells
Erosion Control Mix
Infiltration Trench
Open-Top Culverts
Paths and Walkways
Permitting
Rain Gardens
Rubber Razors
Shoreline Stabilization
Turnouts

Infiltration Steps (2) Rain Barrels Waterbars

The series also includes six native plant lists. Each one is tailored to different site conditions (e.g., full sun and dry soils). The lists include plant descriptions and color photos of each plant to make plant selection easier.

Fact sheets are available to help you install conservation practices on your property. Download at http://www.maine.gov/dep/land/watershed/materials.html

PERMITTING BASICS

Protection of Maine's watersheds is ensured through the goodwill of lake residents and through laws and ordinances created and enforced by the State of Maine and local municipalities. The following laws and ordinances require permits for activities adjacent to wetlands and waterbodies.

Shoreland Zoning Law—Construction, clearing of vegetation and soil movement within 250 feet of lakes, lakes, and many wetlands, and within 75 feet of most streams, falls under the Shoreland Zoning Act, which is administered by the Town through the Code Enforcement Officer and the Planning Board.

Natural Resources Protection Act (NRPA) - Soil disturbance & other activities within 75 feet of the lakeshore or stream also falls under the NRPA, which is administered by the DEP.

Contact the DEP and Town Code Enforcement Officer if you have any plans to construct, expand or relocate a structure, clear vegetation, create a new path or driveway, stabilize a shoreline or otherwise disturb the soil on your property. Even if projects are planned with the intent of enhancing the environment, contact the DEP and town to be sure rules are properly followed.

How to apply for a Permit by Rule with DEP:

To ensure that permits for small projects are processed swiftly, the DEP has a streamlined permit process called **Permit by Rule**. These one page forms (shown here) are simple to fill out and allow the DEP to quickly review the project.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

NRPA PERMIT BY RULE NOTIFICATION FORM

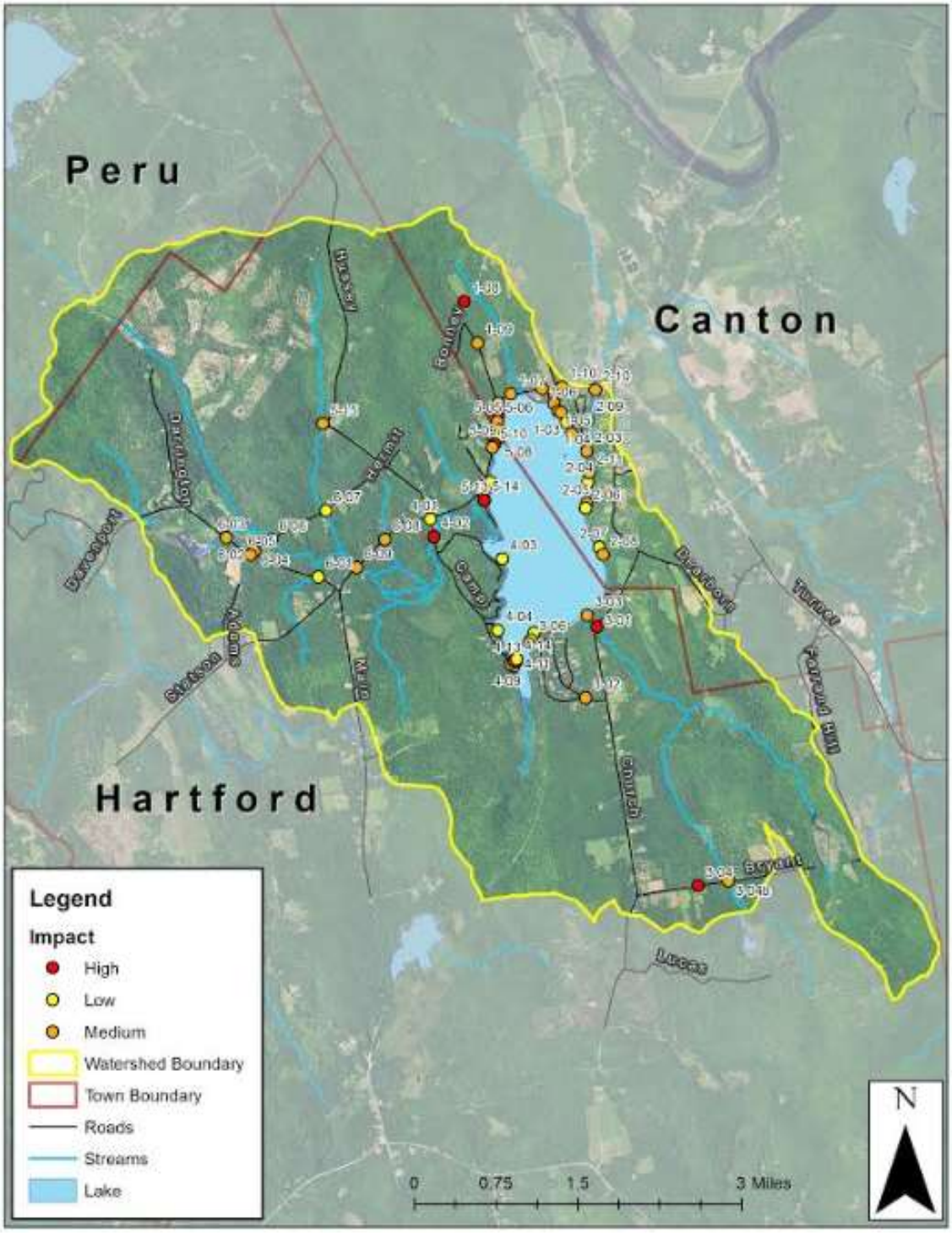
- Fill out a notification form and submit fee and any required materials before starting any work. Forms are available from your town code enforcement officer, Maine DEP offices, or online at www.maine.gov/dep/land/nrpa/pbrform.pdf

- The permit will be reviewed by DEP within 14 days. If you do not hear from DEP in 14 days, you can assume your permit is approved and you can proceed with work on the project.

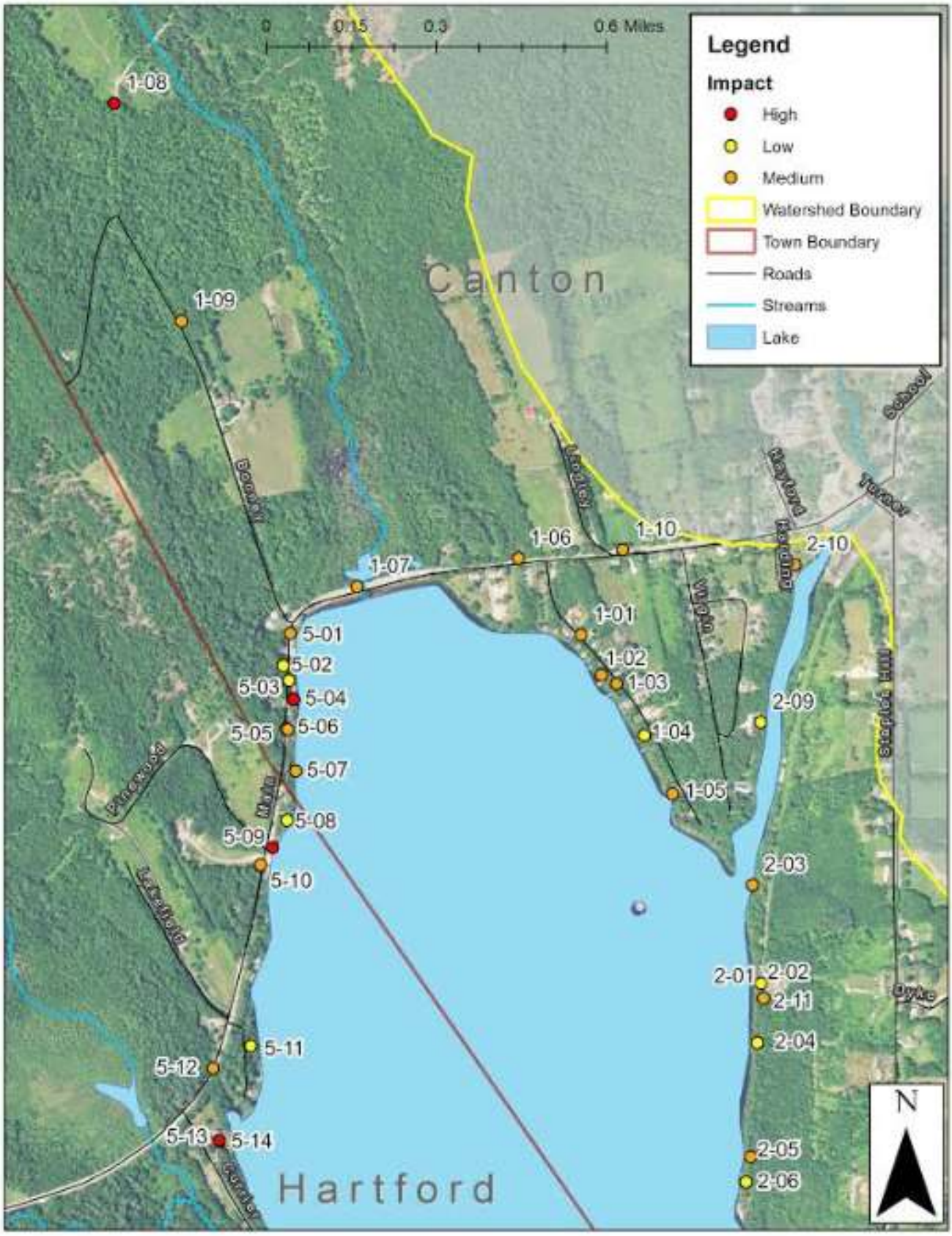
- Follow all standards required for the specific permitted activities to keep soil erosion to a minimum. It is important that you obtain a copy of the standards so you will be familiar with the law's requirements.

APPENDIX A –SECTOR MAPS & IMPACT SITE MAPS

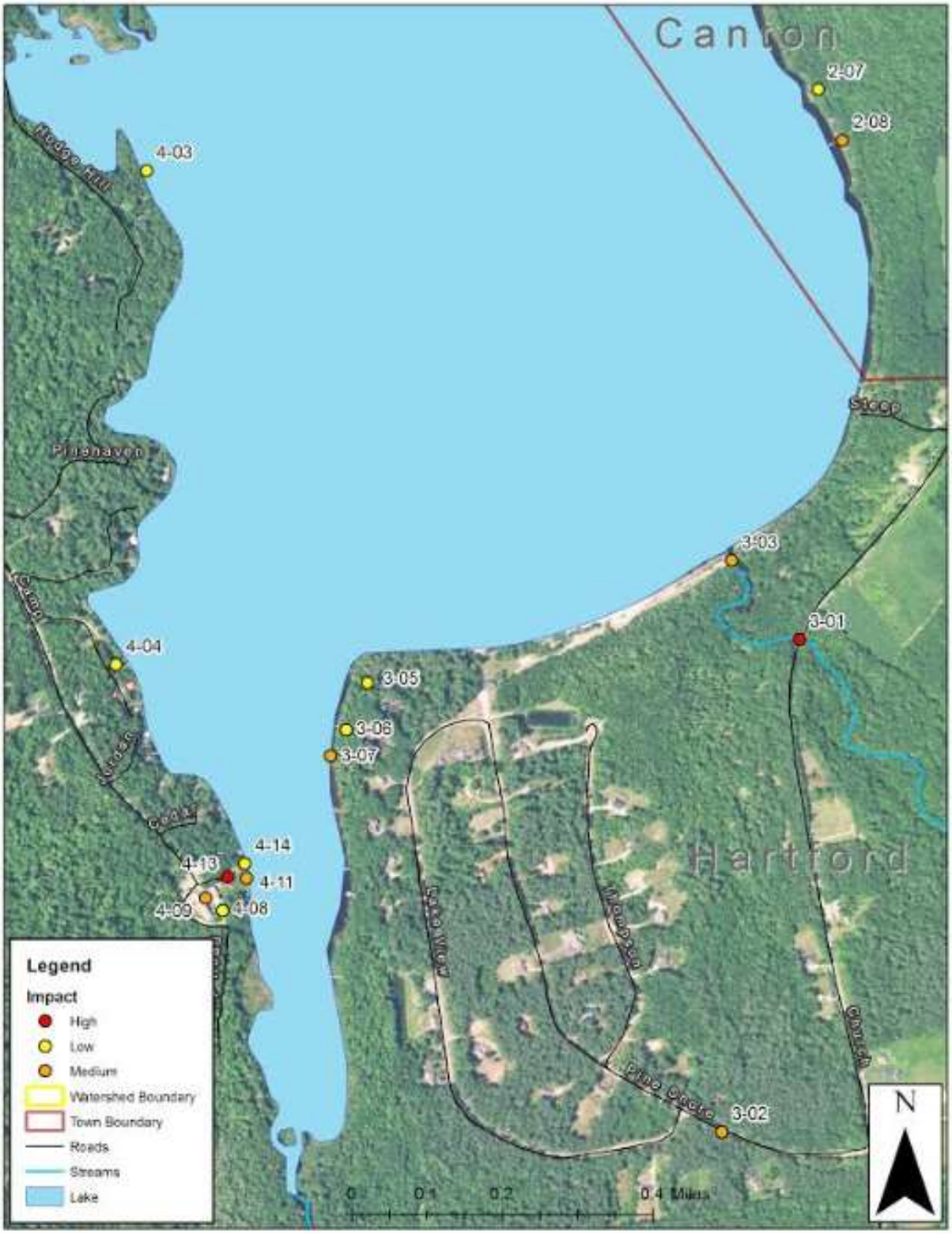
APPENDIX A –IMPACT SITE MAPS



Lake Anasagunticook Impact Sites – North End



Lake Anasagunticook Impact Sites East/South



APPENDIX B–SURVEY DATA – More detailed files available from LAA

HIGH IMPACT SITES – Sorted by Sector

Sec	Surv.	Land Use	Type of Problem	Tax Map & Lot	Recommendations	Impact	Cost
1	08	Town Road/Gravel	Rill surface erosion; Culvert too short with unstable inlet & outlet; rill erosion in the ditch; steep slope; stream flow to lake	R3-0004	Lengthen the culvert; armor with stone the ditch; add new surface material and reshape (crown) road	High	High
3	01	Town Road/paved	undersized culvert (?not stream smart?); gully erosion of road shoulder; roadside		Enlarge and lengthen culvert and clean out plunge pool; install turnouts for ditches; Diversion or curb at	High	High
3	04	Town Road (paved road)	Sheet Surface Erosion; Bare soil; Roof runoff erosion; Moderate slope; Flows by	R11-001, 002, 003	Add new gravel surface material; reshape (crown)	High	High
4	02	Town Road (paved)	Sheet and gully road shoulder erosion; winter sand soil; steep slope; flow via	U02-002	Remove debris/sediment from ditch; use riprap on bridge	High	Medium
4	13	Private Road (gravel)	Sheet surface erosion/ Sheet erosion in Ditch; Bare soil; Roof runoff erosion;	U04-017	Install Culverts; Install sediment pools in ditch; Install catch basin on roads/driveways	High	High
5	04	Residential	Gully ditch erosion; bare soil; moderate slope; Flow directly into lake	U04-04.02	Install plunge pool in culvert; vegetate, armor with stone, and reshape ditch; use vegetation to establish buffer and reseed bare soil and thinning grass	High	Medium
5	09	Beach Access/ Boat Access (gravel)	Rill and gully surface erosion; rill and gully road shoulder erosion; bare, delta in lake/stream, and winter sand soil; lack of	U01-18	Berm/infiltration needed; pave; vegetate shoulder; use vegetation to establish buffer	High	High
5	14	State Road	Unstable inlet/outlet and clogged culvert; moderate slope; flow via stream	Pole #110 on Main Street	Armor inlet/outlet and remove clog in culvert; vegetate shoulder of road	High	High
6	02	Town Road	Gully surface erosion; unstable inlet/outlet culvert; gully road shoulder erosion; steep slope; flow via stream	Pole #21 on Darington Road	Armor inlet/outlet of culvert; reshape crown of road; redirect flow leading to stream	High	Medium

MEDIUM IMPACT SITES – By Sector

Sec	Surv.	Land Use	Type of Problem	Tax Map & Lot	Recommendations	Impact	Cost
1	01	Private Road/Gravel	Rill surface Erosion; Unstable outlet and clogged Culvert; bank undercutting in channel to the lake; moderate slope; stream?	between U3-46 & U3-47	Remove clog in culvert, armor channel and banks; build up and reshape (crown) road	Medium	Low
1	02	Residential	Rill surface erosion; Roof Runoff erosion; minimal vegetation; moderate slope	U3-44	Extend board into trees; dry well @ downspout in front; speed bum @ top of driveway; install runoff diverters; rain garden; add to buffer	Medium	Low
1	03	Residential	sheet & rill surgace erosion; bare soil; moderate slope	U3-42	Installing rubber razor to divert water off road and add mulch or erosion control mix	Medium	Low
1	05	Residential	Rill surface erosion on the beach; flat surface	U3-36	Install infiltration trench above the buffer to the beach	Medium	Low
1	06	State Road/Paved	Rill road shouild erosion; winter sand collection; moderate slope; stream flow to the lake	U4-14	Install turnouts to the ditch; reshape shoulder	Medium	Medium
1	07	State road/paved	Sheet and rill road shoulder erosion; winter sand; flat surface	U4-14	Clean out the turnout @eastern edge of beach; remove winter sand; reshape shoulder	Medium	Medium
1	09	Town Road/gravel	Culvert too short with unstable inlet/outlet; sheet erosion in ditch on moderate slope; stream flow into the lake	R3-0001	Armor and stabilize inlet/outlet and lengthen culvert; armor ditch w/stone; add new surface material and reshape (crown) road	Medium	Medium
1	10	Town Road/gravel	Rill surface erosion; rill erosion of ditch; moderate slope; ditch flow into the lake	U5 and R3	Install cross culverts; armor and reshape ditch with stone; build up, add new surface material and reshape (crown) road	Medium	High

Sec	Surv.	Land Use	Type of Problem	Tax Map & Lot	Recommendations	Impact	Cost
2	01	Municipal/Public	Gully surface erosion; bare soil; erosion and unstable access to shoreline; winter lake access poin where road runoff is channeling to the lake; steep slope directly into the lake	U2-34	Create berm on the lake side; riprap the slope; install runoff diverter (waterbar)	Medium	Medium
2	03	Beach access	Gully surface erosion; bare soil; shoreline is undercut, erosion and unstable access; steep slope; flow running directly into the lake	U1-11	Riprap shoreline slope; narrow the path with vegetation	Medium	Low
2	05	Beach Access	Gully surface erosion; bare soil; erosion of and unstable access to the shoreline; steep slope and flow goes directly into the lake	U1-9._	Use erosion control mulch and barriers to divert and control erosion; install runoff diverter (waterbar)	Medium	Medium
2	08	Beach Access	Sheet surface erosion; bare soil; lack of shoreline vegetation and erosion of shoreline; steep slope; flows directly into the lake	R1-55	Create berm between mulch and water; use mulch/erosion control mix to stabilize soil	Medium	Medium
2	10	Residential	Rill surface erosion; inadequate shoreline vegetation and erosion of shoreline; moderate slope flows directly into the lake	U3-2	Install rain garden and add vegetation to buffer	Medium	Low
2	11	Private Road/gravel	Sheet surface erosion; undersized ditch; sheet erosion of road shoulder; bare soil; inadequate shoreline vegetation; flat surface; flows directly into lake	U2-34	Use rock mattresses to improve drainage; build up, add new gravel surface material and reshap (crown) road; Install catch basin or install detention basin; Add to the buffer on the shoulder on lake side	Medium	High
3	02	Town Road/paved	Undersized (short) culvert; rill and gully erosion of road shoulder; winter sand;	Pine Shore Dr., Hartford	Enlarge and lengthen culvert; armor dich with stone; install turnouts	Medium	Medium
3	03	Town Road/gravel to Beach Access	Delta in lake; winter sand	Town Beach Outlet of Thompson Brook, Hartford	Fix 3-1 (this is in the lake note going to the lake so not really a site? Jah)	Medium	High
3	07	Trail or path	Gully surface erosion; bare soil; inadequate shoreline vegetation; overly	U14-9	Stabilize foot path; install runoff diverter (waterbar); use mulch/erosion control mix to stabilize soil; add	Medium	Low
3	04b	Town Road	Crushed/Broken Culvert; flat surface	R06-032	Replace Culvert	Medium	Medium

Sec	Surv.	Land Use	Type of Problem	Tax Map & Lot	Recommendations	Impact	Cost
4	09 & 10	Private Road(gravel)/ Residential	Uncovered pile of soil (4-9); lack of shoreline vegetation (4-10); Flows directly into the lake; Moderate Slope	U04 - 21	Install ditch; Reshape (crown) (4-09); Install waterbar for runoff diverter (4-09); Establish buffer Vegetation (4-10	Medium	Medium
4	11 & 12	Private Road (gravel)/ Residential	Uncovered pile of soil; Shoreline undercut and lack of shoreline vegetation; Moderate slope; Flows directly into the lake	U04-18	Vegetate Shoulder; Establish buffer	Medium	Low
5	01	State Road (Rt 140 paved)	Unstable inlet/outlet and clogged culvert; rill ditch erosion; rill road shoulder erosion; bare and winter sand soil;	Just south of Bonney Road - Main Street	Remove clog, lengthen, and install plunge pool in culvert; vegetate ditch; vegetate shoulder of road	Medium	High
5	05	Driveway (gravel)	Gully surface erosion; bare soil; moderate slope; flow directly into lake	U04-04	Add recycled asphalt to driveway	Medium	Medium
5	06	Residential/ Burnt-out Lot	Rill surface erosion; bare soil; moderate slope; flow directly into lake	U04-05	Add recycled asphalt and install waterbar runoff diverter on driveway; reseed bare and thinning grass	Medium	Medium
5	07	Residential	Rill surface erosion; undersized ditch; steep slope; flow directly into lake	U04-07	Armor with stone and reshape ditch; reshape crown and install runoff diverts on driveway; reseed bare soil	Medium	Medium
5	10	Residential	Culvert not installed property; undersized ditch; bare and winter sand soil;	R12-13-002	Replace (deepen and angle) culvert; install turnouts and install ditch; install runoff diverters; use vegetation	Medium	Medium
5	12	State Road	Unstable inlet/outlet; gully ditch erosion; moderate slop; flow via stream	Pole #44 on Main Street	Armor inlet/outlet and install plunge pool in culvert	Medium	Medium
5	13	State Road	Sheet surface erosion; clogged culvert; winter sand soil; steep slope; flow via stream	Pole #110 on Main Street	Remove clog and enlarge culvert; vegetate shoulder of road; use vegetation to add to buffer	Medium	Medium
5	15	Private Road/Stream	Rill surface erosion; unstable inlet/outlet; rill road shoulder erosion; steep slope;	R14-009	Armor inlet/outlet of culvert; add gravel to surface and vegetate shoulder of road	Medium	Medium
6	03	Town Road	Unstable inlet/outlet culvert; gully road shoulder erosion; moderate slope; flow	Pole #21 on Darington Road	Armor inlet/outlet, enlarge, and lengthen culvert; remove debris/sediment	Medium	Medium
6	04	Town Road (gravel)	Rill road shoulder erosion; moderate slope; flow via stream	Goding Road NE of Darrington Rd	Armor ditch with stone and install turnouts	Medium	Medium
6	05	Town Road (gravel)	Unstable inlet/outlet culvert; gully road shoulder erosion; flat slope; flow via	Darrington Road SE of Goding Rd	Armor inlet/outlet, enlarge, and lengthen culvert; redirect flow	Medium	Medium
6	08	State Road (paved)	Rill surface erosion; rill road shoulder erosion; flat slope	Pole #68 on Main Street	Armor ditch with stone	Medium	Medium
6	09	State Road (paved)	Rill surface erosion; rill road shoulder erosion; flat slope; flow via stream	Pole #77 on Main Street	Armor ditch with stone and remove debris/sediment	Medium	Low