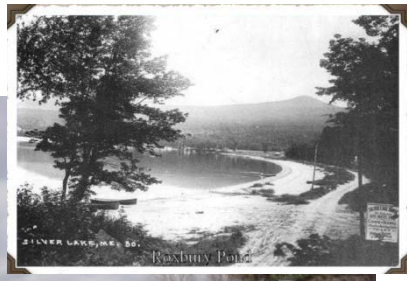
Ellis (Roxbury) Pond Watershed Survey Report



Photos Courtesy of Christine Swain, Laura Crossley, and the Penobscot Marine Museum

JANUARY 2015

ELLIS POND WATERSHED COMMITTEE

Report Prepared by Laura Crossley of the
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The following people and organizations were instrumental in the Ellis Pond 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 Ellis Pond Watershed. It provides the results and analysis of a watershed survey conducted during the summer and fall of 2014. In addition, the report includes basic information about how to protect lake water quality. Ellis Pond is also known as Roxbury Pond and Silver Lake, but it will be referred to as Ellis Pond in this report.

In response to long term water quality monitoring that indicated that the pond is vulnerable to a "nuisance algae bloom," there had been growing discussion among partners in the Ellis Pond watershed about the need for a survey. Then, in the fall of 2013, a localized algae bloom occurred. This bloom was intense, but brief. It occurred after the peak of summer activity, and therefore went unnoticed by many people who visited the lake earlier in the year. Samples of the bloom were tested and found to be a type of algae called *microcystis*, which is associated with poor water quality. The existing concerns about lake water quality and then the bloom served to propel a community led watershed survey to assess the soil erosion impacts at Ellis Pond.

Concerned partners formed a watershed survey committee to organize the survey and invited watershed residents to participate. The steering committee was fortunate to be supported by an engaged community that recognizes that Ellis Pond is central to the quality of life in its surrounding communities. This survey is one of many steps in protecting the lake for future generations. The committee was also privileged to have the involvement of several members of the "future generation" in the survey. Special thanks go out to the two Mountain Valley High School survey teams that participated in the survey and their teacher, Ken Baker.

THREATS TO LAKE WATER QUALITY

What puts water quality at risk? The biggest pollution culprit in Ellis Pond and other Maine lakes is **polluted runoff or nonpoint source (NPS) pollution.** Polluted runoff is found in storm water runoff from rain and snowmelt. During and after storms and snowmelt, streams and overland flow washes soil into lakes from the surrounding landscape. Nutrients, 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 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-leaved 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.

ELLIS POND WATER QUALITY

Since 1981, water quality data has been regularly collected on Ellis Pond.[1] Currently, there are two VLMP certified lake monitors, Christine and Ross Swain.[2] According to Scott Williams, Executive Director of the Maine Volunteer Lake Monitoring Program (VLMP) Ellis Pond's water quality is complex. The Maine Department of Environmental Protection (DEP) has previously stated that Ellis Pond's water quality is average for the state of Maine.[3] Yet, only two years after that summary, the pond experienced a brief, but intense algal bloom, an indicator that water quality may be changing or unstable.

NPS Priority Watersheds

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

A watershed must be listed by as a NPS Priority Watershed in order to be eligible to apply for 319 grant funding under the Clean Water Act.

Ellis Pond is on the 2014 NPS Priority Watersheds list.

Closer inspection of water quality shows that the Total Phosphorus (TP) in Ellis Pond ranges from 9 to 14 parts per billion (ppb), just under the 15 ppb threshold that is problematic for some ponds. The historical average water clarity for Ellis Pond is 4.1 meters (m), and the state average is between 5 m. and 5.5 m.[4] However, late summer dissolved oxygen loss in the deepest area of Ellis Pond, combined with the potential for periodic wind-mixing of the water column during the summer stratification period, creates a significant potential for phosphorus released from the bottom sediments to become available to algae growing near the surface. For these reasons and the algal bloom last fall, Ellis Pond has recently been placed on DEP's list of **Nonpoint Source Priority Watersheds**[5] as a "threatened lake"***.***

[1] Maine DEP, "Water Quality Summary: Ellis Pond (Roxbury Pond, Silver Lake), Byron". 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: Ellis Pond (Roxbury Pond, Silver Lake), Byron". 2011. Maine DEP, Augusta.
[4] VLMP, "Maine Lakes Report, 2012". 2013. Maine Volunteer Lake Monitoring Program, Auburn.
[5] For more information about the NPS Priority Watersheds list, please see the "Maine NPS Management Program Plan 2015-2019" found at http://www.maine.gov/dep/land/watershed/nps_priority_list/index.html

WHY SHOULD WE PROTECT THE LAKE FROM POLLUTED RUNOFF?

- The lake contains valuable habitat for fish, birds and other wildlife.
- Ellis Pond provides recreational opportunities to watershed residents and to visitors. 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![6] 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 pond encourage the growth of invasive plants and can cause algae blooms, all of which impact the habitat for fish and other lake species.

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

The steering committee for the Ellis Pond 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 Ellis Pond. 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.

ELLIS POND WATERSHED

For the purposes of this report, "the watershed" refers to the network of streams, ditches, and land that flow to Ellis Pond (Figure 1). The direct watershed incorporates 26.4 square miles, the majority of which lies in Byron. However, the majority of development in the watershed occurs in Roxbury. Beaver, York, and Phelps Brooks and Little Ellis Pond drain into Ellis Pond via Garland Brook. (Note that Little Ellis Pond's watershed was not included in this survey due to limited resources. A separate

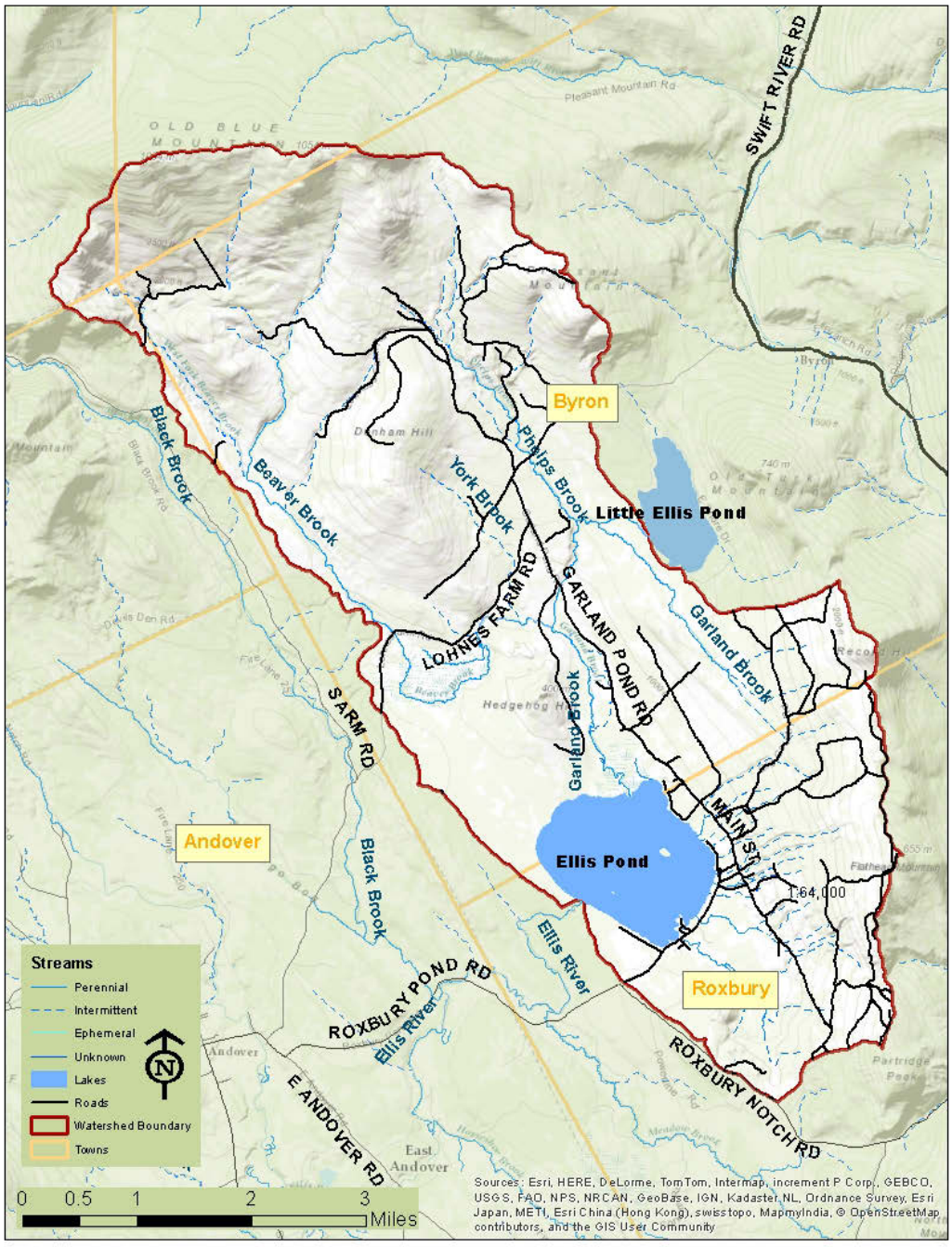
WATERSHED

All the land that surrounds a lake that drains or sheds its water into the lake through streams, ditches, directly over the ground surface or through ground water.

[6] Bouchard, Roy; Boyle, Kevin; Michael, Holly, "Water Quality Affects Property Prices: A Case Study of Selected Maine Lakes," 1996. University of Maine.

watershed survey could be conducted in the future to document additional erosion issues in this subwatershed.) The entire watershed empties into the Ellis River that flows through Andover. The lake surface covers 919 acres and has a perimeter of 5.6 miles. The average depth is 10 ft. and the maximum depth is 43 ft. There is one dam at the eastern outlet of the pond.

Figure 1: Ellis Pond Topographic 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 Ellis Pond Watershed.
- Raise public awareness about the connection between land use and water quality, and the impact of soil erosion on Ellis Pond.
- 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 Ellis Pond. Rather it is the accumulation of all inputs, past and present that 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 steering committee and assistance from agencies concerned with lake water quality, the opportunities for stewardship are limitless.

The 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. Land use in the Ellis Pond watershed is constantly changing. All sites that were fixed after or throughout the survey could not be captured here. There may be improvements to or degradation of the watershed that is not represented in the report. It will be up to future surveyors to incorporate those changes.

The survey was conducted by volunteers with the assistance of trained technical staff from the DEP and hired independent consultants. In May 2014, 30 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 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 throughout May, June and July to complete any unfinished sectors, putting in more than 400 combined hours. Technical staff also conducted follow-up examinations of sites in July and August 2014 to verify data accuracy. Although it was not originally planned as part of the project, a boat survey was also conducted in July to assess the condition of undeveloped shoreline areas.

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. Adjustments were made to ratings that clearly deviated from these general guidelines.

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.

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 Ellis Pond was similar to that of the many lakes that have conducted watershed surveys in Maine. However, the Ellis Pond watershed was relatively unique in other ways. There is an extensive network of recreational trails and logging activity in the watershed's forested areas. As such, teams surveyed recreational trails and some forested upland logging where unexplained erosion was found downstream. Furthermore, the undeveloped portion of the shoreline was surveyed by boat to assess shoreline erosion and potential impact of altered water levels.

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 recreational trails, 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.

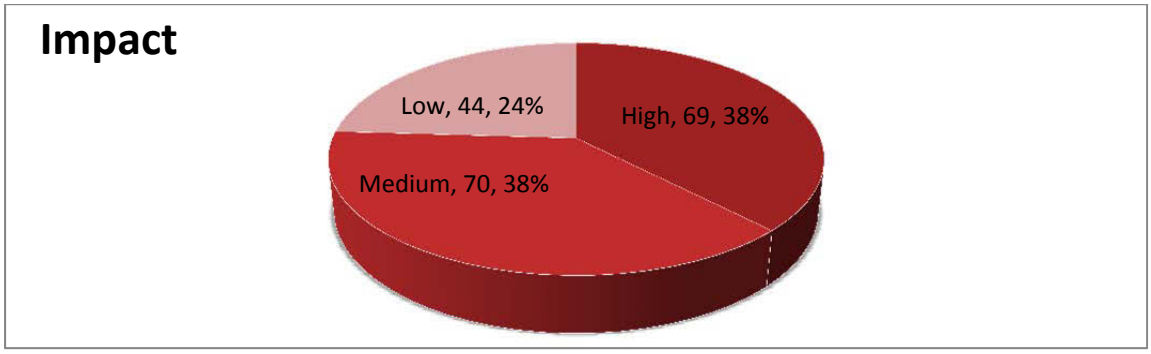
A description of sites and associated rankings are discussed in the next section of this report. Maps of the erosion sites are located in Appendix A, and a spreadsheet with data from the documented sites is located in Appendix B. Contact the Ellis Pond Watershed Committee for additional site information.

SUMMARY OF WATERSHED SURVEY FINDINGS

The watershed survey documented 183 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, 44 sites were rated as low impact, 70 sites as medium impact and 69 as high impact(Figure 3). Overall, 76% of the sites found were rated high or medium impact.

Despite the large number of problems, repair work had already started on several sites by the time the survey was completed and this report was written. Technical staff had time to review eleven sites along Main Street in Roxbury that had been repaired, either eliminating the issue or reducing the impact rating. The Main Street repair work had not been completed at the time of the review, which gave surveyors an opportunity to talk with the Town and give suggestions for further improvements. In addition to the road work, repairs on one of the recreational trails had taken place, but the work was not reviewed before this report was written.[7]

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. These categories included recreational trails, logging activity, public and private roads, driveways, residential, wind energy, commercial, public beach, boat access and undeveloped shoreline. For the purposes of analysis, driveways were included in the total number of residential sites. Public and private roads were also combined. Categories that resulted in less than five sites

[7] All sites that undergo repairs will need periodic review in order to continually assess their effectiveness and need for maintenance. The watershed survey is a snapshot of issues at a particular time. Just as things may change after this report is written to repair and reduce the impact of sites identified within this report, repairs are often not permanent and may become worse over time if not monitored.

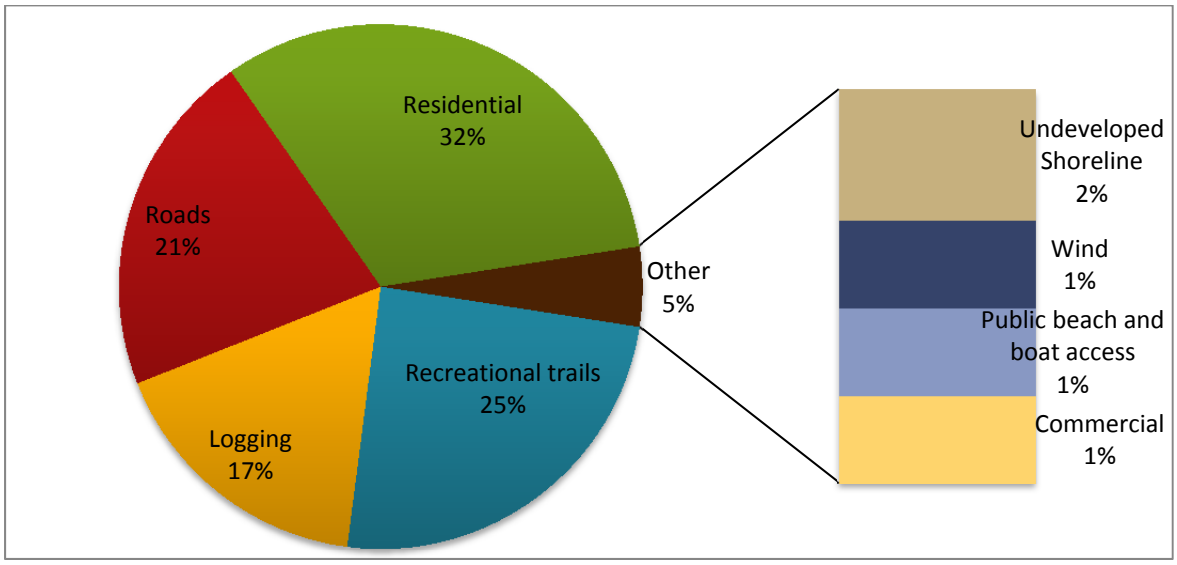
were combined into one category, called "Other". This category encompassed undeveloped shoreline sites, wind energy, public beach access, public boat access and commercial sites.

Table 1: Land Use by Impact Rating

	High	Medium	Low	Total
Residential	10	26	23	59
Recreational trails	22	19	4	45
Roads	15	14	10	39
Logging	18	10	3	31
Other	4	1	4	9

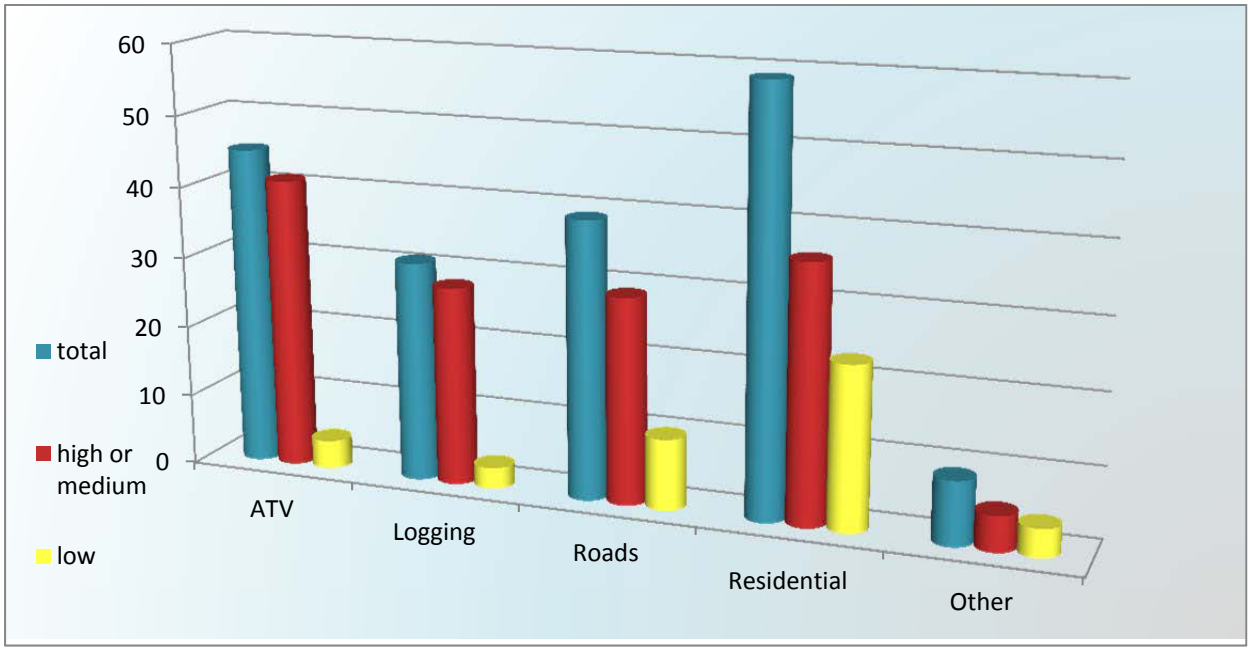
Residential sites accounted for the land use with the greatest number of sites (Table 1 and Figure 4). There were a total of 59 sites, which was 32% of all sites identified. Recreational trails followed with 25% (45), roads with 21% (39), and logging with 17% (31) of sites identified. Undeveloped shoreline, wind energy, beach access, boat access, and commercial categories combined for 5% of the total with nine total sites documented as having an impact. Each of these categories will be explained in more detail in the subsequent land use sections.

Figure 4: Percent of sites identified by land use category



Another way of looking at the data is to compare the number of the high, medium, or low sites for each land use category (Figure 5). Recreational trails contributed the most high and medium sites (41 total). Residential sites included 36 high and medium impact sites. Private and public road sites contributed 29 high and medium impact sites. Logging followed with the next greatest number of high and medium sites for a total of 28. Although all sites are important in the overall picture of a healthy watershed, these aforementioned land uses dwarf the number of high and medium impact sites documented as wind, erosion of the undeveloped shoreline, public beach or boat access, and commercial sites. These land uses had a combined total of five high and medium impact sites.

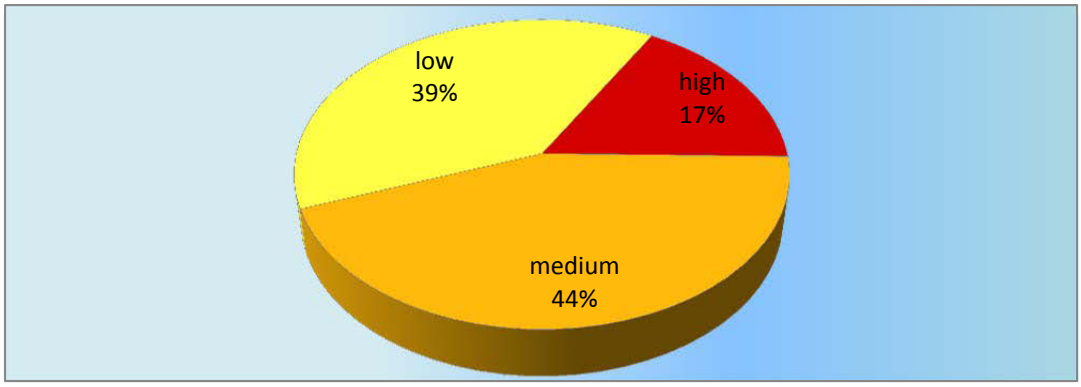
Figure 5: Impact ratings of each land use category



RESIDENTIAL

Residential sites (59) included 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. Just fewer than 20% of residential sites were rated as having high impacts on the lake.

Figure 6: Impact as a Percentage of Total Residential Sites



In some watersheds, driveways tend to be problematic. In the Ellis Pond watershed, driveways contributed to a small percentage of the overall residential impacts, with a total of nine sites. Two of the driveway sites were rated as high impact, four were medium impact, and three were low impact.

This **low** impact site was a small area of sheet erosion going directly into the lake. Surveyors noted that this would be an easy and low cost fix by adding some erosion control mix (ECM) to the bare area.

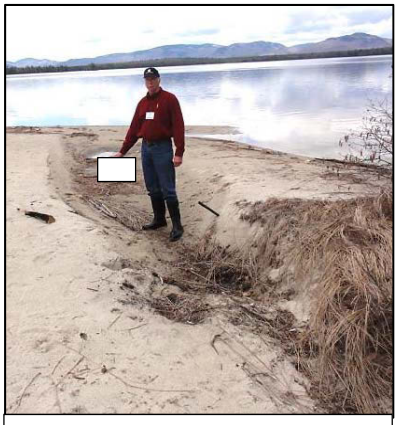
This **high** impact had piles of bare soil and an eroding ditch that leads to the pond. The ditch along the edge of the property needs to be armored with vegetation or stone and the soil piles in the back should be covered.

Suggestions for improvements for residential sites included:

- Establish a vegetative buffer to protect shoreline or other residential areas.
- Add Erosion Control Mix (ECM)[8] 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.
- Pave or add hard packing gravel to steep driveways.

At this **low** impact site, roof runoff spills on and around this path, sweeping soil into the lake. The issues could be fixed by installing a drywell at the gutter downspout and planting along the shoreline.

This **medium** impact driveway site had an unstable culvert under the driveway. There was a small area of rill erosion that connected directly with a ditch or stream. Eroded sediment has filled up the culvert.



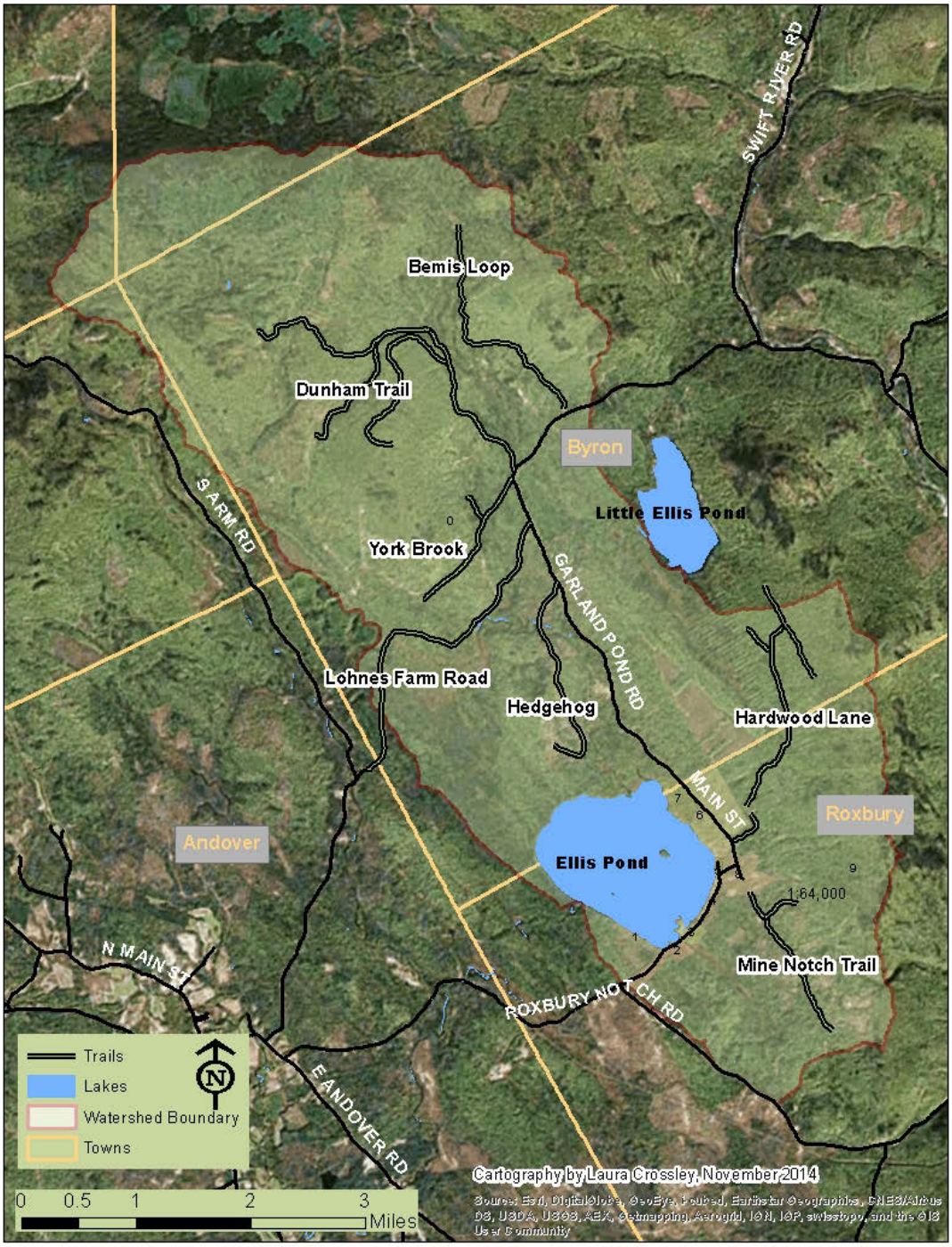
This **medium** impact site was the combination of two small areas of erosion. A culvert on the property had become clogged, which then backed up during high flows, eroding both above and below the culvert.

[8] 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

RECREATIONAL TRAILS

The recreational trail category includes trails used primarily for recreational (snowmobile, biking, hiking or ATV) traffic. These trails include Dunham Trail, Lohnes Farm Road, Hardwood Lane (the new ATV trail connecting Roxbury and Byron), and Mine Notch Trail (Figure 7).

Figure 7: Map of Trails



Overall, recreational trails contributed to the most high impact sites (22), the second most medium impact sites (19), and four low impact sites. Below, Figure 8 compares the percent total of sites for each trail, as well as the number of high, medium, and low impact sites identified on each trail. Figure 9 details the high, medium, or low impacts associated with each of the four main trails in the watershed. The greatest number of sites (16) was found on Hardwood Lane. However, the greatest number of high impact sites (9) was identified on Lohnes Farm Road. Hardwood and Mine Notch both included 6 medium impact sites each.

As previously stated, there has been repair work conducted under the supervision of Maine's Department of Agriculture, Conservation & Forestry's Off-Road Vehicle Program on the Mine Notch recreational trail that was not reviewed for this report. Following suggestions of surveyors to avoid some stream crossings, the Mine Notch trail has been partially rerouted. The old trail path and the new work should be reviewed to assess current impact. For the purpose of this report, discussion revolves around the data collected thus far.

Figure 8: Trails Compared by Percent of Impact

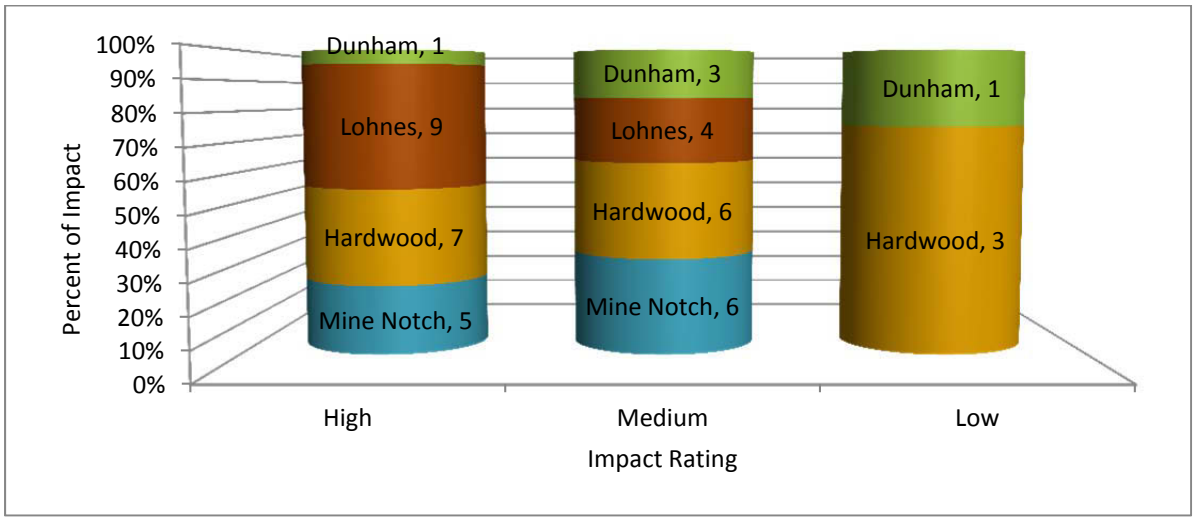


Figure 7: High, Medium or Low Impact Sites by Trail

Surveyors documented this as a **high** impact trail site where severe surface erosion of trail travels about 0.1 miles and flows directly into a stream.

This **high** impact trail site experienced moderate trail surface and shoulder erosion over a large length of the trail, going directly into the stream.

Suggestions for improvements to trails included the following:

- Repair, replace, armor, and otherwise improve upon culverts.
- Repair, replace, and armor bare soil along edges of bridges.
- Discontinue use of less used or unnecessary paths.
- Install water diverters and check dams.
- Resurface areas that erode easily.
- Install sediment pools and armor ditches (not streams) with stone.
- Crown or tilt road into woods and away from ditches and streams.
- Fix failed waterbars and turnouts.
- Consider trail relocation and re-vegetating eroded area.

This was a **high** impact site where ATVs cross through a stream. One suggestion was to block access and/or put signs up educating trail users about protecting water quality and directing them to use the nearby bridge crossing.

An unstable culvert and bridge on this **medium** impact trail were severely eroding into the stream. Surveyors suggested enlarging the culvert and armoring the inlet and outlet with stone for stability.

ROADS

Surveyors identified a total of 39 road sites. These sites included 5 private road sites and 34 town road sites. The private roads sites were located on West Shore Road, Meadow Brook Road, and Tent City Road. The town road sites included Garland Pond Road in Byron and Main Street, Medawisla Way, and Old County Road in Roxbury.

There were a total of 14 town road sites in Roxbury and 20 in Byron. The majority of high and medium impact road sites were found in Byron. Since Lohnes Farm Road was counted as a recreational trail, Garland Pond Road was the only town road in Byron with problem sites. There were nine high impact and 11 medium impact sites on Garland Pond Road.

Overall, the Town of Roxbury was responsible for six high, two medium, and six low impact sites. The majority of the sites documented on Roxbury roads were on Main Street. As previously mentioned, Roxbury completed extensive road work on Main Street during the summer of 2014 so this number would have been much higher if this work had not been done. Some of the remaining sites would have been previously rated as high impacts, but town repairs resulted in lower impact ratings. Note that some of the documented sites might have also been repaired after the survey was completed.

Figure 8: Roxbury and Byron Town Road Sites and Impact Ratings

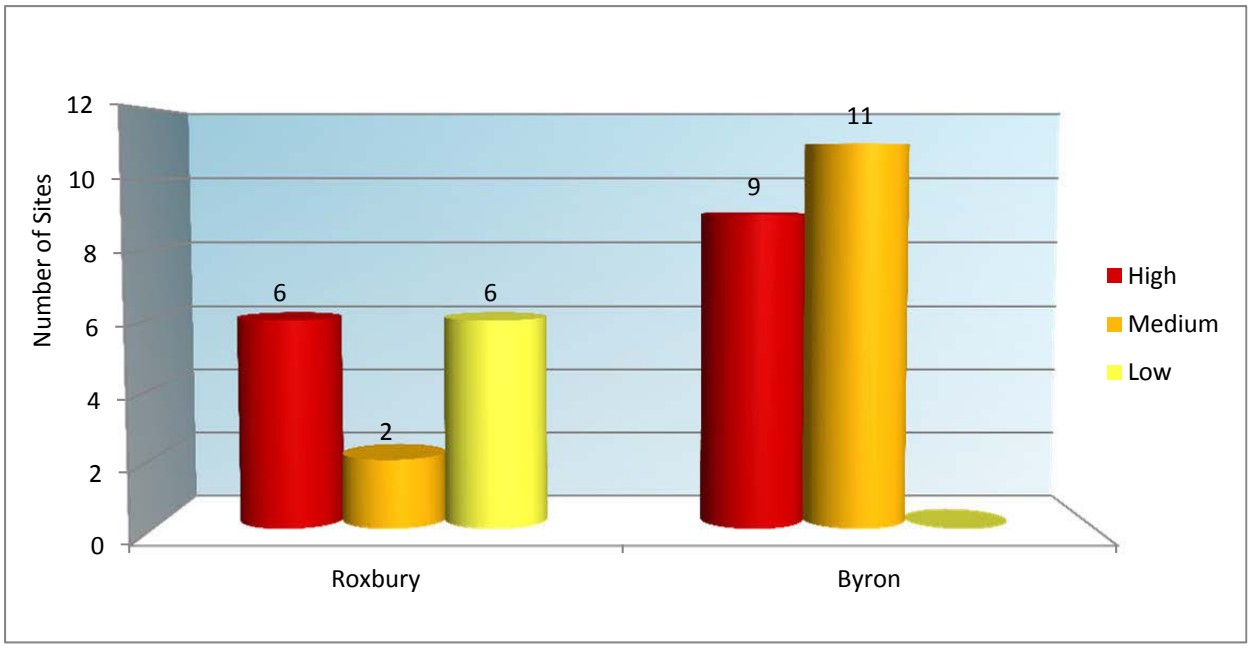
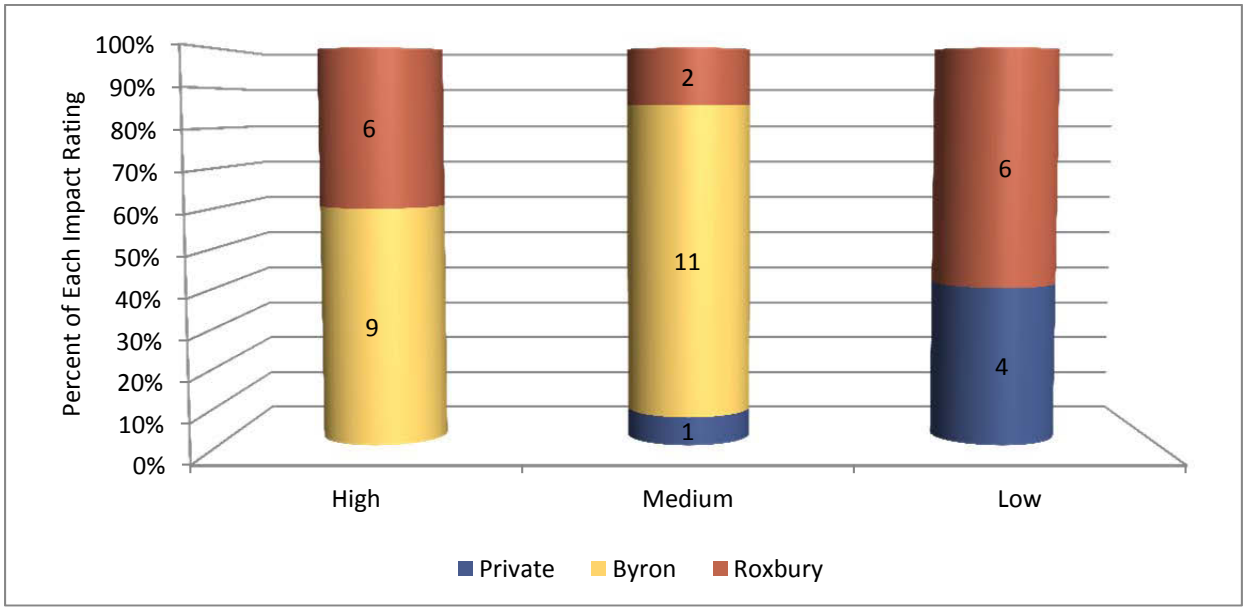
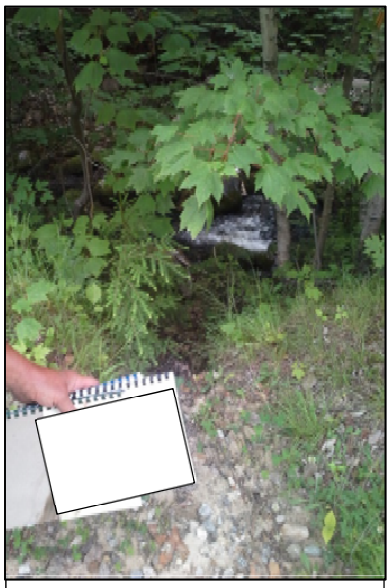


Figure 9: Percent Impact of Road Sites by Responsible Party





This **high** impact town road site deposits sediment directly into a stream. A grader berm at the edge of the road trapped runoff on the road, which then eroded the road.

This **low** impact private road site had an unstable culvert inlet/outlet and road material that had washed into the ditch. The eroded area, however, was small and appeared to have significant buffering before reaching the lake.

The suggestions for improvements to roads include:

- Repair, replace, armor, and otherwise improve upon culverts.
- Add plunge pools, sediment pools, catch basins where appropriate.
- Remove grader berms on edge of road.
- Build up road and add new surface material.
- Armor ditches with stone.
- Reshape road and tilt away from brook.
- Remove sand from road near bridge or install diverters to prevent sand from entering water.
- Stabilize road shoulder with compacted gravel or vegetate where possible.
- Employ Maine DEP certified contractors for road work.
- Utilize Maine DEP's guidance documents for forming road association and road maintenance.[9]

Before - This Roxbury town road site originally ranked as **high** impact with moderate road surface erosion, several road shoulder erosion and winter sand deposition into the stream.

After– Town road site after the road work was completed. As shown in the picture to the left, the road shoulder is still slightly unstable, rendering the site a **low** impact, rather than a no impact site. The new culvert is larger and its ends have been stabilized with stone.

[9] See sections on "Where Do I Get More Information?" and Conservation Practices for Home Owners.

LOGGING

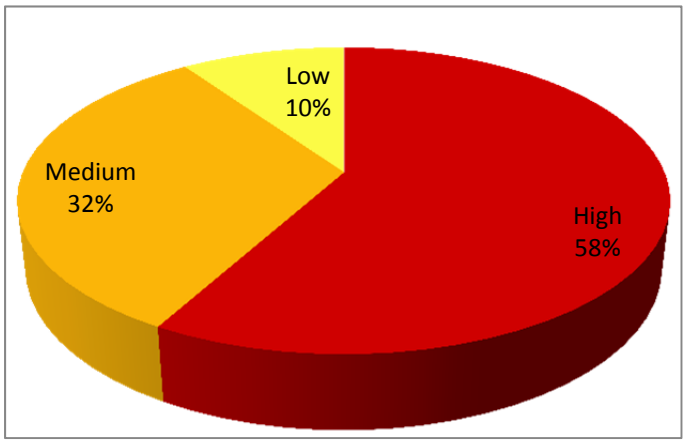
Logging sites include a survey of logging roads, landings, and a few skid trails. Based on the amount of logging that has occurred in the Ellis Pond watershed and the timeframe for this project, it was not feasible to review all of the logging areas and work that had been done over the past few decades. Instead, the surveyors focused on logging roads that were easily accessed and upland areas where evidence of sediment appeared to have travelled through culverts, streams and ditches downstream. When evidence was found of sediment moving downstream from a logging area, surveyors investigated further to look for sources of erosion.

A list of logging areas covered is noted below:

- Bemis Loop[10]
- Hedge Hog Road
- Mine Notch Road
- roads and skid trails off Lohnes Farm Road, Old County Road, and Mine Notch trail
- skid trail between Mine Notch Road and Record Hill Wind
- landing northwest of York Brook

There were a total of 31 logging sites identified. The majority of logging sites, 18 total or 58%, were rated as high impact (Figure 13). Most of these high impact logging sites were found on Mine Notch Road or skid trails of old logging areas. Out of all the logging roads reviewed, Mine Notch Road had the most high (7) and medium (5) impact sites found.

Figure 10: Logging impacts



This **high** impact site is one of several sites where culverts had been removed, but the banking had not been stabilized. The exposed areas next to the stream need to be lessened and stabilized with vegetation or stone.

[10] Bemis Loop Trail is also used as a recreational trail (as depicted in Figure 8), but the primary issues found related to logging activity.

The high impact skid trail sites were often the result of trails not being closed out properly. Streams had been affected by bridges or structures being left behind and partially blocking stream flow or by trails left without adequate drainage. In one case, an old trail crossing was not properly removed resulting in a blockage of the natural stream flow. This blockage caused the stream to reroute into the skid trail, severely eroding along the new route and depositing significant amounts of sediment into a forested wetland adjacent to a perennial stream. While this forested wetland functions as a buffer for the associated stream, its capacity has been significantly diminished and evidence of some sediment reaching the stream was noted.

Overall suggestions for logging sites include the following:

- Repair, replace, armor, and otherwise improve upon culverts.
- Properly size culverts and other stream crossing structures.
- Install sediment pools to capture eroded material.
- Vegetate ditches.
- Armor ditches with stone and install check dams.
- Install runoff diverters, waterbars, and turnouts.
- Adjust slope of road and/or add hard-packing surface material.
- Raise awareness of other erosion prevention techniques, such as the road "rock sandwich".
- Properly close out trails and roads.
- Seek advice from Maine DEP and Maine Forest Service to handle difficult or questionable areas where habitat resources may be of concern.
- Utilize Maine Forest Service's Best Management Practices for Forestry Handbook.

At the other end of the impact scale, this **low** impact site involved an unstable culvert crossing under the road and the beginning signs of bank failure in the ditch.

This **high** impact logging site was a large area that flowed under the access road via a culvert and then directly into a stream. This site was atypical of logging sites, in that there were not that many landings documented.

SITES IN OTHER CATEGORIES

The remaining nine sites were found in the land use categories undeveloped shoreline (3), wind energy (2), commercial (1), and beach and boat access (1). A brief overview of the shoreline and wind energy issues follows.

UNDEVELOPED SHORELINE

Watershed surveys do not generally take into account shoreline erosion in undeveloped areas, which is usually attributed to natural causes. However, in response to citizen concerns, project staff conducted a preliminary investigation and boat survey on July 2, 2014 to evaluate the extent and severity of shoreline erosion.

Three discrete areas within the undeveloped shoreline that extended several hundred feet each were noted as having severe shoreline erosion. These high impact shoreline sites were located along sandy, steep banks and were likely connected to the placement of a dam at the pond outlet. According to local residents, this erosion has been exacerbated by changes to the pond's outlet dam in recent years since the dam has created a year-round water level increase from its seasonally changing natural level. The impacts of water level changes most likely go beyond these three sites.

In addition to the localized erosion problems, there may also be associated impacts to residential areas. Raising the water level essentially moves lake water closer to all developed areas, which is most problematic for septic leach fields and may also contribute to added erosion problems of shoreline, lawns, access paths, driveways and structures. The cumulative effect of increasing the lake water level has the potential to have substantial negative effects on water quality over time. These potential phosphorus inputs to the lake are outside of the watershed survey domain, but may be recommended for further action in an overall watershed plan and future process to engage the community in the issue.

Several sections of the lake's undeveloped shoreline were severely eroding with undercut banks and destabilized trees. It was difficult to discern how much of this erosion was natural or related to human activity. However, lowering the dam would likely reduce the current water level and decrease the amount of time during the year that the banks are reached by wave action.

WIND ENERGY

The survey team found a total of two sites, one medium and one low impact, associated with the wind farm property. Overall, the access road conditions and wind tower pads were in good condition. Both problem sites related to the access road. Other erosion found at the wind project did not export sediment off site and/or did not connect with any streams. Surveyors found that the best management practices (BMPs) employed for stormwater mitigation were effectively controlling sediment transport from entering streams except in the two cases identified, which converged at the same culvert and appeared to be transporting a small amount of sediment. The wind power project is required to maintain and implement a stormwater management plan under the requirements of its DEP permit.

Issues at the wind towers were located on the short steep slopes next to the road. This **low** impact site had a steep embankment above the road that has had difficulty establishing vegetation.

WHERE DO WE GO FROM HERE?

The Ellis Pond 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 steer plan into action.
- 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 a database of survey sites.
- Expanding outreach and education efforts.

WHERE DO I GET MORE INFORMATION?

Contacts

Ellis (Roxbury) Pond Steering Committee
Jerry Cohen, jjcohen@roadrunner.com, 207-418-0427

Town of Roxbury
Tim Derouche, tnt20@roadrunner.com, 207-364-3982

Maine Department of Environmental Protection
312 Canco Road, Portland, ME 04103
Wendy Garland, wendy.garland@maine.gov, 207-615-2451

Volunteer Lakes Monitoring Program
24 Maple Hill Road, Auburn, ME 04210
Scott Williams, scott.williams@mainevlmp.org, 207-783-7733

CONSERVATION PRACTICES FOR HOMEOWNERS

After reading this report, you probably have a general idea about how to make your property more pond-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 Steps (2)
Infiltration Trench
Open-Top Culverts
Paths and Walkways
Permitting
Rain Barrels
Rain Gardens
Rubber Razors
Shoreline Stabilization
Turnouts
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.

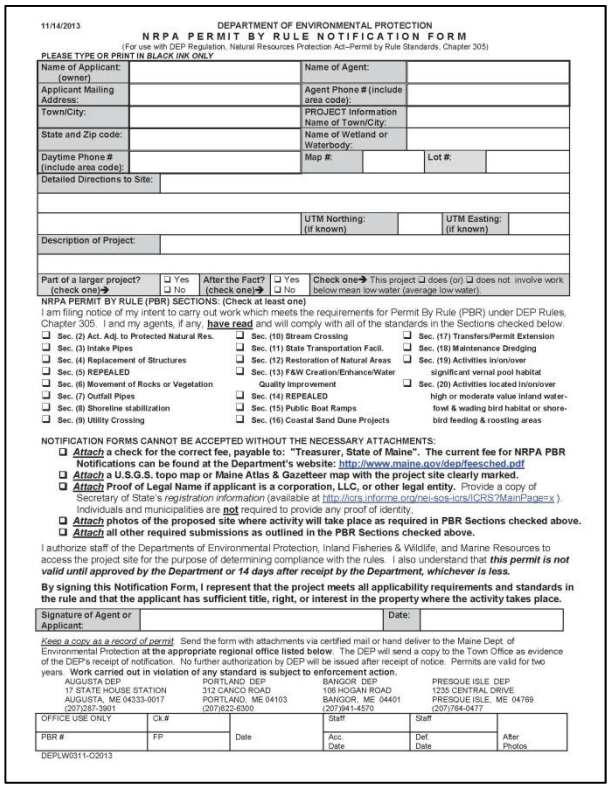
Shoreland Zoning Law—Construction, clearing of vegetation and soil movement within 250 feet of lakes, ponds, and many wetlands, and within 75 feet of most streams, falls under the Shoreland Zoning Act, which is administered by the Town through the Code Enforcement Officer and the Planning Board.

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.



11/14/2013

DEPARTMENT OF ENVIRONMENTAL PROTECTION

NRPA PERMIT BY RULE NOTIFICATION FORM

(For use with DEP Regulation, Natural Resources Protection Act–Permit by Rule Standards, Chapter 305)

PLEASE TYPE OR PRINT IN *BLACK INK ONLY*

Name of Applicant: (owner)		Name of Agent:	
Applicant Mailing Address:		Agent Phone # (include area code):	
Town/City:		PROJECT Information Name of Town/City:	
State and Zip code:		Name of Wetland or Waterbody:	
Daytime Phone # (include area code):		Map #:	Lot #:
Detailed Directions to Site:			
		UTM Northing: (if known)	UTM Easting: (if known)
Description of Project:			
Part of a larger project? (check one)→ ❑ Yes ❑ No	After the Fact? (check one)→ ❑ Yes ❑ No	Check one→ This project ❑ does (or) ❑ does not involve work below mean low water (average low water).	

NRPA PERMIT BY RULE (PBR) SECTIONS: (Check at least one)

I am filing notice of my intent to carry out work which meets the requirements for Permit By Rule (PBR) under DEP Rules, Chapter 305. I and my agents, if any, **have read** and will comply with all of the standards in the Sections checked below.

❑ Sec. (2) Act. Adj. to Protected Natural Res.
❑ Sec. (3) Intake Pipes
❑ Sec. (4) Replacement of Structures
❑ Sec. (5) REPEALED
❑ Sec. (6) Movement of Rocks or Vegetation
❑ Sec. (7) Outfall Pipes
❑ Sec. (8) Shoreline stabilization
❑ Sec. (9) Utility Crossing
❑ Sec. (10) Stream Crossing
❑ Sec. (11) State Transportation Facil.
❑ Sec. (12) Restoration of Natural Areas
❑ Sec. (13) F&W Creation/Enhance/Water Quality Improvement
❑ Sec. (14) REPEALED
❑ Sec. (15) Public Boat Ramps
❑ Sec. (16) Coastal Sand Dune Projects
❑ Sec. (17) Transfers/Permit Extension
❑ Sec. (18) Maintenance Dredging
❑ Sec. (19) Activities in/on/over significant vernal pool habitat
❑ Sec. (20) Activities located in/on/over high or moderate value inland waterfowl & wading bird habitat or shorebird feeding & roosting areas

NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:

❑ ***Attach*** **a check for the correct fee, payable to: "Treasurer, State of Maine". The current fee for NRPA PBR Notifications can be found at the Department's website: http://www.maine.gov/dep/feesched.pdf**
❑ ***Attach*** **a U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.**
❑ ***Attach*** **Proof of Legal Name if applicant is a corporation, LLC, or other legal entity.** Provide a copy of Secretary of State's *registration information* (available at http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x). Individuals and municipalities are **not** required to provide any proof of identity.
❑ ***Attach*** **photos of the proposed site where activity will take place as required in PBR Sections checked above.**
❑ ***Attach*** **all other required submissions as outlined in the PBR Sections checked above.**

I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules. I also understand that ***this permit is not valid until approved by the Department or 14 days after receipt by the Department, whichever is less.***

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in the rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant:		Date:	

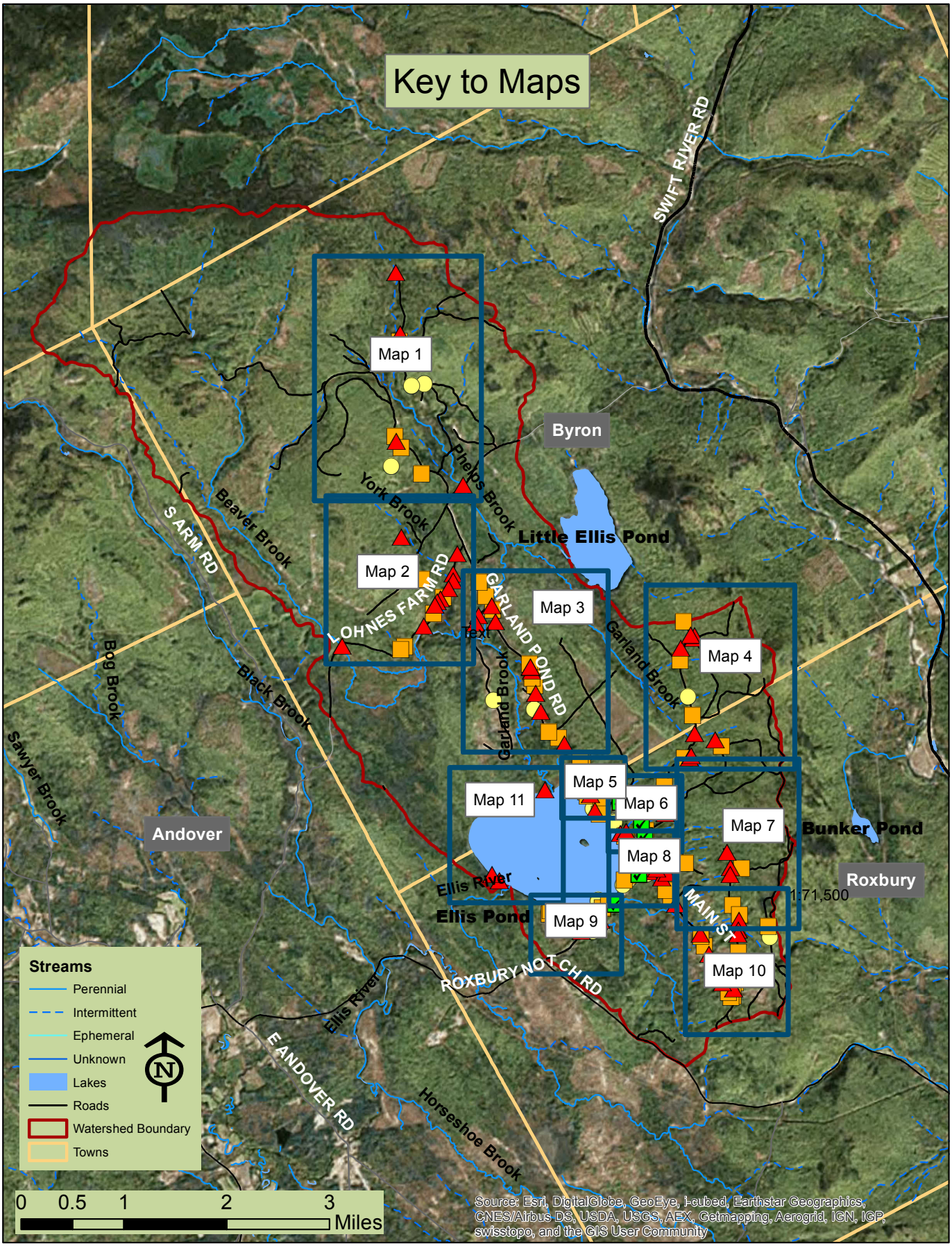
Keep a copy as a record of permit. Send the form with attachments via certified mail or hand deliver to the Maine Dept. of Environmental Protection **at the appropriate regional office listed below**. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. **Work carried out in violation of any standard is subject to enforcement action.**

AUGUSTA DEP	PORTLAND DEP	BANGOR DEP	PRESQUE ISLE DEP
17 STATE HOUSE STATION	312 CANCO ROAD	106 HOGAN ROAD	1235 CENTRAL DRIVE
AUGUSTA, ME 04333-0017	PORTLAND, ME 04103	BANGOR, ME 04401	PRESQUE ISLE, ME 04769
(207)287-3901	(207)822-6300	(207)941-4570	(207)764-0477

OFFICE USE ONLY	Ck.#		Staff	Staff		
PBR #	FP	Date	Acc. Date	Def. Date	After Photos	

DEPLW0311-O2013

- 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.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Map 8
Map 9
Map 10
Map 11
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Andover
Roxbury
Little Ellis Pond
Bunker Pond
Ellis Pond
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LOHNES FARM RD
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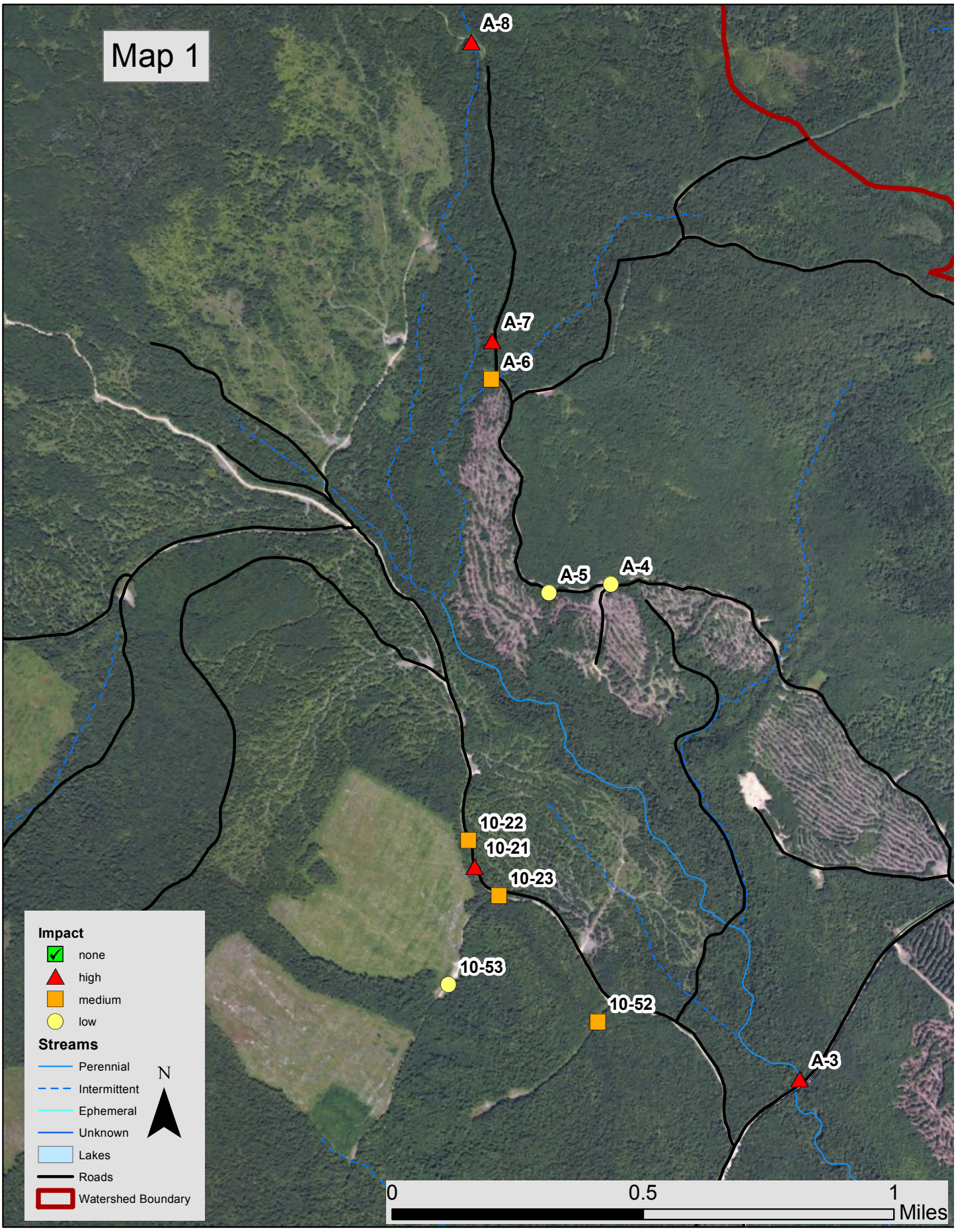
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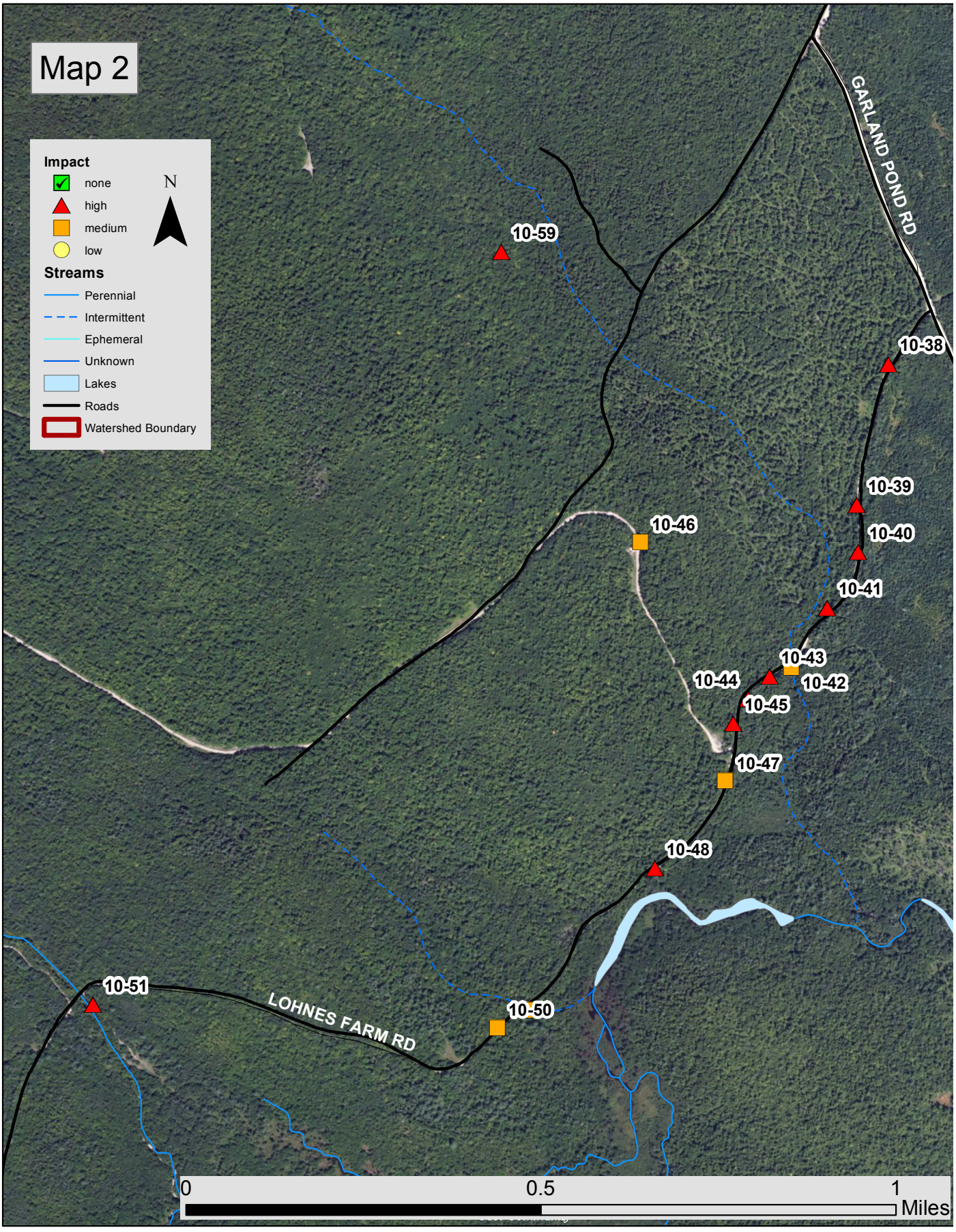
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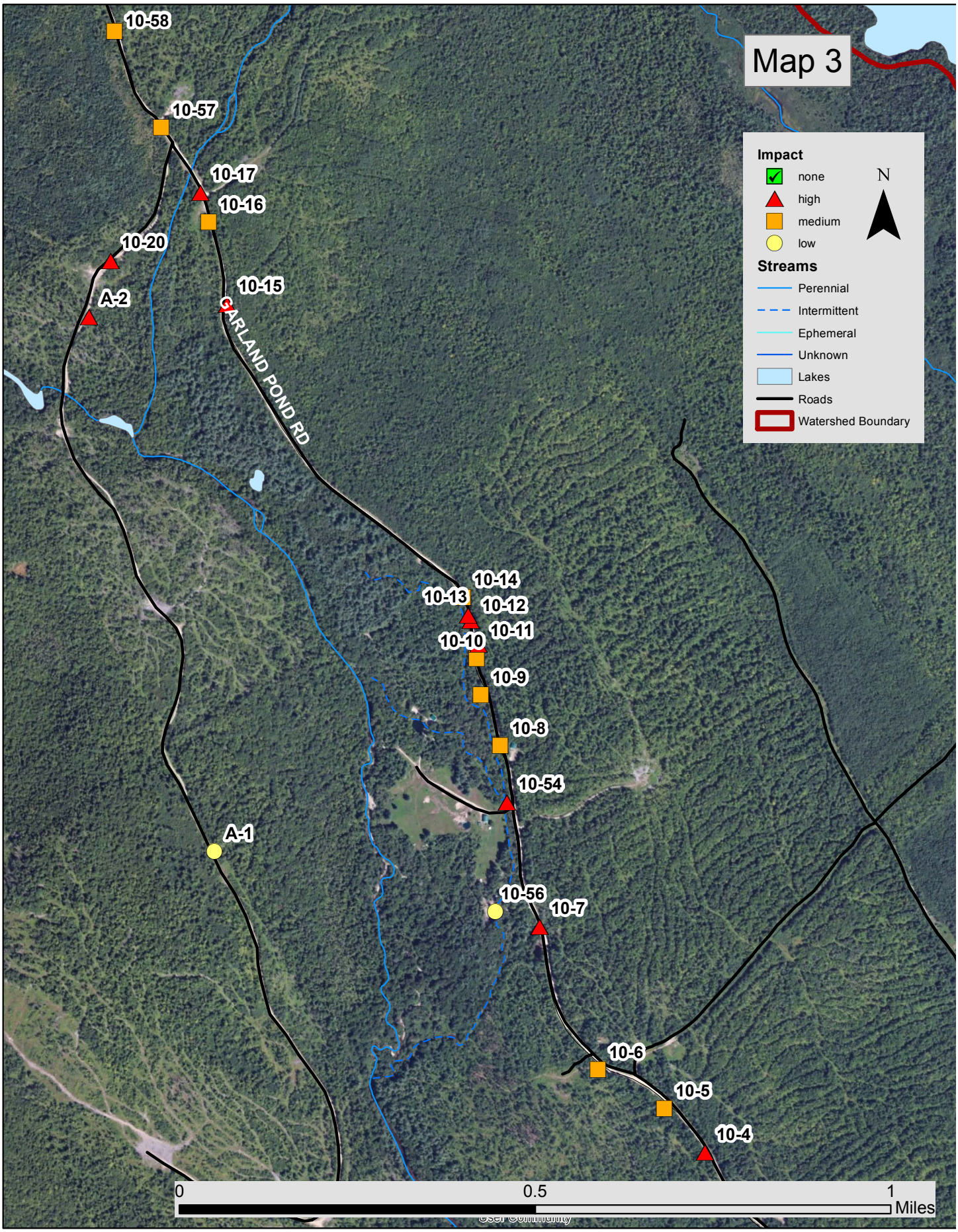
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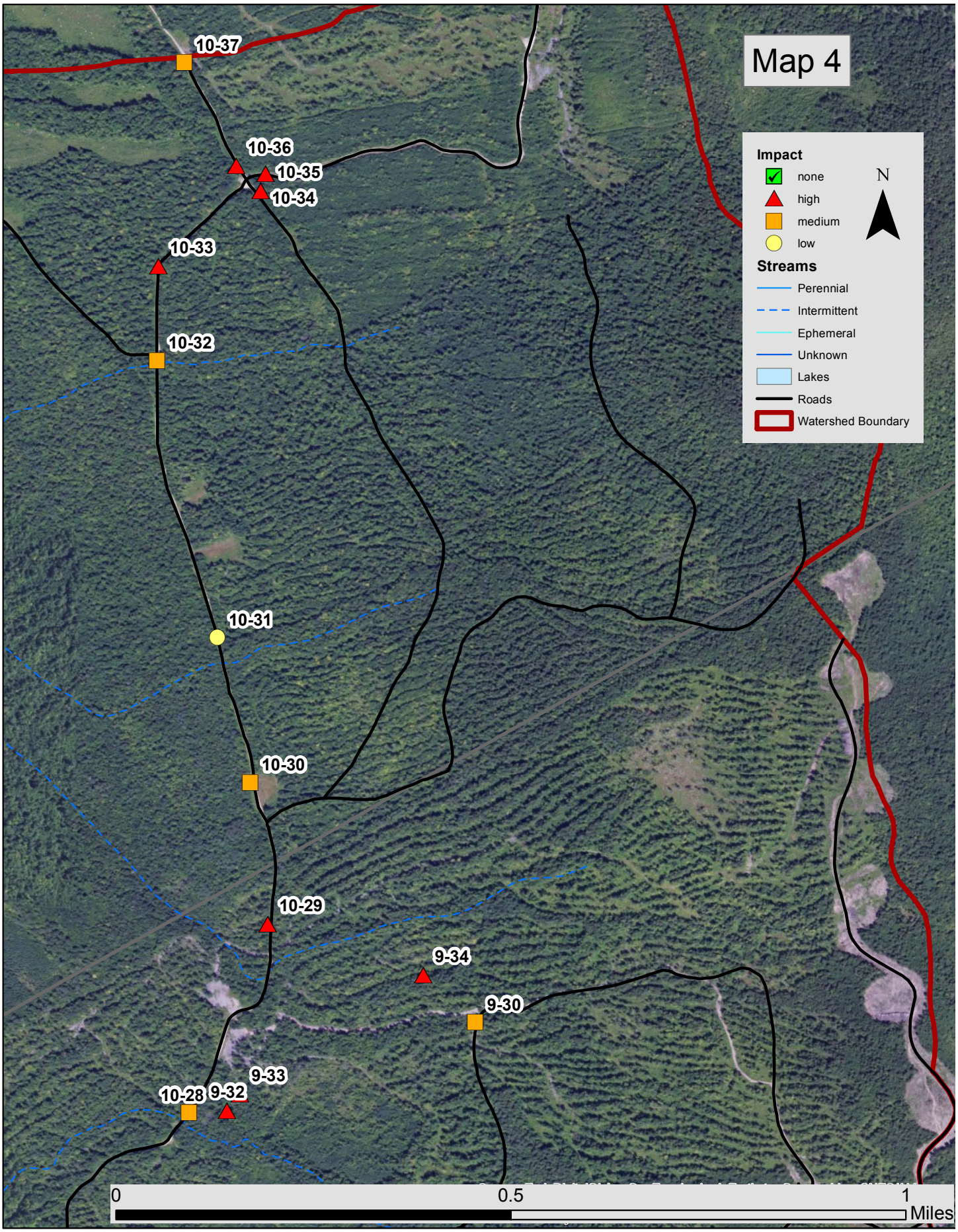
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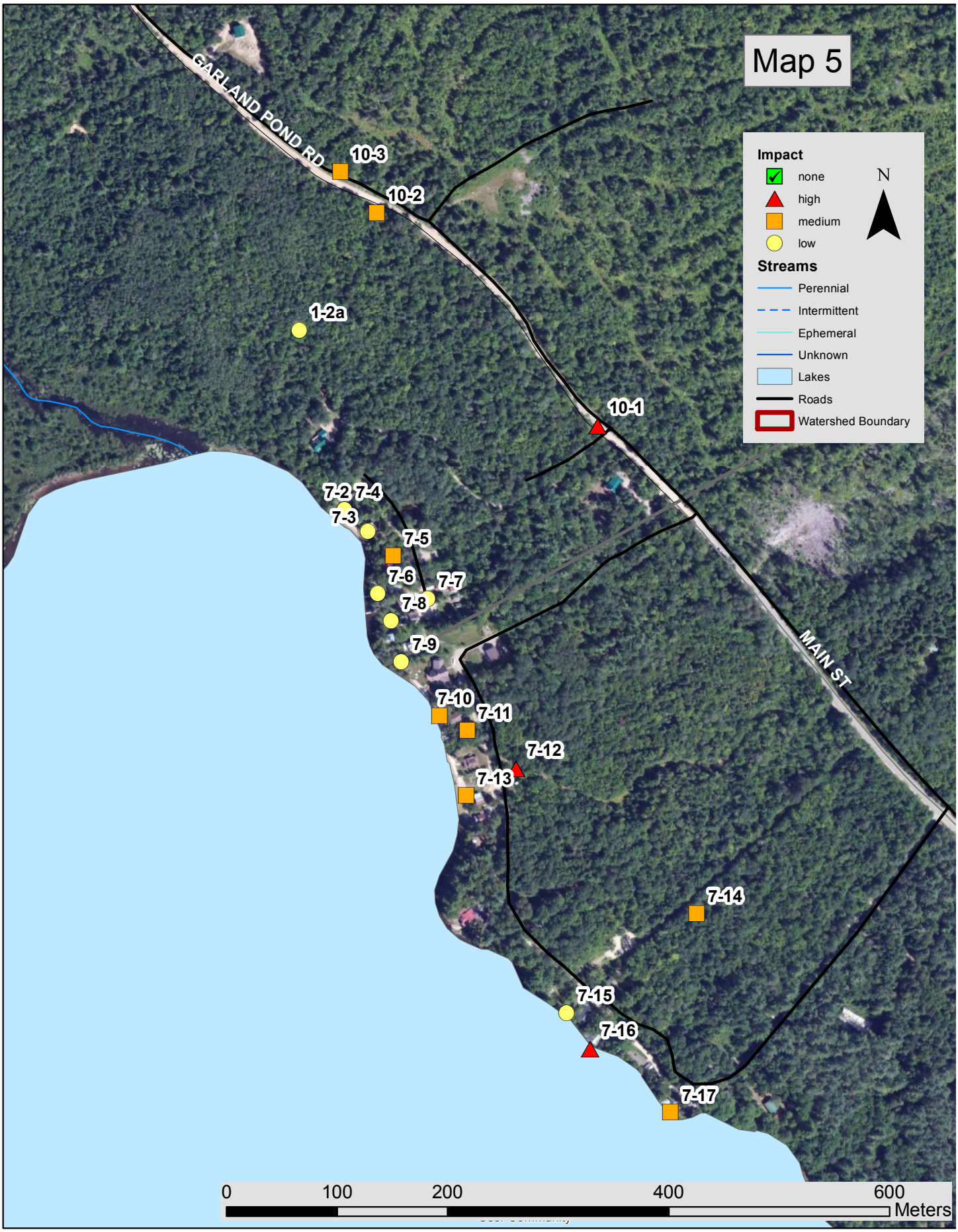
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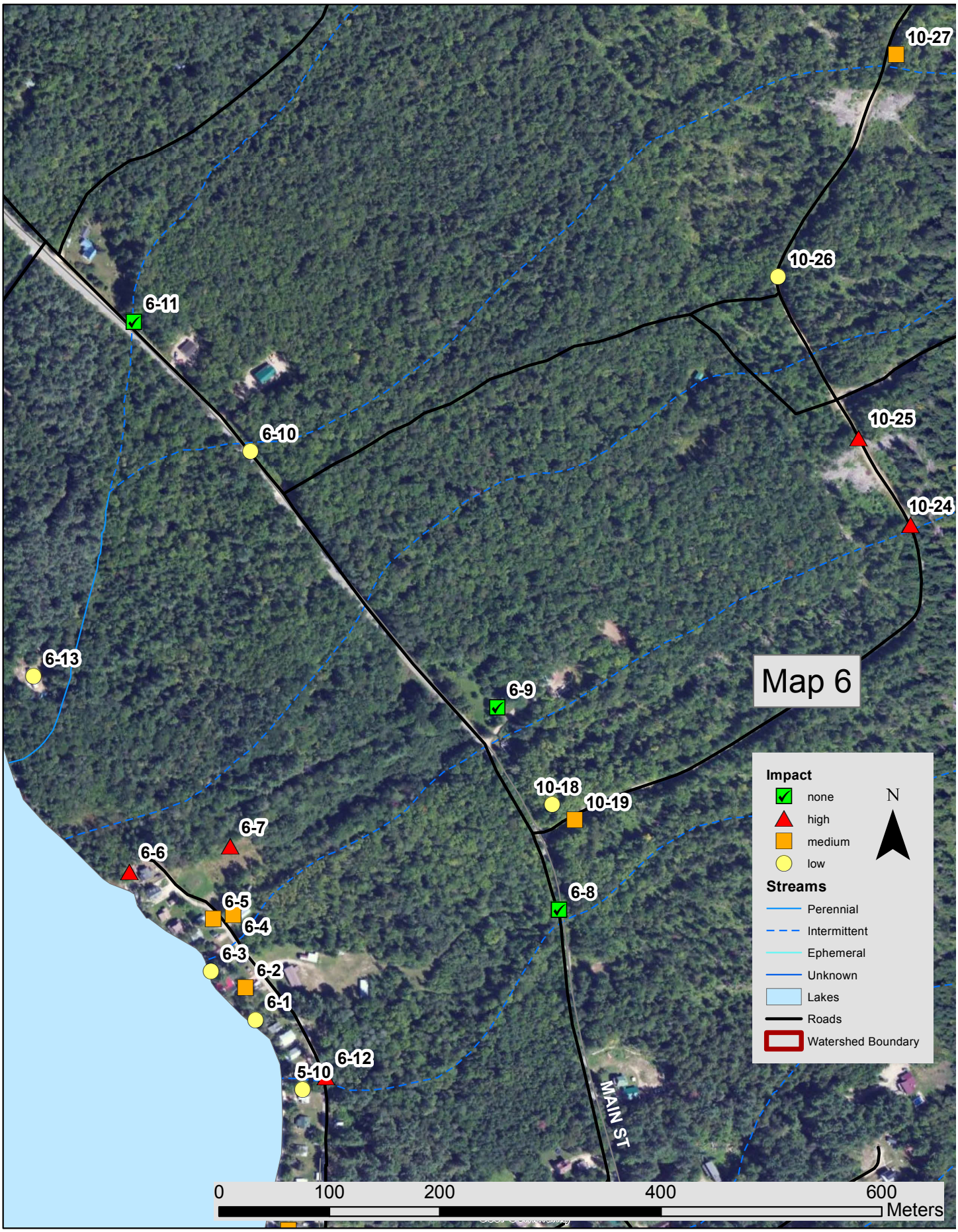
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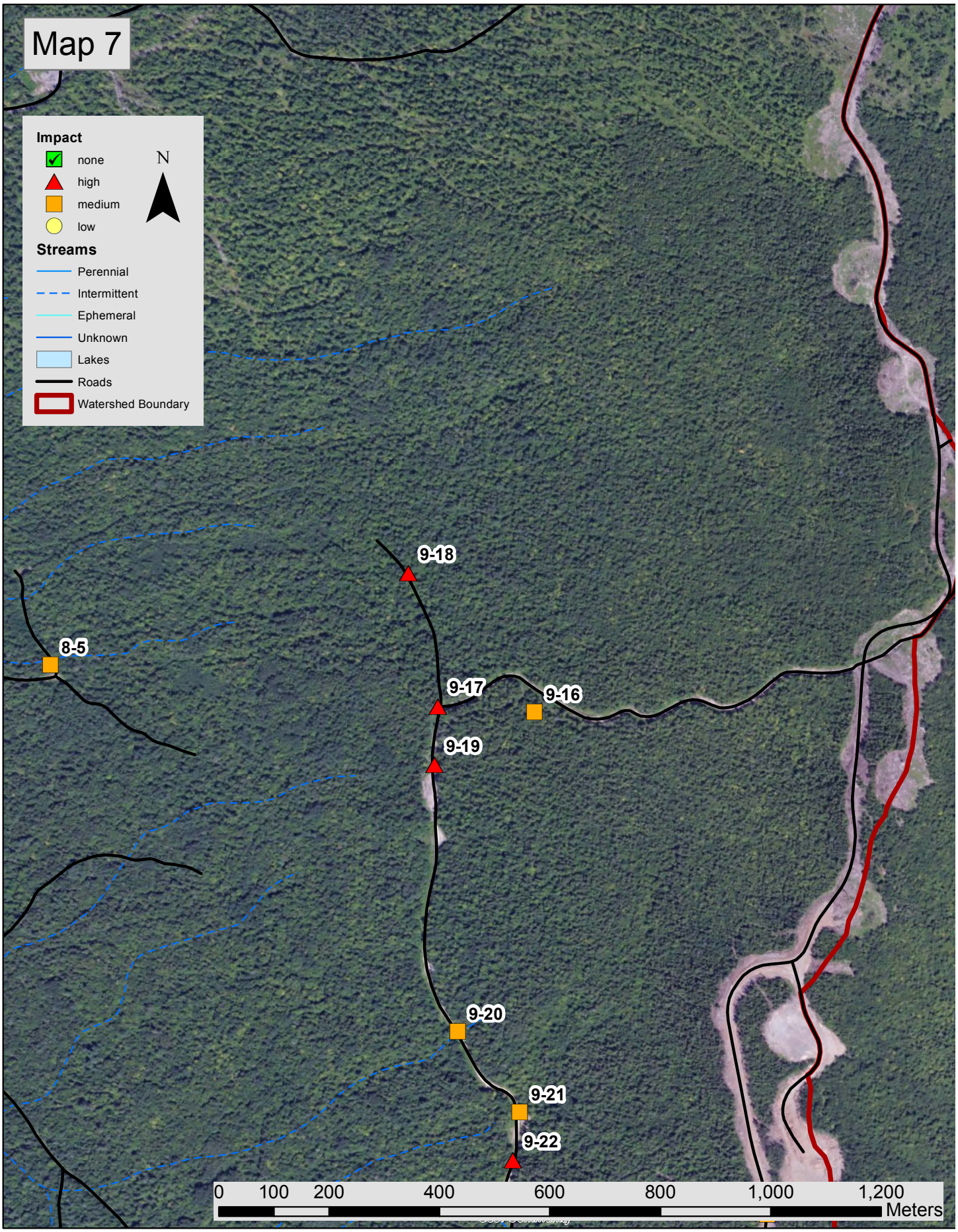
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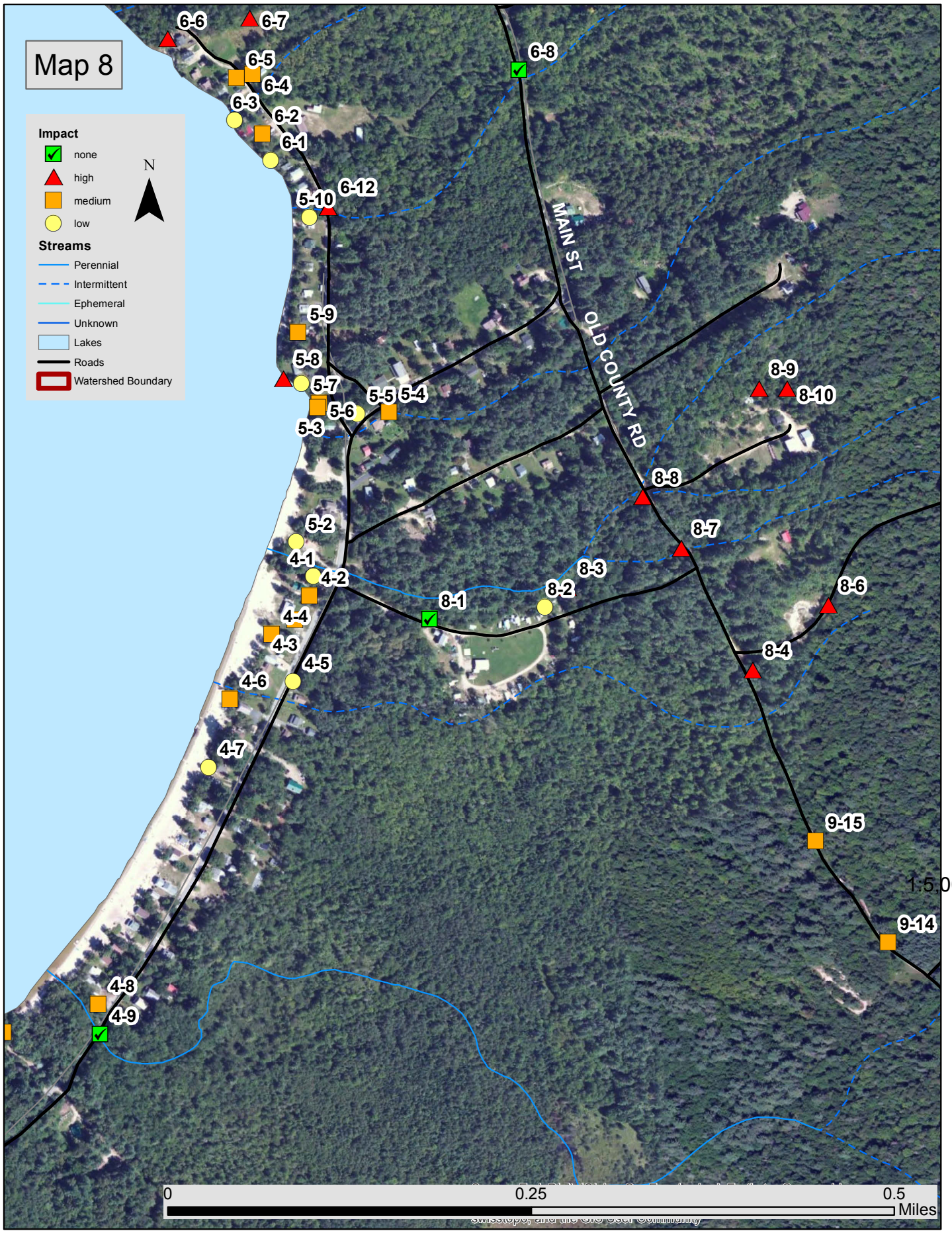
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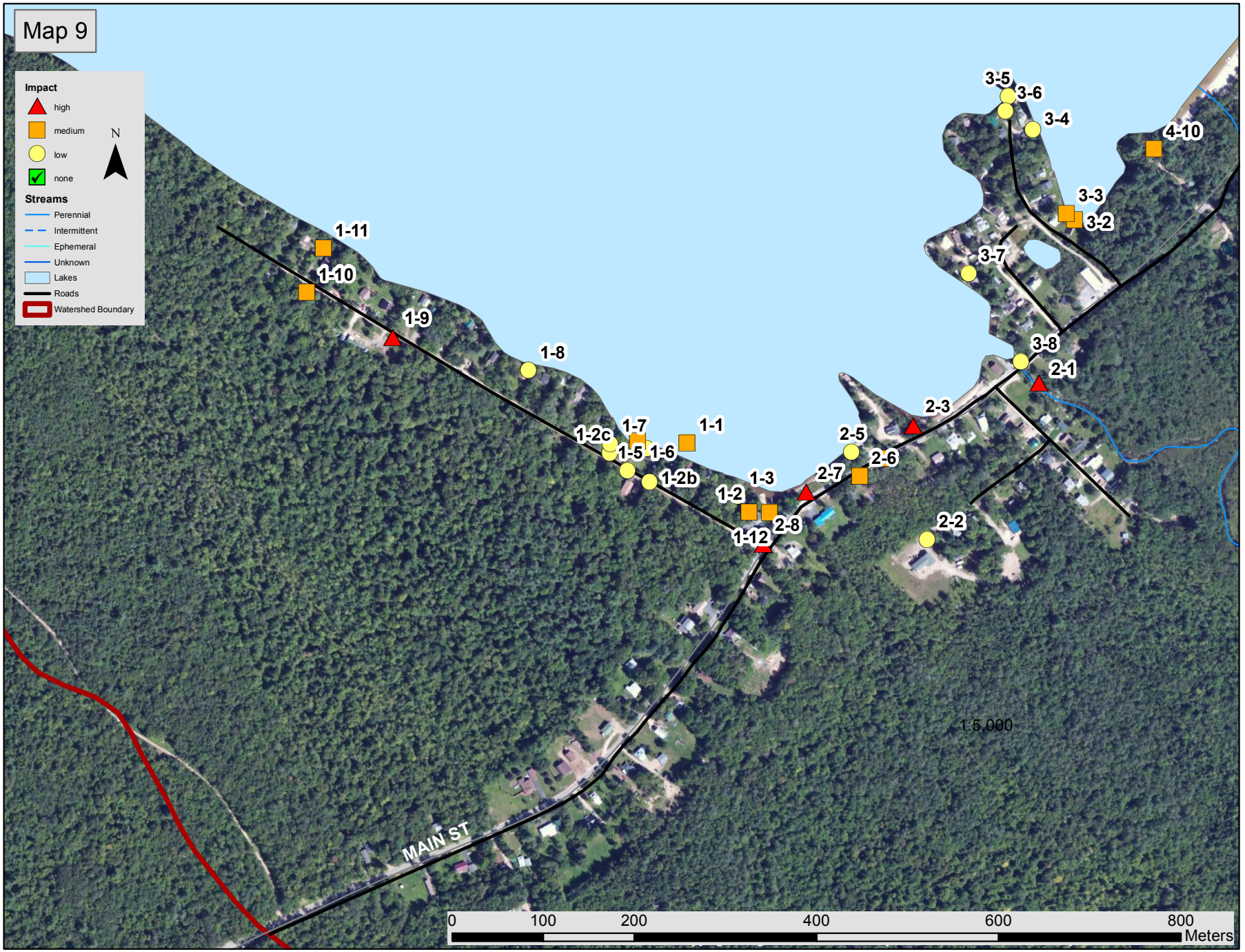
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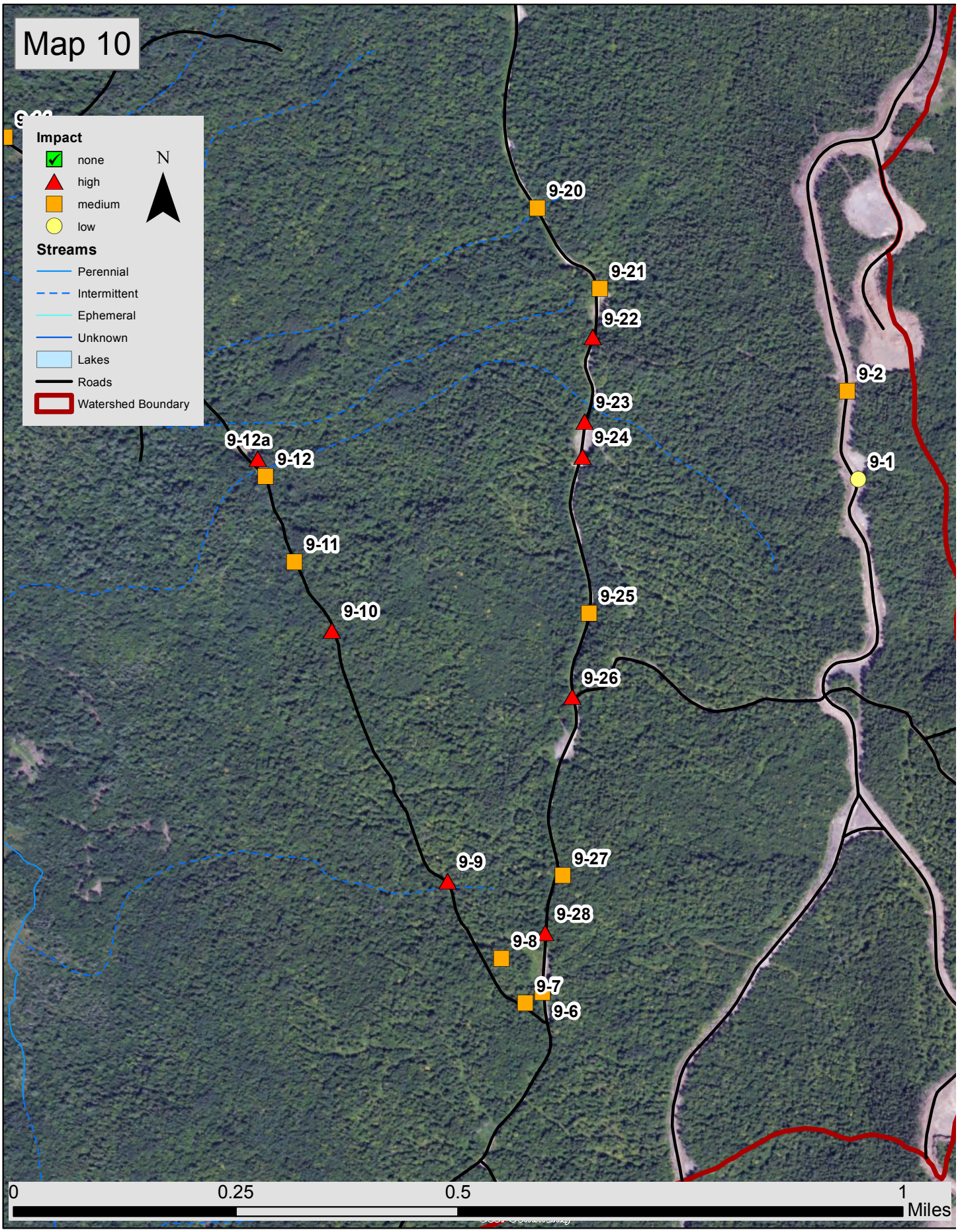
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9-1
9-12a
9-12
9-11
9-10
9-25
9-26
9-9
9-27
9-28
9-8
9-7
9-6
0
0.25
0.5
1
Miles


Map 11
Impact
high
medium
low
none
N
Streams
Perennial
Intermittent
Ephemeral
Unknown
Roads
Watershed Boundary
B-3
B-2
B-1
1:8,000
0
250
500
1,000
Meters

APPENDIX B - SURVEY DATA

Site	Land Use	Location	Problem	Recommendations	Impact	Cost
1-1	Residential	West Shore Road	Moderate surface erosion and roof runoff erosion. Flows directly to lake. Mushy pipe in front yard. Lack of shoreline veg. Road shoulder erosion.	Infiltration trench @ roof dripline or rain barrel. Install runoff diverter.	medium	medium
1-2	Road-Private	West Shore Road, ending around pole # 2	Base of driveway and part of road showing moderate erosion. Some filtering on lower side of road/pond side before running into pond. Slight ditch and moderate road shoulder erosion. Winter sand in ditches leading to lake.	Install culvert under Kersey's driveway. Reshape ditch on upside of road. Add speed bumps or infiltration trenches at start of driveways. Add holding areas for divereted water on properties below road, the first and second houses on right side/down side of road. Crown road and add gravel.	medium	medium
1-2a	Road-Private	West Shore Road, culvert @ #15	Unstable culvert inlet/outlet. Sight surface erosion. Bare soil, road material washed into culvert.	Armor culvert inlet/outlet. Install plunge pool.	low	low
1-2b	Road-Private	West Shore Road, culvert between #23 and #25	Unstable inlet/outlet. Moderate surface erosion and ditch erosion.	Armor inlet/outlet. Install plunge pools at culverts. Reshape and armor ditch with stone.	low	low
1-2c	Road-Private	West Shore Road, culvert between #27 and #29	Partially blocked culvert. Moderate ditch erosion.	Clean out culvert, remove blockage, and install plunge pool. Armor ditch with stone in places with more severe erosion. Install check dams. Cut back on ditch slope.	low	low
1-3	Boat Access	West Shore Road, 2nd house on right	Moderate erosion at shoreline and driveway. Driveway erosion flows through some vegetation.	Install water diverter below driveway and improve vegetative buffer on shoreline	low	medium
1-4	Residential	West Shore Road	Slight surface erosion. Lack of shoreline veg. Possible roof runoff causeing small patio rocks to flow into lake.	Install drywell @ gutter downspout. Create wall at shoreline to catch rocks and steps down to water access or use different type of rock that is heavier and won't erode.	low	medium
1-5	Residential-Driveway	West Shore Road	Moderate surface erosion and roof runoff erosion. Flows directly to ditch.	Infiltration trench @ roof dripline and pave/gravel driveway.	low	medium
1-6	Residential	West Shore Road	Shoreline undercut and eroding.	Stabilize with rip rap.	medium	medium
1-7	Residential	West Shore Road	Roof runoff erosion and inadequate shoreline vegetation.	Seed side lawn. Stabilize foot path. Install infiltration trench @ roof dripline. No raking. Establish veg buffer.	low	medium

APPENDIX B - SURVEY DATA

Site	Land Use	Location	Problem	Recommendations	Impact	Cost
1-8	Residential	West Shore Road	Roof runoff erosion.	Drywell @ gutter downspout or rain barrel.	low	medium
1-9	Residential	West Shore Road	Bare soil moderate erosion of large parking lot beside house. Flows directly to ditch.	If this is a construction site, need to divert water away from ditch using a water bars or settling pools on site. Ditch may need to be deepened so water does not overtake road. Mulch open area.	high	high
1-10	Other	West Shore Road, camp pole #12	Gravel parking lot. Slight surface erosion. Bare soil, uncovered pile. Buffer can't handle high rain flows.	Cover gravel pile and add ECM	medium	low
1-11	Residential	West Shore Road	Moderate surface erosion, lack of shoreline vegetation, unstable shoreline access for canoes.	Discontinue use of ramp. Canoe access can be at steps. ECM canoe storage area. Establish vegetative buffer.	medium	low
1-12	Residential	West Shore Road	Severe surface erosion going directly into lake. Result of site 1-2.	Install raingarden above erosion site. Build up terra e wall above erosion site to slow water runoff from property.	medium	low
2-1	Road-Town	Main St/South Shore Rd.	Severe road shoulder erosion flowing directly to lake. Lack of shoreline veg and also shoreline erosion-Road runs next to water's edge/beach access.	Create terraced wall between road and water. Establish veg. buffer.	high	medium
2-2	Road-Private	Meadow Brook Road	Unstable inlet/outlet at both culverts.	Armor the inlet/outlet.	low	low
2-3	Residential	Dual Point Cove Road	Undercut shoreline and lack of shoreline vegetation	Establish buffer and add rip rap to shoreline	high	medium
2-4	Road-Town	pole #17	Unstable inlet/outlet and moderate road shoulder erosion.	Armor culvert inlet/outlet. Armor ditch with stone.	medium	medium
2-5	Residential	?	Roof runoff erosion flows directly to lake.	Add infiltration trench at roof dripline and add ECM	low	low
2-6	Residential-Driveway	South Shore Rd or Meadow Brook Rd	Culvert is clogged and unstable inlet/outlet.O146	remove clog, armor inlet/outlet	medium	medium
2-7	Road-Town	pole #15	Moderate shoulder and surface erosion flows directly to the lake. Lacks shoreline vegetation.	Establish buffer	high	medium
2-8	Road-Town	Main Street-hill	Moderate road shoulder erosion flows to ditch	Vegetate shoulder, pave up to rip rap, pavement millings, sweep road.	high	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
3-2	Residential	Chapel Street	Moderate surface erosion, bare soil, roof runoff erosion and unstable shoreline access flows directly to lake.	Stabilize footpath, add infiltration trench at roof dripline, armor shoreline and establish a vegetative buffer.	medium	medium
3-3	Residential	Chapel Street	Moderate surface erosion, bare soil, roof runoff erosion and unstable shoreline access and erosion flows directly to lake.	Install rainbarrels or drywell @ gutter downspout. Stabilize bank erosion and establish vegetative buffer.	medium	low
3-4	Residential	Chapel Street	Slight surface erosion flows directly to lake.	Add ECM and establish vegetative buffer.	low	low
3-5	Residential	Chapel Street	Slight surface erosion and bare soil.	Add ECM.	low	low
3-6	Residential	Chapel Street	Slight surface erosion flows directly to lake.	Stabilize footpath, add plants or rip rap.	low	low
3-7	Residential	Birch Point	Slight to moderate surface erosion creating bare soil, roof runoff erosion and unstable access to shoreline.	Add infiltration trench at roof dripline, ECM and or mill felt on boat access.	low	low
3-8	Road-Town	one lane bridge	Winter sand issue.	Sweep road by bridge and create diverters to prevent sand from entering water.	low	low
4-1	Road-Town	Maine Street - across from Tent City.	Sligt erosion of road shoulder. Shoulder slope too steep before culvert. Needs to be packed down before culvert or somehow better stabilized.	Vegetate shoulder and ditch. Reshape ditch. Replace culvert and armor inlet/outlet.	low	high
4-2	Residential	Main Street	Moderate ditch and road surface erosion. Bare soil and lack of shoreline vegetation.	Define parking area and foot path. Add planks over ditch crossing. Establish buffer.	medium	low
4-3	Residential	Main Street	Slight surface erosion causing bare soil. Lack of shoreline vegetation.	Define parking area and foot path. Add new surface material to driveway. Establish vegetative buffer.	medium	low
4-4	Residential	MainStreet	Moderate surface erosion, bare soil, roof runoff erosion, and lack of shoreline vegetation.	Add infiltration trench at roof dripline, install runoff diverter and establish vegetative buffer.	medium	low
4-5	Road-Town	Main Street, between house and stream crossing.	Slight road shoulder erosion about 50' long.	Add loam and seed shoulder to prevent future erosion.	low	low

APPENDIX B - SURVEY DATA

Site	Land Use	Location	Problem	Recommendations	Impact	Cost
4-6	Residential	Main Street	Moderate surface erosion, clogged (undersized) culvert under old road, bare soil, lack of shoreline vegetation and shoreline erosion.	Replace and enlargen culvert. Establish vegetative buffer. Armor ditch with stone.	medium	high
4-7	Residential	Main Street	Moderate surface erosion, bare soil and inadequate shoreline vegetation.	Add to buffer, ECM and define foot path.	low	low
4-8	Residential-Driveway	Main Street/South Shore Rd.	Moderate surface erosion.	Add new surface material to driveway, reshape (crown), vegetate shoulder and install runoff diverters. Define parking area.	medium	medium
4-9	Road-Town	Main Street at stream crossing; North of Hansen Rd.	Slight surface erosion, winter sand issues.	Remove winter sand.	none	low
4-10	Residential	Main Street	Moderate surface erosion on three paths, bare soil, roof runoff erosion.	Install runoff diverters on paths, infiltration trench @roof dripline and add ECM.	medium	low
5-2	Beach Access	Main Street, Buster Beach parking lot	Slight surface erosion on trails/access points to stream that flows into stream. Stream bank failure-resulting from high flows and site 4-1/5-1. Delta in stream/lake and inadequate shoreline vegetation.	Add to buffer along brook.	low	low
5-3	Residential	Main Street	Moderate surface erosion, roof runoff erosion	Infiltration trench @ roof dripline. Establish veg buffer.	medium	medium
5-3b	Road-Town	Main Street culvert	Plunge pool filling with sediment and slight road shoulder erosion.	Plunge pool needs cleaning and establish roadside vegetation.	low	low
5-4	Road-Town	Main Street	Moderate road shoulder erosion flows directly to stream.	Pack road shoulder or better armor.	medium	low
5-5	Road-Town	Main Street intersection w/ Medawisla Way.	Need to stablize shoulder with vegetation or hard packed gravel.	ECM along road to prevent sand erosion. Armor culvert inlet/outlet. "Install turnouts, ditch and check dams.	low	high
5-6	Residential	Medawisla Way	moderate surface erosion and roof runoff erosion flows directly to lake.	Install an infiltration trench at the roof dripline or add a rainbarrel.	medium	medium
5-7	Residential	Medawisla Way	Moderate surface erosion and shoreline erosion.	Stabilize foot path.	low	medium
5-8	Residential	Medawisla Way	Severe surface erosion flows directly to lake.	Define foot path, mulch with ECM, and establish a buffer.	high	low

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
5-9	Residential	Medawisla Way	Moderate surface erosion and bare soil.	stabilize foot path and install infiltration steps. ECM.	medium	low
5-10	Residential	Medawisla Way	Slight surface erosion, bare soil, roof runoff funneled straight into stream.	Stabilize Foot Path with ECM, install drywell @ gutter downspout, and establish a veg buffer.	low	low
6-1	Residential	Medawisla Way	Slight surface erosion, bare soil and exposed root lines.	Define Foot path, ECM, reseed bare soil and thinning grass, and add rock to retaining wall.	low	low
6-2	Residential-Driveway	Medawisla Way	Moderate surface and road shoulder erosion, and winter sand issues.	Build up driveway and add new gravel or recycled asphalt or pave. Establish veg buffer and add to existing buffer.	medium	medium
6-3	Residential	Medawisla Way	Moderate surface erosion, bare soil, roof runoff erosion and inadequate shoreline vegetation.	Add an infiltration trench @ roof dripline, ECM on bare areas, and add to buffer.	low	low
6-4	Residential	Medawisla Way	Moderate surface erosion, bare soil, and roof runoff erosion. Culvert filling up.	Remove culvert clog and install plunge pool. Install gutters. Establish buffer between barn and stream.	medium	medium
6-5	Residential-Driveway	Medawisla Way	Moderate surface erosion, bare soil and winter sand issues. Stream runs right under garage and road contributes to problem.	Reshape road and driveway. Install runoff diverter, infiltration trench, and limit parking area. Reseed bare soil.	medium	high
6-6	Residential	Medawisla Way	Moderate surface erosion and shoreline erosion. Bare soil and lack of shoreline vegetation. Foundation drain causes some erosion.	Install plunge pool and establish buffer.	high	medium
6-7	Residential	Medawisla Way	Severe surface erosion, ditch erosion, bare soil piles next to ditch. Looks like ditch was dug out without any riprap reinforcement.	Install plunge pool, armor ditch with stone and vegetate shoulder. Mulch, EC berm, and seed and hay construction site. Establish buffer.	high	high
6-8	Road-Town	Roxbury	Impacts site 6-12.	see notes	none	high
6-8b	ATV trail	next to lots 83 and 85.	ATV passage next to 6-8 needs review. Erosion next to culvert.	?	?	unknown
6-9	Road-Town	Byron Road.	Impacts site 6-6	see notes	none	high
6-10	Road-Town		Slight road shoulder erosion.	Add loam and seed to prevent road shoulder erosion.	low	low

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
6-11	Road-Town	Main Street - Byron Rd.	See notes.	See notes.	none	high
6-12	Road-Town	Medawisla Road	Slight road surface erosion. Moderate road shoulder erosion. Delta in stream and late. Winter sand issues. Partially result of 6-08.	Deal with upstream issues. Vegetate shoulder and install catch basin at outlet. From 5-11 notes: remove culvert clogs. Reshape ditch, armor with stone or vegetate, install turnouts and remove debris/sediment.	high	high
6-13	Residential-Driveway	Medawisla Road	Severe road surface and shoulder erosion. Delta in stream and lake, undercut shoreline. Result of site 6-11 and above sites?	Install catch basin above site.	high	high
7-2	Residential	Inlet Cove Road	Slight surface erosion, bare soil, roof runoof erosion and undercut shoreline flowing through minimal vegetation.	Define and stabilize foot path. Install drywell @ gutter downspout and runoff diverter. Reseed bare soil and thinning grass. Add rip rap at shoreline.	low	low
7-3	Residential	Inlet Cove Road	Slight surface erosion and roof runoff erosion.	Add to vegetative buffer and install an infiltration trench @ roof dripline.	low	low
7-4	Residential-Driveway	Inlet Cove Road	slight surface erosion on driveway and bare soil.	Attempt to revegetate parking area, enhance buffer area between parking area and lake, and armor eroded area of shoreline.	low	low
7-5	Residential	Inlet Cove Road	roof runoff erosion.	Install an infiltration trench or drywell @ gutter downspout.	medium	low
7-6	Residential	Inlet Cove Road	roof runoff erosion.	Install an infiltration trench or drywell @ gutter downspout.	low	low
7-7	Residential	Inlet Cove Road	roof runoff erosion.	Install an infiltration trench or drywell @ gutter downspout.	low	low
7-8	Residential	Inlet Cove Road	roof runoff erosion	Install and infiltration trench.	low	low
7-9	Residential	Sunset Cove	Slight surface erosion, bare soil, inadequate shoreline vegetation, shoreline erosion. Flows directly to lake.	Add to buffer and reseed bare soil.	low	low
7-10	Residential	Sunset Cove	Roof runoff erosion possibly causing three beach trenches/ditching.	Install infiltraion trench @ roof dripline.	medium	low
7-11	Residential	Sunset Cove	Roof runoff erosionfrom boat house.	Remove shingles from ground and install proper infiltration trench.	medium	low

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
7-12	Residential	Sunset Cove Road	Severe ditch erosion, bare soil. Drainage ditch appears hand dug and possibly washing into stream.	Potentially line with stone.	high	medium
7-13	Residential	Sunset Cove Road	Roof runoff erosion flowing directly to lake.	Install infiltraion trench @ roof dripline or a drywell @ gutter downspout.	medium	low
7-14	Residential	Sunset Cove	Slight surface and roof runoff erosion. Flows directly to lake.	Stabilize foot path. Replace gutter and install drywell @ gutter downspout.	medium	low
7-15	Residential	Sunset Cove	Slight surface and shoreline erosion.	Further define foot path and stabilize.	low	low
7-16	Residential	Sunset Cove	Roof runoff erosion.	Install infiltration trench @ roof dripline.	high	low
7-17	Residential	Sunset Cove	Shoreline erosion, undercutting, lack of shoreline vegetation.	Stabilize shoreline with rip rap. Erosion coming from lake level variation.	medium	low
8-1	Road-Private	Tent City Road	See notes	see notes	none	high
8-2	Commercial	Tent City Road, trailer on campground	Slight surface erosion flows directly to stream. Shoreline undercut and lack of shoreline vegetation.	Establish buffer, reseed with grass and add ECM.	low	low
8-3	Commercial	Tent City Road, campground lot #7	Ditch bank failure, stream bank undercut, lach of streamside vegetation.	Reshape and armor ditch with stone or vegetation. Establish buffer. May require engineer design.	high	high
8-4	ATV trail	Mine Notch-Old County Road-extention, ATV trail	Severe surface erosion causing delta in stream. Culvert clogged, crushed, and undersized.	Replace, enlargen, and lengthen culvert.	high	medium
8-5	Logging	Logging road end, heading east of Mine Notch ATV trail where Old County Road ends	ATV use causing moderate erosion at water crossing that leads to stream.	Add large rocks to prevent ATV access.	medium	low
8-6	Logging	Logging road, heading east of Mine Notch ATV trail where Old County Road ends	Severe erosion flows directly to stream via three waterbars.	Armor ditch with stone, reshape road, install catch basins, install runoff diverters in other direction, armor diverters and waterbars with stone and seed new grass.	high	high
8-7	Road-Town	Old County Road, stream crossing South of Tent City Rd.	Severe surface erosion and unstable culvert outlet. Undercutting stream bank.	Armor and enlarge culvert inlet/outlet. Install/Enlarge plunge pool. Level lip spreader.	high	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
8-8	Road-Town	Old County Road, stream crossing near Tent City Rd.	Severe surface erostion and unstable culvert outlet.	Enlarge and armor culvert. Install and enlarge plunge pool with rip rap. Level lip spreader.	high	high
8-9	Residential	Old County Road	Severe surface erosion, roof runoff erosion, inadequate vegetative buffer and stream bank erosion causing delta in stream. Logging road is too close on slope above stream. Result of site 8-10.	Stabilize top of slope to stream with rip rap. Repair surface erosion with mulch or reseeding. Add infiltration trench @ roof dripline and establish a vegetative buffer.	high	medium
8-10	Logging	Old County Road-skidder trail behind property	Severe surface erosion flows directly to stream causing problems on site 8-9	Reshape and gravel road. Install runoff diverters/waterbars.	high	low
9-1	Wind Energy	access road to wind towers, pole #98	Moderate hillside erosion sliding into ditch and sending sediment through culvert off hill. Misdirected culvert sends sediment about 200' downhill and then goes underground and then back out at 330' with minimal sediment deposit. Also, waterbar on road is directed to this area, sending road erosion into stream. All confluences flow to stream.	Install plunge pool, vegetate ditch and install check dams. Stabilize slope with vegetation. Redirect waterbar below culvert. Could also add one further above on road.	low	medium
9-2	Wind Energy	access road to wind towers, pole #95	Severe surface erosion upstream from pole#98 flows to ditch and connects at same culvert that site 9-1 drains to.	Stabilize hillside, add runoff diverter or some kind of infiltration at top of hill above pole #95, add culvert or some other diversion. Vegetate hillside.	medium	medium
9-6	Logging	Mine Notch Road, northern ATV trail intersection with stream.	Moderate surface erosion flows to stream. Culvert was removed.	Vegetate and armor with stone.	medium	medium
9-7	ATV trail	Mine Notch ATV trail, just before Mine Notch Road	Moderate surface erosion flows to stream.	Add a new surface material and install runoff diverters.	medium	medium
9-8	ATV trail	Mine Notch ATV trail, heading North, bridge #1	Moderate surface erosion.	Add a new surface material and install runoff diverters.	medium	low
9-9	ATV trail	Mine Notch ATV trail, bridge #2	Moderate surface erosion and severe ditch erosion flows to stream.	Armor ditch with stone and install check dams. Ditch should be directed to waterbar 25' from stream. Add new surface material and install runoff diverters.	high	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
9-10	ATV trail	Mine Notch ATV trail, bridge #6	Moderate surface erosion. Installed bridge and dug material out too close to stream and applied to approach. Flows directly to stream.	Consider relocation and stabilize/revegetate old trail. Armor ditch with stone, add new surface material, stabilize path and install runoff diverter.	high	medium
9-11	ATV trail	Mine Notch ATV trail, skid trail crossing	Moderate surface erosion and waterbar is misdirected into small stream. Looks like they just constructed this.	Move waterbar upstream and seed/hay area.	medium	medium
9-12	ATV trail	Mine Notch ATV trail, just South of bridge #7.	Moderate ditch erosion. Recent construction on trail.	Consider relocation. Vegetate and remove ditch. Install sediment pools. Install runoff diverter and reseed/hay.	medium	medium
9-12a	ATV trail	Mine Notch ATV trail, Bridge #7	Unstable bridge access and construction on ATV trail flows to stream.	Install sediment pools, catch basin, and runoff diverter. Reseed/hay area.	high	medium
9-13	ATV trail	Mine Notch ATV trail, coords off	Undersized and unstable culvert I/O flows directly to stream..	Armor inlet/outlet and enlargen.	high	medium
9-14	ATV trail	Mine Notch ATV trail, coords off	Undersized culvert and moderate trail shoulder erosion flows directly to stream.	Enlargen culvert and install runoff diverters.	medium	medium
9-15	ATV trail	Mine Notch ATV trail, entrance of "Black Mountain Trail", coords off	Bridge access is eroding and flows to stream.	Armor banks.	medium	medium
9-16	Logging	skid trail between Mine Notch Rd and Record Hill Wind	Moderate surface erosion flows to stream.	Install runoff diverter and ECM.	medium	low
9-17	Logging	skid trail intersects with Mine Notch Road near end of road.	Severe erosion, failed waterbar runs into small stream.	Backslope and stabilize trail entrance. Install proper waterbar.	high	medium
9-18	Logging	Mine Notch Road, end now closed out.	Ditch and pulled culverts crossing not properly sloped. Ditch runs directly into stream, 150' downstream skid trail crossing needs stabilization.	Vegetate ditch and install sediment pools. Crossing slopes should be 2:1 and stabilized.	high	medium
9-19	Logging	Mine Notch Rd., last yard before met tower access trail.	Stream crossing slopes not vegetated, too steep, and ditch flows to stream.	Install sediment pools and slope to 2:1 and reseed with hay added.	high	medium
9-20	Logging	Mine Notch Rd., perennial stream crossing.	Pulled culvert. Slopes unvegetated and too steep ditch flows into stream.	Slope 2:1. Mulch, hay & seed.	medium	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
9-21	Logging	Mine Notch Rd., perennial stream crossing.	At pulled culvert, the slopes are too steep and unvegetated. Flows to stream.	Correct slope is 2:1. Reseed and hay for vegetative stabilization.	medium	medium
9-22	Logging	Mine Notch Road	Pulled culvert, too steep and unvegetated slopes flows to stream.	Improve slope to 2:1. Reseed and hay.	high	medium
9-23	Logging	Mine Notch Road, near? skid trail crossing.	Pulled culvert, too steep and unvegetated slopes flows to stream.	Backslope to proper 2:1 ratio and stabilize.	high	medium
9-24	Logging	Mine Notch Road, burrow pit.	Pulled culverts (2). Slope too steep and unvegetated. Ditch runs into intermittent stream.	Install turnouts and check dams. Correct slope to 2:1 ratio. Stabilize area.	high	medium
9-25	Logging	Mine Notch Road, near skid trail intersection.	Pulled culvert-slopes too steep and unvegetated. Flows to intermittent stream.	Backslope to 2:1 and stabilize.	medium	medium
9-26	Logging	Mine Notch Road	Pulled culvert. Slopes unvegetated and too steep ditch flows into stream.	Reslope to 2:1 and stabilize/vegetate.	high	medium
9-27	Logging	Mine Notch Road	Pulled culvert in intermittent stream. Slopes too steep and exposed.	Reslope to 2:1 and stabilize/vegetate.	medium	medium
9-28	Logging	Mine Notch Road	Pulled culvert, steep exposed slopes, ditch then flows to stream.	Install sediment pools. Fix backslope 2:1 and stabilize.	high	medium
9-30	Logging	woods northeast of Hardwood Ln.	Dumped hitches in stream.	Remove hitches/crossing and sediment. Vegetate or armor stream. Install plunge pool.	medium	
9-32	Logging	woods northeast of Hardwood Ln.	Failure to close out skid trail properly, depositing san	Stabilize or fill in ditch. Install plunge pool.	high	
9-33	Logging	woods northeast of Hardwood Ln.	Inadequate waterbar, stream crossing closed out below and led to stream rerouting.	Ask DEP if need to restore stream or count new water path as new stream.	high	
9-34	Logging	woods northeast of Hardwood Ln.	Severe surface erosion. Stream next to skid trail-too close. Skid Trail showing signs of bank undercutting and becoming new water pathway. Skid trail not closed out properly.	Add more waterbars and close out trail properly.	high	
10-1	Road-Town	Garland Pond Road @ Inlet Cove intersection	Severe road shoulder erosion flowing directly to stream	Remove plow berms, armor ditch with stone, reshape ditch, install turnouts, install ditch, install check dams	high	medium
10-2	Road-Town	Garland Pond Road, culvert #2	Unstable culvert inlet/outlet	armor inlet/outlet and lengthen culvert	medium	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
10-3	Road-Town	Garland Pond Road, culvert #3	Unstable culvert inlet/outlet	armor inlet/outlet and lengthen culvert	medium	medium
10-4	Road-Town	Garland Pond Road, culvert #4	Unstable culvert inlet/outlet	armor inlet/outlet and lengthen culvert	high	medium
10-5	Road-Town	Garland Pond Road, culvert #5	Unstable culvert inlet/outlet	armor inlet/outlet and lengthen culvert	medium	medium
10-6	Road-Town	Garland Pond Road, culvert #6	Unstable culvert inlet/outlet	armor inlet/outlet and lengthen culvert	medium	medium
10-7	Road-Town	Garland Pond Road, culvert #7	Unstable culvert inlet/outlet, undersized	armor inlet/outlet and lengthen culvert	high	medium
10-8	Road-Town	Garland Pond Road, culvert #8	Unstable culvert	armor inlet/outlet and lengthen culvert	medium	medium
10-9	Road-Town	Garland Pond Road, culvert #9	Unstable culvert inlet/outlet, clogged	remove clog, armor inlet/outlet	medium	medium
10-10	Road-Town	Garland Pond Road, culvert #10	Unstable culvert inlet/outlet, crushed culvert	replace culvert	medium	high
10-11	Road-Town	Garland Pond Road, culvert #11	Culvert is broken or missing	install culvert, add gravel and crown road	high	medium
10-12	Road-Town	Garland Pond Road, culvert #12	Severe road surface erosion and culvert is crushed/broken	replace culvert, add gravel to road	high	medium
10-13	Road-Town	Garland Pond Road for next 1/4 mile	Moderate road surface erosion flowing directly to stream. Wash across Road	install culvert. Increase trench depth and add waterbars to road surface	high	medium
10-14	Road-Town	Garland Pond Road where stream parallels road.	Slight road surface erosion for 100'. Severe road shoulder erosion for 10'.	Remove grader plow berms. Install turnouts. Armor bank. Reshape toad to slop away from stream or install broad based dip.	medium	low
10-15	Road-Town	Garland Pond Road, 1/4mile continuous	Severe road shoulder erosion flows to lake via ditch.	Remove grader plow berms and add ditch from top of hill to culvert	high	medium
10-16	Road-Town	Garland Pond Road - flat portion road	Moderate road surface erosion flows through minimal vegetation	Remove grader berm. Build up road and add new surface material	medium	medium
10-17	Road-Town	Garland Pond Road - Moderately sloping portion of Byron Road.	Moderate road surface erosion flows to lake via ditch. About 50'x20'.	Install ditch and runoff diverters.	high	medium
10-18	ATV trail	Hardwood Lane, start gate @ Byron Rd.	Moderate surface erosion, clogged/crushed culvert, slight ditch and shoulder erosion. Current waterbars divert water to culverts, which connect with stream water.	Replace culvert, install plunge pool, reshape trail and install runoff diverters.	low	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
10-19	ATV trail	Hardwood Lane, start gate @ Byron Rd.	Severe surface and ditch erosion from failed water diversion.	Install runoff diverters and reshape/crown path.	medium	medium
10-20	Logging	Hedgehog logging road at intermittent stream crossing	Severe surface erosion. Clogged and underside culvert.	Replace and enlargen culvert. Gravel road and install runoff diverters.	high	medium
10-21	ATV trail	Dunham ATV trail	Severe surface erosion. Clogged and underside culvert.	Install check dams and sediment pools. Reshape/crown path.	high	medium
10-22	ATV trail	Dunham ATV trail	Road above culvert is sinking, flows to stream.	Replace culvert and install plunge pool.	medium	medium
10-23	ATV trail	Dunham ATV trail	Moderate surface erosion and unstable culvert I/O. Flows to stream.	Armor I/O and install plunge pool. Install ditch check dams and turnouts.	medium	medium
10-24	ATV trail	Hardwood Lane at first perennial stream crossing.	Severe surface and road shoulder erosion. Unstable culvert I/O.	Armor I/O, Enlarge culvert, install plunge pool. Add new material to path and crown.	high	medium
10-25	ATV trail	Hardwood Lane, station 33.	Moderate path surface and shoulder erosion. Ditches on both sides of stream flows directly to stream.	Add new surface material and crown path. Install catch basins.	high	medium
10-26	ATV trail	Hardwood Lane, station 31.	Slight surface, ditch, and road shoulder erosion.	Crown path, install catch basins and runoff diverters.	low	medium
10-27	ATV trail	Hardwood Lane, stations 24, 25, & 26	Moderate surface and ditch erosion. Three failed turn-outs flow directly to stream.	Fix turnouts, armor or redirect. Add new surface material and crown road. Install diverters.	medium	medium
10-28	ATV trail	Hardwood Lane, station 28	Unstable culvert I/O. Moderate ditch and shoulder erosion. Sediment coming from above. Stream bottom below culvert is also eroding.	Armor culvert inlet/outlet and install plunge pool. Armor ditch with stone.	medium	medium
10-29	ATV trail	Hardwood Lane	Moderate surface and shoulder erosion. Stream cut through road.	Install culvert or a bridge. Install runoff diverters.	high	high
10-30	ATV trail	Hardwood Lane	Culvert unstable I/O and severe road shoulder erosion flows directly to stream.	Armor culvert I/O. Maybe replace culvert. Add new path material.	medium	medium
10-31	ATV trail	Hardwood Lane	2 culverts with unstable I/O. Moderate surface erosion.	Armor culvert I/O. Maybe replace culvert. Add new path material.	low	medium
10-32	ATV trail	Hardwood Lane	Severe surface and shoulder erosion. Unstable I/O. Flows to stream.	Armor culvert I/O. Maybe replace culvert. Add new path material.	medium	medium
10-33	ATV trail	Hardwood Lane	Severe erosion along and within path flows directly to stream.	Install runoff diverters-waterbars, turnouts.	high	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
10-34	ATV trail	Hardwood Lane	Severe ditch and road shoulder erosion flows to ditch.	Replace culvert or install bridge. Armor ditch with stone and install check dams.	high	high
10-35	ATV trail	Hardwood Lane	Severe path erosion, moderate ditch and slight shoulder erosion flows directly to ditch.	Close road to ATV, too difficult to maintain. Install check dams and sediment pools. Install runoff diverters and add new surface material.	high	medium
10-36	ATV trail	Hardwood Lane	Severe surface and shoulder erosion. Unstable I/O. Flows to stream.	Armor culvert I/O, replace and install plunge pool. Add new surface material and install runoff diverters.	high	medium
10-37	ATV trail	Hardwood Lane	Severe road surface and shoulder erosion. Unstable culvert I/O.	Replace culvert and armor I/O. Install plunge pool and armor ditch with stone.	medium	medium
10-38	ATV trail	Lohnes Farm Road, eastern entrance, 150' from Roxbury Pond Rd.	Moderate road surface erosion and severe shoulder erosion flows to ditch. Waterbar connects with channeled water.	Armor ditch with stone, add new road surface material, and install runoff diverters that end in catch basins.	high	high
10-39	ATV trail	Lohnes Farm Road	Severe road surface and shoulder erosion for 1/10 of a mile.	Vegetate ditch or armor with stone. Install check dams and sediment pools.	high	high
10-40	ATV trail	Lohnes Farm Road, at 1st crossing culvert	Severe road surface and shoulder erosion for 1/10 of a mile. Flows to a stream.	Armor ditch with stone and install sediment pools. Gravel road surface and crown road.	high	high
10-41	ATV trail	Lohnes Farm Road, just before 2nd culvert up to "slow caution" logging sign	Moderate road surface erosion and severe shoulder erosion for 1/10 mile, that drops off cliff into stream below.Ends at -70.697694, 44.696058	Crown road and add new surface material. Install sediment pools, vegetate or armor ditch with stone.	high	high
10-42	ATV trail	Lohnes Farm Road at creek crossing.	Moderate road surface erosion. Flows to stream. Undersized and unstable culvert I/O.	Armor culvert I/O and enlargen. Gravel road.	medium	high
10-43	ATV trail	Lohnes Farm Road, culvert 50' after York Brook crossling	Undersized and unstable culvert I/O. Slight ditch erosion on one side and severe road shoulder erosion.	Enlargen and armor culvert I/O. Vegetate or armor ditch with stone. Crown and gravel road.	high	high
10-44	ATV trail	Lohnes Farm Road	Unstable culvert I/O. Severe ditch and road shoulder erosion. Flows to ditch.	Armor I/O and install plunge pool. Vegetate ditch and crown road.	high	high

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
10-45	ATV trail	Lohnes Farm Road	Severe road surface erosion. Crushed, undersized culvert with unstable I/O. Ditch bank failure (5'x15'). Moderate road shoulder erosion. Flows directly to stream.	Replace, enlargen, and armor culvert I/O. Install plunge pool. Crown road and add new surface material.	high	high
10-46	Logging	Lohnes Farm Road, side road running North from LFR and parallel to York Brook	Unstable culvert I/O and small bank failure in ditch.	Armor culvert I/O. Vegetate or armor dicth with stone. Reshape ditch.	medium	medium
10-47	ATV trail	Lohnes Farm Road, culvert after logging road off of LFR.	Slight surface and road shoulder erosion. Unstable culvert I/O. Moderate ditch erosion flows to stream.	Enlargen and armor culvert I/O. Vegetate or armor ditch with stone. Reshape ditch.	medium	medium
10-48	ATV trail	Lohnes Farm Road	Severe ditch erosion flows through ditch.	Vegetate ditch and install sediment pools.	high	low
10-49	ATV trail	Lohnes Farm Road, culvert after bog area.	Moderate surface erosion and unstable culvert I/O. Flows to ditch.	Armor culvert I/O. Crown road and install runoff diverters-turnouts.	medium	medium
10-50	ATV trail	Lohnes Farm Road	Clogged culvert and eroding surface above culvert flows to stream.	Armor culvert I/O and remove clog.	medium	low
10-51	ATV trail	Lohnes Farm Road, side road running South from LFR, parallel to Beaver Brook.	Moderate surface erosion. ATVs crossing directly in stream bed.	Install bridge or block ATV access. Add signage. Reshape road and install waterbar on path.	high	low
10-52	ATV trail	Dunham ATV trail, after 1st fork	moderate ditch erosion flows to stream.	Add bridge or block trail from ATV usage.	medium	low
10-53	ATV trail	Dunham ATV trail, 2nd fork West off main trail.	Severe surface erosion flows to ditch.	Add bridge.	low	low
10-54	Residential-Driveway	Garland Pond Road	Moderate road surface erosion from frequent washouts. Under sized and unstable culvert I/O.	Build up road. Enlargen, lengthen, and armor culvert inlet/outlet. (Landowner could potentially provide labor and gravel (if right type)).	high	high
10-56	Residential-Driveway	Garland Pond Road	Slight surface erosion and bare soil, loose gravel adjacent to bridge footings.	Armor bridge sideslopes with stone or vegetation.	low	low

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
10-57	Road-Town	Garland Pond Road, 1st culvert north of Garland Brook	Severe surface erosion, exposing culvert on west side of road. Roadside grader berm for about 500'.	Remove grader berm. Replace and armor culvert.	medium	medium
10-58	Road-Town	Garland Pond Road, stream crossing south of Lohnes Farm Rd.	Moderate road surface erosion caused by roadside grader berm for about 250'. Flowing directly to stream on west side of road.	Install turnouts along road before stream and remove grader berm.	medium	low
10-59	Logging	York Brook, landing west of brook heading NW from logging trail.	Logging occuring in and around stream that was marked with blue flags. Slash area about 100' x 100'. Increased surface water channelling to stream point as a result of logging, compacted soils bringing water to surface. Causing problems downstream.	Educate about rock sandwich-Bill Laflamme. Water bars under slash? Change policy and/or practices for logging in area.	high	low
A-1	Logging	Hedge Hog Road	Moderate surface erosion at stream crossing.	?	low	low
A-2	Logging	Hedge Hog Road	Moderate surface erosion, culvert dammed by beavers,	Remove clog, replace or install culvert. Add new surface material to road and install runoff diverters before low point on road.	high	high
A-3	Road-Town	Garland Pond Road @ Phelps Brook, NE of bridge	Opening in roadside berm where erosion flows directly to stream.	Remove grader berm. Reshape road and tilt away from brook.	high	high
A-4	Logging	Bemis Loop ATV Trail	Moderate road surface erosion and unstable culvert I/O.	Armor inlet/outlet	low	medium
A-5	Logging	Bemis Loop ATV Trail	Unstable culvert I/O. Ditch bank failure.	Armor inlet/outlet. Armor ditch with stone.	low	medium
A-6	Logging	Bemis Loop ATV Trail	Moderate road surface erosion. Clogged culvert. Flows directly to stream.	Remove debris/sediment from ditch. Clean culvert above erosion. Reshape road crown and install runoff diverters.	medium	medium

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Site	Land Use	Location	Problem	Recommendations	Impact	Cost
A-7	Logging	Bemis Loop Trail-landing above stream	Severe surface erosion on and around landing washing into culvert under road and severely eroding hillside below road flowing directly into stream.	Armor ditch with stone, install check dams and sediment pools. Install plunge pool at culvert to slow flow. Landing needs vegetation and reshape so not flowing directly to culvert. Road needs to be reshaped and vegetate shoulder. Slope below road needs revegetation.	high	high
A-8	Logging	Bemis Loop Trail-below Mount Blue	Culvert crushed. Severe road shoulder and ditch erosion.	Enlarge culvert. Vegetate ditch and road shoulder. Intall catch basins along road.	high	medium
B-1	Shoreline	Southwestern quadrant of pond shoreline, undeveloped area.	Severe erosion, undercutting for about 120'.	Investigate water level stability and educate public. Create town policy?	high	low
B-2	Shoreline	Northwestern quadrant of pond shoreline, undeveloped area.	150' severe erosion and undercutting. Ending around -70.690075, 44.658019.	Investigate water level stability and educate public. Create town policy?	high	low
B-3	Shoreline	Northern point of pond shoreline, West of inlet, undeveloped area.	Severe erosion and shoreline undercutting.	Investigate water level stability and educate public. Create town policy?	high	low