Watershed Survey Report
Lovejoy Pond

March 2021

EPP/GEO 244S: Mobile Mapping and GIS
Geography and Environmental Planning

Provided to:

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Introduction

Eutrophication of freshwater ecosystems is a growing issue across the world. Due to human actions and activities, excess amounts of phosphorus can be found accumulated in much of the earth's soils (Bennett et al 2001). Practices such as agriculture use large amounts of fertilizers high in phosphorus content (Bennett et al 2001; Ekholm and Lehtoranta 2011). These particulates can make their way into the soils, increasing its phosphorus levels. Erosive events increase the potential for runoff of phosphorus particulates into freshwater systems (Bennett et al 2001). Higher levels of phosphorus in the soils as well as the increase in activities which promote erosion such as forestry, construction, development, etc., create an increased potential for phosphorus particulates to enter freshwater systems (Bennett et al 2001; Ekholm and Lehtoranta 2011). Increased levels of phosphorus in these ecosystems creates an increase in productivity known as eutrophication (Bennett et al 2001). Eutrophication can have detrimental impacts on aquatic resources within bodies of water as well as the degradation of water which may have been once fit for human consumption and recreational use (Kleinman et al, 2011). It has even been shown to impact the monetary value of real estate along a body of water (Rickert and Spiker 1971).

This report documents a watershed survey conducted by a group of environmental professionals, student researchers and volunteers from the 30 Mile Watershed Association, Maine Department of Environmental Protection, Lovejoy Pond Improvement Association, and the University of Maine at Farmington. The watershed survey focused on the Lovejoy Pond watershed, an area of approximately 4.6 square miles surrounding Lovejoy Pond in Kennebec County, Maine. The purpose of this survey was to investigate and identify potential sources of sediment which could potentially impact Lovejoy Pond. Surveyors identified these key areas and rated them using the Maine DEP survey protocol, based on type of erosion, size of the site, severity, and the estimated cost to fix it. Mitigation efforts can be prioritized with the data collected.

The purpose of this survey was NOT to point fingers, but to aid landowners in preventing erosive events from occurring on their land. Solutions for these erosive events included planting natural vegetative barriers, inserting rubber razors, open culverts, as well as restoring crowns on camp roads and improving infrastructure such as ditches to handle heavy rainfall.

Description of Lovejoy Pond

Lovejoy Pond is a body of water in Kennebec county that is within the towns of Fayette, Readfield and Wayne. Located south of Route 17 and North of Walton Road, the pond is approximately 379 acres on the surface, with an elevation of 301 feet according to the Lake Stewards of Maine Website. The pond reaches a maximum depth of only 22 feet, making management of the pond best suited for warm water fish, such as largemouth bass, smallmouth bass, white perch and others, according to the Maine Department of Inland Fisheries and Wildlife lake survey maps.

The pond sits within the 30 Mile River watershed that begins north of the pond near Chesterville and extends south into the Androscoggin River. The area of the watershed that flows into Lovejoy pond is 2,716 acres. The pond has a flushing rate of 11.4 times per year. This number is an indicator for how long water that flows into the lake remains there before exiting. The flushing rate for Lovejoy pond is higher than the state average. There is over 7 miles of shoreline on Lovejoy Pond and there is moderate development around the pond with many seasonal homes. The outlet is impounded by a dam on the south shore of the pond. There is no public boat launch but a homeowner association as well as a private school have access points to the pond.

Methodology

Before the Lovejoy Pond watershed survey, Maine DEP and 30 Mile River Watershed Association hosted a 90-minute Zoom-based training session that was attended by Lovejoy Pond residents and students from the UMF Mobile Mapping and GIS class (Geography/Environmental Policy & Planning). This session consisted of a slide presentation regarding the watershed that explained different types of erosion features and characteristics and incorporated interactive quizzes that helped participants learn what to expect from the field survey work.

The training session also included detailed specifications of Covid-19 guidelines that required maintaining social distancing and masking while participating in the survey, and how the data collected during the survey can be used to lessen the effects of erosion around Lovejoy Pond.

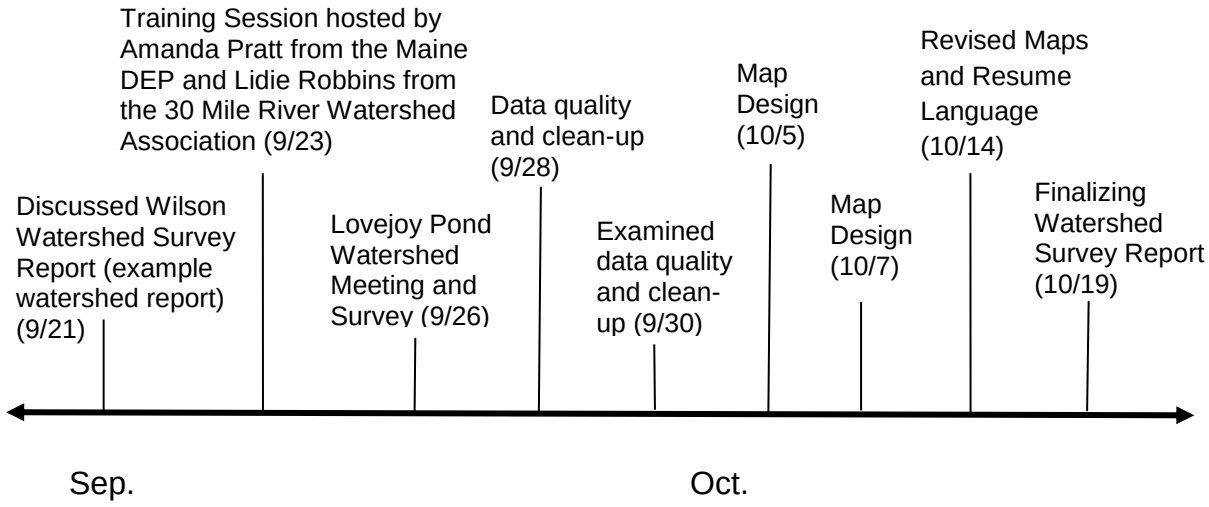
In addition to the DEP/30 Mile River Watershed training, UMF students reviewed the 2016 Wilson Lake Watershed Report created by Ecological Instincts and noted what should be included in this report. The

Survey123 mobile GIS survey that was created for the Lovejoy Pond watershed by Maine DEP was also reviewed so we would be familiar with what data we should collect while in the field.

During the survey, the students, volunteers and technical leaders split into five teams that covered the five sectors of the Lovejoy Pond watershed. Each team was given a map of its sector and a list of property owners. After a brief meeting and distribution of supporting documents, each team walked properties and recorded places where erosion was observed that might impact Lovejoy Pond. The Survey123 app allowed us to map the location of the erosion site, make note of its surroundings and give it an overall impact rating. This impact rating was weighted according to how much the fix of the site would cost, how large the site was, and how experienced people had to be to come fix it. The survey put all sites into a final map, with data we were all able to access and use for other maps with different focuses. These maps focus on certain sectors and important elements such as the impact rating, land use, whether or not YCC can resolve the problem, and types of problems that sites are experiencing.

Timeline

The following timeline outlines the process of planning, preparing for, conducting and reporting on the Lovejoy Pond Watershed Survey.



Why This Survey is Important

The issue of declining lake quality has been a longstanding concern in Maine. In the early 1980's China Lake in Maine experienced an algae bloom in what would become known as the "China Lake Syndrome."

At the time China Lake had the most rapidly declining water quality in the state of Maine. The primary cause was phosphorus rich runoff from the surrounding watershed. China Lake was one of the first lakes studied in Maine in which the results indicated that residential development and agricultural activity were generating most of the phosphorus rather than a small number of large polluters or "point sources." The challenges of China Lake took place alongside an emerging national awareness of the impacts of nonpoint source pollution. China Lake's transformation from a healthy and aesthetically pleasing recreation area to a green lake filled with toxic algae underscored the need to monitor, study and control lake water quality in Maine.

What happened to China Lake is known as eutrophication which still threatens many other bodies of water in Maine, including Lovejoy Pond. As mentioned above, eutrophication occurs when bodies of water receive a surplus of nutrients, usually phosphorus and nitrogen. This is a naturally occurring process, however it can be greatly accelerated by human activity. The excess phosphorus and nitrogen will cause harmful algae blooms and provide an opportunity for the introduction of invasive species. The resulting algae will reduce water clarity and block out sunlight causing the algae and other plants to die. The decaying organic material will consume and reduce oxygen levels. Cold-water fish such as trout and salmon cannot survive in an oxygen deficient habitat. The environmental impact is not limited to these bodies of water as they are part of a larger ecosystem. The Maine Department of Environmental Protection (DEP) reports that the bacteria that cause algae blooms can produce toxins which cause rashes, nausea, diarrhea and, in very rare cases, death. These toxins can make their way into drinking water reservoirs and harm wildlife.

In addition to the environmental impacts of lake eutrophication there are serious economic consequences as well. Maine's 6,000 lakes are one of the state's most precious resources. They provide ample drinking water, an abundance of recreational opportunities, and are fundamental to the economic standing of local communities. A study by the DEP concluded that a decline in water quality can reduce property values by as much as $200 per water frontage foot (Michael et al, 1996). This reduction represents hundreds of millions of dollars in lost property values for lakefront property owners. However, the economic impact is not limited to shore front property owners. The same study also found that over 200,000 Maine adults, who do not own lakefront property, access lakes annually. These access users spend as much as $153 million annually on their recreation, of which 59% is spent in the communities nearest their destinations. This activity supports as many as 3,000 jobs and generates

over $30 million in revenue for Maine (*Lakes page - The Economics of Lakes and Water Quality, Maine DEP,* n.d.).

Results

A total of 51 NPS sites were documented during the Lovejoy Pond Watershed Survey. The sites covering ten different land use types (Figure 1). Residential properties had the highest number of documented sites.

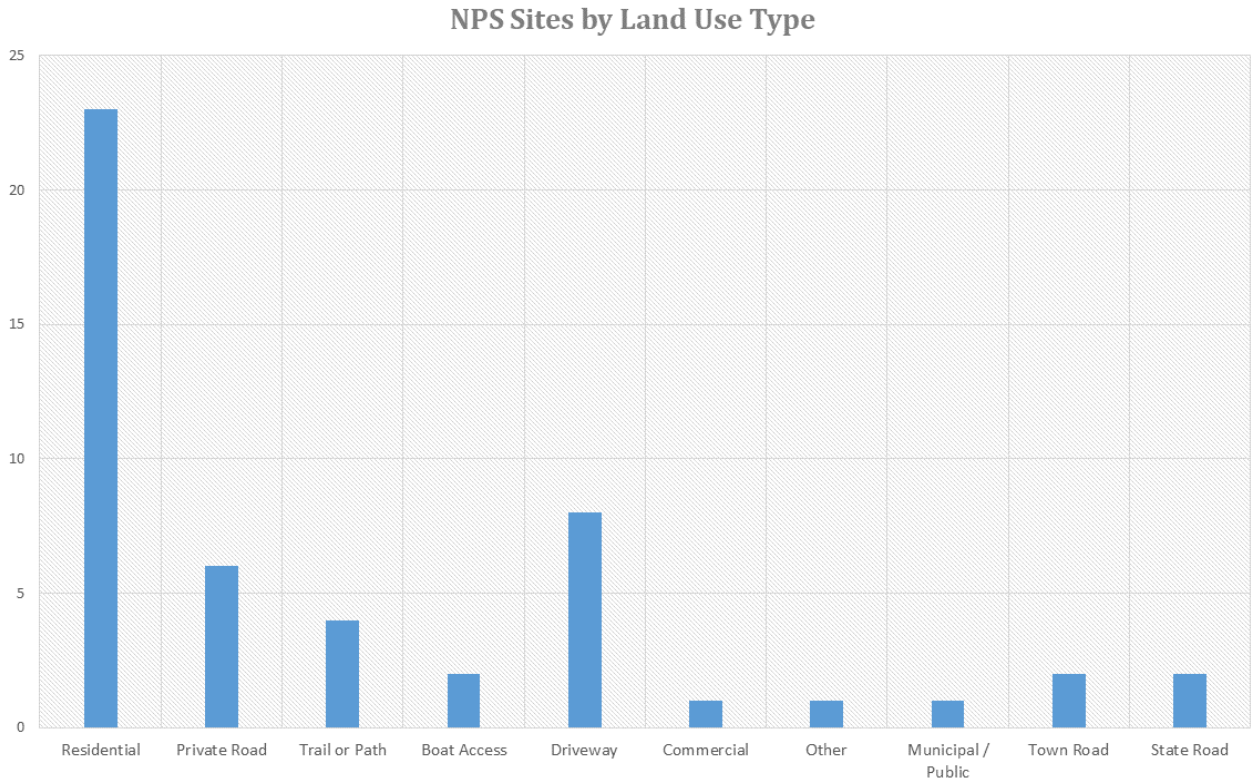


Figure 1. *NPS sites in the Lovejoy Pond watershed survey by land-use type.*

The distribution of NPS site land uses varied by survey sector as illustrated in the chart and map below (Figures 2-3).

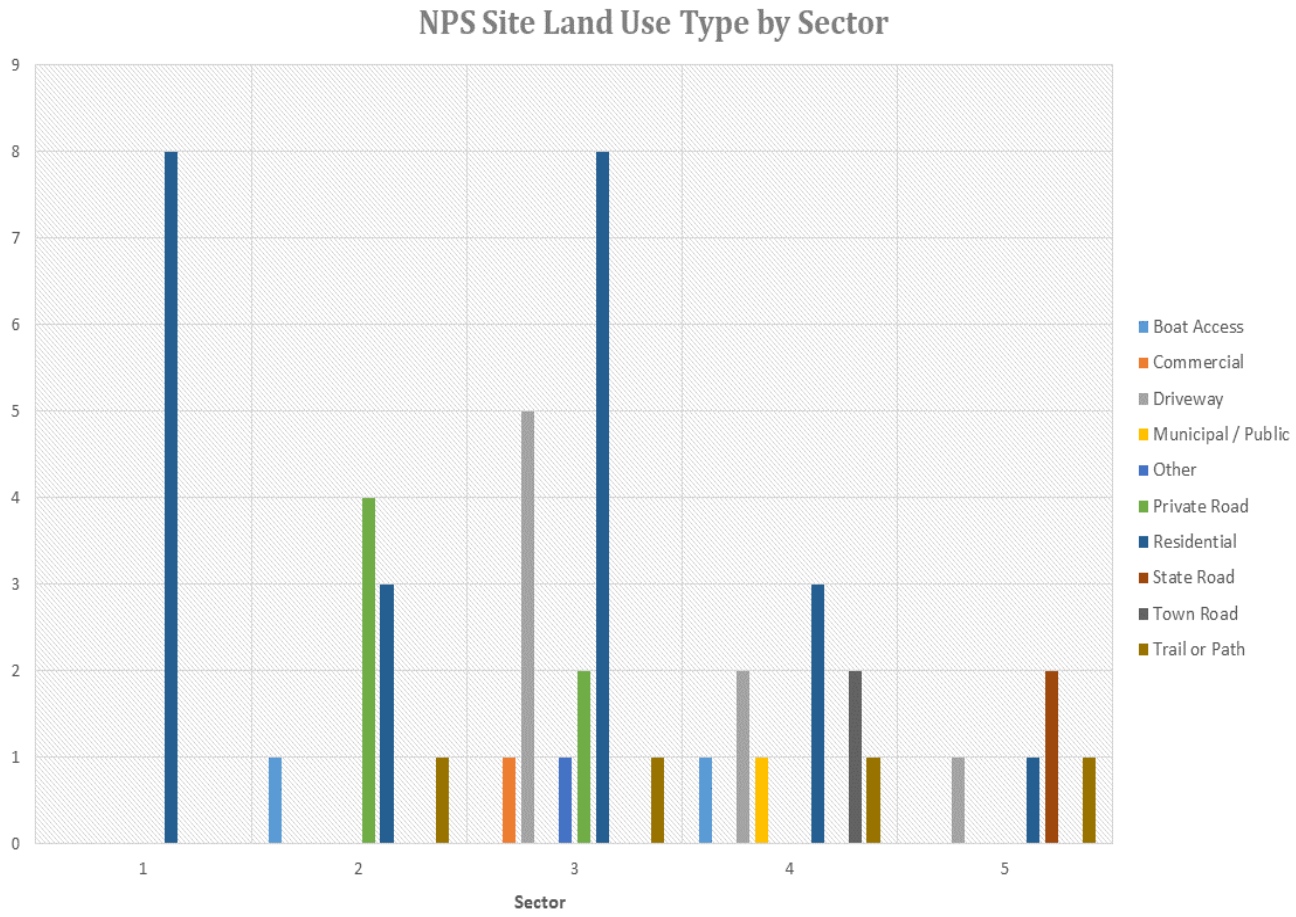


Figure 2. *NPS sites in the Lovejoy Pond watershed survey showing land use by sector.*

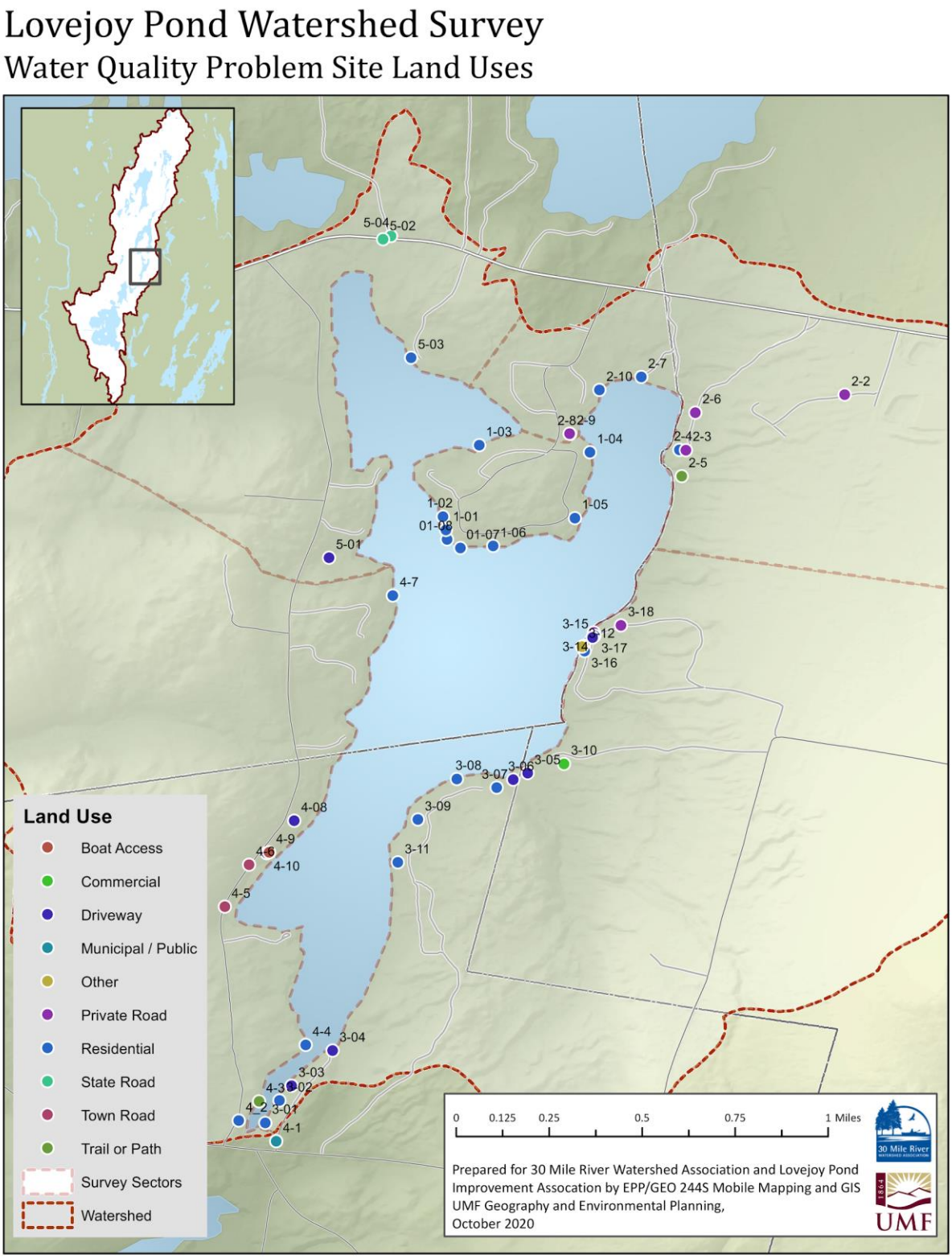


Figure 3. *Map of the NPS sites by land-use type*

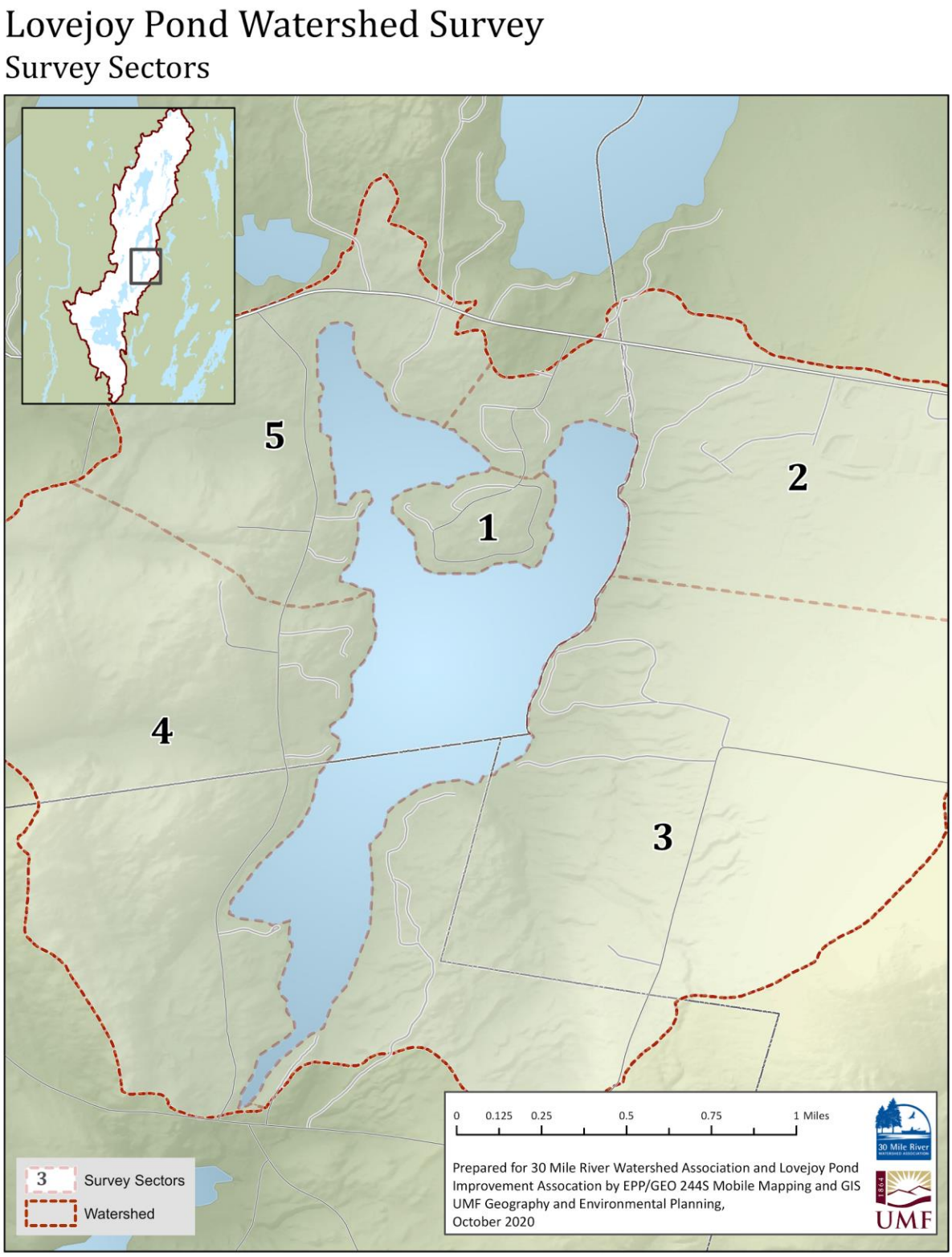
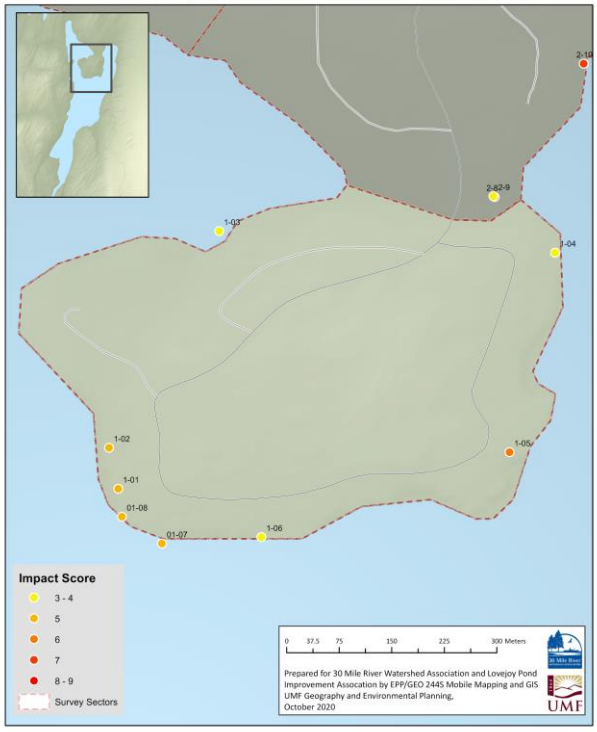
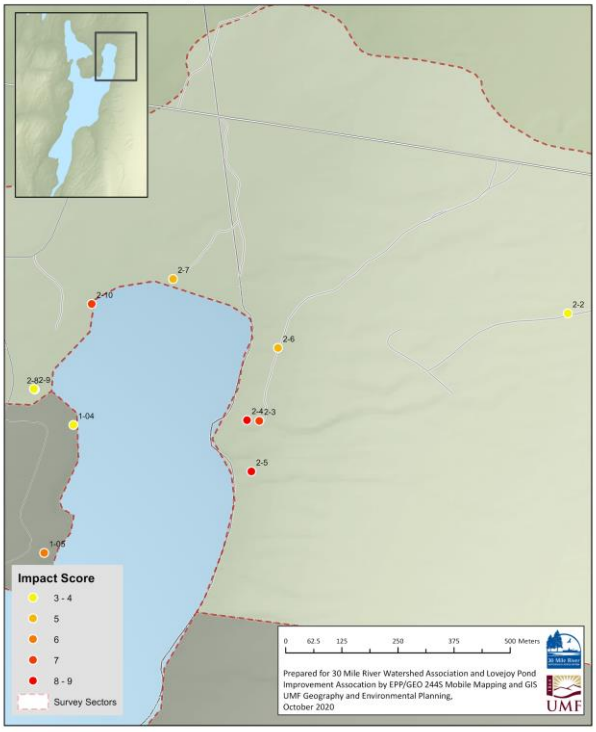


Figure 4. *Map of the NPS sites by land-use type*

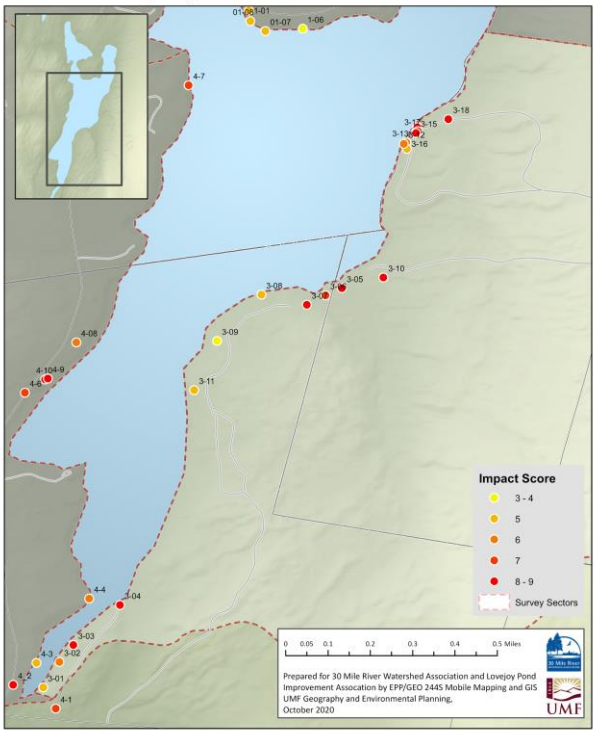
Lovejoy Pond Watershed Survey
Sector 1 Water Quality Problem Sites



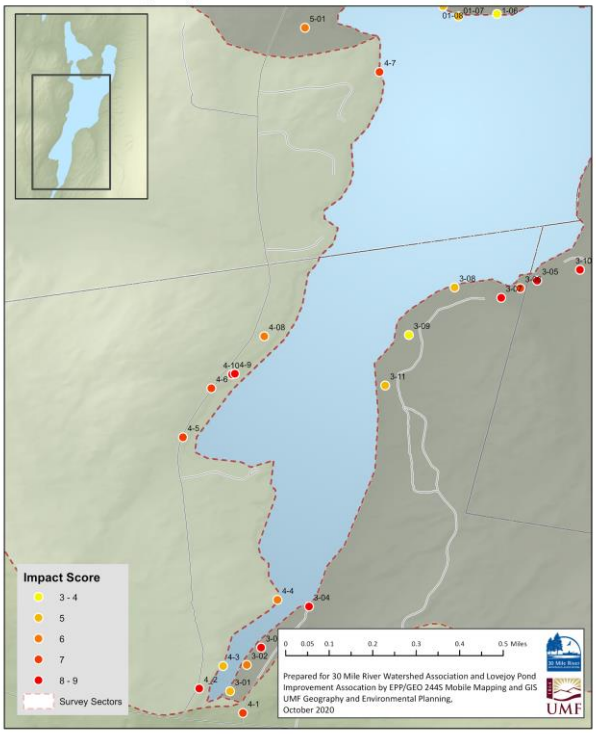
Lovejoy Pond Watershed Survey
Sector 2 Water Quality Problem Sites



Lovejoy Pond Watershed Survey
Sector 3 Water Quality Problem Sites



Lovejoy Pond Watershed Survey
Sector 4 Water Quality Problem Sites



Sector maps show the location of NPS sites coded according to the Impact Rating that was determined by Maine DEP's protocol based on the field determination of site characteristics.

The impact rating indicates each NPS site's potential to transport phosphorus to Lovejoy Pond. See the table below for more information about the impact ratings.

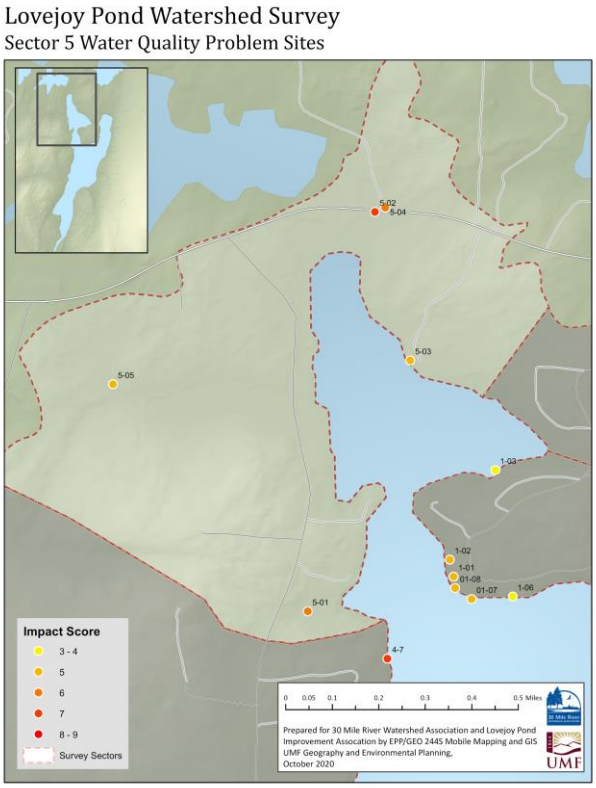


Figure 5-9. *Sector maps of the NPS sites*

Low impact sites include limited transport of phosphorus.

Medium impact sites reveal such transport of phosphorus, yet the erosion does not reach its highest magnitude.

High impact sites are areas with a consequential amount of erosion with a direct flow to water.

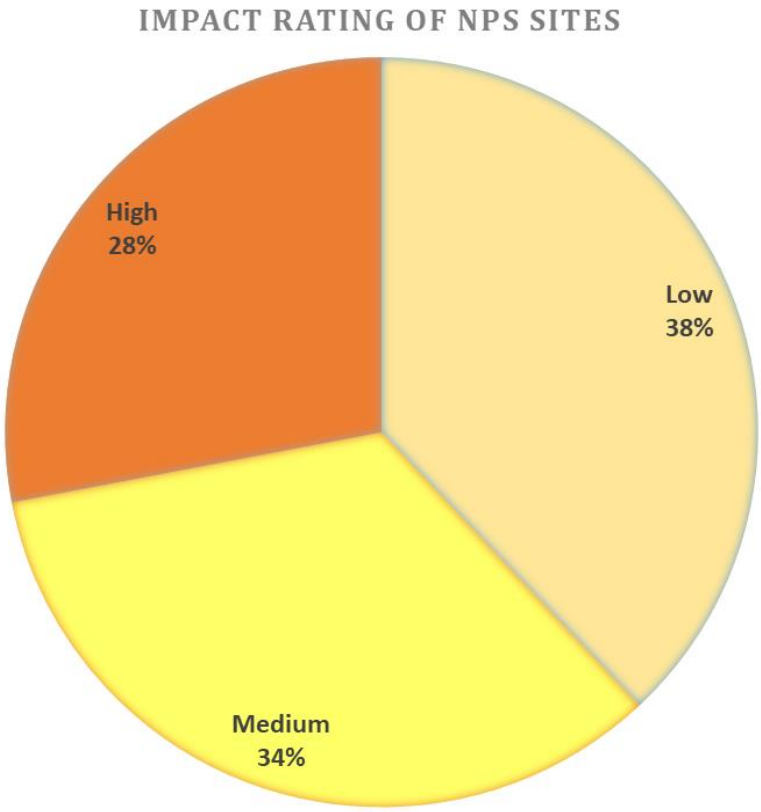


Figure 10. *Estimated impact rating of NPS sites in the Lovejoy Pond watershed.*

Example Sites

The following table provides photographs and brief descriptions of representative NPS sites identified by the Watershed Survey.

	
4-04: This land is being used for residential uses, sheet erosion is evident and is flowing directly into the lake. Recommendations for helping stop the erosion is stabilize a walking path by adding erosion control mulch to the path.	4-09: Site is associated with a residential land use. Rill and sheet erosion are causing bare soil to show. There is minimal vegetation helping to stop the erosion. Recommendations for helping stop the erosion are Install runoff Diverters, also to add erosion control mix to the soil to strengthen up the soil

	5-02: This land is being used for a State Road. It has a Gully Erosion, caused by a rusted and broken culvert inlet and outlet. Recommendations for this site are to replace the culvert, and armor the inlet and outlet of the culvert to prevent erosion.

Next Steps

The next steps for Lovejoy Pond are to look at all of the data collected from the watershed survey, identify all of the highest risk areas, and make sure that those high-risk areas are taken care of in a reasonable amount of time. While high risk areas of the survey should have the most attention, it is also very important to prioritize all sectors and areas recorded from the survey. Next Steps can also look like:

- Share the information collected from the survey with the general public, especially property owners. It is imperative that town and state officials, and land owners, are notified so that a proper plan can be put in place for all of the sectors and the individual work they will need.
- Send letters and notices to landowners and offer advice for the conservation of their property and solution to the problems unique to their land.
- Draw up a budget or a funding method that will allow for the proper precautions to be made for the highest risk areas recorded, and all of other sectors and less severe areas recorded from the data.
- Draft a schedule to attend to problem sites in a timely manner.

- Apply for grants or other types of help in order to find solutions for the sector problems recorded in the survey.
- The last important step to take post-survey is to assess where and what the most problematic areas were, and make landowners aware of what can be done to prevent it from happening in the future.

Future prevention lies mostly on land owners, especially in the areas of decision making and preserving their property according to the results of the survey and the severity of the problem site. Fixing the problem sites and decision making might look like:

- Refraining from raking or mowing areas near the shoreline in order to allow natural vegetation to grow back, which in the long run can allow tree roots to grow back, which can help to prevent future erosion.
- Property owners can use mulch instead of bare soil in certain areas, which can help to control erosion.
- Land owners can receive professional opinions from the DEP before making any final decisions on land treatment to ensure the correct precautions are being taken for that specific problem site.
- Be sure to maintain regular maintenance of septic systems on the property. This might look like every 2-3 years, or 4-5 years if the property is only used seasonally.
- Land owners can get involved by joining their community in making conservation plans with neighbors to ensure proper methods are in place for future conservation.

Municipal Officials

- Conduct regular surveys to keep up with land preservation in high risk areas.
- Enforce shoreland zoning unique to Lovejoy Pond in order to keep the area protected in the long-term.
- Participate in and support watershed projects, or serve on watershed committees.
- Promote education and training of watershed survey crews and management of projects.

Conservation Practices for Homeowners

This report lays out a general evaluation of NPS sites across the Lovejoy Pond Watershed. You now probably have an idea of how you can implement these best practices on your own property. However, taking the steps from evaluation to construction can be difficult.

Additional resources are available on the Portland Water District website at **pwd.org/publications.** These fact sheets include information on types of erosion, common conservation practices, as well as detailed instructions in the form of diagrams and color photos on how to install and maintain these practices.

Each of these fact sheets is tailored specifically to the issue that is trying to be solved and/or the solution being implemented. Some examples of factsheets include pathways and walkways, turnouts, rubber razors etc. Some lists on these fact sheets also include specific plants useful in specific areas and situations along with images and descriptions of the flora.

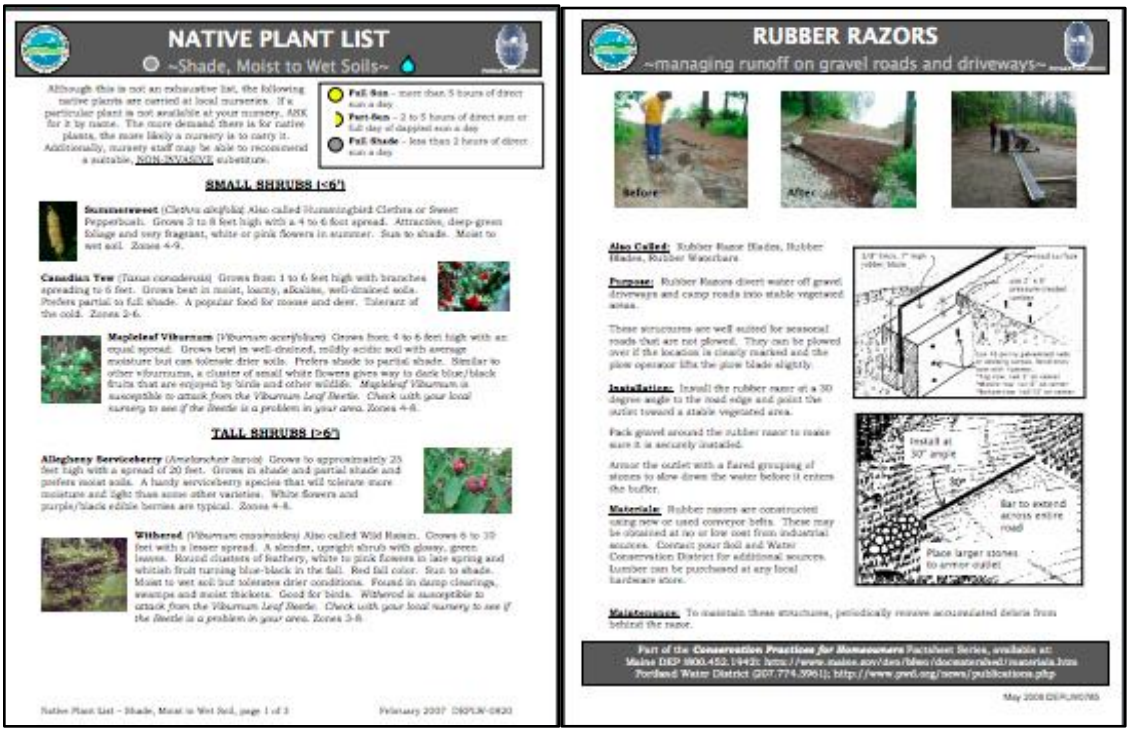


Figure 11. *Examples of the fact sheets available at* ***pwd.org/publications*** *under the* ***Environment Factsheet*** *option in the drop down menu.*

Permitting Overview

The protection of Maine's lake watersheds is driven by the cooperation and consideration of the residents who live in the watershed and along their shores. Permitting laws and ordinances are also created and enforced by the State of Maine for the protection of these natural resources.

The "Permitting" fact sheet produced by the Portland Water District (pwd.org/publications) states:

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."*

For more information on zoning laws and regulations contact the Maine DEP as well as the Town Code Enforcement Officer. Each municipality has its own specific ordinances that need to be followed during the construction and development process.

Applying for a Permit By Rule Through Maine DEP

The Maine DEP has established a permitting process known as **Permit by Rule** allowing landowners who are performing certain development activities to avoid the time and expense of filing a permit application through Maine DEP.

- In order to access this application and more information about the application process, go to **maine.gov/dep/land/nrpa/ip-pbr.html**. Here you will find a list of eligible projects as well as resources for additional facts about the NRPS and Permit by Rule.
- The permits are reviewed by the DEP within 14 days. If the applicant does not hear from the DEP in that period, it is assumed the permit is approved and you may begin work on your project.

Additional Contact Information

For more information about any best management practices, permitting, or this watershed survey report, please contact:

30 Mile River Watershed

Lidie Robbins, Executive Director

lidie@30mileriver.org or (207) 860-4043

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Appendices

List of Lovejoy Pond Watershed Survey Sites

Site	Flow into lake via	Land Use	Problems	Size (ft)	Slope	Recommendations	Impact Rating
1-01	Directly into lake	Residential	Surface Erosion (Sheet), Bare Soil, Shoreline Erosion, Inadequate Shoreline Vegetation	5 x 10	Moderate	Add to Buffer, Rip Rap, Reinforce/embed rock wall and then add vegetation	Low
1-02	Directly into lake	Residential	Undercut Shoreline, Shoreline Erosion, Unstable Shoreline Access	5 x 15	Moderate	Stabilize and define Foot Path, Erosion Control Mulch, Add to Buffer	Low
1-03	Minimal Vegetation	Residential	Surface Erosion (Sheet)	5 x 5	Flat	Add to Buffer, Reseed bare soil & thinning grass, Erosion Control Mix	Low
1-04	Minimal Vegetation	Residential	Surface Erosion (Sheet)	A few patches	Steep	Define Foot Path, Reseed bare soil & thinning grass, Rain Garden, Water Retention Swales	Low
1-05	Minimal Vegetation	Residential	Surface Erosion (Rill)	30 x 40	Moderate	Define Foot Path, Reseed bare soil & thinning grass, Rain Garden, Erosion Control Mix	Medium
1-06	Minimal Vegetation	Residential	Surface Erosion (Sheet)	10 x 20	Moderate	Define Foot Path, Stabilize Foot Path, Add to Buffer, Erosion Control Mix	Low
1-07	Minimal Vegetation	Residential	Surface Erosion (Sheet), Lack Of Shoreline Vegetation	5 x 10 (2)	Moderate	Stabilize and define Foot Path, Add to Buffer, Reseed bare soil & thinning grass	Low
1-08	Directly into lake	Residential	Surface Erosion (Sheet), Unstable Shoreline Access, Shoreline Erosion,	3 x 15	Moderate	Define Foot Path,Stabilize Foot Path,Erosion Control Mulch, Mulch/Erosion Control Mix	Low
2-01	Ditch	Private Road	Surface Erosion (Sheet, Rill), Ditch Erosion (Gully)	10 x 60	Moderate	Install/Reshape Ditch, Reshape road (Crown), Add gravel, Remove Grader/Plow Berms, Build Up, Steeper section of road above Wesleyan ditch needs ditch	Medium
2-02	Ditch	Private Road	Clogged Culvert	10 x 20	Moderate	Remove Clog	Low
2-03	Stream	Private Road	Surface Erosion (Gully)	3 x 20	Moderate	Add gravel	Medium
2-04	Directly into lake	Residential	Surface Erosion (Gully), Lack Of Shoreline Vegetation,Shoreline Erosion,	6 x 100	Steep	Establish Buffer, Install Runoff Diverter, Erosion Control Mix	High

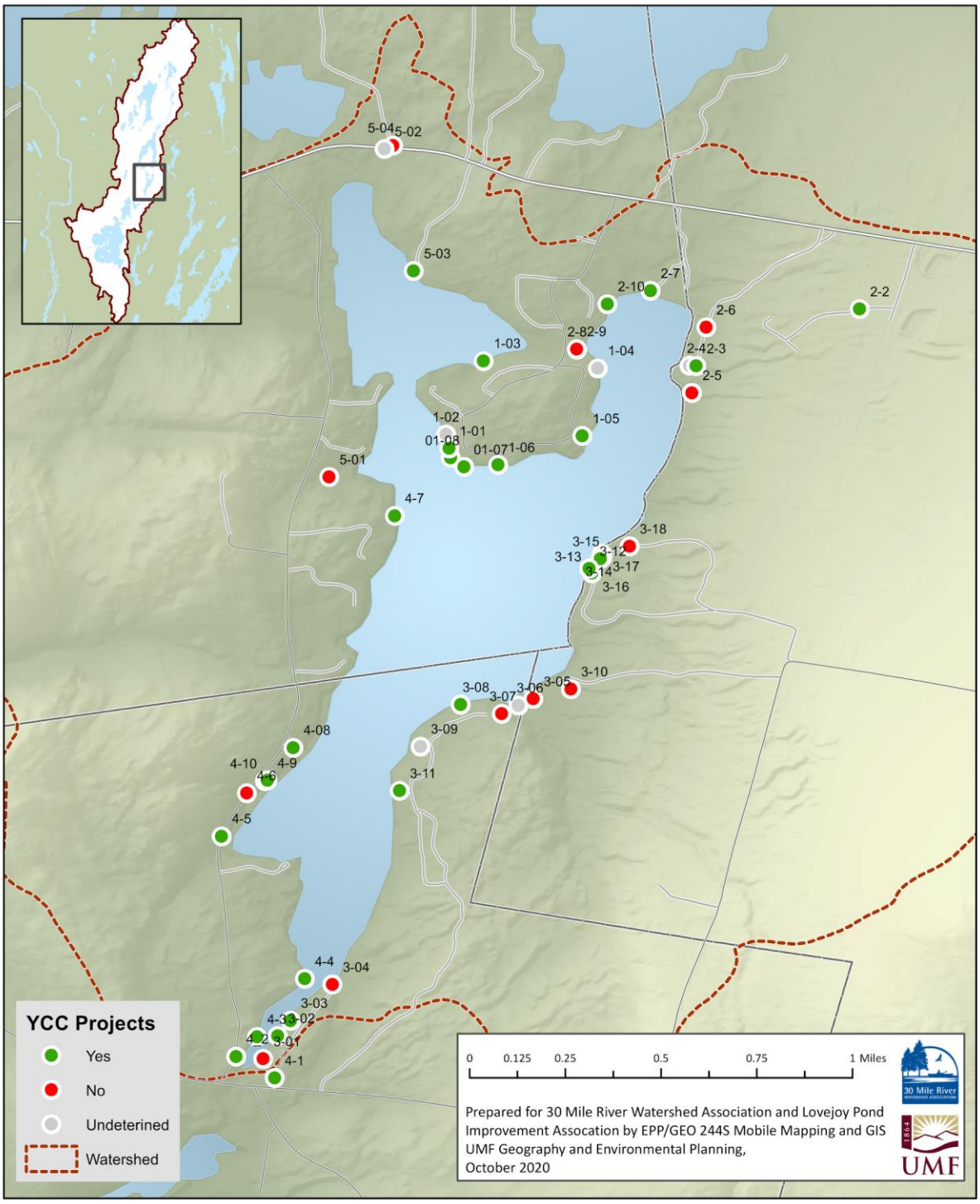
Site	Flow into lake via	Land Use	Problems	Size (ft)	Slope	Recommendations	Impact Rating
2-05	Directly into lake	Trail or Path	Surface Erosion (Sheet, Rill, Gully), Bare Soil, Delta, Undercut Shoreline, Lack Of Shoreline Vegetation, Shoreline Erosion, Access Road Severely Eroded Leading To Turf Before Going Directly Into Lake	12 x 150	Steep	Install Check Dams, Install Ditch, Install Turnouts, Reshape road (Crown), Build Up, Add gravel, Establish Buffer, Install Runoff Diverter, Erosion Control Mix	High
2-06	Directly into lake	Private Road	Surface Erosion (Sheet, Rill)	12 x 75	Moderate	Build Up, Add gravel, Reshape (Crown) Build Up, Add gravel, Reshape (Crown)	Low
2-07	Directly into lake	Residential	Inadequate Shoreline Vegetation	30	Flat	Rain Barrel, Add to Buffer	Low
2-08	Directly into lake	Boat Access	Shoreline Erosion,Undercut Shoreline	50	Flat	Rip Rap	High
2-09	Stream	Private Road	Clogged Culvert	10	Flat	Remove Clog	Low
2-10	Directly into lake	Residential	Undercut Shoreline,Shoreline Erosion	11	Flat	Rip Rap	Medium
3-01	Directly into lake	Residential	Surface Erosion (Sheet), Shoreline Erosion, Inadequate Shoreline Vegetation	10 x 30	Steep	Erosion Control Mulch, Add to Buffer,Reseed bare soil & thinning grass, Potential riprap but not ideal	Low
3-02	Directly into lake	Residential	Surface Erosion (Sheet), Bare Soil, Lack Of Shoreline Vegetation, Shoreline Erosion	8 x 30	Moderate	Install Runoff Diverters, Stabilize Foot Path,Define Foot Path, Mulch/Erosion Control Mix, Currently two driveways that converge. Define one and revegetate other.	Medium
3-03	Directly into lake	Driveway	Surface Erosion (Sheet, Rill), Bare Soil, Lack Of Shoreline Vegetation	10 x 300	Moderate	Reshape (Crown), Install Runoff Diverters, Add gravel, Define Foot Path, Infiltration Trench @ roof dripline, Eastablish Buffer, Define recreation area and footpath	High
3-04	Minimal Vegetation	Driveway	Surface Erosion (Gully)	10 x 200	Steep	Install Ditch, Reshape (Crown), Add gravel, Build Up, Install Runoff Diverters, Establish Buffer, Bluestone gravel	High

Site	Flow into lake via	Land Use	Problems	Size (ft)	Slope	Recommendations	Impact Rating
3-05	Stream	Driveway	Ditch (Bank Failure, Gully Erosion)	> 300	Moderate	Armor Inlet/Outlet, Armor with Stone	High
3-06	Stream	Driveway	Surface Erosion (Rill), Unstable Culvert, Bank Failure In Ditch, Road Shoulder Erosion (Sheet), Undercut Shoreline	200	Flat	Install Plunge Pool, Armor with Stone	Medium
3-07	Minimal Vegetation	Residential	Surface Erosion (Gully), Ditch Erosion (Gully), Bank Failure In Ditch, Bare Soil, Fertilizer Use In Shoreland Zone	3 x 150	Steep	Armor with Stone, Cut slope back, line diverters with stone	High
3-08	Directly into lake	Residential	Surface Erosion (Sheet), Lack Of Shoreline Vegetation	6 x 50	Moderate	Define Foot Path,Stabilize Foot Path, Add to Buffer, Meander path	Low
3-09	Minimal Vegetation	Residential	Surface Erosion (Sheet)	8 x 12	Steep	Install Runoff Diverters-Waterbar,Add recycled asphalt, Erosion Control Mulch, Vegetate slope	Low
3-10	Stream	Commercial	Undercut Shoreline	>300	Moderate	Armor with Stone, Rip Rap, Maybe just be worth focusing on efforts at the culvert and amount the ditches and stream handle from runoff	High
3-11	Directly into lake	Residential	Surface Erosion (Sheet)	3 x 30	Moderate	Stabilize Foot Path,Define Foot Path,Erosion Control Mulch,Infiltration Steps	Low
3-12	Directly into lake	Other	Surface Erosion (Sheet), Bare Soil, Inadequate Shoreline Vegetation, Shoreline Erosion	30 x 30	Steep	Add to Buffer, Mulch/Erosion Control Mix	Medium
3-13	Directly into lake	Trail or Path	Surface Erosion (Sheet), Bare Soil	5 x 40	Flat	Add recycled asphalt, Stabilize Foot Path	Medium
3-14	Directly into lake	Private Road	Surface Erosion (Rill)	25 x 120	Moderate	Reshape (Crown),Install Runoff Diverters-Broad-based Dip,Install Runoff Diverters-Waterbar, Stabilize road with crushed rock or bluestone; tree roots prevent digging down to install diverters	High
3-15	Directly into lake	Driveway	Surface Erosion (Rill)	20 x 20	Moderate	Install Runoff Diverters, Install Runoff Diverters, Mulch/Erosion Control Mix	High

Site	Flow into lake via	Land Use	Problems	Size (ft)	Slope	Recommendations	Impact Rating
3-16	Directly into lake	Residential	Surface Erosion (Sheet), Bare Soil, Inadequate Shoreline Vegetation	10 x 30	Moderate	Define Foot Path, Add to Buffer, Mulch/Erosion Control Mix	Low
3-17	Directly into lake	Residential	Surface Erosion (Rill), Roof Runoff Erosion	6 x 40	Moderate	Infiltration Trench at roof dripline	Medium
3-18	Directly into lake	Private Road	Surface Erosion (Rill)	15 x 200	Moderate	Install Turnouts, Install Detention Basin,Build Up,Reshape (Crown),Add gravel, Extend bluestone	High
4-01	Directly into lake	Municipal / Public	Surface Erosion (Sheet, Rill), Bare Soil, Unstable Shoreline Access, Shoreline Erosion, Invasive Plants On Shoreline	3 x 30	Steep	Install Runoff Diverter, Infiltration Steps, Erosion Control Mulch, Define and stablilize Foot Path, YCC work holding up well but more work needed	Medium
4-02	Directly into lake	Residential	Surface Erosion (Rill), Bare Soil	30 x 50	Steep	Establish Buffer, Erosion Control Mix, Road ronoff going down hill to lake, plant ground cover	High
4-03	Directly into lake	Trail or Path	Surface Erosion (Rill), Bare Soil	2 x 75	Steep	Infiltration Steps, Define Foot Path, Erosion Control Mulch, Make path more meandering	Low
4-04	Directly into lake	Residential	Surface Erosion (Sheet), Bare Soil	20 x 50	Moderate	Stabilize Foot Path,Erosion Control Mulch	Medium
4-05	Ditch	Town Road	Surface Erosion (Rill), Road Shoulder Erosion (Rill), Bare Soil, Winter Sand,	12 x 50	Steep	Steep eroding bank, possibly riprap	Medium
4-06	Ditch	Town Road	Undersized Ditch, Bank Failure In Ditch	3 x 15	Steep	Install Plunge Pool, Plunge pool needs to be deeper	Medium
4-07	Directly into lake	Residential	Surface Erosion (Sheet), Bare Soil, Lack Of Shoreline Vegetation	50 x 80	Moderate	Establish Buffer, Erosion Control Mix, Driveway contributing to problem	Medium
4-08	Minimal Vegetation	Driveway	Surface Erosion (Rill)	10 x 30	Moderate	Install Runoff Diverters, Erosion Control Mix	Medium
4-09	Directly into lake	Boat Access	Surface Erosion (Rill), Bare Soil	6 x 50	Moderate	Erosion Control Mix, Install Runoff Diverter	High
4-10	Minimal Vegetation	Driveway	Surface Erosion (Rill), Bare Soil, Lack Of Shoreline Vegetation	15 x 75	Moderate	Erosion Control Mulch, Install Runoff Diverter, No Raking, Add to Buffer	High

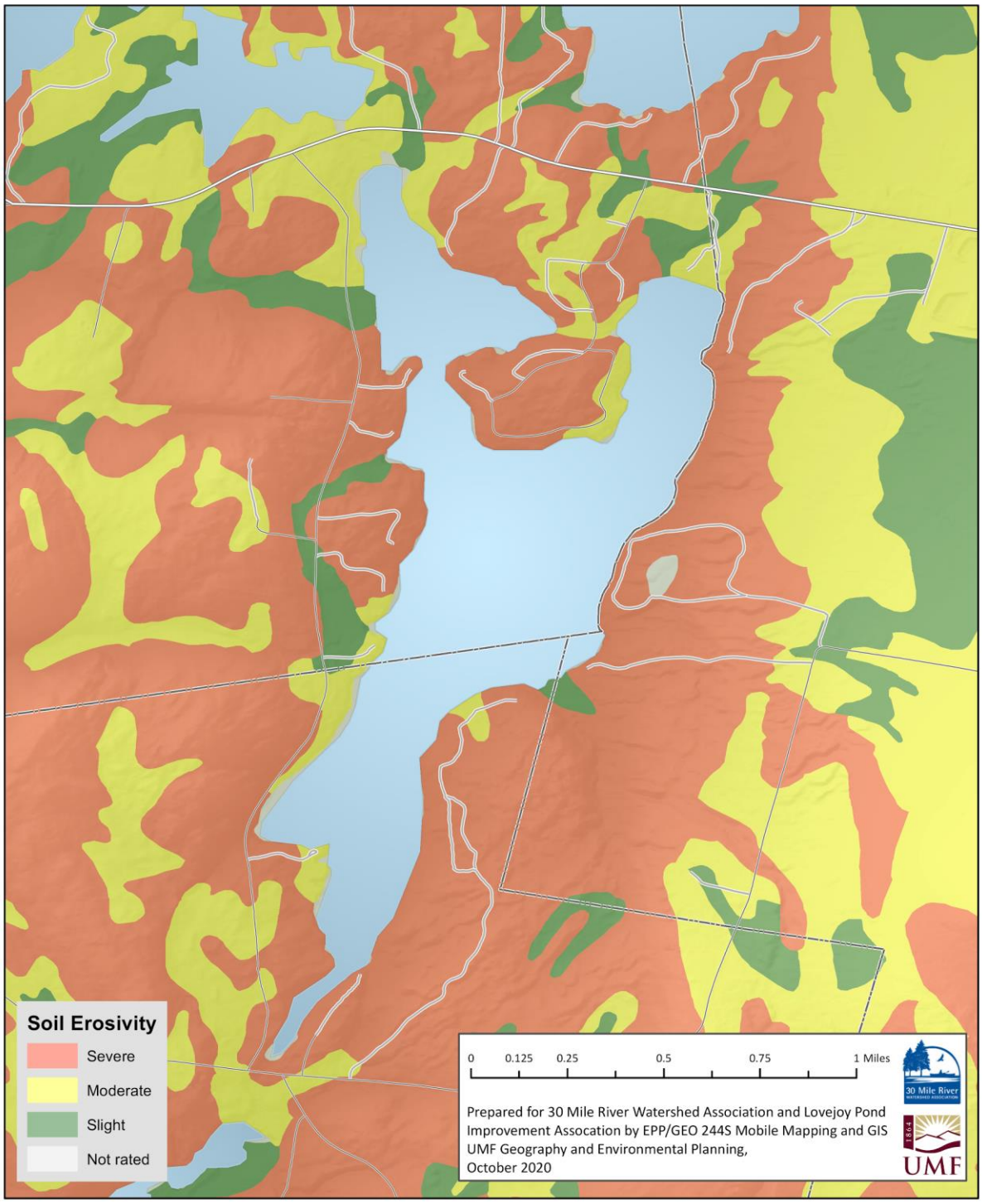
Site	Flow into lake via	Land Use	Problems	Size (ft)	Slope	Recommendations	Impact Rating
5-01	Stream	Driveway	Crushed/Broken Culvert	4 x 20	Flat	Replace, Lengthen culvert	Medium
5-02	Stream	State Road	Surface Erosion (Gully), Crushed/Broken Culvert, Unstable Culvert Inlet/Outlet,	5 x 50	Moderate	Replace culvert, Armor Inlet/Outlet	Medium
5-03	Minimal Vegetation	Residential	Surface Erosion (Sheet), Bare Soil, Inadequate Shoreline Vegetation	20 x 45	Moderate	Add to Buffer,Reseed bare soil & thinning grass, Mulch/Erosion Control Mix	Low
5-04	Ditch	State Road	Road Shoulder Erosion (Gully)	5 x 5	Moderate	Remove debris/sediment, Pave	Medium
5-05	Stream	Trail or Path	Surface Erosion (Sheet), Undersized Culvert, Unstable Culvert Inlet/Outlet	10 x 20	Moderate	Replace,Armor Inlet/Outlet,Enlarge, Build Up	Low

Lovejoy Pond Watershed Survey
Potential YCC Projects



Lovejoy Pond Watershed Survey

Soils: Potential Erosion Hazard



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Water Quality Problem Sites