Clemons Pond Watershed Survey Report

2022 (revised 11/17/22)

PREPARED FOR:

Clemons Pond Association

Acknowledgments

The following people and organizations were instrumental in the Clemons Pond Watershed Survey and deserve recognition for their efforts

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Photo of Clemons Pond by Walt and Louise Novak

Table of Contents

INTRODUCTION

This report serves to compile, summarize, and analyze the data collected during the Clemons Pond watershed survey conducted in the Spring of 2022 and is intended for residents, landowners, and town officials in the Clemons Pond watershed. This survey and report are a great tool to identify problems and locations of problems and provide recommendations to fix soil erosion with the goal of maintaining and protecting the water quality of Clemons Pond.

Watershed surveys are useful in providing a snapshot of the watershed condition at the time of the survey by documenting the evidence of erosion. The data gathered during the watershed survey will be used by the Clemons Pond Association to maintain the health of Clemons Pond

CLEMONS POND AND ITS WATER QUALITY

Clemons Pond is in the Town of Hiram in Oxford County, Maine. It has a surface area of 84 acres and maximum depth of 44 feet. It is located at an elevation of 403 feet above sea level. The pond supports primarily a warm water fishery including rainbow smelt, largemouth bass, chain pickerel, perch, and sunfish. It and adjoining Little Clemons Pond are stocked at least annually by Maine IF and W with brook trout. Public fishing access is via a boat launch at the northern end of the pond.

Big Clemons Pond water quality has been monitored since 1978 (except for one hiatus of several years) sponsored by the Clemons Pond Association and under the guidance of Lake Stewards of Maine (formerly Maine VLMP). Water quality testing by a certified monitor is conducted from May- October.

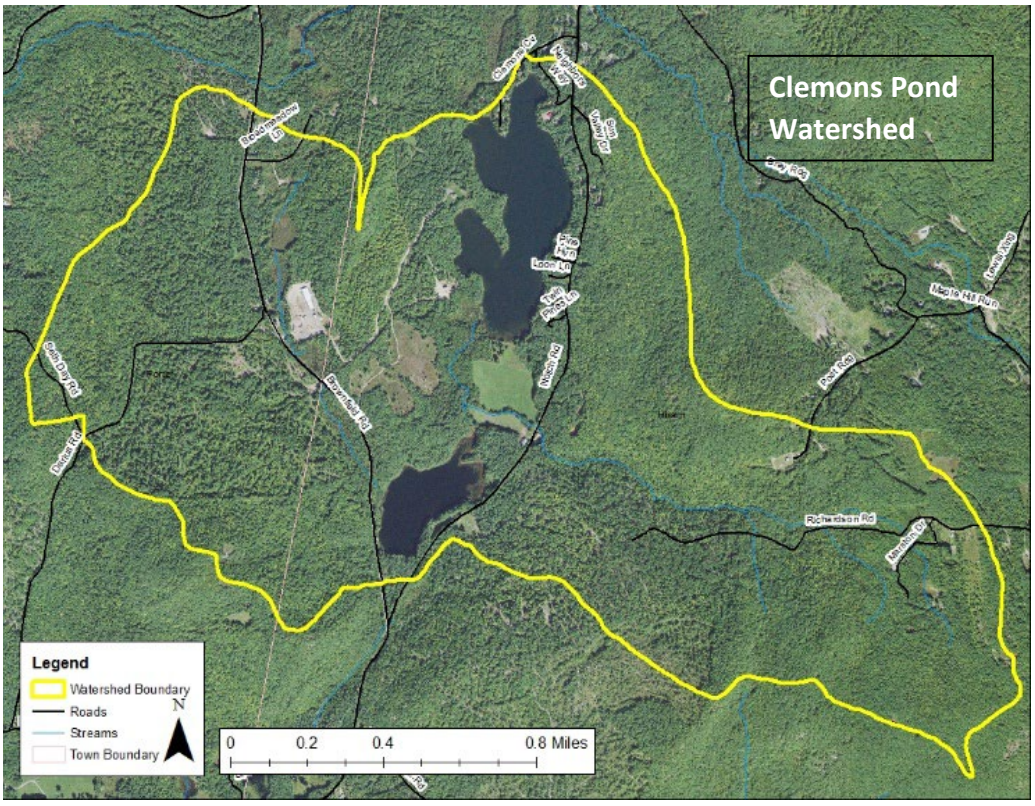
Clemons Pond is considered a “mesotrophic” water body. It has a mean water clarity (SD) of 18 feet (5.6 m) with clarity typically ranging between 11 feet (3.4 m) and 24 feet (7.6 m). Clemons Pond usually demonstrates thermal stratification during the summer months and experiences mid to late summer oxygen depletion below a depth of 22 feet. Surface testing of total phosphorus has averaged 5.8 ppb and total chlorophyll has averaged 2.7. Bottom grab phosphorus sampling has averaged 18 ppb. The presence of phosphorus rich bottom sediment plus late summer oxygen depletion at the bottom of the water column can potentially lead to internal recycling of phosphorus encouraging algal growth. To date Clemons Pond has not experienced algal blooms or the presence of any invasive aquatic plants.

To be proactive, the Clemons Pond Association (CPA) decided to conduct a watershed survey to identify any potential sources of phosphorus pollution to the pond through non-point source pollution (erosion).

CLEMONS POND WATERSHED

The Clemons Pond Watershed included a network of streams and ditches and land that flow into the pond (figure 1). The watershed spans the towns of Hiram and Porter, Maine. The watershed contains 145 parcels, 42 (30%) of which are along the shoreline. Clemons's pond drains into the ocean via the Tenmile River and then the Saco River.

The watershed is an extension of the pond ecosystem. The pond water quality, to a large extent, reflects what is going on in the watershed, in fact 90% of protecting and managing a lake involved protecting and managing a watershed.



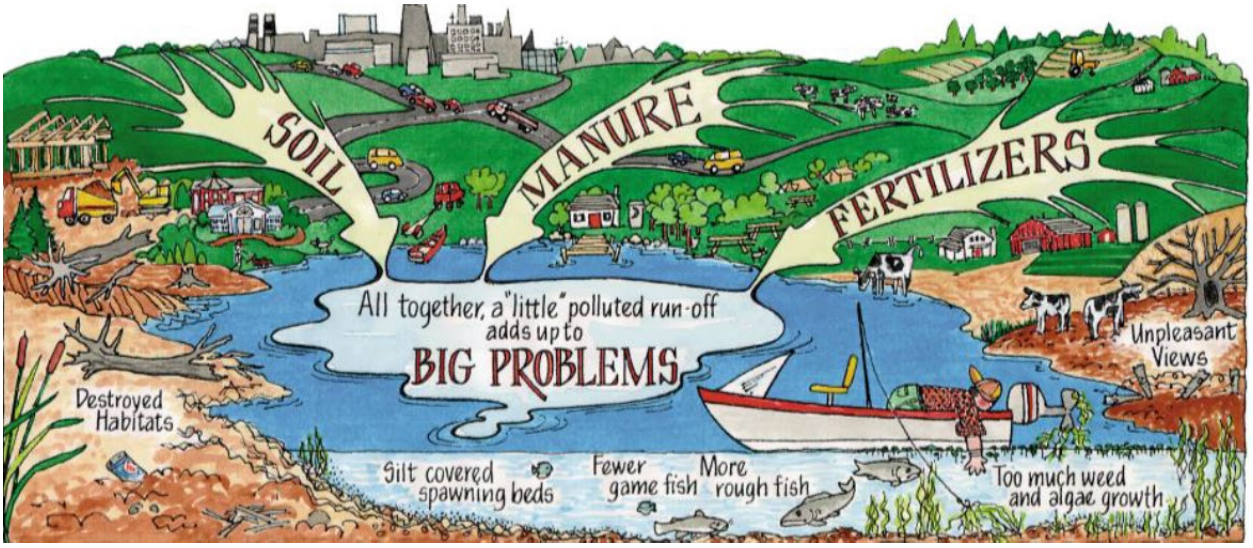
WATERSHED

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

Figure 1. Clemons Pond Watershed

WHAT CAN THREATEN CLEMONS POND WATER QAULITY

The greatest threat to water quality in Maine lakes today is polluted runoff. In an undeveloped, forested watershed, stormwater runoff is slowed and filtered through trees, shrubs, and other vegetation. In a naturally forested system (without development), the forest acts like a natural sponge, soaking up rainfall. In a developed watershed, however, when it rains or during snowmelt, the runoff flows over impervious surfaces like rooftops, paved roads, compacted soil, gravel camp roads and lawns which don't allow runoff to be absorbed and filter, and instead carries with it anything it picks up along the way, this can include eroded soil, grass clippings and leaves, pet waste, fertilizers, septic tank effluent and much more, this is what is considered nonpoint source pollution.



A primary pollutant of concern to water quality in lakes is **phosphorus**. Phosphorus is a naturally occurring element in our soils and is needed by plants for growth. In natural conditions, the scarcity of phosphorus in a lake limits **algae** growth. Every lake can utilize a specific amount of phosphorus without experiencing significant change in water quality, however, if the amount of phosphorus entering the lake increases the lake will eventually become over-fertilized and produce excessive amounts of algae. Algal blooms can turn water green, decrease water clarity, deplete the oxygen supply, and ultimately impact wildlife habitat, impair scenic views, and reduce recreational appeal.

WHY SHOULD WE PROTECT THE LAKE FROM POLLUTED RUNOFF?

- A 1996 University of Maine study demonstrated that lake water quality affects property values. For every meter (3') decline in water clarity, shorefront property values can decline as much as 10 to 20 percent. This can affect individual landowners as well as the entire community.
- A study conducted by Maine DEP in the 1980's captured water coming off a forested watershed and captured water coming from a developed watershed and the study found that there was 5-10x the amount of phosphorus in the runoff from developed areas. This study emphasizes the need to limit the impacts from development to maintain the water quality of the lake.
- The lake contains valuable habitat for fish, birds, and other wildlife.
- Clemons Pond provides recreational opportunities to both its residents and visitors. It is used for fishing, ice fishing, kayaking, canoeing, boating and wildlife viewing.
- Once a pond has declined, it can be difficult and prohibitively expensive to restore, therefore preventative measures are the best defense.

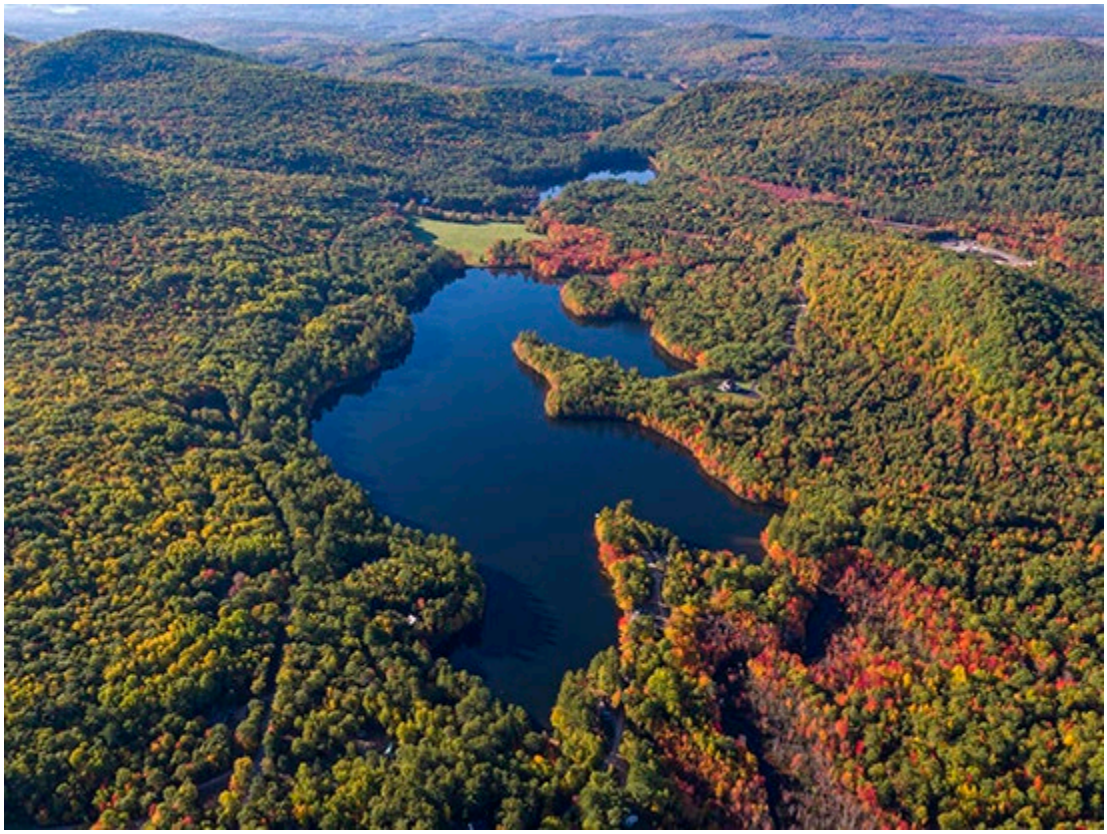


Figure 2. Clemons Pond overview taken by Ethan Tucker

PURPOSE OF THE WATERSHED SURVEY

The primary purpose of the watershed survey was to identify, document, and prioritize potential sources of polluted runoff getting into Clemons Pond in the form of soil erosion. However, of equal importance was to:

- Raise public awareness of the connection between land use and water quality
- Raise public awareness of the impacts of polluted runoff, by informing watershed residents that bare eroding soil is a primary source of water pollution and help landowners look at their properties differently and more consciously.
- Make general recommendations to landowners for fixing erosion problems on their properties

The purpose of this survey is to share knowledge, provide resources and information for balancing the protection of the valuable resource with other activities and uses of the resource and surrounding land. The purpose of this survey was NOT to point fingers at landowners with problem areas, nor was it to seek enforcement action against landowners not in compliance with ordinances. While it is important to be accountable for the problems that arise, there is no individual or single entity responsible for water quality issues that could impact the lake, rather it is an accumulation of diffuse inputs from past and present activities that together can have an impact. The hope is that this survey and document can educate landowners, and aid in assisting landowners in addressing sites and solve problems on their properties.

THE SURVEY METHOD

The watershed survey is a method of documenting soil erosion in lake watersheds in Maine. The survey gives an idea of soil erosion impacts on a lake at one point in time. Because lakes and the surrounding watershed are constantly changing, identified sites might be fixed before this report is released, and other erosion sites may appear that were not identified during the survey.

When concerns started to arise around possible development in the watershed Victor Lerish, Clemons Pond Association member, had discussions with the Lake Stewards of Maine on how to address these issues. The watershed survey was brought up to the pond association where they voted to move forward. Victor Lerish then organized the steering committee that helped get it all in motion.

The overall impact of each site was determined using the rating system shown below (Figure 3), as well as estimated cost to fix and technical level needed to install.

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.

Cost to Fix

High:	Greater than $2,500
Medium:	$500-$2,500
Low:	Less than $500

Technical Level to Install

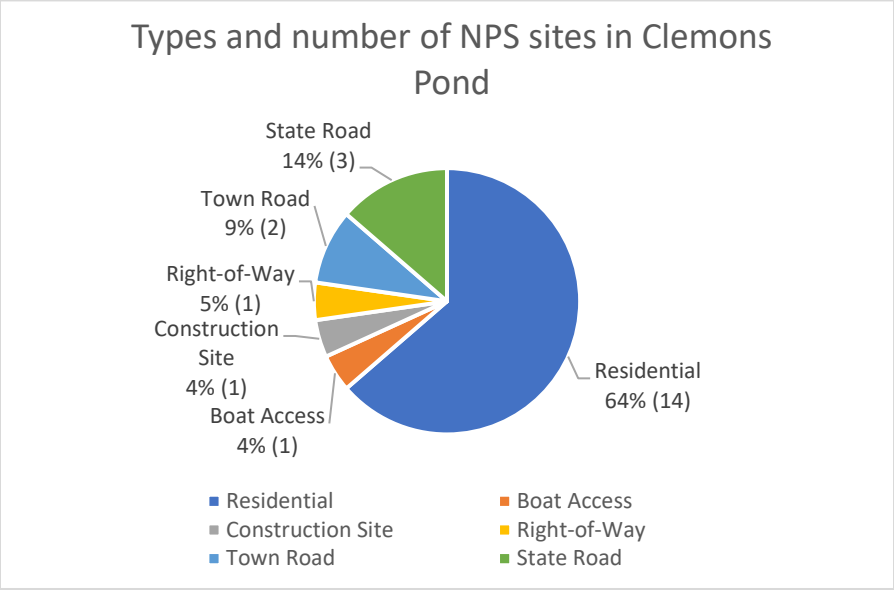
High:	Site requires engineered design
Medium:	Technical person should visit site & make recommendations
Low:	Property owner can accomplish with reference materials

Figure 3. Method to Determine Impact

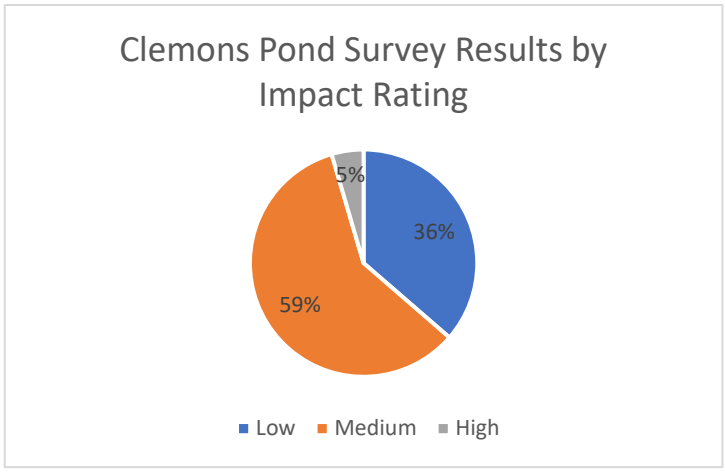
The data collected on tablets was exported into an excel spreadsheet that contains details of the location, land use, type of problem, recommendation, impact, technical level to fix and cost estimate (Appendix C).

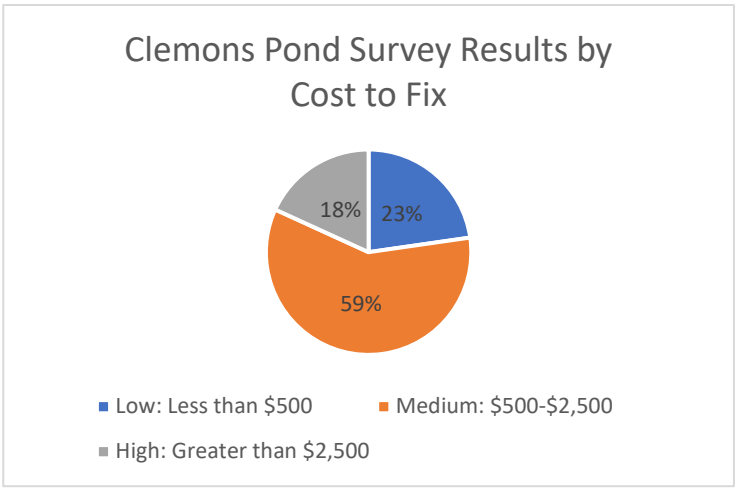
SUMMARY OF WATERSHED SURVEY FINDINGS

The watershed survey documented 22 sites (Figure 4) in the watershed that are contributing to runoff to Clemons Pond. As mentioned above, sites were ranked on impact to the water quality based on the type of erosion, the size of the area and if there was any buffer or filtration of the runoff before it reached the lake



Of the 22 sites 1 was rated as high impact, 13 rated as medium impact, and 8 rated as low impact. Over half of the sites were identified on residential properties at 64%, followed by state roads at 14%. Only 1 high impact site was found, most of the sites (59%) were identified as medium impact, and 36% as low impact. 64% of the sites that were identified could be accomplished by the homeowner with reference materials. 27% of the sites were identified as medium and could use a technical person to make recommendations. Lastly, 9% of the sites require a high level of technical assistance and engineered design to fix.





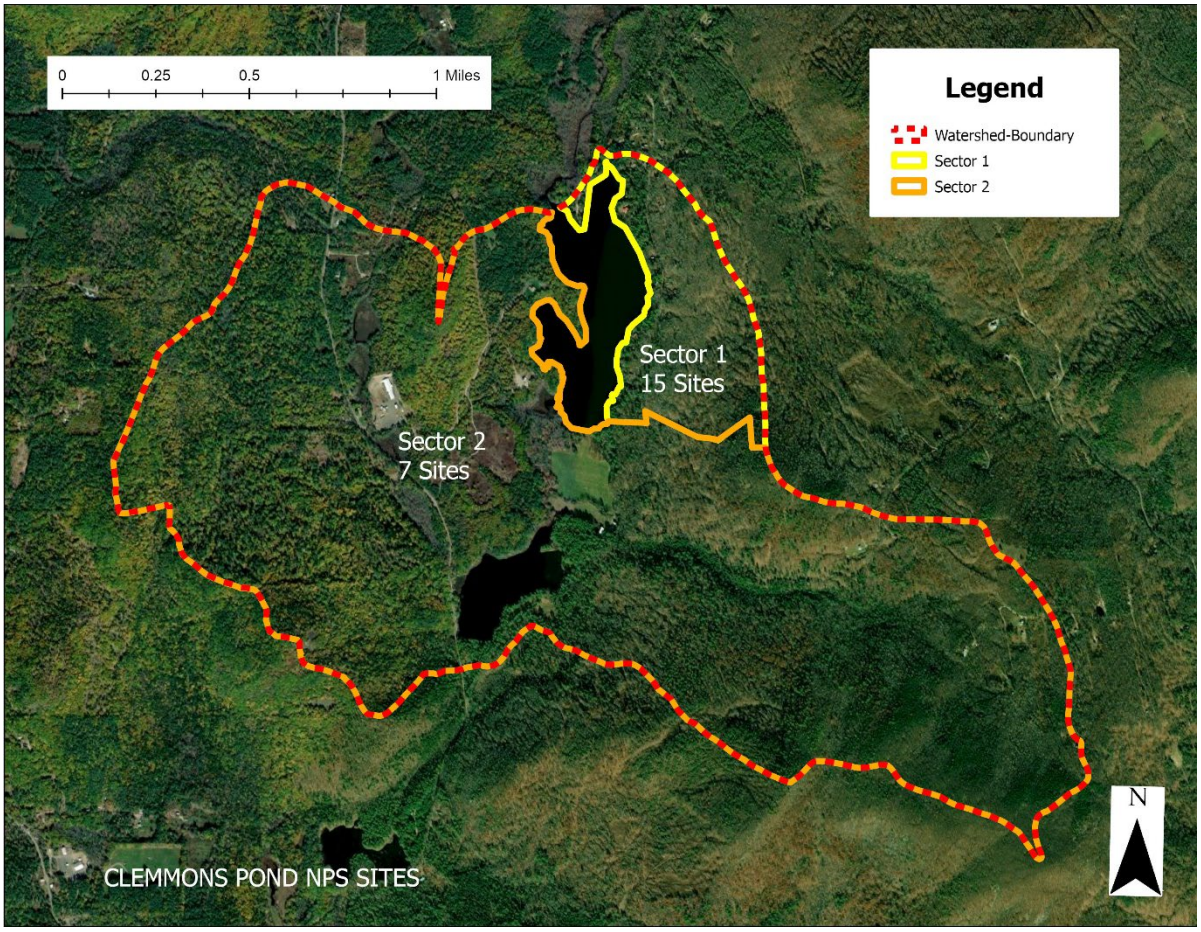


Figure 4. Clemons Pond Nonpoint Source Pollution Sites

LAND USE FINDING AND RECOMMENDATIONS

As part of the documentation process, surveyors selected land use types associated with each site. The types of sites identified in the survey included: residential, private roads, town roads, driveways, beach access, construction, municipal and boat access. Table 1 below provides the total number of each, as well as how many of each land use type ranked in the high, medium, or low priority category. Examples for each land use type and suggestions for improvements are provided below.

	High	Medium	Low	TOTAL	% of Total
Residential	0	7	7	14	64%
Town Roads	0	2	0	2	9%
Construction	0	1	0	1	4%
State Roads	0	2	1	3	14%
Boat Access	0	1	0	1	4%
Other-right of way	1	0	0	1	5%
TOTAL	1	13	8	22	

Table 1. Breakdown of Land Use Types and Impact Rating

RESIDENTIAL

Residential sites (14) include any erosion that occurred on a residential property, including but not limited to foot paths, roof runoff, shoreline erosion, and any other bare soil areas that delivered soil to a surface water body. Driveways were not documented as residential sites, but as a separate land use type. Residential sites made up 64% of the sites. Of the residential sites, nine were ranked a medium cost to fix, and five as a low cost. These sites could likely be fixed by the landowner, or by the landowner with some guidance from a technical person.

Site Example:

This is a low impact site that has shoreline erosion due to the sheet erosion, bare soil, and shoreline undercutting. Some recommendations are to add erosion control mulch to the bare soil, add shoreline vegetation, and a infiltration trench at the roofs dripline

Suggestions for improvements for residential sites included:

- Install infiltration steps
- Install plunge pools
- Install runoff diverters
- Stabilize foot paths
- Establish and/or add to buffer to protect shoreline
- Cover bare soil with erosion control mulch where vegetation does not grow easily
- Reseed or leave duff layer
- Stabilize banks

- Install drywell at gutter downspout
- Install infiltration trenches at roof drip line
- Install rain barrels at gutter downspouts
- Install raingarden

STATE ROADS

Many issues that we see with state roads are unstable or broken culverts, ditch erosion, and shoulder erosion. During the survey three state road sites were identified. Clemons Pond Association is planning to reach out to the Maine Department of Transportation to get on their radar to get these sites addressed.

This is a medium impact rated site. The problem here was an unstable, undersized culvert and the recommendation is to get it replaced with something bigger.

Suggestion for improvements for state road sites included:

- Replace culvert, armor culvert
- Reshape ditch, armor vegetate ditch
- Pave

TOWN ROADS

Town roads (9) especially gravel roads have similar issues and causes to private roads in lake watersheds (as described above) but are maintained and cared for by the Towns. In this survey 10% of the sites were on town roads. Of the nine sites, six were ranked as medium priority and three were ranked as low priority. All sites were in the low-medium cost category range, and all could benefit from a technical person visiting the site and making specific recommendations.

This is a medium impact town road site. This site shows road shoulder erosion, and it is recommended to armor the area around the culvert.

Suggestions for improvements for town road sites included:

- Armoring the inlet and outlet of culverts
- Lengthening and enlarging undersized culverts
- Installing plunge pools
- Building up the road base, adding gravel, and vegetating the shoulder
- Install runoff diverters

BOAT ACCESS

One boat access site was identified during the survey. The Clemons Pond Association has reached out to the town road commissioner to address some sites and he has already fixed the boat launch site.

This is a medium impact site for boat access. Here we see rill erosion, bare soil, and the shoreline undercutting. Some recommendations were to build up the road, add gravel, and crown the road.

CONSTRUCTION

One construction site (1-05) was addressed during the survey. This site has the potential to become a high impact to the pond if not handled properly.

RIGHT-OF-WAY

One site was identified on a right-of-way.

This is a high impact site at a right-of-way that we can see some gully erosion and shoreline erosion. The recommendations here are to stabilize the foot path, add infiltration steps and cover bare soil with erosion control mulch.

WHERE DO WE GO FROM HERE?

The Clemons Pond Association intends to distribute this report and conduct direct outreach to landowners whose sites were identified as potentially contributing nonpoint source pollution to the lake. Additional efforts could include:

- Work with the Towns to address sites found on town roads, one site at the boat launch has already been addressed and fixed by the town road commissioner and is expected to fix another site that was found during the survey.
- Private landowners can utilize the Conservation Practices Factsheets below to address residential sites
- Get in contact with the Maine Department of Transportation to address the sites found on state roads.

WHERE CAN I GET MORE INFORMATION?

Clemons Pond Association

www.clemonspond.com

email: cpawatershed@gmail.com

RESOURCES AND PUBLICATIONS

Manuals and Guides to Reduce Water Pollution

https://www.maine.gov/dep/land/watershed/materials.html

Conservation Practices for Homeowner Factsheets

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

The Maine DEP and Portland Water District produced a series of 24 fact sheets that answer many common how-to questions. The fact sheets provide 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
Rain Gardens
Dripline Trench
Drywells
Erosion Control Mix
Infiltration Steps (2)
Infiltration Trench
Open-Top Culverts
Paths and Walkways
Permitting
Rain Barrels
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 https://www.maine.gov/dep/land/watershed/materials.html

Gravel Roads Maintenance Manual

For the sites identified on driveways, private roads and even gravel town roads, the following publication is a great resource:
https://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf

Buffer Handbook

https://www.maine.gov/dep/land/watershed/buffhandbook.pdf

Buffer Plant List

https://www.maine.gov/dep/land/watershed/buffer_plant_list.pdf

Portland Water District – Lakes like Less Lawn

https://www.pwd.org/sites/default/files/lakes-llike-less-lawn.pdf

Nonpoint Source Training Center – Course Schedule

https://www.maine.gov/dep/training/npstrc-schedule.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 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.

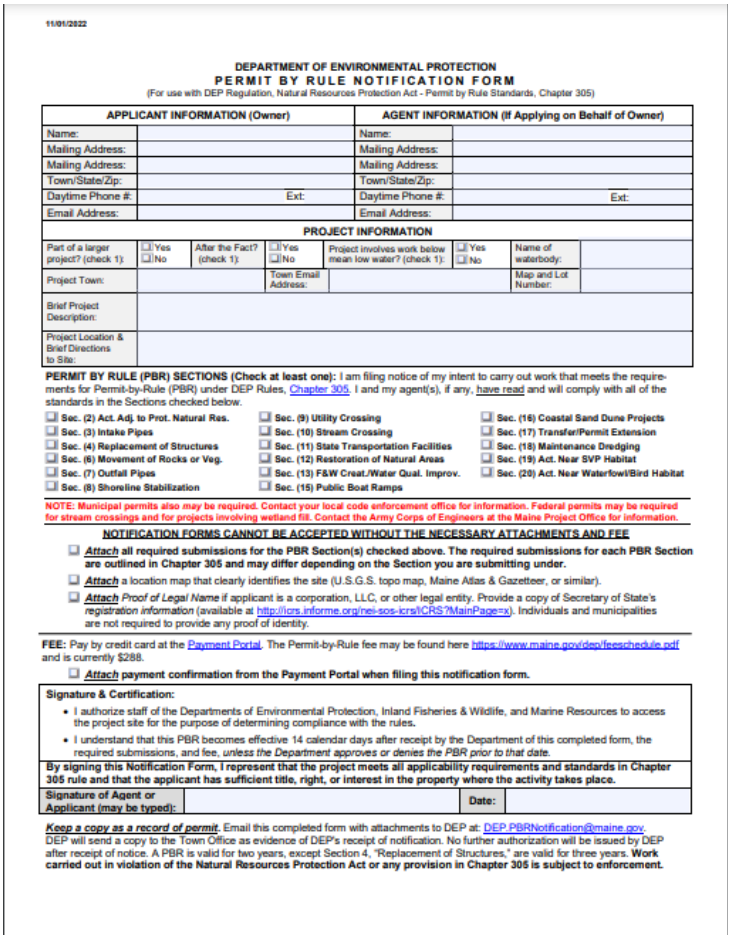
How to apply for a Permit by Rule with DEP:

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.

- Fill out a notification and submit fee and any required materials before starting any work. Forms are available from your town code enforcement office, Maine DEP offices or online at https://www.maine.gov/dep/land/nrpa/nrpa-pbr-notification.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 process 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 requirement.



11/01/2022

DEPARTMENT OF ENVIRONMENTAL PROTECTION
PERMIT BY RULE NOTIFICATION FORM
(For use with DEP Regulation, Natural Resources Protection Act - Permit by Rule Standards, Chapter 305)

APPLICANT INFORMATION (Owner)		AGENT INFORMATION (If Applying on Behalf of Owner)	
Name:		Name:	
Mailing Address:		Mailing Address:	
Mailing Address:		Mailing Address:	
Town/State/Zip:		Town/State/Zip:	
Daytime Phone #:	Ext:	Daytime Phone #:	Ext:
Email Address:		Email Address:	

PROJECT INFORMATION

Part of a larger project? (check 1):	☐ Yes ☐ No	After the Fact? (check 1):	☐ Yes ☐ No	Project involves work below mean low water? (check 1):	☐ Yes ☐ No	Name of waterbody:	
Project Town:		Town Email Address:				Map and Lot Number:	
Brief Project Description:							
Project Location & Brief Directions to Site:							

PERMIT BY RULE (PBR) SECTIONS (Check at least one): I am filing notice of my intent to carry out work that meets the requirements for Permit-by-Rule (PBR) under DEP Rules, Chapter 305. I and my agent(s), if any, have read and will comply with all of the standards in the Sections checked below.

- ☐ **Sec. (2) Act. Adj. to Prot. Natural Res.**
- ☐ **Sec. (3) Intake Pipes**
- ☐ **Sec. (4) Replacement of Structures**
- ☐ **Sec. (6) Movement of Rocks or Veg.**
- ☐ **Sec. (7) Outfall Pipes**
- ☐ **Sec. (8) Shoreline Stabilization**
- ☐ **Sec. (9) Utility Crossing**
- ☐ **Sec. (10) Stream Crossing**
- ☐ **Sec. (11) State Transportation Facilities**
- ☐ **Sec. (12) Restoration of Natural Areas**
- ☐ **Sec. (13) F&W Creat./Water Qual. Improv.**
- ☐ **Sec. (15) Public Boat Ramps**
- ☐ **Sec. (16) Coastal Sand Dune Projects**
- ☐ **Sec. (17) Transfer/Permit Extension**
- ☐ **Sec. (18) Maintenance Dredging**
- ☐ **Sec. (19) Act. Near SVP Habitat**
- ☐ **Sec. (20) Act. Near Waterfowl/Bird Habitat**

NOTE: Municipal permits also may be required. Contact your local code enforcement office for information. Federal permits may be required for stream crossings and for projects involving wetland fill. Contact the Army Corps of Engineers at the Maine Project Office for information.

NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS AND FEE

- ☐ ***Attach*** **all required submissions for the PBR Section(s) checked above. The required submissions for each PBR Section are outlined in Chapter 305 and may differ depending on the Section you are submitting under.**
- ☐ ***Attach*** a location map that clearly identifies the site (U.S.G.S. topo map, Maine Atlas & Gazetteer, or similar).
- ☐ ***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.

FEE: Pay by credit card at the Payment Portal. The Permit-by-Rule fee may be found here https://www.maine.gov/dep/feeschedule.pdf and is currently $288.

- ☐ ***Attach*** **payment confirmation from the Payment Portal when filing this notification form.**

Signature & Certification:

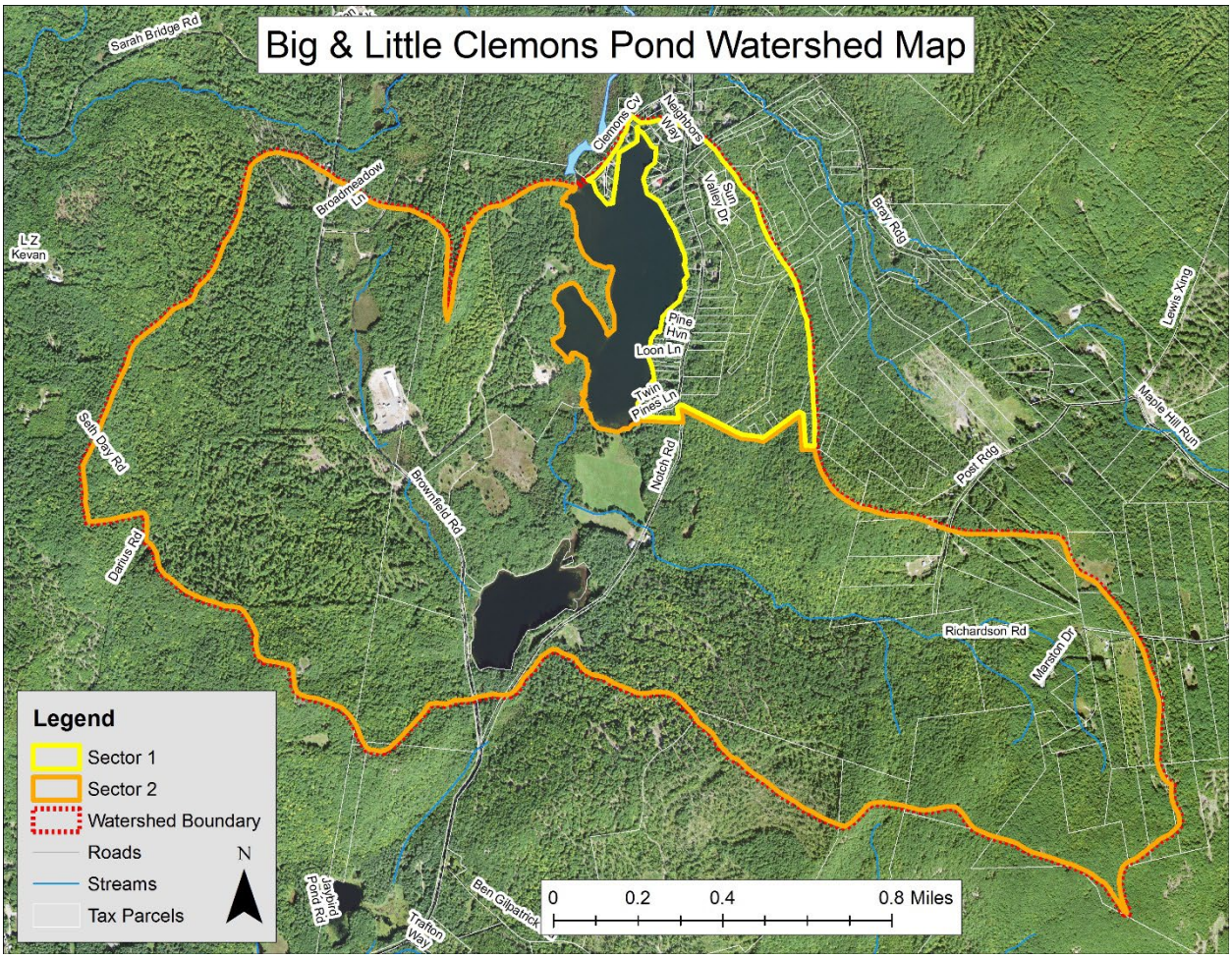
- I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules.
- I understand that this PBR becomes effective 14 calendar days after receipt by the Department of this completed form, the required submissions, and fee, *unless the Department approves or denies the PBR prior to that date.*

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in Chapter 305 rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant (may be typed):		Date:	

Keep a copy as a record of permit. Email this completed form with attachments to DEP at: DEP.PBRNotification@maine.gov. DEP will send a copy to the Town Office as evidence of DEP's receipt of notification. No further authorization will be issued by DEP after receipt of notice. A PBR is valid for two years, except Section 4, "Replacement of Structures," are valid for three years. **Work carried out in violation of the Natural Resources Protection Act or any provision in Chapter 305 is subject to enforcement.**

APPENDIX A-Sector Map



APPENDIX B-Survey Forms front

Final Site #_____ Checked by _____ Date _____

Clemons Pond Watershed Survey

REMINDER: Only write up if there is likely transport of sediment or phosphorus into the lake.

Sector & Site _____ Date_____ Surveyor Initials _____

Location *(house #, road, utility pole #)* _____

Building Color _____ Landowner Name _____

Tax Map & Lot _____ Talked to Landowner? _____

Flow into Lake via (check ONE): ❒ Directly into Lake ❒ Stream ❒ Ditch ❒ Minimal Vegetation

Note: If flow does not make it into lake, do not fill out a form. It would not be considered a site.

GPS Coordinates in **UTM**
(no degrees or decimal points)

_____ feet (Error)

0 ☐☐☐☐☐☐☐
☐☐☐☐☐☐☐

Land Use/Activity Circle ONE	**Description of Problems** Circle ALL that apply	
State Road*	**Surface Erosion**	**Soil**
Town Road*	Sheet	Bare
Private Road*	Rill	Uncovered Pile
Driveway*	Gully	Delta in Stream/Lake
Residential	**Culvert**	Winter Sand
Commercial	Unstable Inlet / Outlet	**Roof Runoff Erosion**
Municipal / Public	Clogged	**Shoreline**
Beach Access	Crushed / Broken	Undercut
Boat Access*	Undersized	Lack of Shoreline Vegetation
Trail or Path	**Ditch**	Inadequate Shoreline Vegetation
Logging	Sheet Erosion	Erosion
Agriculture	Rill Erosion	Unstable Access
Construction Site	Gully Erosion	**Agriculture**
OTHER:	Bank Failure	Livestock Access to Waterbody
	Undersized	Tilled Eroding Fields
* Is it: paved, gravel or other/unknown?	**Road Shoulder Erosion**	Manure Washing off Site
	Sheet	**OTHER:**
	Rill	
	Gully	
	Roadside Plow/Grader Berm	

Slope: ❒ Flat ❒ Moderate ❒ Steep **Size of Area Exposed or Eroded** (length & width): _____

back

Recommendations		
Culvert	**Roads / Driveways**	**Paths & Trails**
Armor Inlet/Outlet	Remove Grader/Plow Berms	Define Foot Path
Remove Clog	Build Up	Stabilize Foot Path
Replace	Add New Surface Material	Infiltration Steps
Enlarge	• Gravel	Install Runoff Diverter (waterbar)
Lengthen	• Recycled Asphalt	**Roof Runoff**
Install Culvert	• Pave	Infiltration Trench @ roof dripline
Install Plunge Pool	Reshape (Crown)	Drywell @ gutter downspout
Ditch	Vegetate Shoulder	Rain Barrel
Vegetate	Install Catch Basin	**Other**
Armor with Stone	Install Detention Basin	Install Runoff Diverter (waterbar)
Reshape Ditch	Install Runoff Diverters	Mulch / Erosion Control Mix
Install Turnouts	• Broad-based Dip	Rain Garden
Install Ditch	• Open Top Culvert	Infiltration Trench
Install Check Dams	• Rubber Razor	Water Retention Swales
Remove debris/sediment	• Waterbar	**Vegetation**
Install Sediment Pools	**Construction Site**	Establish Buffer
Other Suggestions:	Mulch	Add to Buffer
	Silt Fence / EC Berms	No Raking
	Seed / Hay	Reseed bare soil & thinning grass
	Check Dams	

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.

Cost to Fix

High:	Greater than $2,500
Medium:	$500-$2,500
Low:	Less than $500

Technical Level to Install

High:	Site requires engineered design
Medium:	Technical person should visit site & make recommendations
Low:	Property owner can accomplish with reference materials

Potential Youth Conservation Corps Project? YES NO

APPENDIX C- Excel Spreadsheet of Nonpoint Source Sites

Sector & Site	Flow into lake	Land use/Activity	Problem	Size of area	Recommendations	Impact Rating	Cost to Fix	Technical Level to Install
1-01	Directly into lake	Residential	Sheet Erosion, Bare Soil, Lack of Shoreline Vegetation, Roof Runoff Erosion	50 x 20	Stabilize and Define Foot Path, Erosion Control Mulch, Infiltration Trench at roof dripline, Establish Buffer, No Raking, Border sandy area and plant with lots of vegetation	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-02	Directly into lake	Residential	Sheet Erosion, Bare Soil, Shoreline Undercut, Roof Runoff Erosion	40 x 10	Infiltration Trench at roof dripline, Add to Buffer, Mulch/Erosion Control Mix, Add shoreline vegetation, especially where there is a gap in the buffer and undercutting	Low	Low: Less than $500	Low: Property owner can accomplish with reference materials
1-03	Directly into lake	Residential	Sheet Erosion, Bare Soil, Inadequate Shoreline Vegetation	10 x 30	Add to Buffer, No Raking, Mulch/Erosion Control Mix, Rain Garden, live stake undercut steep bank; prevent water from reaching steps by putting down mulch or diverting runoff to a rain garden	Low	Low: Less than $500	Low: Property owner can accomplish with reference materials
1-04	Directly into lake	Boat Access	Rill Erosion, Bare Soil, Shoreline Undercut, Lack of Shoreline Vegetation. Boat launch is unstable; consists of all native soil and needs to be fornalized/stabilized. Road coming down is in rough shape but does not appear to make it to the lake - settles out in a depression to the side.	25 x 20	Build Up Road, Add gravel, Reshape (Crown) Road, Add to Buffer. For the boat launch - either add pavers or add coarse gravel/crushed stone with geotextile underneath. Shoreline - cut back slope and vegetate, fill undercut with stone.	Medium	High: Greater than $2,500	Medium: Technical person should visit site & make recommendations
1-05	Minimal Vegetation	Construction Site	Sheet Erosion, Bare Soil, Uncovered Soil Pile, Unstable Shoreline Access, potential future erosion. There are erosion control measures in place, but path to shoreline is at risk of being a conduit for water as its a low point where water	12 x 50	Define and Stabilize Foot Path, Erosion Control Mulch, No Raking, Add to Buffer. Dig out/clear sediment behind erosion control mulch berm, make an elevated meandering path to water, vegetate hillside	Medium	Medium: $500-$2,500	Medium: Technical person should visit site & make recommendations
1-06	Directly into lake	Other - Right-of-Way	Gully Erosion, Shoreline Erosion	250 x 12	Stabilize Foot Path, Infiltration Steps, Erosion Control Mulch, Add to Buffer	High	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-07	Directly into lake	Residential	Rill Erosion, Shoreline Erosion. Driveway contributes to erosion problem.	30 x 5	Define and Stabilize Foot Path, Erosion Control Mulch, Install Runoff Diverter, Add to Buffer	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-08	Stream	Town Road	Gully Road Shoulder Erosion, Bare Soil (Outlet side only)	20 x 10	Armor Culvert Inlet/Outlet, Rip rap entire bank	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-09	Directly into lake	Residential	Sheet Erosion, Bare Soil, Lack of Shoreline Vegetation. Relatively steep site with lots of loose bare soil and no vegetation	40 x 15	Establish Buffer, No Raking, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix, Do not cut shoreline vegetation	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-10	Ditch	Residential	Rill Erosion, Rill Ditch Erosion, No Turnouts/Settling, Bare Soil	5 x 100	Vegetate or Armor Ditch with Stone, Stabilize Foot Path, Infiltration Steps, Erosion Control Mulch. Steep driveway/path leads directly to ditch, need to mitigate bare soil	Medium	Medium: $500-$2,500	Medium: Technical person should visit site & make recommendations
1-11	Directly into lake	Residential	Sheet Erosion, Bare Soil, Unstable Shoreline Access	7 x 15	Stabilize Foot Path, Add to Buffer, Need to cover bare soil and roots on new path	Low	Low: Less than $500	Low: Property owner can accomplish with reference materials
1-12	Ditch	Residential	Sheet and Rill Erosion, Ditch Rill Erosion, Bare Soil	25 x 25	Vegetate or Armor Ditch with Stone, Reseed bare soil & thinning grass, Mulch/Erosion Control Mix, Vegetate side of house or put down mulch, same with bare area near ditch	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-13	Directly into lake	Residential	Rill Erosion, Bare Soil, Lack of Shoreline Vegetation, Shoreline Erosion, Undercut Shoreline, Path and Side of Stairs is Unstable	25 x 5 on path and shoreline	Define and Stabilize Foot Path, Install Runoff Diverter, Erosion Control Mulch, Add to Buffer, Stop cutting shoreline plants and allow to revegetate	Medium	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
1-14	Directly into lake	Residential	Rill Erosion, Bare Soil, Uncovered Soil Pile	5 x 30	Stabilize and Define Foot Path, Erosion Control Mulch. Footpath is conduit for water straight to lake	Medium	Low: Less than $500	Low: Property owner can accomplish with reference materials
1-15	Directly into lake	Residential	Sheet Erosion	5 x 25	Stabilize and Define Foot Path, Infiltration Steps, Erosion Control Mulch	Low	Low: Less than $500	Low: Property owner can accomplish with reference materials
2-02	Directly into lake	State Road	Clogged/Undersized/Broken Culvert with Unstable Inlet and Outlet, Sediment Delta in Stream/Lake	5 x 5 at outlet	Replace existing culvert with larger and longer culvert, Armor Culvert Inlet/Outlet, Remove Clog	Medium	High: Greater than $2,500	High: Site requires engineered design
2-03	Directly into lake	Residential	Sheet Erosion	75 x 5	Stabilize and Define Foot Path, Infiltration Steps, Install Runoff Diverter, Erosion Control Mulch, Add to Buffer	Low	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
2-04	Stream	State Road	Undersized Culvert with Unstable Inlet/Outlet, Sheet Road Shoulder Erosion	10 x 5	Armor Culvert Inlet/Outlet, Lengthen Culvert, Vegetate Shoulder, Rip Rap Slope, Consider additional culvert	Low	High: Greater than $2,500	Medium: Technical person should visit site & make recommendations
2-05	Ditch	Residential	Sheet Erosion, Bare Soil, Livestock Access to Waterbody, Manure Washing off Site	40 x 60	Establish Buffer, Move chickens to flat area and restabilize slope	Low	Medium: $500-$2,500	Medium: Technical person should visit site & make recommendations
2-06	Stream	Town Road	Gully Erosion, Unstable Culvert Inlet/Outlet, Gully Road Shoulder Erosion	7 x 2	Lengthen Culvert, Install Ditch Turnouts	Medium	Medium: $500-$2,500	Medium: Technical person should visit site & make recommendations
2-07	Minimal Vegetation	Residential	Manure Washing off Site	Field is 500 x 500 with manure	Add to Buffer, Pull fence away from stream	Low	Medium: $500-$2,500	Low: Property owner can accomplish with reference materials
2-01	Directly into lake	State Road	Sheet and Gully Erosion, Sheet Road Shoulder Erosion, Bare Soil, Sediment Delta in Stream/Lake, Lack of Shoreline Vegetation, Unstable Shoreline Access	200 x 15	Add to Buffer, Rip Rap Road Shoulder	Medium	High: Greater than $2,500	High: Site requires engineered design