

# Flying Pond Watershed Survey Report



**30 Mile River Watershed Association**

**July 2015**

**[www.30mileriver.org](http://www.30mileriver.org)**

# Acknowledgments

The *Flying Pond Watershed Survey* was conducted by the 30 Mile River Watershed Association with support from the following:

## Project Partners

Flying Pond Improvement Association  
Maine Department of Environmental Protection  
Town of Mount Vernon  
Town of Vienna

## Steering Committee

Lidie Robbins	30 Mile River Watershed Association
Rick Christenson	Flying Pond Improvement Association, 30MRWA
Kristin Feindel	Maine Department of Environmental Protection
Muffy Floyd	Town of Vienna
Liz Hays	Flying Pond Improvement Association, 30MRWA

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## **Volunteers**

Rick Christenson  
Gary Courtelyou  
Paul Crockett  
Cathi DiCocco  
Linda Fish  
Allan Harville  
Libby Harville

Liz Hays  
Bonnie Frye Hemphill  
Hillary Hutton  
Mark Hutton  
Tim Kinney  
Diana McLaughlin  
Randy Oakley

Dan Onion  
Pat Onion  
Quimby Robinson  
Debbie Roe  
Len Roe  
Bill Swan  
Mary Viruleg



*Volunteer Watershed Survey Training, May 2014*

## **Watershed Survey Technical Leaders**

Rick Christenson  
Laura Crossley  
Kristen Feindel  
Wendy Garland  
Liz Hays  
Matt Kennedy  
Lidie Robbins  
Jake Van Gorder

30MRWA, FPIA  
Maine DEP, Americorps  
Maine DEP  
Maine DEP  
30MRWA, FPIA  
Maine DEP, Americorps  
30MRWA  
Maine DEP, Americorps

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# Introduction

In the spring and summer of 2014, the 30 Mile River Watershed Association, with the support of its partners and additional volunteers, conducted a watershed survey of Flying Pond, near the head of the 30 Mile River watershed, located in Central Maine. The survey was conducted to protect and improve water quality in these lakes by identifying sources of erosion and runoff that are now, or could in the future, damage water quality, and recommending solutions to correct the problems identified.

Trained volunteers and technical leaders surveyed the developed areas of the Flying Pond watershed and identified 84 erosion sites that are impacting or have the potential to impact water quality. This report provides the results and analysis of the survey, along with information about how landowners can find support in addressing erosion issues on their properties. It was designed specifically for citizens living in the Flying Pond watershed, and other residents of the towns of Vienna and Mt. Vernon.

## WHAT IS A WATERSHED?

A watershed is all the land that surrounds a pond that drains or sheds its water into the pond through streams, ditches, directly over the ground surface or through ground water. It includes everything within its borders—the land, air, plants, animals, towns, farms and people. Activities in this entire area—not just the shoreline areas—eventually impact the lake’s water quality, for better or worse.

## Purposes of the Watershed Survey

The purpose of the watershed survey was to identify and prioritize for remediation existing sources of polluted runoff, particularly soil erosion sites, within the Flying Pond watershed. However, of equal importance, the survey was to:

- ◆ Raise public awareness of the connection between land use and water quality, and the impact of polluted runoff.
- ◆ Inspire people to become active stewards of the watershed.
- ◆ Use the information gathered as one component of a long-term pond protection strategy.
- ◆ Make general recommendations to landowners for fixing erosion problems on their properties.

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.

Local citizen participation was essential in completing the watershed survey and will be even more important in upcoming years. Through the leadership of the 30 Mile River Watershed Association, and with assistance from groups and agencies concerned with pond water quality, the opportunities for stewardship are limitless.



# Threats to Water Quality

The biggest pollution threat to these and other Maine ponds is **polluted stormwater runoff** or nonpoint source (NPS) pollution. Storm water runoff from rain and snowmelt picks up soil, nutrients and other pollutants as it flows across the land, and washes into the pond.

In an undeveloped, forested watershed, storm water runoff is slowed and filtered by tree and shrub roots, grasses, 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. Rainwater picks up speed as it flows across impervious surfaces like rooftops, compacted soil, gravel camp roads and pavement, and it becomes a destructive erosive force. In this way, runoff from the developed areas in these watersheds often washes directly into the ponds or their feeder streams.

## POLLUTED STORMWATER RUNOFF

Also called nonpoint source pollution or NPS, polluted stormwater runoff is made up of soil, fertilizers, septic waste, pet waste and other pollutants from diffuse sources across the landscape that are carried into the pond by rainfall.



## Why is Runoff a Problem?

The problem is not necessarily the water itself; it is the sediment and nutrients in the runoff that can be bad news for Maine lakes. Studies have shown that runoff from developed areas has **5 to 10 times** the amount of **phosphorus** compared to runoff from forested areas.

The nutrient, phosphorus, is food for algae and other plants and is found in soils, septic waste, pet waste and fertilizers. In natural conditions, the scarcity of phosphorus in a lake limits algae growth. However, when a lake receives extra phosphorus, algae growth increases dramatically. Sometimes this growth causes choking blooms, but more often it results in small changes in water quality that, over time, damage the ecology, aesthetics and economy of lakes.

Soil is the biggest source of phosphorus to many Maine lakes. As every gardener knows, phosphorus and other nutrients are naturally present in the soil. So, we are essentially “fertilizing” our lakes with the soil that erodes from our driveways, roads, ditches, pathways and beaches.



Excess **phosphorus** can “fertilize” a lake and lead to nuisance **algal blooms**.

## Why is it important to protect these lakes from polluted runoff?

- ♦ They provide recreational opportunities to watershed residents and to visitors.
- ♦ They are important contributors to the local economy.
- ♦ Lakes contain valuable habitat for fish, birds and other wildlife.
- ♦ A 1996 University of Maine study demonstrated that pond water quality affects property values. For every meter (3 ft.) decline in water clarity, shorefront property values can decline as much as 10 to 20 percent! Declining property values affect individual landowners as well as the economics of the entire community.
- ♦ **Once a lake’s water quality has declined, it can be difficult or impossible to restore.**

# Flying Pond

Flying Pond is part of the 30 Mile River watershed, near the headwaters of the “30 Mile River,” a connected chain of lakes in Central Maine, northwest of Augusta. It is the second lake in the chain’s eastern branch, after Kimball Pond, and flows into Minnehonk Lake. From there, the chain continues to Taylor Pond, Echo Lake, Lovejoy Pond, Pocasset Lake, and Androscoggin Lake, eventually reaching the Androscoggin River. These lakes are vital to the economy and quality of life in the surrounding towns.

Flying Pond has a water surface area of approximately 403 acres or 0.6 square miles. While the entire lake is located within the Town of Vienna, its watershed of 7,437 acres, or 11.6 square miles is located in both the Towns of Vienna and Mount Vernon in Kennebec County. The land area of the Flying Pond watershed is exponentially larger than the surface area of the pond itself. This helps explain the significant changes in waters level, which frequently occur during and immediately following major storm events.

## Flying Pond Watershed Facts:

- Surface area: 403 acres
- Size of watershed: 11.6 square miles
- Average depth: 27 feet
- Flushing rate: 1.60 times/year.

The majority of developed waterfront properties on Flying Pond are seasonal residences. The remainder are year-round homes.

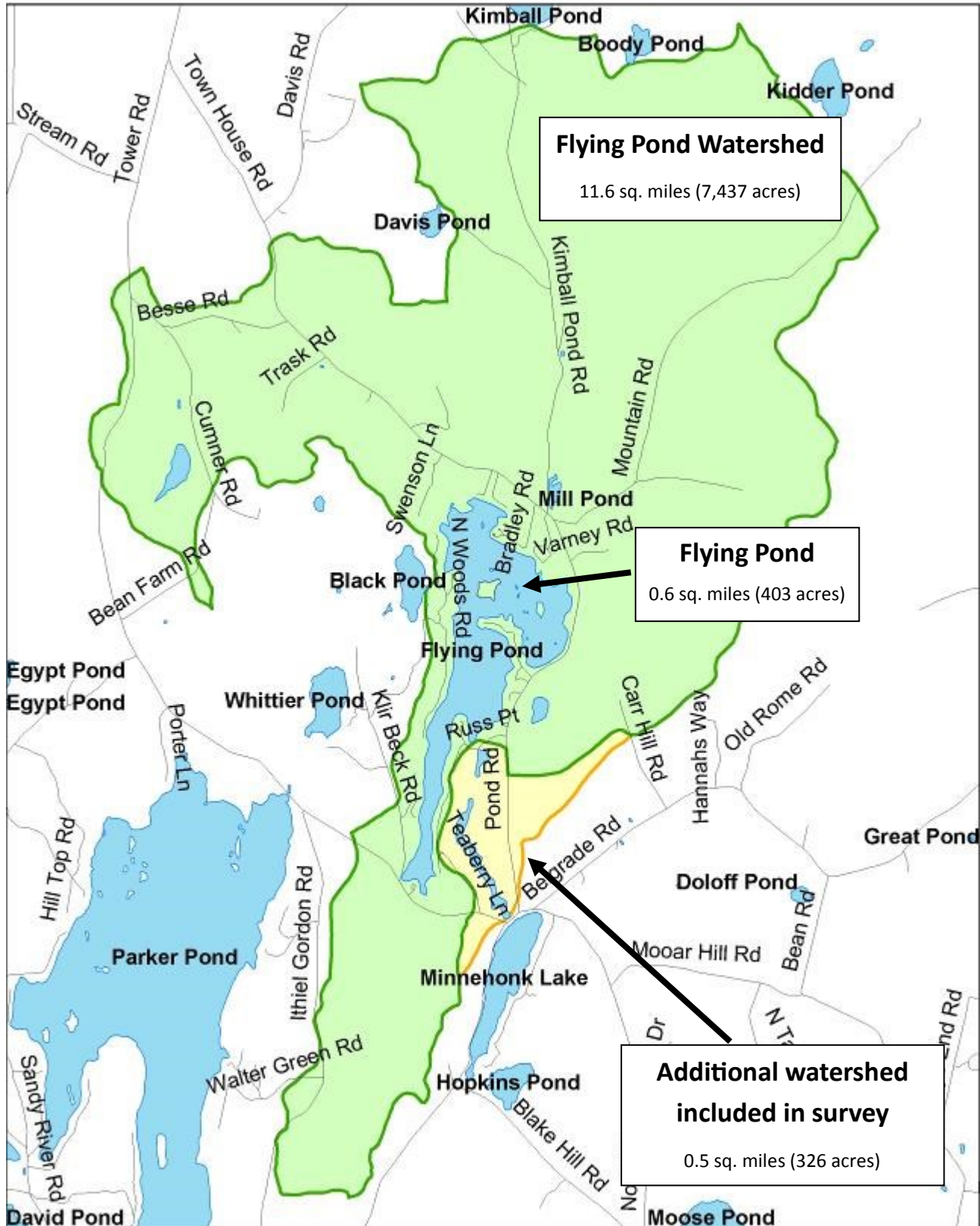
Water quality data have been collected from Flying Pond since 1976. Water quality is considered to be average with low potential for nuisance algal blooms.

Flying Pond is a valuable resource for the general public, many of whom use it for fishing, swimming, primitive camping, canoeing, kayaking, cross-country skiing, snowmobiling, and ice fishing. Public access is available at a boat launch located on State Highway 41, in the northeast corner of the lake, and owned by the Maine DOT.





# FLYING POND WATERSHED



## The Survey Method

Planning for the watershed survey began in early 2013, and was coordinated by the 30 Mile River Watershed Association with support from a steering committee composed of representatives from the various partner groups. In April 2014, all landowners within the watershed were contacted to inform them of the survey and give them the opportunity to “opt-out” their property. Out of the 442 landowners contacted, 27 (6%) asked to have their property excluded from the survey.

On May 9, 2014, 20 volunteers and 8 technical leaders gathered to participate in a morning training session on survey techniques. Following the classroom training, the volunteers and technical staff were broken into eight teams, and spent the remainder of the day traveling on foot and by car, documenting potential erosion problems in their assigned sectors. All developed areas of the entire watershed were surveyed. The teams collected data using standardized forms (consistent with Maine DEP format requirements), cameras and GPS units. Where necessary, some teams went out on additional days to complete their surveys. For the most part, all data were collected within two weeks, although additional “spot check” inspections were conducted by technical staff to verify data completeness and accuracy.



Data collected included information on the type of land use, a description of the problem, and the level of impact on water quality. (See Appendix A on page 25 for the data collected.) During the field survey, the teams also recommended solutions to remediate each identified erosion source, along with estimates of the cost and technical level required to do so. The collected data were entered into a database and the documented erosion sites were plotted on a map.

Each site was rated for its potential impact on Flying Pond. Impact was based on the **size of the site, its slope, amount of soil eroded, and proximity to water.**

**Low Impact** sites are those with limited soil transport off-site; a small site with no evidence of rills or gullies.

**Medium Impact** sites are those where sediment is transported off-site, but not a high volume.



# Watershed Survey Findings

Overall, eighty-four (84) sites were identified during the survey as current or potential sources of pollution to Flying Pond. Fifty-four (54), or approximately 64%, were located in the Town of Vienna, while thirty (30), or approximately 36%, were located in the Town of Mount Vernon.

Residential areas (not including driveways) constituted the largest single type of identified erosion sites in the survey. Town roads constituted the second largest type of erosion sites, with private roads a distant third.

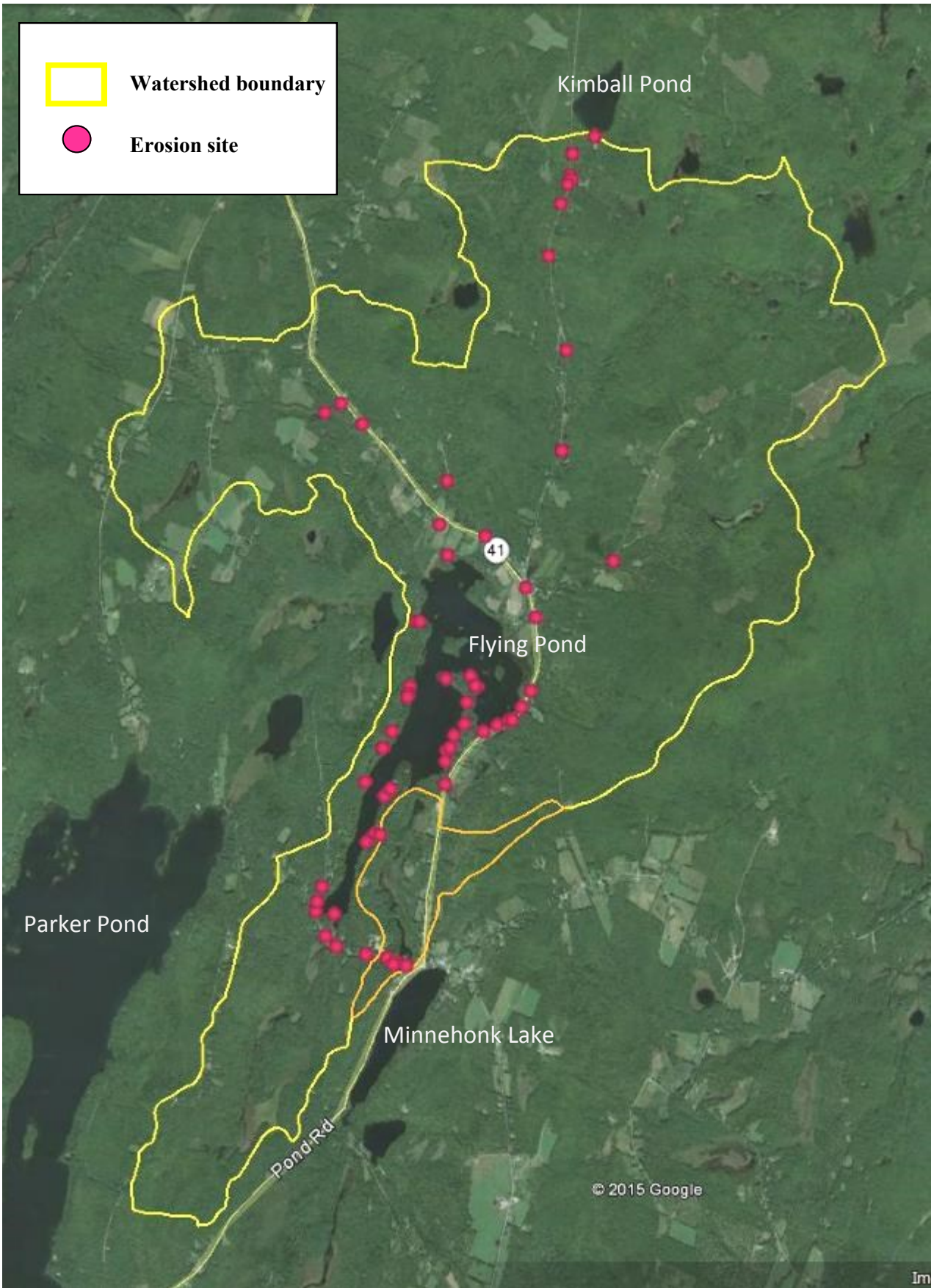
The results of the survey and summary of the data are discussed here. A complete listing of all sites can be found in the Table beginning on Page 25.

## Key Findings:

- ♦ Fifteen (15) or approximately 18% of all eighty-four (84) identified sites identified in the survey were rated as *high impact*, while thirty-three (33), or approximately 39%, were rated as *medium impact* and thirty-six (36), or 43%, as *low impact*. Most of the low impact sites can be corrected with low cost repairs. Remediation of many of the smaller scale, low impact/low cost sites could be completed by the Youth Conservation Corps of the 30 Mile River Watershed Association.
- ♦ Of the eighty-four (84) sites, thirty-one (31), or approximately 37%, were classified as a *residential land use*. Another six (6) sites, or approximately 7%, were identified as *driveways* located on residential properties.
- ♦ Twenty-three (23), or approximately 27% of the eighty-four (84) sites were associated with *town roads*, including thirteen (13) paved and ten (10) dirt surfaces. Many of the problems identified at these sites are the result of the migration of winter (deicing) sand from the road surface into roadside ditches, or directly into nearby streams, and from erosion of exposed soil along road shoulders and in roadside ditches. This topic is discussed in greater detail elsewhere in this report.
- ♦ Many of the town road sites will require substantial work by the towns to correct the existing problems, including removing loose winter sand, re-grading the road shoulders, stabilizing roadside ditches, and re-grading ditches. Most of these sites are located in the Town of Vienna. Eight (8) of the twenty-three (23) sites were determined to be of low impact. Eleven (11) were determined to be of medium impact, and four (4) were determined to be high impact sites.
- ♦ Nine (9) of the eighty-four (84) sites, or approximately 11%, were associated with *private roads*. Four (4) were determined to be low impact, one (1) medium impact and four (4) high impact. Remediation of private road sites usually requires the cooperation of a road association or group of owners. Comprehensive planning by road associations is critical for proper, long-term road maintenance.

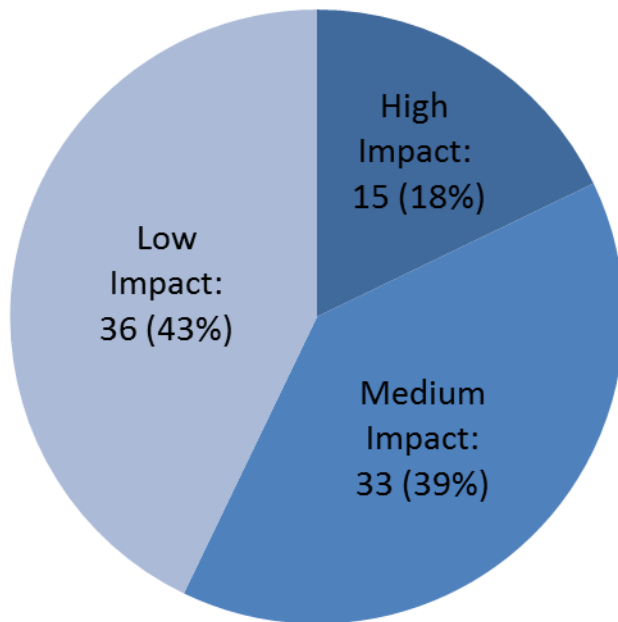


# Watershed Survey Sites





## Erosion Sites by Impact

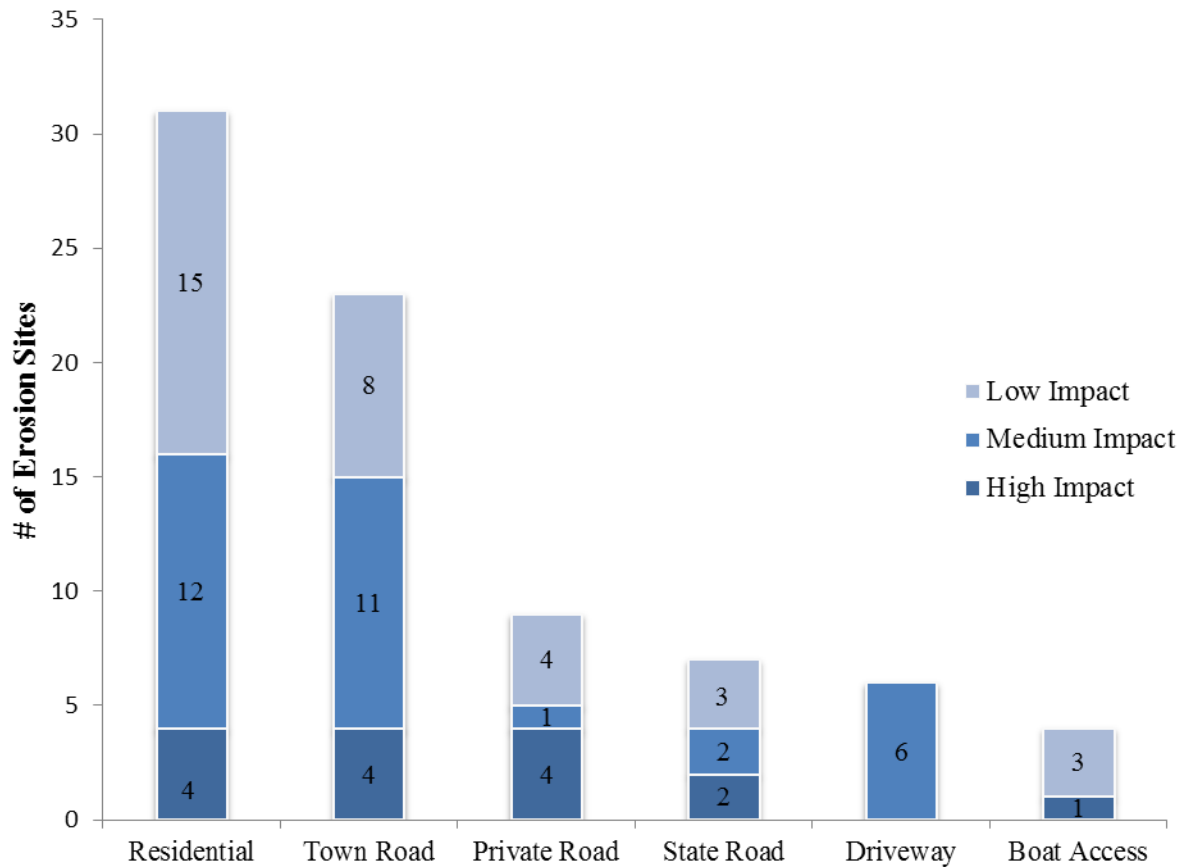


Each site identified during the survey was rated for its potential impact to the pond. Impact was based on the size of the site, its slope, amount of soil eroded, and proximity to water.

- ♦ **Low Impact** sites are those with limited soil transport off-site; a small site with no evidence of rills or gullies.
- ♦ **Medium Impact** sites are those where sediment is transported off-site, but not a high magnitude.
- ♦ **High Impact** sites are large sites with significant erosion that flows directly into a stream or the pond.

Thirty-six (36), or nearly half of the sites (43%) were identified as being low impact. However, nearly as many, thirty-three (33), or approximately 39%, were identified as medium impact, and the cumulative effect of all of these sites is very significant.

## Erosion Sites by Land Use



Thirty-seven (37), or 44% of all sites identified during the survey were associated with residential land uses (31 residential, 6 driveway). The majority of these sites (18 of 37) were rated medium impact. Only four (4) were rated high impact. Twenty-seven (27), or approximately 73% of the residential/driveway sites were determined to be suitable for remediation by the Youth Conservation Corps (YCC), including fourteen (14) medium impact sites.

Town roads (both paved and dirt) accounted for 27% of all sites identified during the survey. Remediation of these sites will require the full cooperation the Towns.

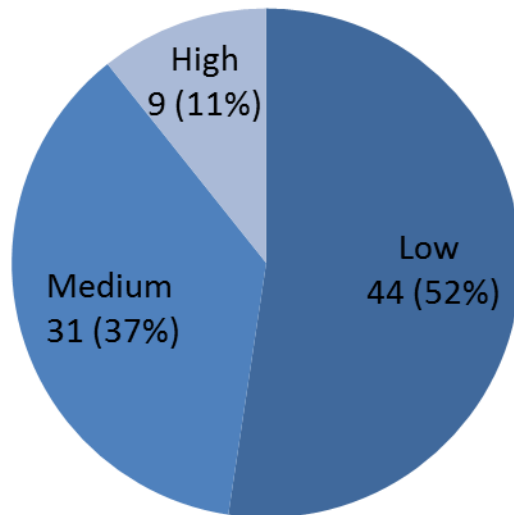
Nine (9), or approximately 11% of the identified sites were associated with private roads. In most cases, remedial action will be required by a road association or other owner. Comprehensive planning by a road association is critical to ongoing road maintenance. 30MRWA is available to assist in planning efforts.

The remaining fifteen (15) sites, or approximately 18% of all identified sites, represent 6 other land uses, including agriculture (1 site), boat access (4 sites), commercial (1 site), construction site (1 site), state roads (7 sites), and trail/path (1 site).

## Erosion Sites by Town

Town	High Impact	Medium Impact	Low Impact	Total
Mount Vernon	4	12	14	30
Vienna	11	21	22	54
Total	15 (18%)	33 (39%)	36 (43%)	84

## Cost to Fix Sites



**Cost** is an important factor in planning for remediation. The cost of labor and materials to fix each site was estimated and rated as follows:

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

Forty-four, or over half of the sites (52%) can be fixed at low cost (under \$500). Thirty-one, or 37% of all sites can be fixed at medium cost. Only nine, or 11%, require high cost fixes (over \$2,500).

## Residential Sites (31)

Fifteen (15) residential sites were designated low impact, twelve (12) were medium impact, and four (4) were high impact. Most of these sites (18) can be fixed at low cost. Twelve (12) others can be fixed at medium cost. Only one (1) residential site will require high cost repairs.

### Common Problems Identified:

- ◆ Slight to severe surface erosion
- ◆ Inadequate shoreline vegetation
- ◆ Erosion from roof runoff
- ◆ Shoreline erosion
- ◆ Bare soil

### Recommended Solutions:

- ◆ Establish vegetative buffer
- ◆ Install runoff diverters
- ◆ Install drip line protection
- ◆ Install infiltration steps
- ◆ Install dry well for roof runoff
- ◆ Define and stabilize foot path to shoreline
- ◆ Install erosion control mulch
- ◆ Allow leaf litter to remain to protect soil



### Problems:

Slight surface erosion; inadequate shoreline vegetation

### Solutions:

Install runoff diverters on driveway; add mulch/erosion control mix; establish vegetated buffer

Residential areas (not including driveways) were associated with approximately 37% of the identified sources of polluted runoff.

Fortunately, most of these sites can be corrected with easy, low cost fixes.

***It is the cumulative impact of all the sites that causes water quality to decline.***



## Town Road Sites (23)

Thirteen (13) town road sites were identified on paved surfaces and ten (10) were identified on dirt surfaces. Eight (8) were considered low impact, eleven (11) were medium impact, and four (4) were high impact. Eleven (11) were estimated at a low cost to fix, while eight (8) were medium and four (4) were high.

### Common Problems Identified:

- ♦ Migration of winter sand (deicing material) from road surfaces
- ♦ Moderate to severe road shoulder erosion
- ♦ Undersized culverts
- ♦ Blocked culverts
- ♦ Crushed/broken culverts
- ♦ Unstable inlet/outlet of culverts
- ♦ Severe ditch erosion
- ♦ Grader berms

### Recommended Solutions:

- ♦ Remove winter sand from road surfaces, shoulders and ditches
- ♦ Re-grade road to establish proper crown and shoulder
- ♦ Armor inlet/outlet of culvert
- ♦ Install plunge pool at culvert outlet
- ♦ Install turnouts in ditch
- ♦ Stabilize sides slopes of ditch
- ♦ Vegetate and/or armor ditch



### Problems:

Unstable inlet/outlet at culvert; partial blockages at both ends of culvert; culvert crushed due to inadequate cover, creating sink hole in road; road shoulder failure at both ends of culvert

### Solutions:

Replace and lengthen culvert

**Runoff from paved and dirt road surfaces is one of the biggest sources of pollution in Maine ponds and lakes.**

***Proper maintenance is essential to prevent erosion from road surfaces, shoulders and roadside ditches.***

## Private Road Sites (9)

Four (4) Private Road sites were considered Low Impact, one (1) was Medium Impact, and four (4) were High. Three (3) were estimated at a Low Cost to correct, three (3) were Medium and three (3) were High.

### Common Problems Identified:

- ♦ Moderate to severe surface erosion
- ♦ Crushed/broken culvert
- ♦ Moderate to severe road shoulder erosion
- ♦ Slight to severe ditch erosion
- ♦ Side slope failure in ditch
- ♦ Partial blockage of culvert

### Recommended Solutions:

- ♦ Replace broken culvert
- ♦ Armor inlet/outlet of culvert
- ♦ Install new road surface material
- ♦ Install runoff diverters in road
- ♦ Install check dams in ditch



### Problems:

Severe surface erosion; crushed/broken culvert

### Solutions:

Replace culvert; install runoff diverters on road

**Unpaved roads are a major source of particulate pollution into Maine ponds.**

***While a one-time fix may cost more up front, it will reduce pond pollution and reduce maintenance costs on your road, ditches and vehicle.***

## Driveway Sites (6)

All six (6) Driveway sites were considered Medium Impact. Three (3) were determined to have a Low Cost of repair and three (3) a Medium Cost. None (0) will require a High Cost of repair.

### Common Problems Identified:

- ♦ Slight to moderate surface erosion
- ♦ Moderate shoulder erosion
- ♦ Bare soil

### Recommended Solutions:

- ♦ Vegetate driveway shoulder
- ♦ Add new surface material to driveway
- ♦ Install runoff diverters in driveway
- ♦ Install erosion control mulch
- ♦ Re-seed and hay bare soil area
- ♦ Allow leaf litter to remain to protect soil



### Problems:

Moderate surface erosion

### Solutions:

Build up driveway surface and add new surface material; reshape (crown) road; vegetate driveway shoulder; install runoff diverters



## State Road Sites (7)

Three (3) State Road sites were designated as Low Impact, two (2) were designated as Medium Impact and two (2) as High. Three (3) were rated as Low Cost to repair and four (4) as Medium Cost.

### Common Problems Identified:

- ◆ Winter sand
- ◆ Unstable inlet/outlet of culvert
- ◆ Slope erosion
- ◆ Slight to severe road shoulder erosion
- ◆ Bare soil

### Recommended Solutions:

- ◆ Armor culvert
- ◆ Install plunge pool at culvert outlet
- ◆ Remove debris from ditch
- ◆ Stabilize bank with rip rap
- ◆ Stabilize road shoulder



### Problem:

Severe shoulder erosion

### Solutions:

Armor inlet/outlet of culvert; install turn-outs; install ditch



## Boat Access (4)

Three (3) Boat Access sites were determined to be Low Impact with Low Costs of repair and one (1) as High Impact with High Cost of repair.

### Common Problems Identified:

- ♦ Slight to severe surface erosion
- ♦ Bare soil
- ♦ Lack of shoreline vegetation
- ♦ Unstable surface at boat ramp

### Recommended Solutions:

- ♦ Define and stabilize foot path
- ♦ Install erosion control mulch
- ♦ Install runoff diverters
- ♦ Add new surface material to boat ramp



### Problems:

Severe surface erosion; inadequate shoreline protection; unstable access to shoreline

### Solution:

Add new surface material to launch ramp

## **Agriculture (1)**

One (1) Agriculture site was identified as Low Impact, with a Low Cost of Repair.

### **Problems:**

- ◆ Bare soil
- ◆ Cultivation too close to stream
- ◆ Sod dumped too close to stream

### **Recommended Solutions:**

- ◆ Avoid sod disposal near stream
- ◆ Install vegetative buffer along stream

## **Commercial (1)**

One (1) Commercial site was identified as Medium Impact with a Low Cost of Repair.

### **Problems:**

- ◆ Moderate surface erosion
- ◆ Broken and undersized culvert
- ◆ Moderate ditch erosion
- ◆ Slope failure
- ◆ Bare soil

### **Recommended Solutions:**

- ◆ Replace with larger diameter and longer culvert
- ◆ Vegetate side slopes of ditch
- ◆ Armor culvert
- ◆ Re-grade driveway
- ◆ Install runoff diverter

## **Construction (1)**

One Construction site was identified as Low Impact with a Low Cost of repair.

### **Problem:**

- ◆ Uncovered soil pile

### **Recommended Solutions:**

- ◆ Install silt fence
- ◆ Add mulch or erosion control mix
- ◆ Seed/hay bare soil area

## **Trail or Path (1)**

One Trail or Path site was identified as Low Impact with a Medium Cost of repair.

### **Problems:**

- ◆ Slight surface erosion
- ◆ Erosion at shoreline

### **Recommended Solutions:**

- ◆ Define and stabilize footpath
- ◆ Install infiltration steps in path
- ◆ Install runoff diverter in path

## Next Steps ~ Where Do We Go From Here?

Fixing the erosion sites identified in this survey will require efforts by individuals, road associations, municipal officials, lake associations and the 30 Mile River Watershed Association (30MRWA). **Paying attention to run-off problems and identifying sites in need of work should be continual activities of everyone interested in protecting these lakes.** This survey provided a snapshot of the situation of the surveyed areas on a particular day; new erosion sites develop, particularly after heavy rain or snowmelt.

### Individual Citizens

- ♦ Be careful not to unnecessarily disturb the ground that drains into the lake and avoid exposing bare soil. Seed and mulch exposed soil right away.
- ♦ Stop mowing and raking, and let lawn and raked areas revert back to natural plants.
- ♦ Minimize the amount of cleared land and road surfaces on your property.
- ♦ Encourage shrubs and trees, as their deep roots help hold the shoreline.
- ♦ Detain runoff in depressions or divert flow to vegetated areas. (Contact 30MRWA or DEP for assistance. Please see page 24 for contact information.)
- ♦ Check with your town's Code Enforcement Officer or Planning Board before cutting vegetation within 250 feet of the shoreline, as cutting may violate shoreland zoning regulations.
- ♦ Maintain septic systems properly. Pump septic tanks every 2 to 3 years for year-round residences or every 4 to 5 years if seasonal, and upgrade marginal systems.
- ♦ Join your local lake association to support their water quality and conservation activities.

### Road Associations (or private road owners without associations)

- ♦ Minimize road runoff by doing regular, comprehensive maintenance.
- ♦ Form a road association if one does not already exist. If you need assistance with planning, please contact 30MRWA. (Please see page 24 for contact information.)
- ♦ Get a copy of *Gravel Road Maintenance Manual – A Guide for Landowners*, a must for anyone managing a camp or other gravel road. [www.maine.gov/dep/land/watershed/camp/road/gravel\\_road\\_manual.pdf](http://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf)

### Municipalities

- ♦ Enforce shoreland zoning ordinance to assure full protection of these lakes.
- ♦ Conduct regular maintenance on town roads in the watershed and fix town road problems identified here.
- ♦ Participate in and support long-term watershed management projects.
- ♦ Promote training for road crews, planning boards, conservation commissions and other decision-makers.
- ♦ Continue collaboration with 30MRWA and the lake associations on remediation projects and ongoing monitoring of these watersheds.

**Remember, the long-term health of the watershed depends on you!**



## **Flying Pond Improvement Association**

- ◆ Help disseminate the summary report.
- ◆ Share information on “Best Management Practices” and how we can work together to help protect and improve water quality.
- ◆ Continue collaboration with 30MRWA and the towns on remediation projects and ongoing monitoring of these watersheds.

## **30 Mile River Watershed Association**

- ◆ Contact all landowners with identified erosion sites. Describe the nature of identified erosion issues, make recommendations for remediation, and encourage landowners to make improvements.
- ◆ Provide the services of the Youth Conservation Corps to fix identified erosion problems.
- ◆ Provide free site evaluations and recommendations for landowners.
- ◆ Provide free camp road maintenance workshops and planning assistance for road associations.
- ◆ Provide educational resources and guidance to lake associations, towns and community members.
- ◆ Maintain a database of erosion problems in the watershed and track them over time.
- ◆ Continue to partner with the towns, lake associations, Kennebec County Soil and Water Conservation District, Maine DEP and others to seek funding and implement projects to protect lake water quality.



# 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:

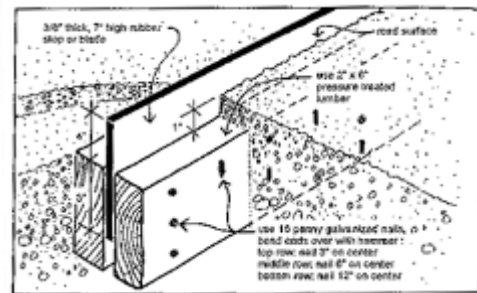
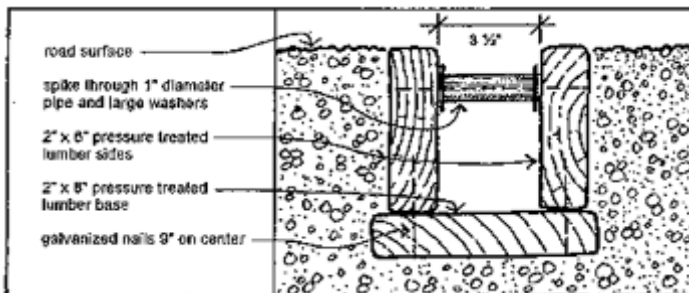
Construction Practices	Live Plant Staking	Rain Barrels
Dripline Trench	Native Plant Lists	Rain Gardens
Drywells	Open-Top Culverts	Rip Rap
Erosion Control Mix	Paths and Walkways	Rubber Razors
Infiltration Steps	Permitting	Turnouts
Infiltration Trench	Planting Vegetation	Waterbars

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 small color photos of each plant to make plant selection easier.

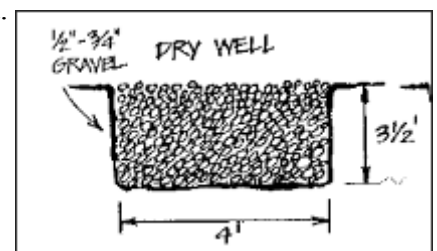
**Fact sheets are available to help you install conservation practices on your property.**

**Download at <http://www.maine.gov/dep/land/watershed/materials.html>**

**Rubber Razor Blade:** Use this structure in a gravel driveway or camp road. It can be plowed over only if the plow operator is aware of its presence and lifts the plow blade slightly. Place it at a 30 degree angle to the road edge and direct the outlet toward a stable vegetated area.



**Open Top Culvert:** Use this structure in a gravel driveway or camp road that does not get plowed in the winter. Place it at a 30 degree angle to the road edge and point the outlet into stable vegetation. Remove leaves and debris as needed.



**Dry Well:** Use a dry well to collect runoff from roof gutter downspouts. Drywells can be covered with sod, or left exposed for easy access and cleanout. Dry wells and infiltration trenches work best in sandy or gravelly soils.

# Permitting ABC's

Protection of Maine's watersheds is ensured through the goodwill of pond 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.

## How to apply for a Permit by Rule with DEP:

To ensure that permits for small projects are processed swiftly, the DEP has established 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 form 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/ip-pbr.html](http://www.maine.gov/dep/land/nrpa/ip-pbr.html).
- 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.

4/3/96

DEPARTMENT OF ENVIRONMENTAL PROTECTION  
PERMIT BY RULE NOTIFICATION FORM  
(For use with DEP Regulation, Chapter 305)

PLEASE TYPE OR PRINT IN BLACK INK ONLY

Name of Applicant: (owner)	Sandy Waters		Applicant Mailing Address:	123 Blueberry Lane	
Town/City:	Brunswick		State:	Maine	
Zip Code:	04011	Daytime Telephone No: (include area code)	(207) 555-1234		Project Location: (town)
County:	Cumberland	Map #:	20	Lot #:	50
Name of Agent:			Name of Wetland or Waterbody:	Sabattus Lake	
Detailed Directions to Site:			121 Outlet Road, Rte 26 North, turn right onto Outlet Road, 121 Outlet Road is on the left 4th to 5 houses before Barefoot Beach.		
Description of Project:			Installation of a drywell to allow infiltration of roof runoff		
UTM Northing: (if known)			UTM Easting: (if known)		
Part of a larger project?			Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>		

(CHECK ONE) This project: does ☐ does not ☒ involve work below mean low water.

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.

<input checked="" type="checkbox"/> Sec. (2) Act. Adjacent to Protected Natural Res.	<input type="checkbox"/> Sec. (8) Shoreline Stabilization	<input type="checkbox"/> Sec. (14) REPEALED
<input type="checkbox"/> Sec. (3) Intake Pipes	<input type="checkbox"/> Sec. (9) Utility Crossing	<input type="checkbox"/> Sec. (15) Public Boat Ramps
<input type="checkbox"/> Sec. (4) Replacement of Structures	<input type="checkbox"/> Sec. (10) Stream Crossing	<input type="checkbox"/> Sec. (16) Coastal Sand Dune Projects
<input type="checkbox"/> Sec. (5) REPEALED	<input type="checkbox"/> Sec. (11) State Transportation Facilities	<input type="checkbox"/> Sec. (17) Transfer/Permit Extension
<input type="checkbox"/> Sec. (6) Movement of Rocks or Vegetation	<input type="checkbox"/> Sec. (12) Restoration of Natural Areas	<input type="checkbox"/> Sec. (18) Maintenance Dredging
<input type="checkbox"/> Sec. (7) Outlet Pipes	<input type="checkbox"/> Sec. (13) F&W Conditions/Enhance Water Quality Improvement	

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.

I have attached the following required submittals: NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:

- ☒ Attach a check for \$55 (non-refundable) made payable to: "Treasurer, State of Maine".
- ☒ Attach a U.S.G.S. topo map or Maine Atlas & Gazetteer map with the project site clearly marked.
- ☒ Attach all other required submissions as outlined in the PBR Sections checked above.

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:	Sandy Waters	Date:	3/4/06
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KNOW YOUR RIGHTS: Send the form with attachments via certified mail 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.

OFFICE USE ONLY	CL#	Date	Staff	Staff
PBR #	PP		Acc. Date	Def. Date
After Photos				

DEPLW0305-12005

MAINE STATE DEP: AUGUSTA, ME 04333-0017 (207) 287-2111  
PORTLAND DEP: 212 CANOE ROAD, PORTLAND, ME 04103 (207) 852-6000  
BANGOR DEP: 100 HIGGAN ROAD, BANGOR, ME 04401 (207) 641-4610  
PRESQUE ISLE DEP: 1225 CENTRAL DRIVE, PRESQUE ISLE, ME 04769 (207) 794-1637



# Where Do I Get More Information?

## Contacts

### **30 Mile River Watershed Association**

P.O. Box 132, Mount Vernon, ME 04352

(207) 860-4043; [lidie@30mileriver.org](mailto:lidie@30mileriver.org); [www.30mileriver.org](http://www.30mileriver.org)

Provides free services including site evaluations and recommendations for landowners; camp road maintenance workshops and planning assistance for road associations; and the Youth Conservation Corps to fix identified erosion problems.

### **Kennebec County Soil and Water Conservation District**

21 Enterprise Drive, Suite #1, Augusta, ME 04330

(207) 622-7847 ext.3; [dfinseth@kcsxcd.org](mailto:dfinseth@kcsxcd.org); [www.kcsxcd.org](http://www.kcsxcd.org)

Provides technical assistance to landowners, road associations, lake associations, municipalities, and other conservation groups.

### **Maine Department of Environmental Protection**

17 State House Station, Augusta, ME 04333

(800) 452-1942 or (207)287-3901; [www.maine.gov/dep](http://www.maine.gov/dep)

Provides permit applications and assistance, numerous reference materials, technical assistance, environmental education, project funding opportunities, and stewardship activities for lakes.

### **Code Enforcement Officers**

Town of Mt. Vernon: (207) 293-2636; [CEO@mtvernonme.org](mailto:CEO@mtvernonme.org)

Town of Vienna: (207) 293-2674; [CodeEnforce@viennamaine.org](mailto:CodeEnforce@viennamaine.org)

## Publications

**Gravel Road Maintenance Manual: A Guide for Landowners.** Kennebec County Soil and Water Conservation District and Maine Department of Environmental Protection. 2010. [www.maine.gov/dep/land/watershed/camp/road/gravel\\_road\\_manual.pdf](http://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf)

**A Guide to Forming Road Associations.** Maine Department of Environmental Protection. 2009. [www.maine.gov/dep/land/watershed/road\\_association\\_guide.pdf](http://www.maine.gov/dep/land/watershed/road_association_guide.pdf)

**Conservation Practices for Homeowners.** Maine Department of Environmental Protection and Portland Water District. 2006. 24 fact sheets. [www.maine.gov/dep/land/watershed/materials.html](http://www.maine.gov/dep/land/watershed/materials.html)

Online information for shorefront property owners on creating and maintaining a healthy shorefront property. Maine Department of Environmental Protection. [www.maine.gov/dep/land/watershed/camp/index.html](http://www.maine.gov/dep/land/watershed/camp/index.html)



## Appendix : Survey Data

Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Agriculture	V	Uncovered pile of soil; Tilled eroding field is too close to stream on right side of property (as you face the house); Sod is being thrown/piled next to stream	Directly into lake	Flat	¼ acre	Avoid dumping sod near stream; Establish a vegetative buffer beside stream	Low	Low	Low	No
Boat Access	MV	Moderate surface erosion; Lack of shoreline vegetation; Unstable access to shoreline	Directly into lake	Moderate	4' x 10'	Armor ditch with stone to edge of boat ramp	Low	Low	Low	Yes
Boat Access	V	Slight surface erosion; Bare soil	Directly into lake	Moderate	100' x 15'	Install new surface material on road; Install runoff diverters	Low	Low	Low	Yes
Boat Access	MV	Moderate surface erosion; Bare soil	Directly into lake	Steep	2' x 10'	Define and stabilize foot path; Install mulch/erosion control mix	Low	Low	Low	Yes
Boat Access	MV	Severe surface erosion; Inadequate shoreline protection, Unstable access to shoreline	Directly into lake	Moderate	120' x 15'	Add new surface material to launch ramp	High	High	High	No
Commercial	V	Moderate surface erosion; Broken and undersized culvert; Moderate ditch erosion and bank failure; Bare soil	Stream	Steep	8' x 20'	Replace with larger diameter and longer culvert; Re-grade, vegetate and/or armor ditch and both ends of culvert; Install runoff diverter in driveway	Medium	Low	Low	Yes
Construction Site	V	Bare soil; Uncovered pile of soil	Directly into lake	Moderate	20' x 40'	Install erosion control mulch on area to left of home; Add mulch; Install silt fence at disturbed area; Seed and hay bare area	Low	Low	Low	Yes
Driveway	MV	Moderate shoulder erosion; Bare soil	Stream	Moderate	60' x 20'	Vegetate driveway shoulder	Medium	Low	Low	No
Driveway	V	Moderate surface erosion	Directly into lake	Moderate	12' x 75'	Install new surface material on driveway; Install catch basin; Install runoff diverters in driveway; Add mulch/erosion control mix; Install rain garden	Medium	Medium	Medium	No
Driveway	V	Moderate surface erosion; Bare soil	Directly into lake	Moderate	15' x 75'	Install new surface material on driveway; Install runoff diverters in driveway	Medium	Medium	Medium	Yes
Driveway	MV	Slight surface erosion; Bare soil	Minimal vegetation	Moderate	120' x 16'	Install new surface material on driveway; Install runoff diverter; Establish vegetative buffer; Allow leaf litter to remain; Re-seed bare soil & thin grass areas	Medium	Low	Low	Yes
Driveway	MV	Moderate surface erosion	Directly into lake	Moderate	200' x 12'	Install runoff diverter on driveway; Add mulch/erosion control mix	Medium	Low	Low	No
Driveway	V	Moderate surface erosion	Minimal vegetation	Steep	10' x 50'	Build up driveway surface and add new surface material; reshape (crown) road; Vegetate driveway shoulder; Install runoff diverters	Medium	Medium	Medium	No

Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Private Road	V	Severe surface erosion; dirt rill, washes out from hillside	Directly into lake	Moderate	20' x 30'	Install runoff diverters on road	High	High	High	No
Private Road	V	Severe surface erosion on road; Severe road shoulder erosion; Severe erosion in ditch; Bare soil	Stream	Steep	4' x 100 yds	Regrade road surface (slope to west); Install runoff diverters in road	High	Medium	Medium	No
Private Road	V	Severe surface erosion; Crushed/broken culvert	Directly into lake	Steep	20' x 20'	Replace culvert; Install runoff diverters in road	High	High	High	No
Private road	V	Moderate surface erosion; Bank failure	Minimal vegetation	Steep	100' x 8'	Armor ditch; Install new surface material on road; Install runoff diverter on road	Medium	Medium	Medium	Yes
Private Road	V	Moderate surface erosion; Moderate road shoulder erosion; Oil observed on leaves on side of erosion site	Directly into lake	Flat	2' x 10'	Install new surface material on road; Install runoff diverter in road	Low	Low	Medium	Yes
Private Road	V	Partial blockage of culvert under Waite Road at Rte. 41	Ditch	Steep	5' x 8'	Remove blockage, stabilize bank, install headwall protection at culvert	Low	Medium	Medium	No
Private Road	V	Slight erosion in ditch	Directly into lake	Moderate	655' x 1'	Install check dams in ditch	Low	Low	Low	Yes
Private Road	V	Slight surface erosion; Improper road crown	Minimal vegetation	Moderate	200'	Build up road surface; Reshape (crown) road	Low	Low	Low	No
Private Road	MV	Severe surface erosion; Severe ditch erosion; Severe road shoulder erosion	Directly into lake	Steep	300' x 6'	Armor ditch; Install ditch	High	High	High	No
Residential	V	Unstable access to shoreline; Stream delta into pond at driveway	Directly into lake	Flat	.5 acre	Re-grade ditch; Install water retention swales; Add more vegetation to buffer	High	High	High	No
Residential	MV	Moderate surface erosion; Bare soil	Directly into lake	Moderate	24' x 30'	Add mulch; Define foot path; Install runoff diverter; Establish vegetative buffer	High	Medium	Medium	Yes
Residential	MV	Slight surface erosion; Bare soil	Directly into lake	Flat	30' x 30'	Add new surface material to driveway; Mulch construction site; Define foot path; Establish vegetative buffer	Medium	Medium	Medium	Yes
Residential	MV	Slight surface erosion; erosion from roof runoff; Inadequate shoreline vegetation	Directly into lake	Moderate	12' x 80'	Install runoff diverters on driveway and at top of lake access; Install infiltration trench at roof dripline; Add mulch/erosion control mix; Establish vegetative buffer	Medium	Low	Low	Yes
Residential	MV	Severe surface erosion at shoreline; Inadequate shoreline vegetation; unstable access at shoreline	Directly into lake	Moderate	20' x 25' and 20' x 4'	Stabilize shoreline; Install crushed stone under barn; add more vegetation to existing vegetative buffer	Medium	Medium	Low	Yes
Residential	V	Slight surface erosion; Bare soil	Minimal vegetation	Moderate	150' x 80'	Add mulch/erosion control mix; Establish vegetative buffer; Allow leaf litter to remain; Re-seed bare soil & thin grass areas	Medium	Medium	Low	Yes
Residential	V	Slight surface erosion; Bare soil; Inadequate shoreline vegetation	Directly into lake	Moderate	60' x 30'	Install runoff diverter in path; Add mulch/erosion control mix; Establish vegetative buffer; Allow leaf litter to remain; Re-seed bare soil & thin grass areas	Medium	Medium	Low	Yes

Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Residential	V	Slight surface erosion; Bare soil; Roof runoff erosion; Lack of shoreline vegetation	Directly into lake	Moderate	350 ft. sq.	Stabilize foot path; Install infiltration steps; Install drywell at gutter downspout; Add mulch/erosion control mix; Establish vegetative buffer	Medium	Medium	Medium	Yes
Residential	MV	Moderate surface erosion; Bare soil; Roof runoff erosion	Directly into lake	Moderate	20' x 1'	Define foot path; Install infiltration trench at roof dripline; Install rain barrel; Add mulch/erosion control mix; Establish vegetation buffer; limit raking to allow leaf litter to remain	Medium	Medium	Medium	Yes
Residential	MV	Slight surface erosion; Inadequate shoreline vegetation	Directly into lake	Steep	15' x 15'	Establish vegetative buffer; Store dock in alternative location	Medium	Low	Low	Yes
Residential	V	Moderate surface erosion; Bare soil; Roof runoff erosion	Directly into lake	Steep	15' x 200'	Define and stabilize foot path; Install infiltration steps; Install runoff diverter in path; Install drywell at gutter downspout; Install mulch/erosion control mix; Allow leaf litter to remain	Medium	Medium	Medium	Yes
Residential	V	Moderate surface erosion; Bare soil; Roof runoff erosion	Directly into lake	Steep	12' x 200'	Define and stabilize foot path; install infiltration steps; Install runoff diverter on path; Install infiltration trench at roof dripline; Install mulch/erosion control mix	Medium	Medium	Medium	Yes
Residential	MV	Slight beach erosion; bare soil; Lack of shoreline vegetation and erosion at shoreline	Directly into lake	Flat	4' x 30'	Install runoff diverters; Create water retention swales above beach; establish vegetation buffer	Low	Low	Low	Yes
Residential	MV	Slight surface erosion; Bare soil	Directly into lake	Moderate	2' x 70'	Remove grader/plow berms along road/driveway	Low	Low	Low	No
Residential	V	Slight surface erosion; Bare soil; Lack of shoreline vegetation	Directly into lake	Moderate	10' x 30'	Add mulch/erosion control mix; Establish vegetative buffer; Allow leaf litter to remain	Low	Low	Low	Yes
Residential	MV	Moderate surface erosion; Bare soil	Directly into lake	Moderate	10' x 20'	Add new surface material to driveway; Install mulch/erosion control mix;	Low	Low	Low	Yes
Residential	MV	Slight surface erosion; inadequate shoreline vegetation	Directly into lake	Moderate	20' x 12'	Establish vegetative buffer; Allow leaf litter to remain	Low	Low	Low	No
Residential	V	Slight surface erosion; Roof runoff erosion; Inadequate shoreline vegetation	Directly into lake	Moderate	20' x 10'	Install infiltration steps on path; Install drywell at gutter downspout (angle drain spout away); Install mulch/erosion control mix	Low	Low	Low	Yes
Residential	MV	Moderate surface erosion; Bare soil	Directly into lake	Slight	20'x 30'	Define foot path to shoreline; Add mulch/erosion control mix; Establish vegetative buffer	Low	Low	Low	Yes
Residential	MV	Slight surface erosion; bare soil; Lack of shoreline vegetation and erosion on shoreline	Directly into lake	Steep	4' x 50'	Add mulch/erosion control mix; establish a vegetative buffer	Low	Low	Low	Yes
Residential	MV	Moderate surface erosion; Bare soil; Erosion from roof runoff	Directly into lake	Steep	40' x 20'	Install mulch/erosion control mix	Low	Low	Low	Yes
Residential	MV	Severe surface erosion; Bare soil	Directly into lake	Moderate	100' x 20'	Establish vegetative buffer; Re-seed bare soil & thin grass areas	High	Low	Low	No



Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Residential	V	Bank of stream is undercut (natural condition); Inadequate vegetation between lawn and stream; Some erosion of bank	Directly into lake	Flat	5' x 10' ?	Stabilize bank with stone. Add buffer along open portion of bank	Medium	Low	Low	Yes
Residential	V	Moderate surface erosion; Bare soil	Directly into lake	Steep	5' x 30', 2' x 15'	Install retaining wall below fire pit and below garden; Install mulch/erosion control mix; Establish vegetation buffer; Re-seed bare soil & thin grass	Medium	Medium	Medium	Yes
Residential	V	Slight surface erosion; Shoreline is undercut and has unstable access	Directly into lake	Moderate	70'	Create meandering path; Fill in hole at shoreline; Install infiltration steps on path; Add mulch/erosion control mix	Low	Low	Low	Yes
Residential	V	Moderate surface erosion; Open pipe discharging in front of building	Minimal vegetation	Moderate	20' x 10'	Add mulch/erosion control mix; Install stone apron at pipe outlet	Low	Low	Medium	No
Residential	V	Moderate surface erosion	Directly into lake	Moderate	20' x 4'	Install infiltration steps on path	Low	Medium	Low	Yes
Residential	V	Slight surface erosion; Bare soil; Common area between two camps is bare	Directly into lake	Moderate	50' x 40'	Install mulch/erosion control mix	Low	Low	Low	Yes
Residential	V	Slight surface erosion; Roof runoff erosion	Directly into lake	Steep	10' x 30'	Re-direct drain spout; Install drywell at gutter downspout	Low	Low	Low	Yes
Residential	V	Moderate surface erosion; Bare soil; Roof runoff erosion; Erosion from driveway runoff	Minimal vegetation	Moderate	5' x 40'	Build up road surface; Install infiltration trench at roof dripline; Install mulch/erosion control mix	High	Medium	Medium	No
Residential	V	Slight surface erosion; Bare soil	Minimal vegetation	Moderate	15' x 40'	Add mulch/erosion control mix	Low	Low	Low	Yes
State Road	V	Unstable inlet/outlet of culvert; Slope erosion	Stream	Steep	3' x 50'	Armor inlet/outlet of culvert; Install plunge pool	High	Medium	Medium	No
State Road	V	Severe road shoulder erosion	Stream	Steep	2' x 10'	Armor inlet/outlet of culvert; Install turnouts; Install ditch	High	Medium	Medium	No
State Road	MV	Moderate road shoulder erosion; Bare soil	Ditch	Moderate	6' x 1650'	Armor inlet/outlet of culvert; Install plunge pool at culvert outlet; Remove debris/sediment from ditch; Re-grade and stabilize road shoulder	Medium	Medium	Medium	No
State Road	V	Unstable inlet/outlet of culvert, Culvert is undersized and crushed; Moderate road shoulder erosion	Stream	Moderate	5' x 5'	Replace culvert; Armor ditch;	Medium	Medium	Medium	No
State Road	MV	Slight surface erosion; Slight road shoulder erosion; Winter sand	Stream	Moderate	5' x 200'	Remove grader/plow berms along road	Low	Low	Low	No
State Road	V	Small, eroded area abutting bridge (downstream side)	Stream	Steep	2' x 2'	Repair deteriorating road shoulder	Low	Low	Medium	Yes
State Road	MV	Moderate road shoulder erosion	Directly into lake	Steep	5' x 10'	Add to existing natural buffer at shoreline. Stabilize bank with rip rap	Low	Low	Low	Yes



Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Town Road	V	Severe road shoulder erosion; Winter sand. Delta of sediment formed below water level at shoreline	Directly into lake	Moderate	60' x 10'	Remove winter sand; Install plunge pool at culvert outlet; Armor and/or vegetate ditch	High	Medium	Medium	No
Town Road	V	Severe road shoulder erosion. Winter sand sheet flows directly into stream in steep portion of road	Stream	Steep	6' x 22.5' & 6' x 120'	Re-grade ditch; Install turnouts, Remove debris/sediment; Re-grade road crown; Slow down the flow of runoff and get it off the road before it reaches the stream	High	High	High	No
Town Road	V	Severe surface erosion; Severe road shoulder erosion; Winter sand	Directly into lake	Steep	10' x 100'	Armor and/or vegetate ditch; Install runoff diverters in road	High	High	High	No
Town Road	MV	Severe surface erosion; Unstable inlet/outlet of culvert; Winter sand	Stream	Flat	20' x 2'	Armor inlet/outlet of culvert; Remove winter sand	Medium	Medium	Low	No
Town Road	V	Moderate surface erosion; Winter sand	Stream	Flat	30' x 10'	Remove winter sand; Install stone surface; Stabilize side slopes	Medium	Low	Medium	No
Town Road	V	Winter sand	Stream	Moderate	25' x 10'	Remove debris/sediment from ditch; Remove excess sand from road surface and shoulder	Medium	Low	Low	No
Town Road	V	Moderate road shoulder erosion	Stream	Moderate	3' x 100'	Regrade road shoulder; Install stone rip rap along ditch	Medium	Medium	Medium	Yes
Town Road	MV	Clogged and crushed/broken culvert; Slight erosion in ditch; Roadside plow/grader berm	Stream	Moderate	200' x 5'	Remove debris/sediment from ditch; Remove clog in culvert; Armor and/or vegetate ditch; Remove grade/plow berm	Medium	Medium	Medium	No
Town Road	V	Severe erosion in ditch; Severe erosion of road shoulder	Ditch	Moderate	100' x 4'	Regrade ditch; Armor and/or vegetate ditch	Medium	Medium	Medium	No
Town Road	MV	Severe surface erosion; Undersized culvert; Severe road shoulder erosion; Winter sand	Minimal vegetation	Steep	45' x 20'	Armor culvert and bank; Install ditch; Install sediment pools; Remove winter sand	Medium	Medium	High	No
Town Road	MV	Clogged culvert; Moderate road shoulder erosion; Winter sand	Ditch	Moderate	30' x 16'	Remove clog in culvert; Install turnouts in ditch; Remove debris/sediment in ditch; Remove winter sand. Install stone filtration bed between turn-out and ditch	Low	Low	Low	No
Town Road	MV	Unstable inlet/outlet of culvert; winter sand	Ditch	Steep	10' x 20'	Armor inlet/outlet on culvert; remove winter sand	Low	Low	Low	No
Town Road	V	Winter sand	Stream	Moderate	25' x 10'	Remove debris/sediment from ditch; Remove excess sand from road surface and shoulder	Medium	Low	Low	No
Town Road (Dirt)	V	Unstable inlet/outlet at culvert; Partial blockages at both ends of culvert; Culvert crushed due to inadequate cover, creating sink hole in road; Road shoulder failure at both ends of culvert	Stream	Moderate	50 Sq. ft. incl. Culvert	Replace and lengthen culvert	High	High	High	No

Land Use	Town	Type of Problem	Direct flow	Slope	Site Size	Recommendations	Impact	Cost	Technical Level	YCC?
Town Road (Dirt)	V	Slight road shoulder erosion; winter sand; Sediment in ditch from road	Stream	Moderate	6' x 45'	Reshape ditch, remove debris/sediment, and install plunge pools (Site is long and will need context-sensitive solution)	Medium	High	High	No
Town Road (Dirt)	V	Severe road surface erosion; road shoulder erosion; sedimentation (delta) in stream	Stream	Steep	6' x 30'	Re-establish road crown; Install new surface material on road; Remove sediment from stream	Medium	Medium	High	No
Town Road (Dirt)	V	Severe erosion on road shoulder	Stream	Steep	30' x 6'	Stabilize and vegetate road shoulder; Stabilize stream bank	Medium	Low	Medium	No
Town Road (Dirt)	V	Slight surface erosion; Slight road shoulder erosion; Winter sand	Stream	Flat	6' x 50'	Remove debris/sediment from ditch; Install new surface material to road; Install buffer between road and stream	Low	Low	Low	No
Town Road (Dirt)	V	Moderate surface erosion; Moderate road shoulder erosion; Bare soil; Winter sand	Stream	Moderate	30' x 30'	Install new surface material to road; Establish buffer between road and stream	Low	Low	Medium	No
Town Road (Dirt)	V	Moderate surface erosion; Slight road shoulder erosion; Winter sand	Stream	Moderate	10' x 20'	Install new surface material to road; Re-establish road shoulder; Install buffer between road and stream	Low	Low	Low	No
Town Road (Dirt)	V	Winter sand	Stream	Moderate	10' x 90'	Remove debris/sediment from ditch; Install new surface material to road	Low	Low	Low	No
Town Road (Dirt)	V	Winter sand	Stream	Moderate	20' x 25' & 5' x 20'	Armor inlet/outlet of culvert; Remove blockage in culvert; Build up road surface on west side	Low	Medium	Medium	No
Town Road (Dirt)	V	Minor bank failure in 4 turn out ditches on very steep section of road; Winter sand	Stream	Severe	5' x 100' (x4)	Vegetate road shoulder	Low	Low	Low	No
Trail or Path	MV	Slight surface erosion; Erosion on shoreline	Directly into lake	Moderate	40' x 6'	Install infiltration steps and runoff diverter on path	Low	Medium	Medium	Yes