

Pleasant Lake & Parker Pond Watershed Survey Report



**Cumberland County
Soil and Water Conservation District
Pleasant Lake & Parker Pond Association
Maine Department of Environmental Protection
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Watershed Survey Volunteers

Lew Wetzel	Allene B. Bowler	Wendy Bowler
Bob MacGregor	Peter Sargent	Louise Henderson
Georgette Burgess	Joel Bloom	Nadia Hermos
Bob Francis	Kathy Reilly	Joan Jagolinzer
Peter Barber	Jim Bishop	Will Sommerville
Clare Adams		

Steering Committee

Joel Bloom	Lew Wetzel	Georgette Burgess
Bob MacGregor	Louise Henderson	Bob Francis

Technical Staff

Betty Williams, Cumberland County Soil and Water Conservation District
Heather True, Cumberland County Soil & Water Conservation District
Wendy Garland, Maine Department of Environmental Protection
Don Kale, Maine Department of Environmental Protection
Joe Anderson, AmeriCorps
Phoebe Hardesty, Consultant

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When combined with many other similar sites from throughout a watershed, even erosion from small sources such as this can have a significant impact on lake water quality.

Introduction

This report is specifically designed for citizens living in the Pleasant Lake & Parker Pond Watershed. It provides the results and analysis of a watershed survey conducted on June 9th, 2007. The survey was conducted in response to evidence compiled over many years that has shown the lake's water quality to be considered above average. However, Pleasant Lake only flushes 0.2 times per year and Parker Pond flushes .95 times per year. This is well below the 1-1.5 flushes per year average for Maine Lakes. As a result, any pollutants entering the lake likely remain there for 5 years.

The Pleasant Lake & Parker Pond Association and the Maine Department of Environmental Protection Agency has tested water quality in Pleasant Lake & Parker Pond for more than 25 years. In recent years, clarity and dissolved oxygen levels in the lake and pond have shown some decline. Pleasant Lake is beginning to show signs of oxygen depletion in deeper areas that

could have an impact on coldwater fishery. Long term trends show that in some portions of the lake, the clarity of the water is decreasing.

WATERSHED

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

For the past two years the phosphorus readings in Parker Pond have increased to 10 parts per million. Phosphorus is a naturally occurring element and can be found in the atmosphere, septic waste, fertilizers and soil erosion. If phosphorus increases, then the amount of algae increases and can lead to nuisance algae blooms.

However, the Maine Department of Environmental Protection's (DEP) statistical analysis of the long term data shows that despite periodic fluctuations, the lake and pond are under stress.

Based on observations at other Maine lakes, these trends forecast a future decline in water quality. For these reasons, plus its regional significance, Pleasant

NONPOINT SOURCE POLLUTION

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



Runoff from the driveway and rooftops on this property combine to transport significant sediment into Parker Pond.

Lake & Parker Pond appears on the list of

Nonpoint Source Priority Watersheds.

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, storm water does not always receive the filtering treatment the forest once provided. It gathers with other runoff from impervious surfaces like rooftops, compacted soil, gravel camp roads and pavement, speeds up, and becomes a destructive erosive force.

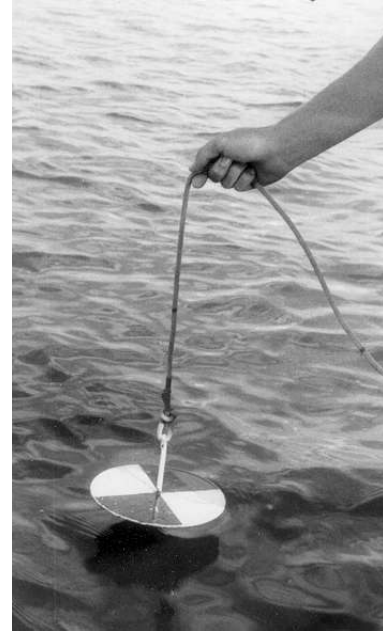
Water Quality

Why is the Water Quality at Risk?

The biggest pollution culprit in Pleasant Lake & Parker Pond and other Maine's lakes is **nonpoint source (NPS) pollution**. NPS is found in storm water runoff from rain and snowmelt. During and after storms and snowmelt, soil (and hitch-hiking nutrients like phosphorus and nitrogen) washes into lakes from the surrounding landscape by streams and overland flow.

The Maine Department of Environmental Protection and the Volunteer Lake Monitoring Program collaborate to collect lake data, evaluate present water quality, track algal blooms and determine water quality trends.

Pleasant Lake data have been collected since 1977. During this period, 11 years of basic chemical information were collected such as alkalinity, conductivity, pH, chlorophyll, total phosphorus and 25 years of Secchi Disk Transparencies. Parker Pond data has been collected since 1978. During this period, 7 years of the same basic chemical information was collected in addition to Secchi Disk Transparencies.



Monitoring Parameters

Transparency or clarity is measured by using a Secchi disk. The Secchi disk is lowered into the water and slowly raised to the surface and measured at which point the disk is seen. Clarity is the distance one can see down into the water. Transparency is influenced by the amount of algae growing the natural color of the water and by suspended sediments in the water.

Transparency is one of the best indicators of overall lake water quality. Readings are taken in meters with the **Pleasant Lake** average being 8.6 (28 feet) and the **Parker Pond** average being 5.5 (18 feet).

Total Phosphorus is one of the major nutrients needed for plant growth. It is a naturally occurring element and can be found in the atmosphere, septic waste, manure and pet waste, fertilizers and soil erosion. If phosphorus increases, then the amount of algae increases and can lead to nuisance algae blooms. The **Pleasant Lake** values for total phosphorus are ranging from 3-7 milligrams per liter and an average of 5 milligrams per liter. The **Parker Pond** range is 7-17 milligrams per liter with an average of 10 milligrams per liter. Levels over 15 milligrams per liter can support algae blooms.

pH is the measure that determines the acidity of how basic the water is and also helps determine which type of plant and animal species are present. The measure is 1-14 with 7 being neutral. Lower numbers mean more acidity and higher numbers mean more basic. **Pleasant Lake** and **Parker Pond** measurements range from 5.8 to 7.5.

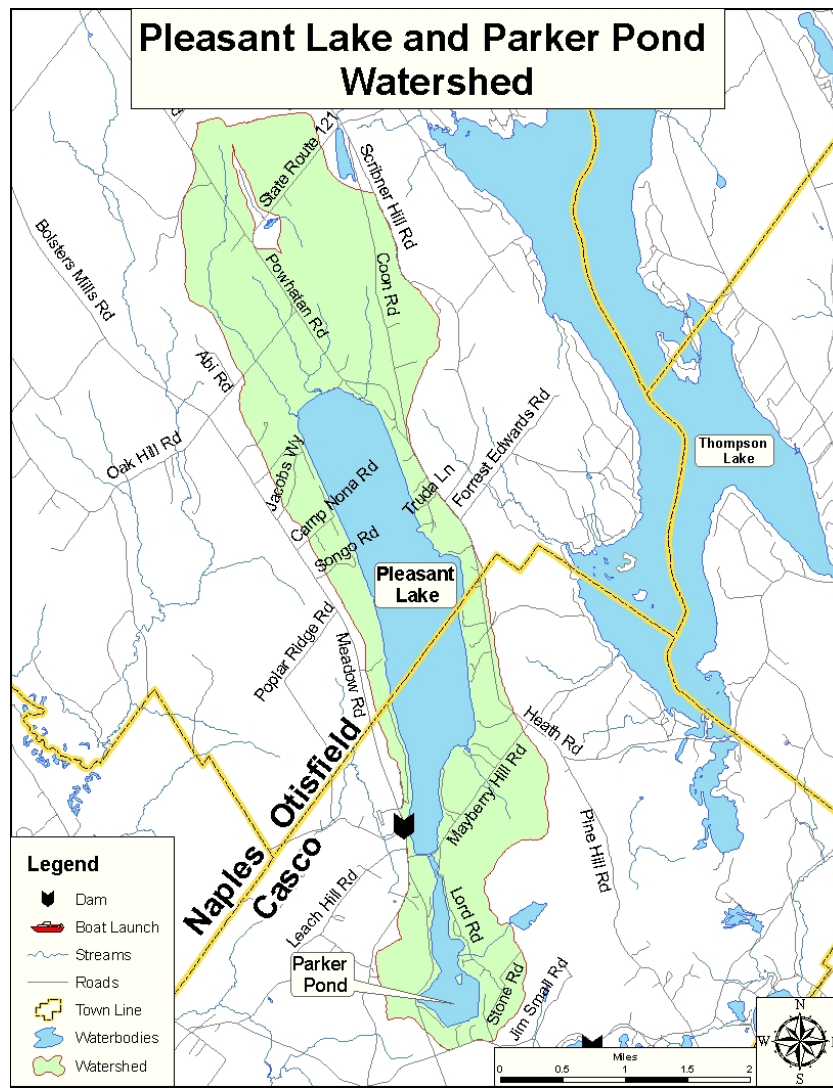
Alkalinity is a measure of the capacity of the water to neutralize acids. It is due primarily to the presence of naturally available bicarbonate and other ions. It varies from 1-158 milligrams per liter. Total Alkalinity readings of less than 10 open the door to pH swings from rain storms and the like. **Pleasant Lake** and **Parker Pond** have a range of between 5-13 mg/l.

Why is Stormwater Runoff a Problem?

The problem is not necessarily the water itself, it's the nutrients and the sediment in the storm water runoff that can be bad news. Large volumes of sediment can settle out in the lake, creating an ideal substrate for nuisance and invasive aquatic plants such as variable-leaf water milfoil. **Phosphorus**, a nutrient that is common on land and in storm water runoff, is a primary food for all plants, including **algae**. In natural conditions, the scarcity of phosphorus in a lake limits algae growth. However, when a lake receives extra phosphorus from the watershed, algae growth increases dramatically. Sometimes this growth causes choking blooms, but more often it results in small, insidious changes in water quality that, over time, damage the ecology, aesthetics and economy of lakes.



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



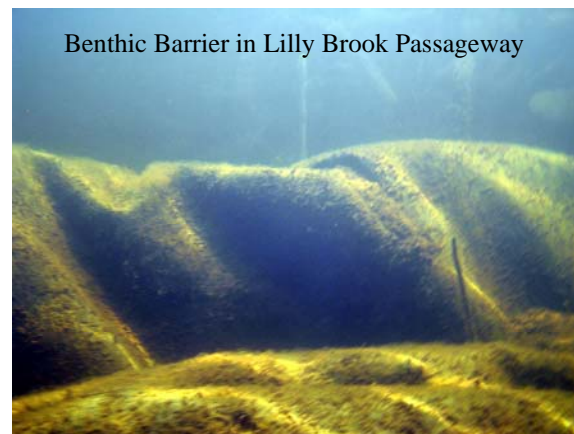
All the area shaded in green consists of the Pleasant Lake & Parker Pond Watershed

Why should we protect the lake from polluted runoff?

- ◆ The Lilly Brook Passageway is already host to variable-leaved water milfoil, an invasive aquatic plant. This plant and other invasive plants thrive in shallow areas with silty bottoms. Sediment deposited into the passageway from erosion creates the ideal environment for these plants to thrive.
- ◆ The lake contains valuable habitat for fish, birds and other wildlife.
- ◆ Pleasant Lake & Parker Pond provide recreational opportunities to watershed residents and to visitors. It is an important contributor to the local economy.
- ◆ A 1996 University of Maine study demonstrated that lake water quality affects property values. For every meter (3 ft) decline in water clarity, shorefront property values can decline as much as 10 to 20 percent! Declining property values affect individual landowners as well as the economics of the entire community.
- ◆ Once a lake has declined, it can be difficult or impossible to restore.



Invasive variable-leaf water milfoil thrives in silty areas caused by sediment deposition.



What is being done to protect the lake from polluted runoff?

The Pleasant Lake & Parker Pond Association (PL/PPA) is one of the most proactive lake associations in the region, and is dedicated to addressing the Non Point Source issues facing the lake. Its board and members work with agencies and watershed residents to promote conservation efforts within the watershed. The PL/PPA also tests water quality in Pleasant Lake & Parker Pond as part of the Maine Volunteer Lake Monitoring Program.

In 2001, the PL/PPA placed Benthic barriers (10' x 12' woven Geo Textile Fabric) in the Lilly Brook passageway between the two lakes to cover the existing Milfoil in hopes of preventing the spread of Milfoil. To date they have been successful. The infested areas were covered with the barriers for periods of 2 to 3 months. After removal, photos revealed that the Milfoil including the roots had been killed.

Benthic Barriers are made of a geotextile material that, when laid over the Milfoil, keeps the sunlight from the plants for a period of 10 to 12 weeks which kills the plants. Over a period of 5 years, the Milfoil has almost been eliminated. Surveys are conducted each summer to check for any regrowth.

The Purpose of the Watershed Survey

The primary purpose of the watershed survey was to:

- ◆ Identify and prioritize existing sources of polluted runoff, particularly soil erosion sites, in the Pleasant Lake & Parker Pond Watershed.
- ◆ 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 lake protection strategy.
- ◆ Make general recommendations to landowners and provide them with resources for fixing erosion problems on their properties.

The purpose of the survey is NOT to point fingers at landowners with problem spots, nor is it to seek enforcement action against landowners not in compliance with ordinances. It is our hope that through future projects we can work together with landowners to solve erosion problems on their property, or help them learn how best to accomplish solutions on their own.

Local citizen participation was essential in completing the watershed survey and will be even more important in upcoming years. Through the leadership of the Pleasant Lake & Parker Pond Association, and with assistance from groups and agencies concerned with lake water quality, the opportunities for stewardship are limitless!

The Survey Method

The survey was conducted by volunteers with the help of trained technical staff. Volunteers were trained on survey techniques and erosion identification during a two hour classroom workshop on June 9, 2007. Following the classroom training, the volunteers and technical staff spent the remainder of the day in the field documenting erosion on the roads, shoreline, streams, and foot trails in their assigned sectors using cameras and standardized forms. The teams worked together throughout the next few weeks to complete their sectors. Trained technical staff conducted follow-up examinations of sites in the summer and fall of 2007 to verify data accuracy and to calculate estimates, where possible, of the pollutant loading from each site.

The data collected was entered into a computer database to create a spreadsheet, and the documented erosion sites were plotted on maps using GIS (Geographic Information Systems). The sites were broken out into categories (driveways, roads, private residences, etc.) and ranked based on their impact on the lakes and the estimated cost of fixing the problem. Maps and a description of sites and associated ranks are discussed in the next section of this report. A copy of the spreadsheet that contains all collected data is located in Appendix A.



Summary of Watershed Survey Findings

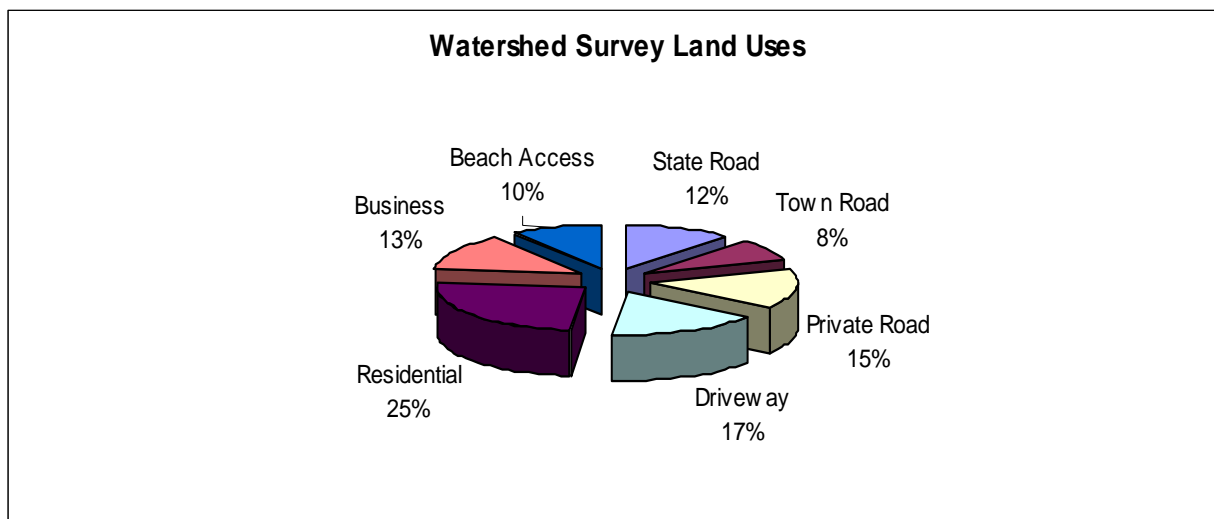
Volunteers and technical staff identified 64 sites in the Pleasant Lake & Parker Pond Watershed that are currently impacting or have the potential to impact water quality of the lake. The data are outlined in the following pages in a variety of maps, tables and charts designed to summarize the problems documented and compare their relative impact on the lake. Also, information in Appendices A and B describe in more detail the locations of the sites documented through the survey.

Each documented site was placed into one of ten land use categories and ranked with a relative impact on the lake. Table 1 represents the tally of sites in each category as well as their impact rank. The different levels of impact are defined on the following page. The pie chart in Figure 2 below depicts the percentage of sites documented in each category. The majority of sites were associated with residential areas (25%).

Table 1. Summary of site categories and impacts

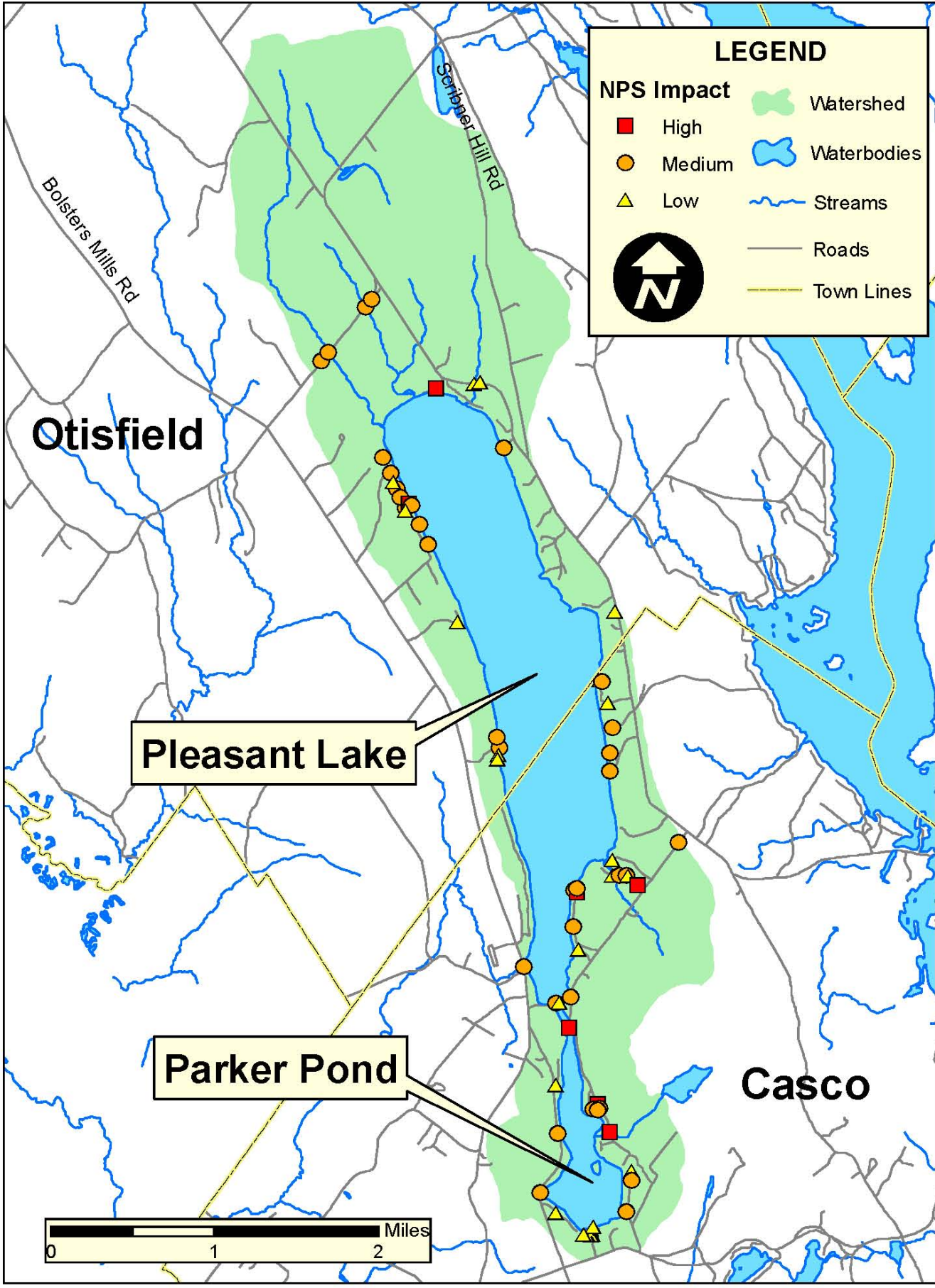
Land Use	High Impact	Medium Impact	Low Impact	Total
State Road		7		7
Town Road	1	2	2	5
Private Road	2	4	3	9
Driveway	2	6	2	10
Residential	1	7	8	16
Business		3	5	8
Beach Access		5	1	6
Boat Access	1			1
New Construction		1		1
Right of Way		1		1
Total	7	36	21	64

Figure 2.



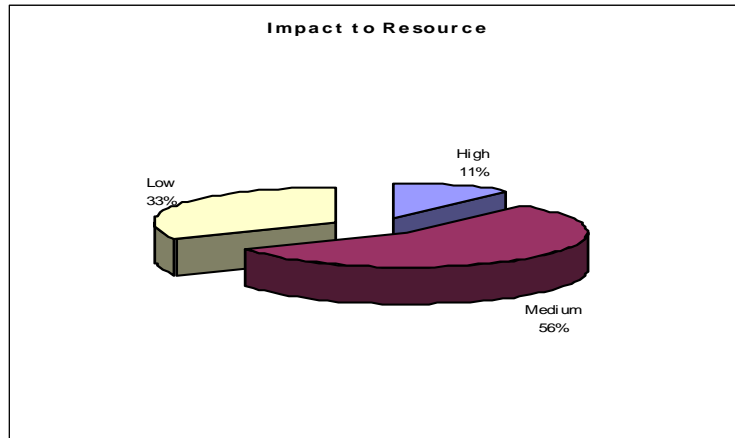
* Other sites include Construction (4%), Boat Access (2%), Right of Way (2%)

Pleasant Lake and Parker Pond Watershed Survey



All of the documented sites were rated for their relative impact to water quality, and the costs of potential fixes. Figures 4, 5, and 6 depict these ratings.

Figure 4.



Impact was based on slope, soil type, amount of soil that’s eroding, proximity to water or buffer, and size of buffer.

- “Low” impact eroding sites are those with limited soil transport off-site.
- At “medium” impact sites, sediment is transported off-site, but the erosion doesn’t reach a high magnitude.
- “High” impact sites are large sites where there is significant erosion that flows directly into a stream, lake or ditch.

Figure 5.

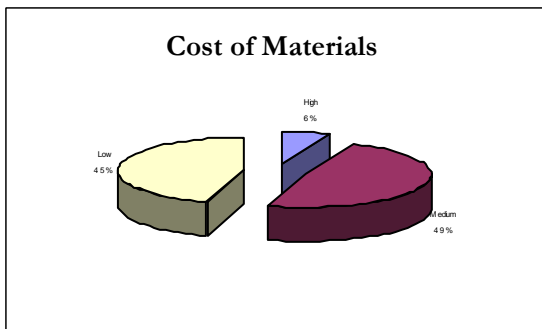
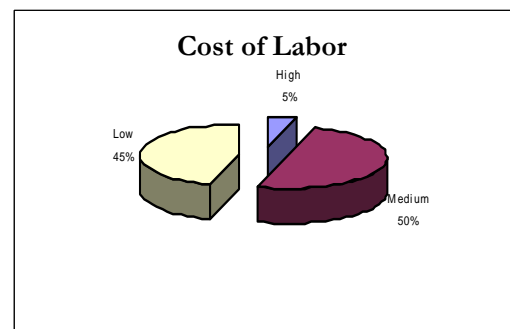


Figure 6.



Cost is an important factor in planning for restoration. It is useful to consider costs for materials and labor individually, so as to not miss any “hidden” costs.

- “Low” cost sites were estimated to cost less than \$500 to fix.
- An estimate of \$500 to \$2,500 was rated “medium”.
- If the estimated cost to fix a site exceeded \$2,500, a “high” rating was assigned.

Residential

Of the 16 sites associated with residential areas documented through the survey, 8 were low impact and 7 were medium impact. The majority of the sites can be fixed with little technical expertise and low cost.

Common Problems Identified:

- Slight or moderate surface erosion
- Bare and sparsely vegetated soil
- Lack of vegetated buffer along shoreline
- Direct flow of runoff to lake
- Roof runoff causing erosion

Typical Solutions to these Problems:

- Seed and mulch bare soil
- Establish or enhance buffer
- Limit foot traffic in eroding areas
- Install dripline trench to catch roof runoff
- Install waterbar, open-top culvert, rubber razor or other runoff diverter
- Place mulch or stone on footpaths

Below is an actual example of residential polluted runoff on Pleasant Lake & Parker Pond, as well as a description of the problems and possible solutions for this site.



Problems:

- Bare soil with surface erosion.
- Direct flow of sediment to lake.
- Lack of shoreline vegetation

Solutions:

- Install a stone-filled dripline trench to manager roof runoff.
- Plant trees and shrubs to enhance buffer.
- Create stable, meandering foot path.
- Seed or mulch bare soil areas.
- Seek proper permits from DEP and Town.

Residential areas were associated with (25%) of the identified sources of polluted runoff in Pleasant Lake & Parker Pond. These problems can pose a significant threat to lake water quality. Fortunately, most of these sites can be corrected with easy, low cost fixes.

Driveways

Of the 10 driveways documented to have problems, 2 were low impact, 6 were medium impact, and 2 were high impact. Most of the sites could be fixed with low cost and technical expertise.

Common Problems Identified:

- Slight to moderate surface erosion
- Direct flow to lake or ditch
- Poor shaping
- Poor (too sandy) surface material
- Slight ditch erosion

Recommended Solutions:

- Crown driveways so that water flows to either side
- Build up driveway with cohesive surface material
- Install diverters such as waterbars, open top culverts or rubber blades to get water off driveway
- Install turnouts to direct water into wooded depressions

Below is an actual example of polluted runoff from a driveway on Pleasant Lake & Parker Pond, as well as a description of the problems and possible solutions for this site.



Problems

- Moderate surface erosion.
- Poor driveway shaping and ruts cause water to concentrate and erode the surface.

Solutions

- Add new surface material.
- Reshape and crown driveway so water moves quickly from the surface.
- Install diverters such as waterbars or rubber razors to get water off driveway.

Preserve water quality and save time, money, and wear and tear on your vehicle by having a well crowned driveway. Use adequate surface material and add diversions to direct runoff into buffers. (See page 20)

It's great for watershed residents and it's great for the lake!

Private Roads

Of the 9 private road sites documented through the survey, 2 were low impact, 4 were medium impact and 3 were high impact. The problems are more expensive to fix and most require technical assistance.

Common Problems Identified:

- Slight to moderate surface erosion
- Direct flow to lake or stream
- Moderate to severe ditch erosion
- Poor (too sandy) surface material
- Unstable culvert inlet and outlet
- Clogged ditches and culverts
- Slight to moderate shoulder erosion
- Plow or grader berms
- Hillside failure

Recommended Solutions:

- Crown and reshape road to get water off road
- Install diverters such as waterbars, open top culverts or rubber blades to get water off road
- Build up road with cohesive surface material
- Clean out culverts
- Clean, reshape and armor ditches with stone or grass
- Remove grader berms and winter sand to allow proper drainage
- Formalize culverts and stabilize ends with stone, plunge pool

Below is an actual example of polluted runoff from a private road on Pleasant Lake, as well as a description of the problems and possible solutions for this site.



Pleasant Lake

Problems:

- Moderate to severe surface erosion
- Moderate road shoulder erosion
- Direct flow of road material to lake.

Solutions:

- Add new material, reshape and crown road.
- Create turnouts, plunge pools, and broad-based dip to collect water and settle out sediment.

Unpaved roads are one of the biggest sources of pollution to Maine lakes.

(please see page 20 for more information)

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

Business

Of the 8 Business sites documented through the survey, 5 were low impact and 3 were medium impact. Most sites would benefit from technical assistance, and have relatively low to medium cost.

Common Problems Identified:

- Bare soil
- Slight to severe surface erosion on access roads
- Slight to moderate ditch erosion
- Shoreline erosion
- Lack of vegetation
- Direct flow of sediment to lake

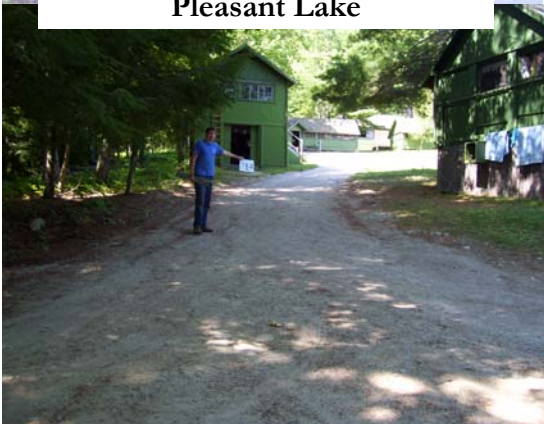
Recommended Solutions:

- Add better surface material
- Reshape or crown if used for vehicular traffic
- Install runoff diverters, such as waterbars, open-top culverts, or rubber razor blades.
- Stop raking
- Establish or enhance shoreline buffer

Below are actual examples of polluted runoff on a Business site in the Pleasant Lake & Parker Pond watershed, as well as a description of the problems and possible solutions for this site.



Pleasant Lake



Problems:

- Unstable culvert inlet/outlet
- Moderate surface and shoulder erosion.
- Direct flow of sediment and winter sand into stream.

Solutions:

- Armor culvert inlet/outlet
- Vegetate ditch
- Add surface material and crown and grade

Remember, it's the cumulative impact of all the sites that causes water quality to decline.

Sites in Other Categories

State Road Sites

Seven state road sites were documented; and all seven with medium impact to the lakes. Problems identified at these locations included unstable culvert inlet/outlets, severe ditch erosion, moderate to severe shoulder erosion, broken pavement and a paved spillway with direct flow to the lake. These problems can be fixed by adding riprap and armoring culvert inlets/outlets, reshaping and stone lining/vegetating ditches, reshape, add new material to shoulders and compact, and install detention basin. The cost and technical level necessary to fix these sites are low to moderate.

Town Roads

Of the five town road sites documented in this survey, one was a high impact site, and two were medium impact and two were low impact. Two sites involved reshaping, adding new material, installing culverts and turnouts throughout the entire length of road. Another site involved severe shoulder erosion and a paved spillway with direct flow to the lake. The cost and technical level necessary to fix these sites are moderate to high.

Beach Access

Of the six beach access sites documented in this survey, five were medium impact and one was low impact. Problems ranged from moderate shoreline and surface erosion, bare soil and in one case a manmade beach (dumped sand) with undercutting at the shoreline was noted. The cost and technical level necessary to fix these sites are low to moderate.

Construction Sites/Boat Access/Right of Way

Two **construction** sites were noted as having impacts on the watershed; One with high impact and one with moderate impact. Bare soil on construction sites is inevitable, however, proper use of silt fences, hay bales, and other temporary erosion control measures is effective at limiting the impact of construction activity on the watershed. Maintenance of temporary measures, seeding and mulching disturbed areas, and frequent visits by trained code enforcement personnel are also critical to ensuring protection of the lake from the disturbance associated with construction. One **Right of Way** site was documented with medium impact to the lakes and one **Boat Access** site documented with a high impact to the lake. The cost and technical level necessary to fix these sites are low to moderate.

Examples of Good Watershed Protection Techniques

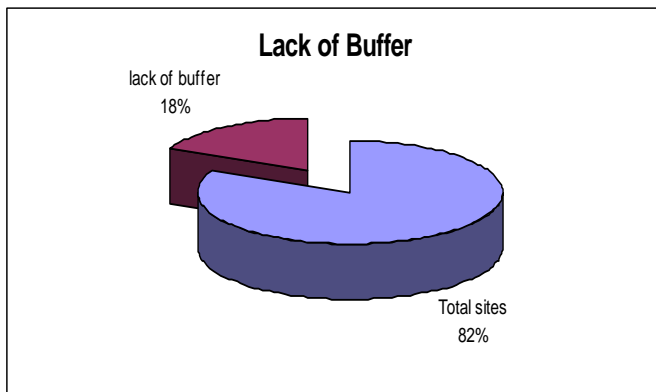
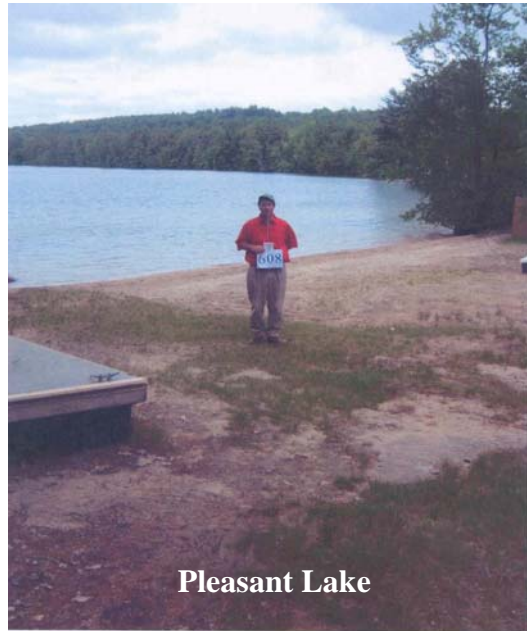


Photos Above: Both examples of good watershed protection techniques and both are types of water diverters that direct runoff into vegetated areas. As with any technique, maintenance is the key to proper function.

Buffers Benefit

Survey volunteers noted many sites throughout the watershed that lacked buffers. Active erosion was also present at many of these sites. Approximately 18% of the sites documented lacked adequate buffers and 25% of the total sites were documented as having some level of shoreline erosion. The lack of buffers and shoreline erosion around Pleasant Lake & Parker Pond should be of concern for the residents of the watershed.

The watershed area has mostly steep topography with just a few moderate to flat areas. Many properties had beaches that abutted expansive lawns. While these factors may seem to reduce the flow of stormwater runoff, it still reaches the lake. Lawns alone cannot provide sufficient water quality protection. The grasses used in common lawn mixes are shallow-rooted. While they provide some protection against surface erosion, they can't provide adequate protection over the long term. Buffers act as natural filters and are the key to absorbing runoff into Pleasant Lake & Parker Pond.



Many lakeshore properties had little or no vegetation at the water's edge. Lawns alone do little to prevent polluted stormwater from reaching the lake.

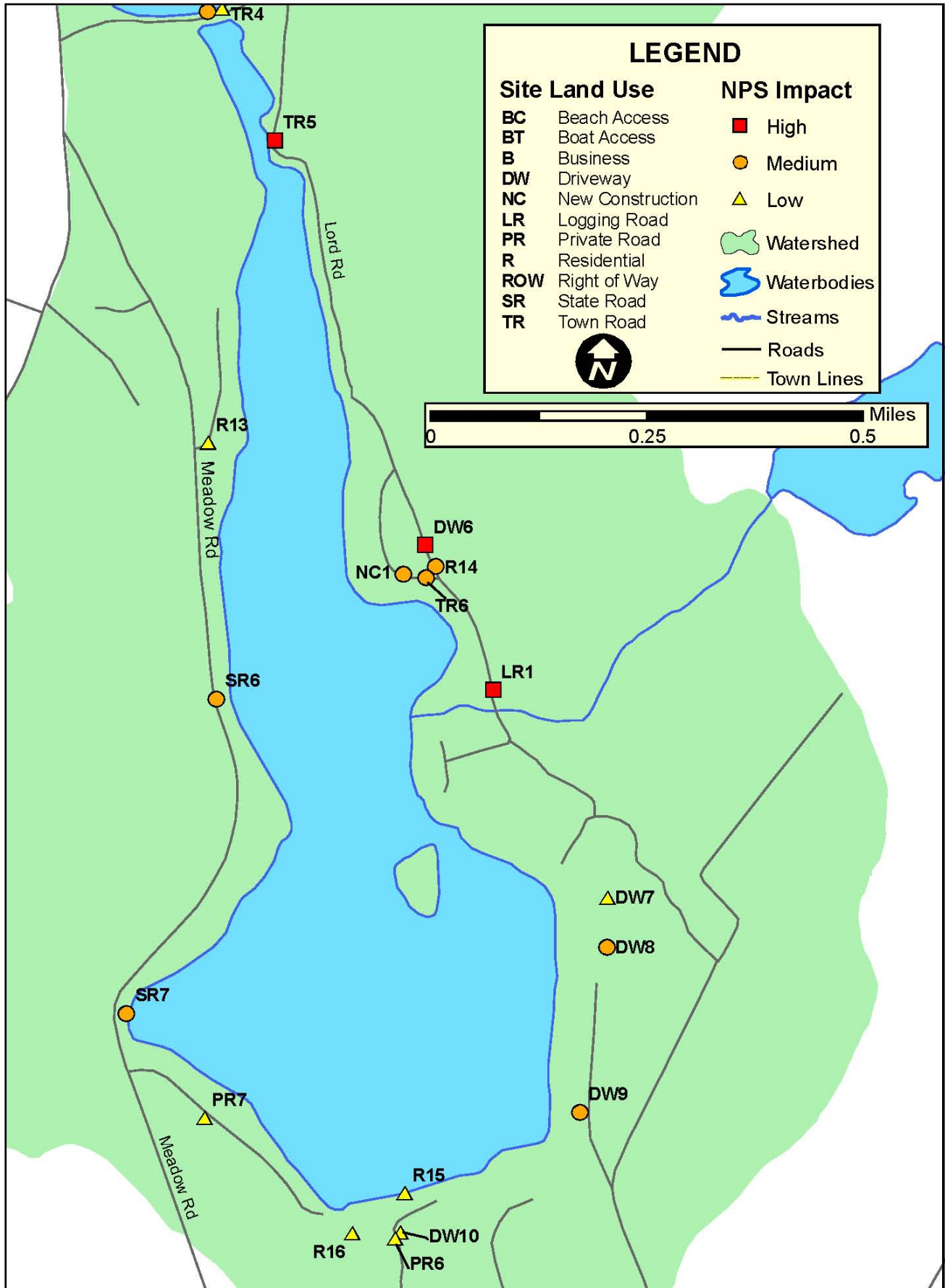
How do buffers work?

- ⇒ The tree and shrub canopy intercepts raindrops and reduces their impact on the soil.
- ⇒ Leaf surfaces collect rain and allow for evaporation.
- ⇒ Shorter plants, groundcover, and the duff layer filter sediment and pollutants from runoff.
- ⇒ Root systems hold soil in place and absorb water and nutrients.
- ⇒ An uneven soil surface allows rain and snowmelt to puddle and infiltrate.

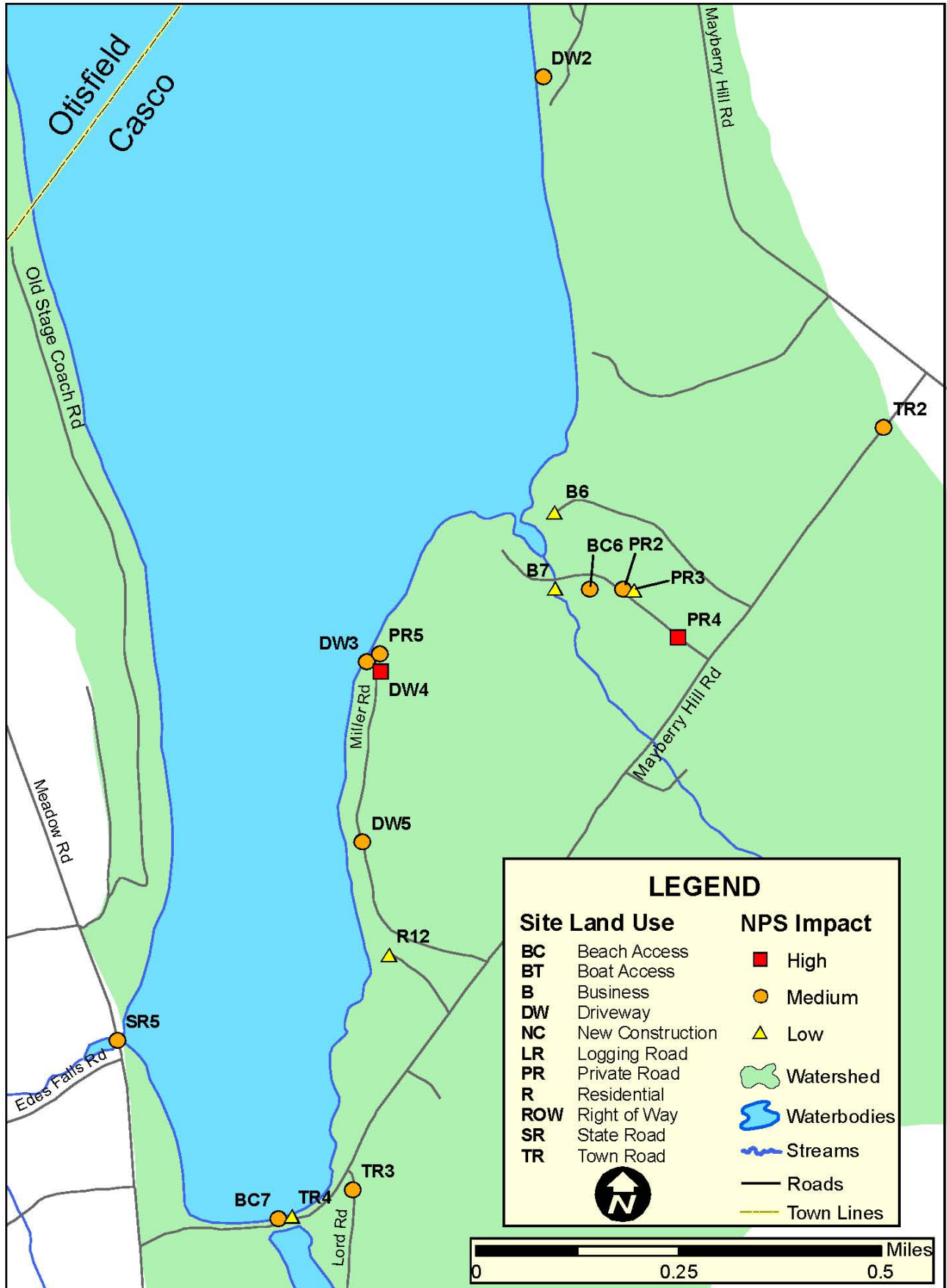
Buffers can be designed to offer both privacy and noise protection while also providing adequate protection against stormwater runoff.

You can reduce the effects of polluted runoff, protect the quality of Pleasant Lake & Parker Pond, and improve property values....simply by establishing new vegetated buffers and enhancing existing ones!

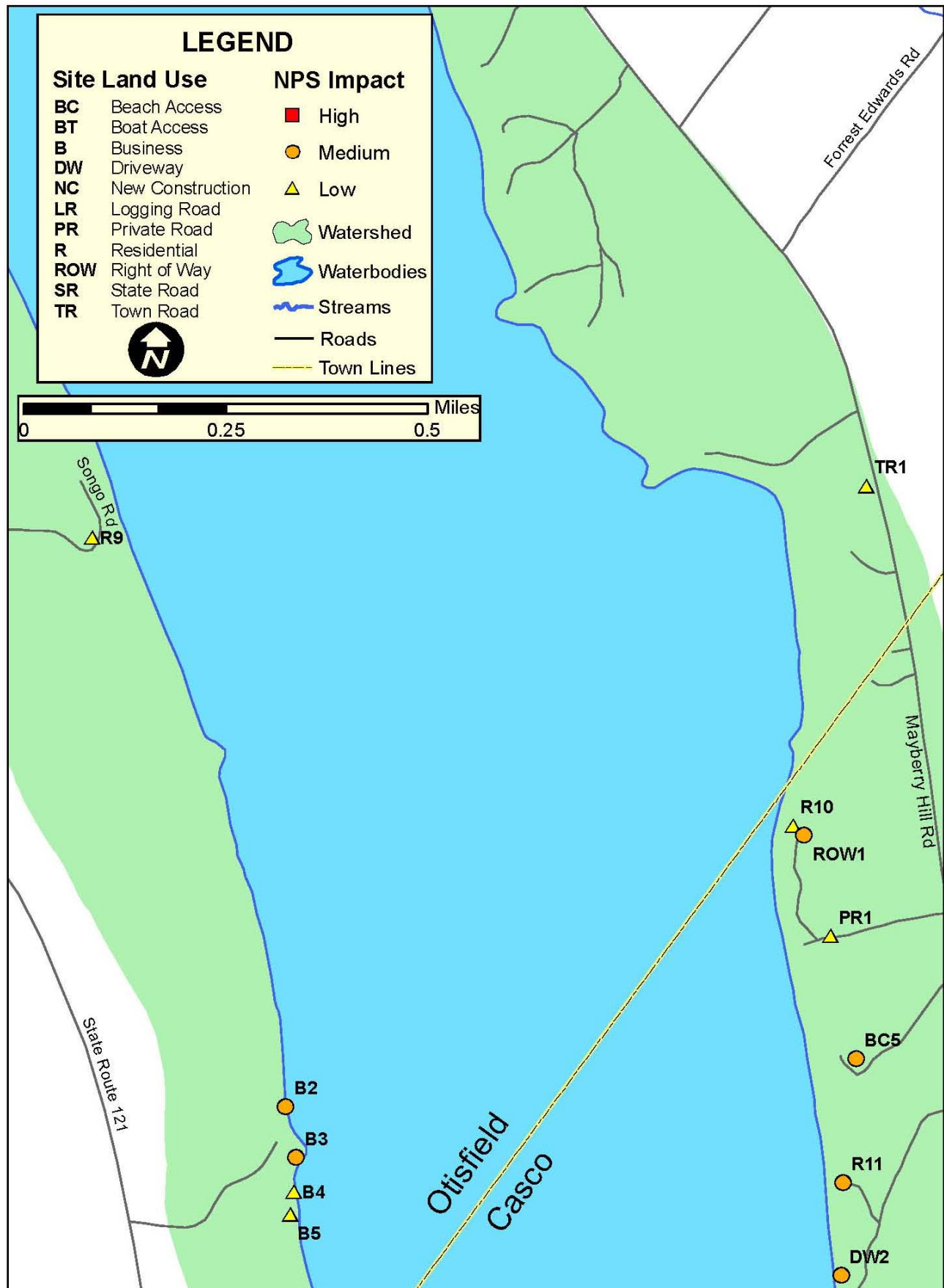
Map 1 - Parker Pond



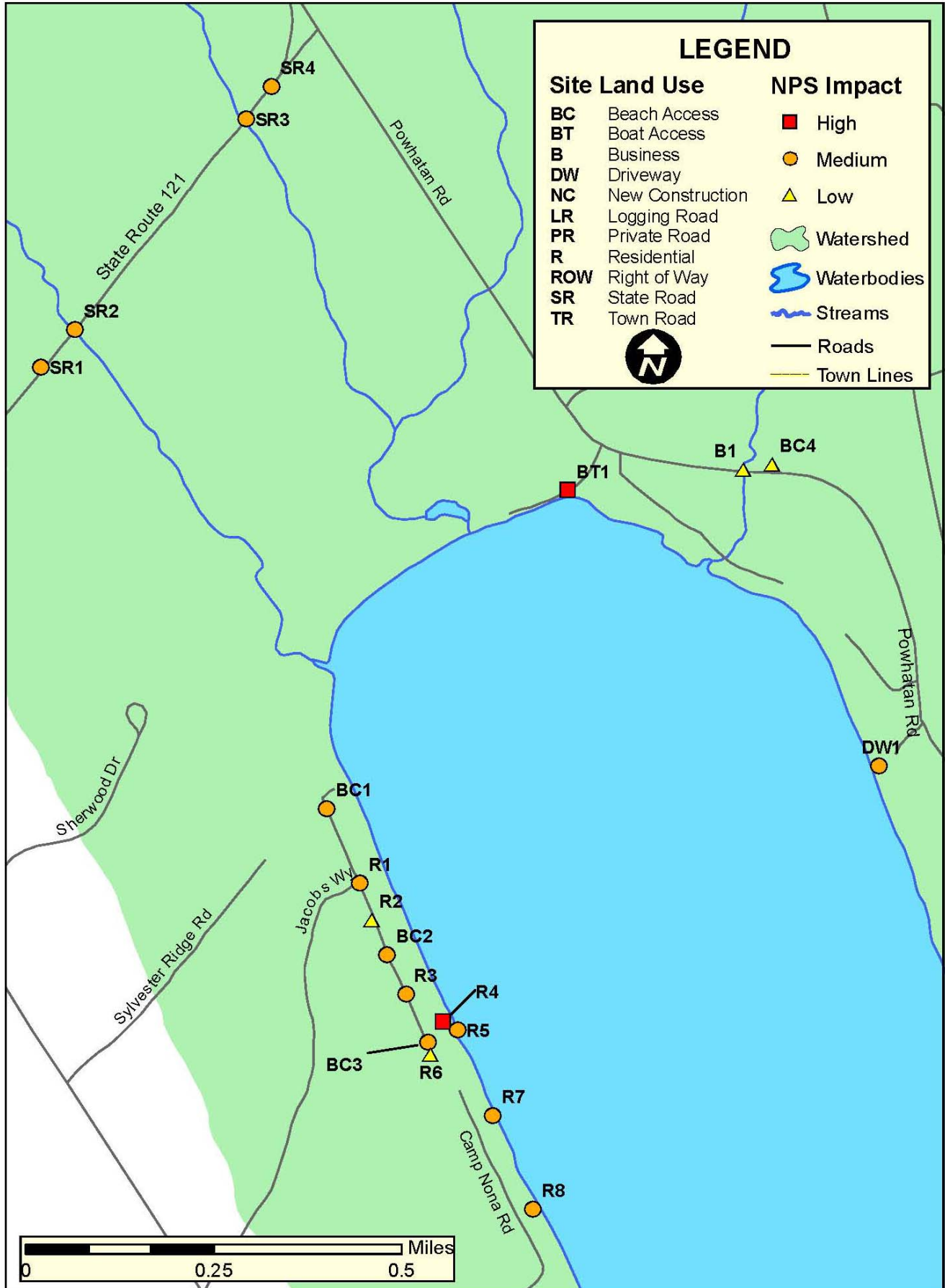
Map 2 - Pleasant Lake



Map 3 - Pleasant Lake



Map 4 - Pleasant Lake



Map ID	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
1	R15	0038	35	Residential	Surface erosion, bare soil around culvert, inadequate shoreline vegetation	Mulch/ECM, enhance shoreline buffer	low	low	low
1	DW10	0038	35	Driveway	Clogged culvert, slight ditch erosion shoreline erosion, catch basin currently full	Install plunge pool at outlet, clean out catch basin	low	low	low
1	PR6	0038	35	Private Road	Moderate surface erosion	Add new surface material, reshape, crown, install diverters rubber razor, turn outs.	low	low	low
1	R16	0038	19	Residential	Culvert crushed, moderate surface erosion, stabilize shoreline	Enlarge culvert, Build up road/driveway, reshape and crown, water diverter,	low	medium	medium
1	PR7	0038	PR	Private Road	Unstable inlet/outlet, moderate ditch erosion, bare soil	Enlarge & armor culvert, armor ditch with stone	low	medium	medium
1	SR7	0039	MDOT	State Road	Severe Road Shoulder erosion/ broken pavement	Install detention basin, riprap shoulder to stabilize	medium	medium	medium
1	SR6	0040	MDOT	State Road	Moderate shoulder erosion, paved spillway with direct flow to lake	Install Plunge pool or catch basins, remove paved spillway and establish vegetative buffer	medium	medium	medium
1	R13	41	6	Residential	Slight Ditch erosion	Install Runoff Diverter	low	low	low
1	TR4	41	Town	Town Road	Slight surface erosion, bare soil, shoreline erosion and inadequate shoreline vegetation	Re-establish stone, establish buffer	low	medium	medium
2	BC7	0043	28	Beach Access	Bare soil, shoreline beach erosion	establish water diverters on sidewalks above beach, drain into plunge pool	medium	medium	medium

Map ID	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
2	SR5	41/42	MDOT	State Road	Moderate ditch erosion, moderate shoulder erosion, shoreline erosion	vegetation, plunge pool, curbing or bridge	medium	high	high
3	R9	U21	O15	Residential	Slight surface erosion, slight shoreline undercut	Infiltration steps	low	low	low
4	R7	U21	10	Residential	shoreline erosion	Roof drip line trench and infiltration steps	medium	low	low
4	R8	U21	PR	Residential	Moderate ditch erosion	Install check dams, sediment pools, and reestablish vegetation along shoreline at end of ditch.	medium	low	low
4	R5	U17	20/20B	Residential	Bare soil, uncovered pile, lack of shoreline vegetation and shoreline erosion, moderate surface erosion on driveway	Establish buffer, driveway water diverters	medium	low	low
4	R4	U17	19	Residential	Bare soil, no vegetation	Establish vegetation, need erosion controls	High	High	high
4	R6	U17	18	Residential	Inadequate shoreline vegetation	Install plants, and enlarge dry well	low	low	low
4	BC3	U17	Town	Beach Access	Minor shoreline erosion	Infiltration steps	medium	low	low
4	R3	U17	12	Residential	Slight surface erosion, slight shoreline erosion, path to water eroding	Install buffer, ECM on path and water diverters	medium	low	low
4	BC2	U17	Town	Beach Access	shoreline erosion, ditch needs sediment basin	Install vegetation, improve rock wall	medium	medium	medium
4	R2	U17	5	Residential	shoreline erosion	install infiltration steps, improve wall	low	low	low
4	R1	R09	68	Residential	shoreline erosion/landowner may have added sand to beach	install buffer/landowner outreach	medium	low	low

Map ID	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
4	BC1	R09	68	Beach Access	slight surface erosion, shoreline erosion	Install runoff diverter & infiltration steps	medium	medium	medium
3	B5	R10	17	Business	shoreline undercut, lack of shoreline vegetation, slight shoreline erosion	Armor ditch/shoreline with stone, install berm @ top of dock to prevent direct runoff of path to shoreline	low	low	low
3	B4	R10	17	Business	road to the right has bare soil, evidence of wash outs	Install sediment basin or catch basin, rubber razor blade	low	low	low
3	B3	R10	17	Business	path/boat launch near swimming area washes towards beach/lake	Install infiltration tiers, runoff diverters, waterbar, rubber razor blade	medium	medium	medium
3	B2	R10	17	Business	Villa Road-severe shoulder erosion	Install runoff diverters, RRB, and establish vegetation at shoreline or sediment basin	medium	low	low
4	SR1	R09	MDOT	State Road	Unstable inlet/outlet, severe ditch erosion, moderate shoulder erosion and moderate to severe surface erosion at driveway	Armor inlet/outlet, add more cover, install ditch & armor w stone, buildup at culvert, reshape and crown with good compaction	medium	medium	medium
4	SR2	R09	MDOT	State Road	Unstable culvert inlet/outlet slight to moderate shoulder erosion	armor inlet/outlet, lengthen culvert	medium	medium	medium
4	SR3	R09	MDOT	State Road	Unstable culvert inlet/outlet Crossing #2	Haning culvert.armor inlet and outlet	medium	medium	medium
4	SR4	R09	MDOT	State Road	Severe shoulder erosion in 3 areas, major consideration	Armor ditch with stone, stabilize shoulders with quality material	medium	medium	medium

Map ID	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
4	BT1	U16	1	Boat access	Moderate surface erosion, inadequate shoreline vegetation, unstable access	Add new surface material, reshape and crown, install runoff diverters, stabilize boat ramp	High	high	medium
4	DW1	U14	004	Driveway	Moderate surface erosion, inadequate shoreline vegetation	Install turnouts, reshape/crown, install runoff diverters	medium	medium	low
4	BC4	U15	2	Beach Access	Bare soil, lack of shoreline vegetation, unstable access	Define foot paths, establish vegetation	low	low	low
4	B1	U15	2	Business	(near white boat shed) slight surface erosion	Build up road and better and new surface material	low	low	low
3	TR1		Town	Town Road	Moderate to severe shoulder erosion, paved spillway with direct flow to lake	stabilize shoulders with new compacted material maybe stone	low	low	low
3	R10	0010	25D	Residential	Roof runoff erosion, shoreline erosion, unstable access	Define foot path, roof drip line trenches, infiltration steps, establish plantings	low	low	low
3	ROW1	0010	ROW	ROW	Severe surface erosion, lack of shoreline vegetation, shoreline erosion	Runoff install diverters, waterbar, install erosion control mulch, establish shoreline stabilization	medium	medium	medium
3	PR1	0010	0027	Private Road	unstable culvert inlet/outlet, clogged, broken, slight shoulder erosion, slight surface erosion	Replace culvert, armor inlet/outlet, install plunge pool reshape and crown road	low	medium	medium
2	BC5	0010	ROW	Beach Access	Man made beach, dumped sand, undercut shoreline, lack of shoreline vegetation, unstable access, shoreline erosion	Install erosion control mulch, establish buffer and contain sand	medium	low	low

Map	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
3	R11	0048	001	Residential	bare soil/new sand	Install erosion control mulch and establish buffer	medium	low	low
2	DW2	0048	0004	Driveway	moderate surface erosion	Install shoulder vegetation, open top culvert or waterbar	medium	low	low
2	B6	0010	0014	Business	Lack of shoreline buffer	Establish buffer	low	low	low
2	B7	0010	0013	Business	lack of shoreline buffer, slight surface erosion	Define foot path, install erosion control mulch, enhance shoreline vegetation	low	low	low
2	BC6	0010	0013	Beach Access	lack of shoreline vegetation, shoreline erosion, moderate surface erosion	Install erosion control mulch, enhance with additional plants	medium	low	low
2	PR2	0010	0013	Private Road	Unstable inlet/outlet, slight shoulder erosion, slight surface erosion	Armor culvert inlet/outlet, open top culverts or rubber razor blades, install turn outs	medium	medium	medium
2	PR3	0010	0013	Private Road	Discoloration in seasonal brook, orange/slick heavy residue	Armor culvert inlet/outlet, enlarge and lengthen	?	medium	medium
2	PR4	0010	0013	Private Road	Unstable culvert inlet/outlet, severe ditch erosion, moderate shoulder erosion, moderate surface erosion	Armor culvert inlet/outlet, enlarge culvert and vegetate ditch	High	medium	medium
2	R12	0046	2	Residential	Roof runoff , slight surface erosion	Install infiltration trench, create berm at rear of property to direct runoff to woods	low	low	low
2	TR2	0046	08	Town Road	Moderate ditch erosion, moderate shoulder erosion, winter sand	Install sediment pools, remove grader/plow berms, grade, reshape shoulders and ditches	medium	medium	medium





Map ID	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
2	PR5		PR	Private Road	Slight to moderate surface erosion	Grade, reshape, crown, clean detention basin, install broad based dip	medium	medium	medium
2	DW3	0010	0	Driveway	Moderate surface erosion	Replace culvert, grade & reshape road, add swale along road side and direct runoff into woods	medium	medium	medium
2	DW4	0047		Driveway	Moderate surface erosion	Add new surface material, reshape, crown and grade, possibly reconfigure turnaround	High/ Medium	medium	medium
2	DW5	0047	0004	Driveway	Gully, partially filled with gravel, moderate to severe surface erosion	Improve drainage on driveway and road, difficult due to camp proximity	medium	medium	medium
2	TR3	0008	Town	Town Road	Direct drainage of road to lake	Reshape ditch, improve upland ditch, reshape, crown and grade road	medium	medium	medium
1	TR5	0008	Town	Town Road	Large delta in lake, 8-10 tons	numerous culverts along Lord Rd with direct flow to lake (not all problematic), need ditching on upland side	High	medium	medium
1	DW6	0008	0056-4	Driveway	Severe surface erosion and sediment deposition	Reshape, add new material, crown install sediment basin or pool at outlet of ditch, need more frequent maintenance, erosion has occurred despite semi hard surface-repave	High	High	high

Map	Map ID	Tax Map	Tax Lot	Land Use	Type of Problem	Recommendations	Impact of Problems	Cost Materials	Cost Labor
1	NC1	0040	6	New Construction	Bare soil, uncovered pile, inadequate shoreline vegetation, unstable access, slight to moderate surface erosion, silt fence failure	Construction site had no erosion controls, needs erosion control mulch, silt fence, berms	medium	low	medium
1	R14	0040	22	Residential	Culvert missing to stream, slight surface erosion	Install culvert, plunge pools, sediment pools, rubber razor blade	medium	medium	medium
1	TR6	0040	Town	Town Road	Hanging culvert, ineffective	Shorten culvert, ample cover, armor inlet/outlet, install plunge pool	medium	medium	medium
1	DW9	0008	43-A4	Driveway	Slight to moderate surface erosion	Waterbars	medium	medium	medium
1	DW8			Driveway	moderate to severe surface erosion	grade, reshape, crown and compact	medium	medium	medium
1	DW7	0008	0045-1	Driveway	extensive use of asphalt	add vegetation to infiltrate from impervious surface	low	low	low
1	LR1	0008	0054	Logging Road	Severe surface erosion	Install many water bars, turnouts, stabilize with vegetative cover, eliminate ATV - Truck abuse	High	medium	medium

Using Soils to Help the Watershed

Understanding the soils in your watershed helps with planning erosion control measures, as well as choosing plants that will thrive. The soils in the Pleasant Lake & Parker Pond Watershed are mostly stony sandy loams that are permeable and well drained. These soils are moderately acidic.

Plant types of vegetation that can handle drought conditions and acidic soils. The following plants are examples of those well suited to Pleasant Lake & Parker Pond properties, are a good addition to any buffer planting, and are readily available at local nurseries.

Native Plant Recommendations		
<u>Shrubs</u>		<u>Perennials</u>
◆ Blueberry (High & Lowbush)		◆ Black Eyed Susan
◆ Bearberry	Black Eyed Susan	◆ Cinnamon Fern
◆ Bayberry		◆ Yarrow
◆ Sweet Fern		◆ Purple Coneflower
◆ Sheep Laurel		◆ Scarlet Bee Balm
◆ Snowberry	Snowberry	◆ Hay Scented Fern
◆ Blue Rug Juniper		◆ Solomon Seal
	Bee Balm	◆ Mint
		

Phosphorus Free Fertilizer Dealers

Most soils in Maine have enough phosphorus to keep a lawn healthy. If you must fertilize, use phosphorus free fertilizer. Retailers include:

Aubuchon	1243 Roosevelt Trail	Raymond	655-7320
Paris Farmers Union	5 Portland Street	Bridgton	647-2383
Aubuchon Hardware	Maine Street	Naples	693-3343
West Paris Village Hardware	138 Main Street	W. Paris	674-2900

All stores should carry phosphorus-free fertilizer by 2008

Next Steps ~ Where Do We Go From Here?

Fixing the sites identified in this survey will require efforts by individuals, the Pleasant Lake & Parker Pond Association, road associations and municipal officials.

Pleasant Lake & Parker Pond Association

- Continue to increase and empower the association's membership, and provide educational materials and guidance to members of the Pleasant Lake & Parker Pond watershed community.
- Continue to partner with agencies, municipalities, Districts, and others to jointly seek funding and implement projects to protect the lake water quality.
- Organize workshops and volunteer "work parties" to start fixing identified erosion problems and teach citizens how to fix similar problems on their own properties.
- Educate municipal officials about lake issues and work cooperatively to find solutions.

Individual Citizens

- Prevent runoff from washing sediment into the lakes. Detain runoff in depressions or divert flow to vegetated areas. Call the Cumberland County SWCD or DEP for free advice.
- Minimize the amount of cleared land and road surfaces on your property.
- Stop mowing and raking, and let lawn and raked areas revert back to natural plants. Deep shrub and tree roots help hold the shoreline.
- Avoid exposing bare soil. Seed and mulch bare areas.
- Don't bring in sand or rebuild beaches without permits and technical assistance.
- Call the Town Code Enforcement Officer before cutting vegetation within 250' of the shore.
- Maintain septic systems properly. Pump septic tanks (every 2 to 3 years for year round residences; 4-5 years if seasonal) and upgrade marginal systems.
- Join the Pleasant Lake & Parker Pond Association.

Road Associations (or private roads without associations)

- Minimize road runoff by doing regular, comprehensive maintenance. Form a road association if one does not already exist.
- Get a copy of "Camp Road Maintenance Manual – A Guide for Landowners." and share it with contractors working on and/or plowing the road. This reference is a "must-have" for anyone managing a gravel road. (Call the DEP at 822-6300 to order a free copy.)
- For more extensive problems, contact the Cumberland County SWCD or DEP to get help.

Municipal Officials

- Enforce shoreland zoning ordinance to ensure protection of Pleasant Lake & Parker Pond.
- Conduct regular maintenance on town roads in the watershed, and fix town road problems identified in this survey.
- Participate in and support long term watershed management projects.
- Promote training for road crews, boards, commissions, and other decision-makers.

Permitting ABC's

Protection of the Pleasant Lake & Parker Pond Watershed is ensured through the good will of residents around the lakes and through laws and ordinances created and enforced by the State and Towns.

How do you know when you need a permit?

- Construction, clearing of vegetation and soil movement within 250 feet of the lake shore falls under the Shoreland Zoning Act, which is administered by the Towns through the Code Enforcement Officer and the Planning Board.
- Soil disturbance within 75 feet of the lakeshore or stream also falls under the Natural Resources Protection Act, which is administered by the DEP.

To ensure that permits for projects that will not result in significant disturbance are processed swiftly, the DEP has established a streamlined permit process called **Permit by Rule**. These one page forms (shown below) are simple to fill out and allow the DEP to quickly review the project.

The Natural Resources Protection Act seeks to establish reasonable regulation in order to assure responsible development that does not harm Maine's precious natural systems.

~from Protecting Maine's Natural Resources~Volume 1, DEP 1996

The project partners encourage you to contact the DEP and Town Code Enforcement Officer if you have any plans to construct 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—such as installing some of the practices mentioned in this report—contact the DEP and Town to be sure. See the last page of this report for contact information.

6/99 DEPARTMENT OF ENVIRONMENTAL PROTECTION (DEP)
PERMIT BY RULE NOTIFICATION FORM
 (For use with DEP Regulation, Chapter 305)

PLEASE TYPE OR PRINT IN BLACK INK ONLY (3 COPIES, PLEASE BEAR DOWN)

Name of Applicant: <u>Kimberland County SWCD</u>	Name of Owner: <u>Norm & Michelle Grolean</u>
Mailing Address: <u>381 Main St. Suite 3</u>	Town/City: <u>Gorham</u>
State: <u>Maine</u> Zip Code: <u>04038</u>	Daytime Telephone No: <u>207 839-7839</u>
Name of Wetland, Water Body or Stream: <u>Subsaturday Lake</u>	
Detailed Directions to Site: <u>121 Outlet Road, Rte. 26 North turn right onto Outlet Road. 121 Outlet Road is on the left 4 to 5 houses before you reach Barefoot Beach.</u>	
Town/City: <u>New Gloucester</u>	Map #: _____ Lot #: _____ County: _____
Description of Project: <u>Installation of a drywell to allow infiltration of roof runoff.</u>	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 Regulation, Chapter 305. I have a copy of PBR Sections checked below. I have read and will comply with all of the standards.

<input checked="" type="checkbox"/> Sec. (2) Soil Disturbance	<input type="checkbox"/> Sec. (8) Shoreline Stabilization	<input type="checkbox"/> Sec. (14) Piers, Wharves & Pilings
<input type="checkbox"/> Sec. (3) Inside 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. (16) 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) Transfers/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) Outside Pipes	<input type="checkbox"/> Sec. (13) FAW Creation/Enhance/Repair 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 all of the following required submittals. NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS:

- Attach a check for \$50 (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 photographs showing existing site conditions (unless not required under standards).

Signature of Applicant: [Signature] Date: 7/28/00

Keep the bottom copy as a record of permit. Send the form with attachments via certified mail to the Maine Dept. of Environmental Protection, P.O. Box 12060, Augusta, ME 04333-0017. The DEP will send a copy to the Town Office as evidence of _____ or further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. Work carried out in violation of any standard is subject to enforcement action.

AUGUSTA DEP STATE HOUSE STATION 17 AUGUSTA, ME 04333-0017 (207)587-2111	PORTLAND DEP 312 CANCO ROAD PORTLAND, ME 04103 (207)852-6300	BANGOR DEP 106 HOGAN ROAD BANGOR, ME 04401 (207)741-4570	PRESQUE ISLE DEP 1235 CENTRAL DRIVE PRESQUE ISLE, ME 04769 (207)764-0477
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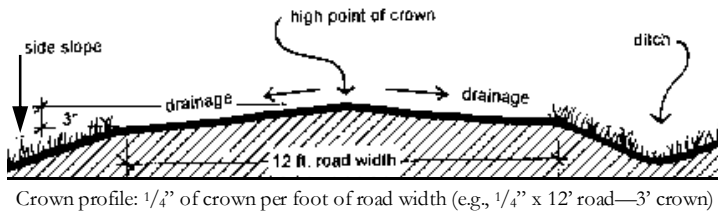
OFFICE USE ONLY		CL#	Staff	Staff
PBR #	FF	Date	Acc. Date	Del. Date
				After Photos

DEPLM-27-899

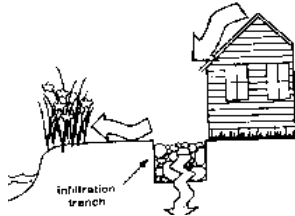
How to apply for Permit by Rule with DEP:

1. Fill out a notification form before completing any work on the ground. Forms are available from your town code enforcement officer or the Maine DEP offices in Portland or Augusta.
2. The permit will be reviewed by DEP within 14 days. If you do not hear from DEP within 14 days, you can assume your permit is approved and you can proceed with work on the project. If you bring the permit directly to a DEP office, you could get your permit approved immediately.
3. Follow the proper standards for keeping soil erosion to a minimum during construction, such as installing silt fence. It is important that you obtain a copy of the standards so you will be familiar with the law's requirements.

Glossary of Common Conservation Measures

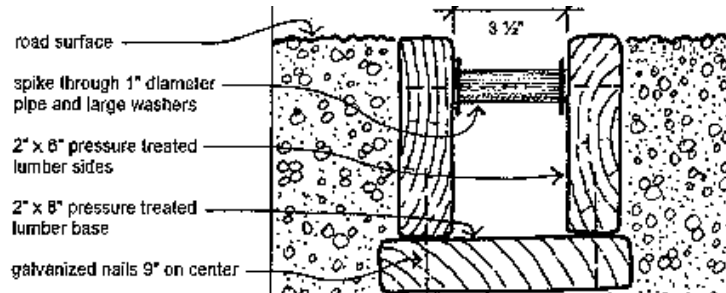


Crown—High point that runs lengthwise along the center of a road or driveway. The high point slopes gently away from the center toward the outer edge of the road, allowing water to drain off the road and preventing erosion of the road surface.

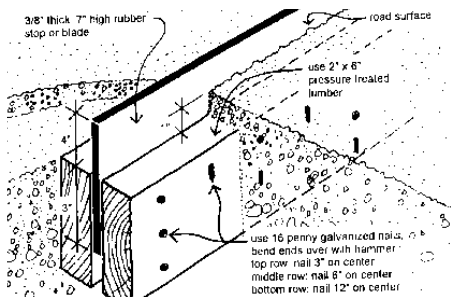


Dripline Trench—Rock-filled trench beneath the roof edge dripline that collects and stores roof runoff until it soaks into the ground. Helps control erosion and reduce wear on the house by preventing backsplash. A typical trench is 6-8" deep and 12-18" wide and filled with 3/4" stone. Can also be used along the edges of driveways to encourage infiltration of runoff.

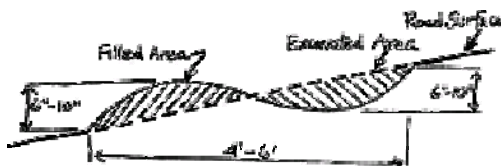
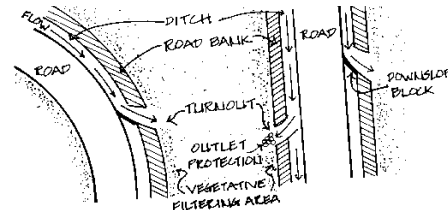
Open Top Culvert—Box-like structure that collects and diverts road surface runoff away from a sloped driveway or camp road. They are seldom recommended for year-round roads due to the likelihood of plow damage. Install at a 30° angle to the road and direct the outlet into a stable buffer. Clean out leaves and debris periodically.



Rubber Blade—Structure that protrudes above the road surface high enough to intercept and collect water, while allowing traffic to pass over it. It is generally not used on seasonal roads and driveways because of the likelihood of plow damage. Install at a 30° angle to the road and direct the outlet into a stable buffer. The rubber conveyor belts can be purchased at some hardware stores or Portland Rubber Company (774-3993).



Turnout—A conservation practice used to direct runoff from a ditch (or road ruts) into a vegetated buffer. The turnout should have a flared end section that is level and lined with rock to spread out the flow.



Waterbar—Ridge (like a speed bump) that runs diagonally across a road, driveway or path, typically at a 30° angle. Stops water from running down the road and diverts it to the side. Easy to construct and most appropriate for roads with low traffic volume. Needs to be rebuilt periodically.

Where Do I Get More Information?

Contacts

Pleasant Lake & Parker Pond Association

285 Powhattan Road

Otisfield, ME 04270

Outreach and advocacy within the watershed, provides educational materials and directs individuals to appropriate agencies.

Town of Casco Conservation Commission

940 Meadow Road

Casco, Maine 04015

and

Town of Otisfield

403 Route 121

Otisfield, Me 04270

Cumberland County Soil and Water Conservation District

35 Main St. Suite 3, Windham, ME 04062

(207) 892-4700 or web site: www.cumberlandswcd.org

Offers assistance with watershed planning and survey work, environmental education, engineering support, seminars and training sessions, and education on the use of conservation practices.

Maine Department of Environmental Protection

312 Canco Road, Portland, ME 04103

Toll Free (888) 769-1036 or (207) 822-6300

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

Maine Congress of Lake Associations (COLA)

1-877-254-2511

E-mail: info@mainecola.org

Web site: www.mainecola.org

The only statewide network of individuals and lake associations devoted solely to the protection and preservation of our lakes.

Publications

The Buffer Handbook: A Guide to Creating Vegetated Buffers for Lakefront Properties. Androscoggin Valley SWCD and Lake and Watershed Resources Management Associates. 1998. 20 pgs. plus inserts.

Camp Road Maintenance Manual: A Guide for Landowners. Kennebec County SWCD and Maine DEP. June, 2000. 54 pgs.

A Homeowner's Guide to Environmental Laws Affecting Shorefront Property in Maine's Organized Towns. Maine DEP. December, 1997. DEPLW-38-B98. 28 pgs.

Maine Shoreland Zoning—A Handbook for Shoreland Owners. Maine DEP. 1999. DEPLW 1999-2. 34 pgs.

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