Bear Pond Watershed Survey

Bear Pond Association

Oxford County Soil & Water Conservation District

Fiddlehead Environmental Consulting

Lakes Environmental Association

Portland Water District

Town of Waterford

November 2013

Acknowledgments

The following people were instrumental in the Bear Pond Watershed Survey Project and deserve special recognition for their efforts.

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Cover photo of Bear Pond by Colin Holme
Printed on recycled paper

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Watershed Overview

Bear Pond and its entire watershed are located in the Town of Waterford in Oxford County, Maine (Figure 1.). The lake has a surface area of 250 acres. The lake's immediate watershed covers 5,331 acres. Bear Pond is Waterford's deepest lake, reaching a maximum depth of 72 feet. It provides excellent habitat for cold water and warm water fish. Bear Pond drains to the Bear River, which flows to Long Lake and eventually into Sebago Lake. Sebago Lake is a public drinking water source for nearly 200,000 people in southern Maine.

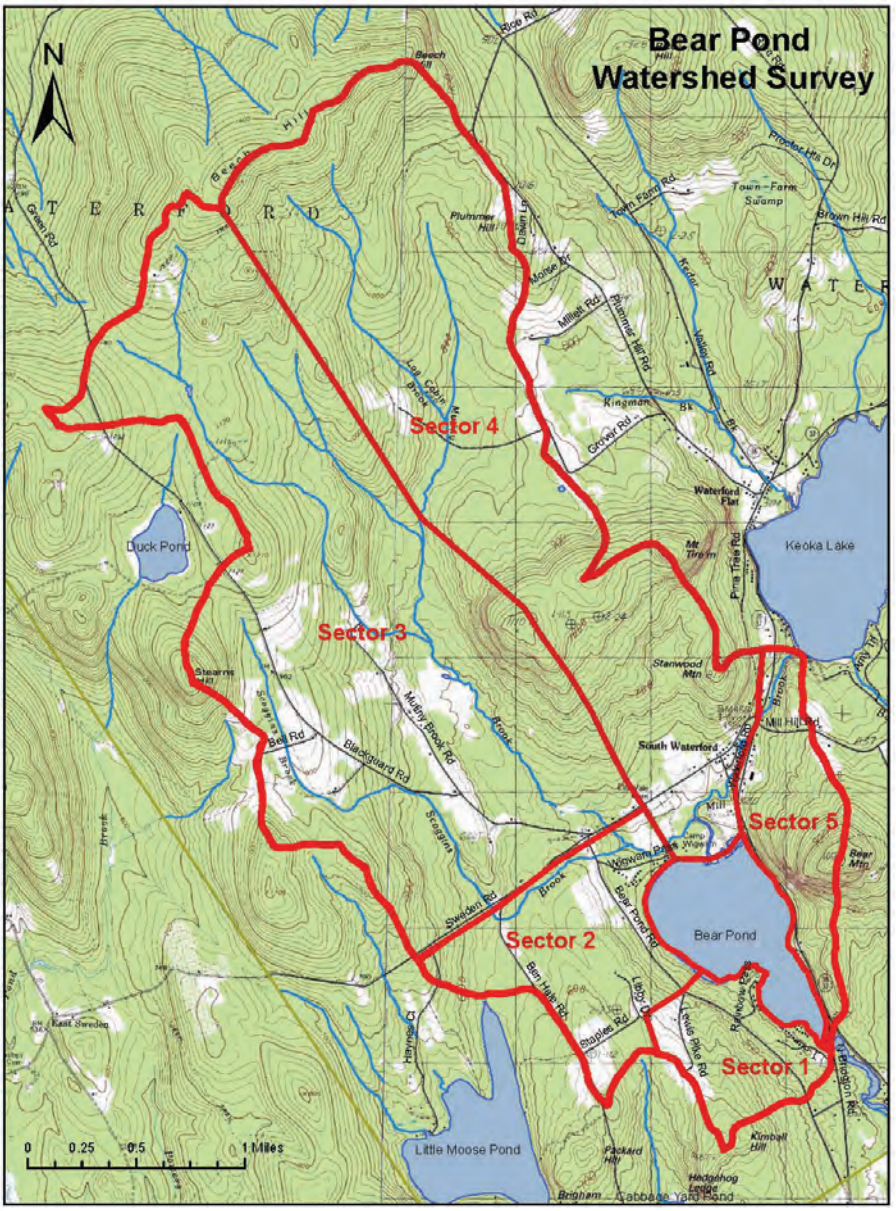


Figure 1. Bear Pond Watershed and Survey Sectors

Map created by Michele Windsor, Oxford County SWCD

Bear Pond is an important asset to the economy and quality of life in Waterford. Bear Pond's shoreline is fringed with 70 seasonal and year-round residences. The lake draws significant recreational use in every season. The Town of Waterford has a boat launch on the south end of the lake. A summer youth camp, Camp Wigwam, annually attracts 170 campers to the shores of the lake.

The Maine Department of Inland Fisheries & Wildlife regularly stocks Bear Pond with landlocked salmon and brook trout, and these species have been known to spawn in Mutiny Brook, a major tributary to the lake. The pond also supports lake trout, splake, rainbow smelt, smallmouth and largemouth bass, white and yellow perch, pickerel, and a variety of minnows and shiners. Bear Pond is a popular smelting pond.

The Maine Department of Environmental Protection (MDEP) has placed Bear Pond on its list of Nonpoint Source Priority Watersheds. Over the past decade, Bear Pond has experienced significant soil runoff from the surrounding land during storm events. This storm water runoff is a type of **nonpoint source pollution** (see box). Rain and snowmelt sweep over the watershed, moving debris and soil into the lake from the surrounding land and streams.

NONPOINT SOURCE POLLUTION

Also called NPS or polluted runoff. Pollution that can not be traced back to a discharge from a particular direct source (e.g., an industrial outfall pipe).

One way to visualize NPS pollution is to think of rain and snow melt as a giant broom that sweeps over the watershed, moving debris and soil into the lake from the surrounding land and streams.

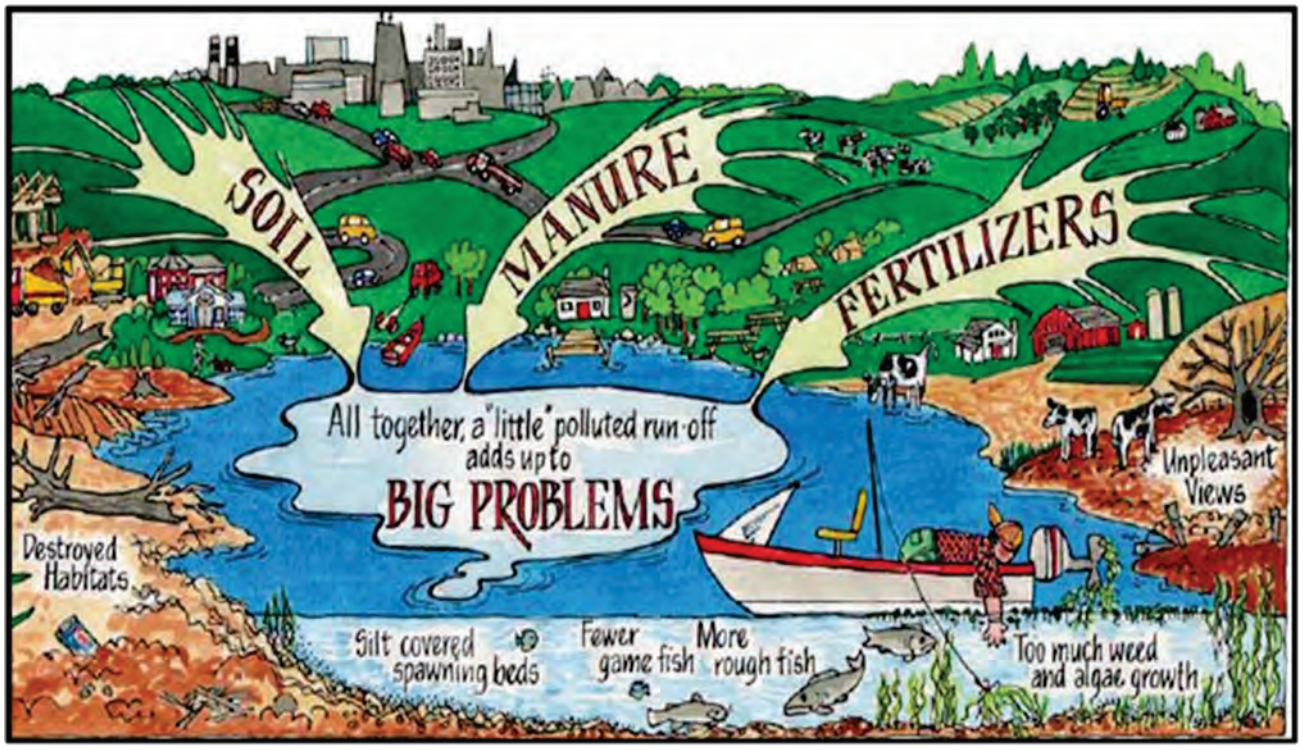
In an undeveloped, forested watershed, storm water runoff (rain and snowmelt) is slowed by trees, shrubs, and vegetative groundcover. It is then filtered through the soil and soaks into the uneven forest floor. In this way, nonpoint source pollution is trapped on land so it doesn't flow into the lake. But in *developing* watersheds, the velocity of storm water runoff increases on impervious surfaces like rooftops, compacted and bare soil, gravel roads and pavement. Storm water runoff does not receive the filtering treatment the forest once provided.

Soil particles carry **phosphorus** (a plant nutrient) as a "hitch hiker". If eroding soil carries too much phosphorus into a lake, it upsets the natural balance, and algae growth is fueled by the excessive amounts of the nutrient. When algae growth explodes the lake can become covered with slimy green plant matter, which ruins swimming, boating, fishing and the quality of wildlife habitat.

Excess phosphorus can "fertilize" a lake and lead to nuisance algal blooms.

Algae "blooms" like this have already occurred in lakes around Lewiston and Augusta. Once these blooms occur, they are enormously expensive to fix. Restoring a lake's clarity may take decades. That's why minimizing soil erosion is so important; we want to keep Bear Pond clear and healthy for the enjoyment of all. Prevention is the key.

In order to fix erosion problems we first need to find out where they are. This is what the survey is all about. We not only look for erosion at the lakeshore, but also in the surrounding watershed which can flow downhill to Bear Pond via streams and surface runoff.



In 2013, the Bear Pond Association and volunteers surveyed the watershed for soil erosion “hotspots”. Survey results are contained in this report (see Appendix). The survey was funded in part by the U.S. EPA under Section 604(b) of the Clean Water Act in addition to local contributions from the Bear Pond Association, Camp Wigwam, the Town of Waterford, and Portland Water District. LEA, Fiddlehead Environmental Consulting, Portland Water District and the Maine Department of Environmental Protection contributed valuable staff time, technical expertise and funding administration to the project.

Purpose of the Watershed Survey

The primary purpose of the watershed survey is to identify and prioritize existing sources of polluted runoff, particularly soil erosion sites, in the Bear Pond Watershed. However, the following goals are also important:

- 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 a component of a long term lake protection strategy.
- Make general recommendations to landowners for fixing erosion problems on their properties.

Local citizen participation was essential in completing the watershed survey and will be even more important in coming years. Through the leadership of the Bear Pond Association and watershed residents, and with assistance from groups and agencies concerned with lake water quality, the opportunities for stewardship are limitless! We hope that you will find this report interesting and informative.

*Several lakeshore properties were observed to have little or no **vegetated buffer** at the water's edge. It is important to note that buffers of shrubs and trees do a much more effective job than bare ground or grass at keeping NPS pollution from entering lakes. Deep shrub and tree roots also help hold the shoreline.*

(Bear Pond, Hartford, Maine)

Buffers can be installed inexpensively. You can either stop mowing, stop raking to the water's edge and let plants grow up naturally (as in the picture on the right). Or you can plant the area with native trees and shrubs.

Buffers enhance the appearance of shorefront property, increase privacy, and attract birds and other wildlife without ruining the landowner's view.

(MDEP file photo)

Why is it important to protect Bear Pond from polluted runoff?

- Bear Pond provides recreational opportunities to watershed residents and visitors. It is an important contributor to the local economy.
- Bear Pond provides valuable habitat for fish, birds and other wildlife.
- 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 land-owners as well as the tax revenue of the entire community.
- Once water quality problems occur in a lake, they can be difficult or impossible to fix.

What is being done to protect Bear Pond?

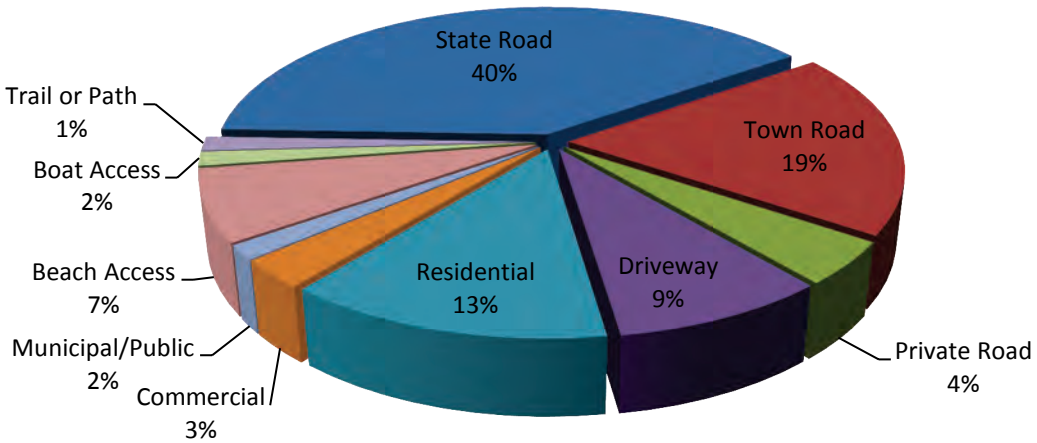
LEA and volunteers have tested water quality in Bear Pond since 1978. Water quality data are shared with the Maine Department of Environmental Protection and the Maine Volunteer Lake Monitoring Program.

Volunteer watershed surveys are one of the most effective ways to protect lake water quality because they get citizens involved in identifying existing and potential sources of polluted runoff. During the course of the watershed survey in the spring and summer of 2013, it was observed that many residents and the summer camp had already installed erosion control measures, such as rubber razor bars and open-top culverts across driveways, to reduce erosion into Bear Pond. Several road associations maintain most of the private roads in the watershed.

Bear Pond Watershed Survey Findings

Volunteers and technical staff identified 68 **sites** that may have an impact on Bear Pond.

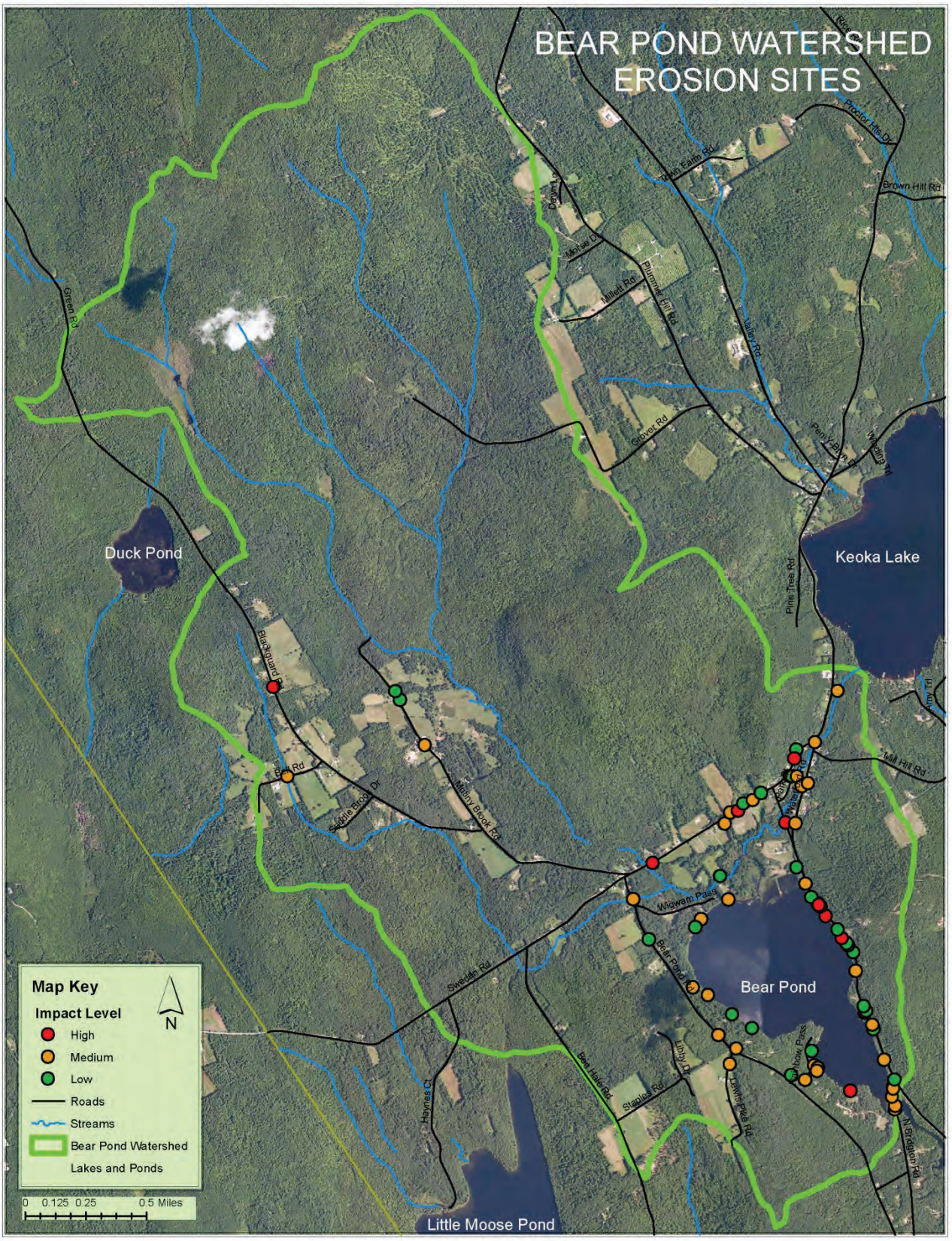
Site Breakdown by Land/Use Activity



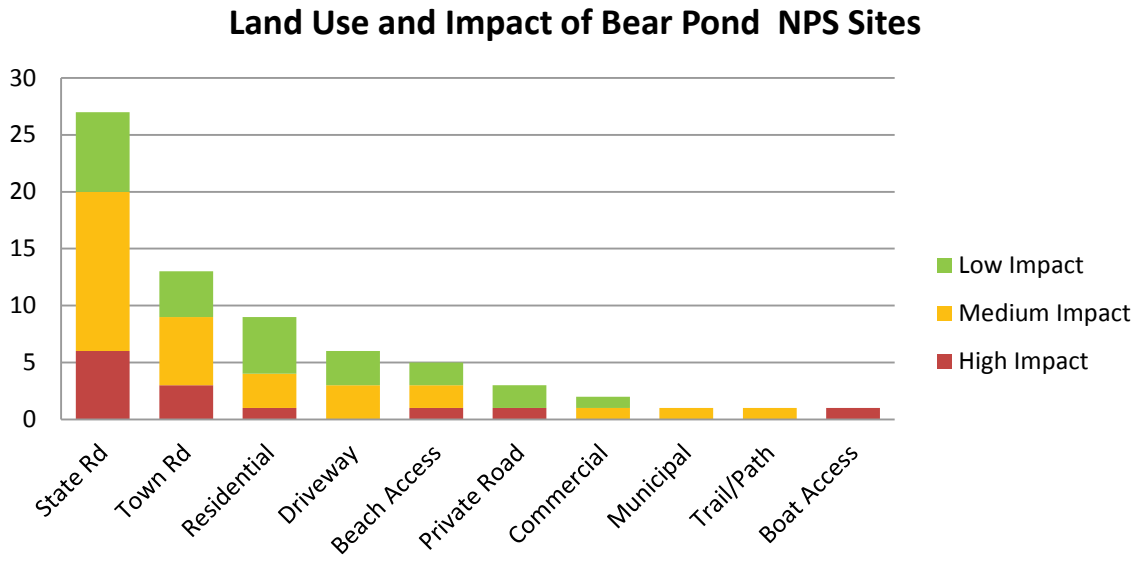
By the Numbers

Land Use/Activity	Totals
State Road	27
Town Road	13
Residential	9
Driveway	6
Beach Access	5
Private Road	3
Commercial	2
Municipal/Public	1
Boat Access	1
Trail or Path	1
Logging	0
Agriculture	0
Construction Site	0
Total	68

Impact	# of Sites
High	12
Medium	31
Low	25
Total	68



Locations of Erosion Sites Identified in the Watershed



Land Use/Activity	High Impact	Medium Impact	Low Impact	Total Sites
State Rd	6	14	7	27
Town Rd	3	6	4	13
Residential	1	3	5	9
Driveway		3	3	6
Beach Access	1	2	2	5
Private Road	1		2	3
Commercial		1	1	2
Municipal		1		1
Trail/Path		1		1
Boat Access	1			1
Total	**13**	**31**	**24**	**68**

A total of 10 different land uses were associated with the identified sites in the survey. Detailed descriptions of some example **sites associated with the land use categories** are on the following pages.

Site Impact Ratings

Impact ratings were based on the type of erosion, size of the area, and amount of buffer or filtering of run-off based on observations of the survey volunteers at the time the survey was done. Using the table below the sites were scored to estimate the potential impact to Bear Pond.

Type of Erosion	Area	Buffers and Other Filters	IMPACT
Gully - **3**	Large - **3**	No filter, all channelized direct flow into lake or stream - **3**	High: 8-9 pts
Rill - **2**	Medium - **2**	Some buffer or filtering, but visible signs of concentrated flow and/or sediment movement through buffer and into lake - **2**	Med: 6-7 pts
Sheet - **1**	Small - **1**	Significant buffer or filtering* - **1**	Low: 3-5 pts

State and Town Roads

There were by far more problems on State and Town Roads, a total of 40, than any other land use that impacts Bear Pond. The problems with State and Town Roads were very similar and for that reason are grouped here. Below are some examples of the problems found and some recommendations. Some problems identified will be easy to fix, but others are major contributors to erosion and fixing them will be complicated. Many of the impacts observed were addressed by routine maintenance by the DOT and the Town of Waterford in the months after the survey was completed but some were still recurring and recommendation below are designed to prevent some of the recurring problems.

Problems Identified:

- Moderate to severe shoulder erosion.
- Severe ditch erosion.
- Direct flow of sediment to streams or Bear Pond.
- Unstable culvert inlet and outlet.
- Winter sand build-up.

Recommended Solutions:

- Clean, reshape and armor ditches with stone or plant grass.
- Armor culvert inlets and outlets.
- Install plunge pools below culverts to hold runoff and catch sediment before it enters streams or Bear Pond.
- Properly size and align culverts.

Private Roads and Driveways

Private Roads and driveways have similar problems since they involve similar materials (gravel) and maintenance considerations. 6 Driveways and 3 private road problems were identified. Below are some examples of the problems found and some recommendations.

Problems Identified:

- Poor shaping
- Moderate to severe surface erosion.
- Sediment flowing directly to stream or lake.
- Grader berms trap flows on road.

Recommended Solutions:

- Reshape road (crown), and remove grader berms which allows the road to shed water.
- Install water bars, open-top culverts or rubber razor bars to divert flow off road.
- Clean, reshape and armor ditches with angular stone rip rap, or plant grass.

Residential

9 Residential sites were found. Many are low impact, and will be inexpensive to fix. Residential areas were associated with 13% of the identified sources of polluted run- off to Bear Pond. Their cumulative effects pose a significant threat to water quality. Fortunately, most can be easily corrected.

Problems Identified:

- Roof runoff causes erosion.
- Bare soil is exposed to the erosive force of snow and rain.
- Exposed roots indicate heavy foot traffic that increases erosion.

Recommended Solutions:

- Install an infiltration trench beneath the roof dripline.
- Apply erosion control mulch on bare areas or plant with grass and shrubs in sunny spots.
- Define and narrow the foot path to reduce erosion.

Beach/Boat Access

6 Beach access sites and 1 Boat access sites were found. Most of these beach access sites are private beaches. The boat launch is public. These sites receive heavy traffic and have little vegetation to stabilize soils or buffer runoff.

Problems Identified:

- Shoreline- undercut, tree roots exposed
- Lack of shoreline vegetation
- Rill and gully erosion
- Unstable access

Recommended Solutions:

- Divert runoff with rubber razor/waterbar in open area on path
- Apply mulch/erosion control mix to bare areas of exposed soil
- Create a rain garden in open area upslope of beach
- Establish buffer or add to buffer vegetation
- Add rock/crushed stone to stabilize edges of boat access

Commercial

Only 2 Commercial Sites were documented. Both of the commercial sites were found at the summer youth camp, Camp Wigwam, which is an important part of the Bear Pond Watershed. It contributes to the local economy and protects large swaths of land from high density development. It should be noted that the camp had many notable erosion control measures in place before the survey was done and was doing a great job of minimizing erosion throughout the grounds. Below are examples of commercial sites identified on Bear Pond in this survey.

Problems Identified:

- Moderate to severe surface erosion
- Rill/gully erosion
- Shoreline erosion

Recommended Solutions:

- Enlarge natural existing sediment pool,
- Add mulch/erosion control mix to pathways,
- Improvements to road to waterfront will help this site
- Reshape/mono slope upper road
- Fill gully with stone to level of pavement

Important Points!

- A full summary of all erosion sites identified in the survey is contained in a spread sheet in the appendix. Sites are grouped in order by survey sector. Each listing shows the map site number, the type of problem(s) encountered, location, size or area, and recommended solutions.

- In addition to the surveyed sites, numerous lakeshore properties were observed to have little or no vegetated buffer at the water's edge. Since the primary purpose of this survey was to document erosion, not all of these sites were included in the survey results because some weren't actively eroding. However, it is important to note buffers of shrubs and trees do a much more effective job than bare ground or grass to keep NPS pollution from entering lakes.

- During the survey, we found that many landowners in the Bear Pond Watershed have already taken steps to protect water quality. Surveyors found numerous open top culverts and waterbars across driveways, as well as dripline trenches under roof edges. These simple conservation measures do an effective job of minimizing, and in some cases eliminating, soil erosion. Landowners' concern for protecting Bear Pond bodes well for future efforts to continue the great erosion control work.

Site Rankings

Sites in the spreadsheet were ranked according to these criteria:

- Impact was assigned by considering factors such as the size of disturbed area, slope, soil type, amount of soil that's eroding, proximity to water, and size of buffer. **Low** impact eroding sites are those with limited transport off-site. At **medium** impact sites, sediment is transported off-site, but the erosion does not reach a high magnitude. Large sites where there is significant erosion that flows directly into the lake, a stream, or ditch, were rated **high** impact.

- Cost is an important factor in planning for restoration. **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.

With a few exceptions, virtually all of the sites identified in the survey are significant to one degree or another. The cumulative effect of many "low" and "medium" impact sites can exceed that of any one "high" impact site. This should be considered when a strategy is developed to address problems in the watershed.

Recommendations

Fixing the erosion sites identified in this survey will require efforts by the entire community. Below are some suggestions for individuals and groups.

Individual Citizens

- Prevent runoff from washing sediment into Bear Pond. Detain runoff in depressions or divert flow to vegetated areas. Call Oxford County SWCD, LEA or Maine Department of Environmental Protection (MDEP) for free technical assistance.
- Minimize the amount of cleared land and road surfaces.
- 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. Use erosion control mulch around construction projects which involve excavation.
- Do not bring in sand or rebuild beaches. Call Oxford County SWCD, LEA, Fiddlehead Environmental Consulting or MDEP for technical assistance with beach or shoreline erosion.
- Call the town code enforcement officer before cutting vegetation within 250 feet of the shoreline. The Waterford town office phone number is 207-583-4403.
- Join the efforts of the Bear Pond Association.
- Oxford County SWCD and LEA provide erosion control assistance to landowners and the town. LEA also conducts water quality testing.

Bear Pond Association

- Develop an active membership, provide educational materials and guidance to members of the Bear Pond Watershed community and to town officials.
- 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 and the watershed community about lake issues and work cooperatively to find solutions.
- Use this watershed survey to keep track of fixed sites and new problems.

Private Road Associations

- Minimize road runoff by doing regular, comprehensive maintenance.
- Decrease water velocity in steep ditches by installing check dams.
- Get a copy of “*Gravel Road Maintenance Manual – A Guide for Landowners*.” This reference is a must for anyone managing a gravel road. (Visit the MDEP website: http://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf
- Use hard packing road material and regularly grade gravel roads to allow water to drain into ditches and adjacent vegetation.
- For more extensive problems, seek technical help. Contact Oxford County SWCD, LEA, Fiddlehead Environmental Consulting or MDEP to request technical assistance. Contact information is at the end of this report.

Municipal Officials

- Enforce shoreland zoning standards to assure full protection of Bear 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 in erosion control for road crews, planning boards and conservation commissions.

Next Steps

With publication of this report, the watershed community has taken a major step forward by completing the survey of erosion sites. We now have the information needed for planning purposes, and for fundraising, as well.

What happens next? The Bear Pond Association and Oxford County SWCD will prepare a grant proposal to the MDEP Section 319 Program that, if awarded, will allow us to share the costs of controlling erosion with the town, summer youth camps, private road associations, and property owners. This grant proposal is usually due in late spring. If awarded, it would start in January 2015 and run for two years. Additional action items in the coming years can include:

2014:

- Create a formal lake association that encompasses representatives from the ad hoc Bear Pond Association, private road associations, Camp Wigwam, and watershed residents/landowners. Creating a formal lake association will facilitate protection efforts in the coming years.
- Apply for nonprofit status once the lake association is formed. This will allow the association to directly submit proposals for grants (most funders require nonprofit status), as opposed to the current situation where we must rely on another organization to be our grant sponsor.
- Contact landowners whose properties were identified in the watershed survey and notify them of the survey results.

2015 -2017:

- Implement the MDEP erosion control grant, assuming it is awarded. Given the realities of current restrictions in funds, it is likely this grant will only be the first phase in fixing the highest impact erosion sites that were found in the watershed survey. Therefore, the lake association should seek subsequent phases, as needed, from the MDEP Section 319 Program, as well as other erosion control grants.

Ongoing action items (Those that can begin right now):

- Keep an eye out for new erosion sites that have emerged after the watershed survey was completed.
- Spread the word about the survey findings and suggestions made in this report to encourage homeowners to consider fixing them on their own.
- Continue education efforts about erosion control in the watershed. Volunteers and technical staff identified numerous places around the lake where landowners have already installed erosion control measures. This is a great sign, but we need to educate all users – especially young people who are the next generation of lake stewards - about the link between erosion and diminishing water quality.
- Encourage participation in LEA's "Clean Lakes Check-Up" Program to identify and minimize erosion hot spots.

Appendix

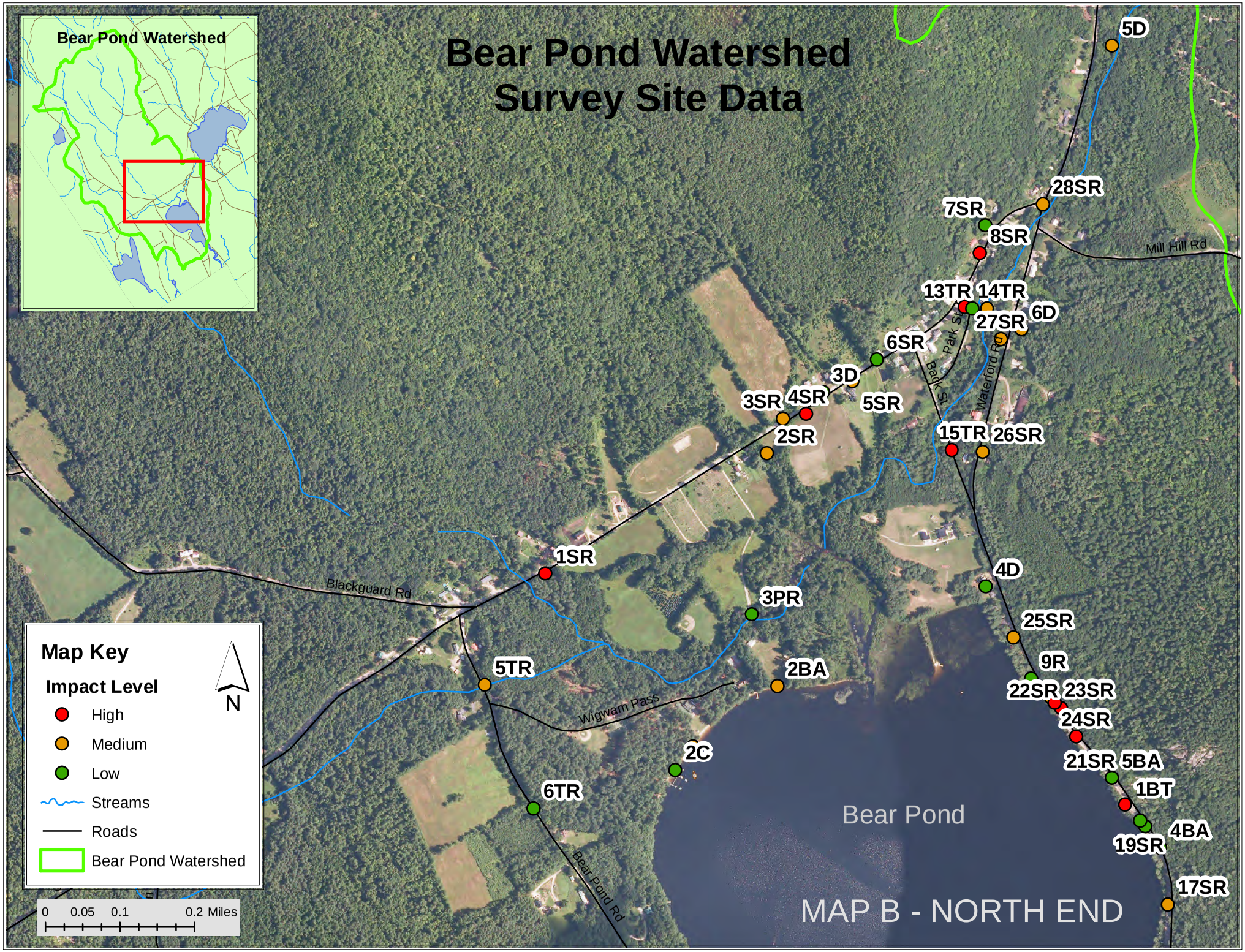
- **Site Location Maps**
- **Spreadsheets**
- **Glossary of Erosion Control Terms**
- **Conservation Practices for Homeowners**
- **Permitting ABCs**
- **Where to Go For More Information**

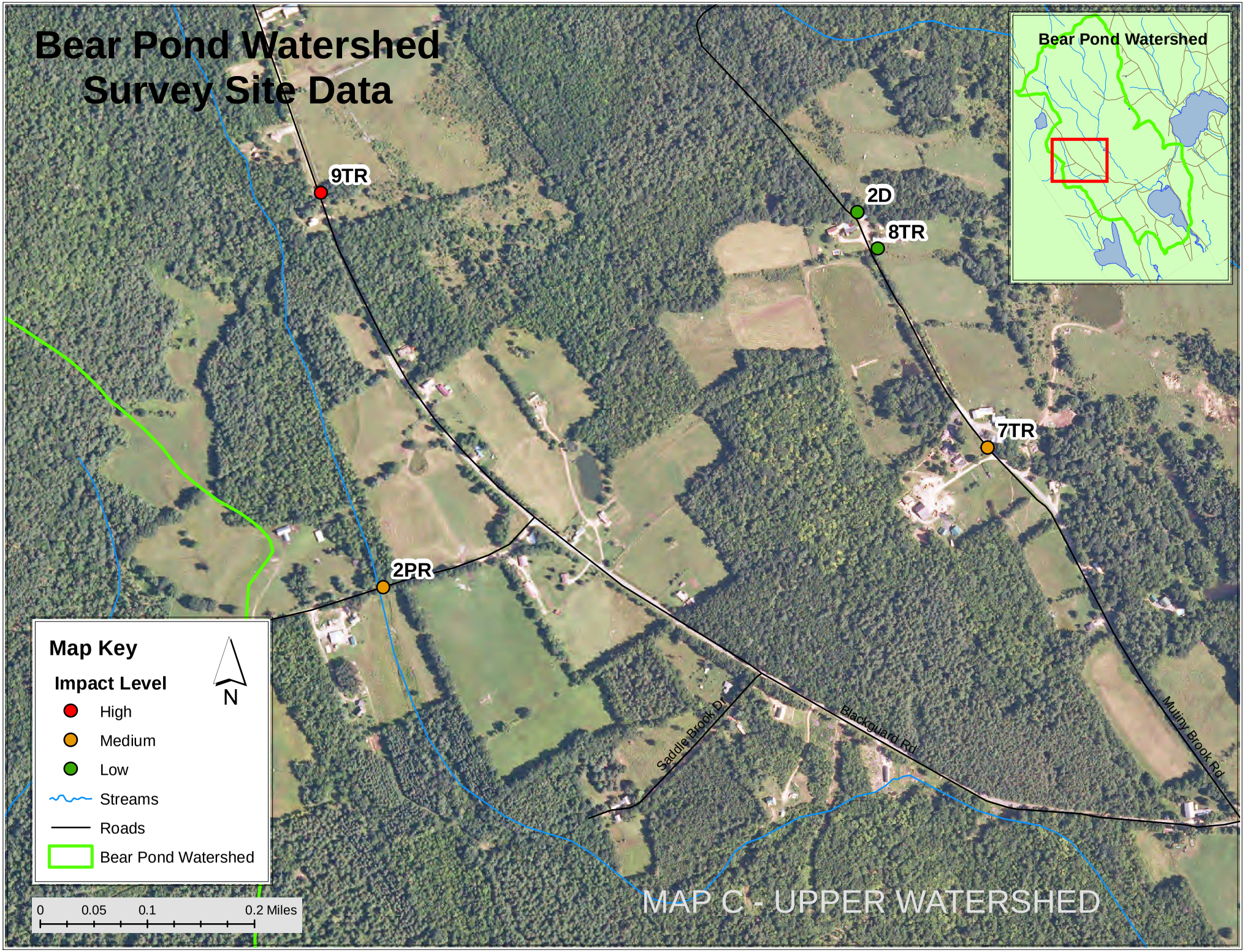
Map Key:

BA = Beach Access
BT = Boat Access
C = Commercial
D = Driveway
P = Path/Trail
PR = Private Road
R = Residential
SR = State Road
TR = Town Road
M = Municipal/Public

*GPS Coordinates may be off as much as 90 feet due to limitations of satellite positioning.


Bear Pond Watershed
Survey Site Data
Bear Pond
16P
1D
6R
1R
4TR
1TR
3TR
2R
4R
5R
3R
2TR
1PR
1BA
8R
16SR
7R
15SR
14SR
13SR
12SR
11SR
3BA
1M
10SR
9SR
Bear Pond Rd
Rainbow Pass
Waterford Rd
Libby Dr
Staples Rd
Lewis Pike Rd
N Bridgton Rd
Lewis Rd
Bear Pond Watershed
Map Key
Impact Level
High
Medium
Low
Streams
Roads
Bear Pond Watershed
N
0
0.05
0.1
0.2 Miles
MAP A - SOUTH END


Bear Pond Watershed
Survey Site Data
Bear Pond Watershed
5D
28SR
7SR
8SR
Mill Hill Rd
13TR
14TR
6D
27SR
6SR
Park St
Badk St
Waterford Rd
3D
5SR
3SR
4SR
2SR
15TR
26SR
1SR
Blackguard Rd
4D
3PR
25SR
9R
5TR
2BA
22SR
23SR
Wigwam Pass
24SR
2C
21SR
5BA
1BT
6TR
Bear Pond
4BA
19SR
Bear Pond Rd
17SR
MAP B - NORTH END
Map Key
Impact Level
High
Medium
Low
Streams
Roads
Bear Pond Watershed
N
0
0.05
0.1
0.2 Miles


Bear Pond Watershed
Survey Site Data
9TR
2D
8TR
7TR
2PR
Bear Pond Watershed
Map Key
Impact Level
High
Medium
Low
Streams
Roads
Bear Pond Watershed
N
0
0.05
0.1
0.2 Miles
Saddle Brook Dr
Blackguard Rd
Mutiny Brook Rd
MAP C - UPPER WATERSHED

Bear Pond Watershed Survey Data
Collected: May 2013

Map_Site	Land_Use	Problem	UTM_East*	UTM_ North*	Location	Area	Recommend	Impact	Cost
1BA	Beach Access	Severe surface erosion, bare soil, undercut shoreline	363074	4889485	Fire pit below basketball court, Wabenaki Pass	20'x20'	Install runoff diverter in open area on path, mulch/erosion control mix/ rain garden in open area, establish buffer/add to buffer vegetation	High	Medium
4BA	Beach Access	Bare soil, Shoreline- lack of shoreline vegetation/inadequate shoreline vegetation/ erosion/unstable access	363094	4890402	Across from CMP pole # 124	40'x20'	Add mulch/erosion control mix	Low	Medium
5BA	Beach Access	Moderate surface erosion, bare soil	362989	4890553	Between CMP pole #128-#129 at jumping rock	20'x15'	Add mulch/erosion control mix, reseed bare soil & thinning grass of vegetation	Low	Medium
2BA	Beach Access	Moderate surface erosion, shoreline- undercut/lack of shoreline vegetation/erosion/unstable access	362267	4890751	Red house at boundary line of Camp Wigwam	60'x20'	Riprap along lawn and beach, add rain garden and establish buffer vegetation	Medium	Medium
3BA	Beach Access	Slight surface erosion, bare soil, Shoreline- undercut/lack of shoreline vegetation/erosion/unstable access	363358	4889499	right across from 35/37 sign, CMP pole #2	20'x25'	Install runoff diverter to path/trail, add mulch/erosion control mix, add buffer to vegetation and reseed bare soil & thinning grass	Medium	Low
1BT	Boat Access	Moderate surface erosion	363018	4890496	Across from CMP pole # 127 on 35/37-Town Boat Launch	50'x3'	Roads/Driveways- add rock/crushed stone/rubber razor/waterbar	High	Medium
2C	Commercial	Moderate surface erosion, bare soil, shoreline erosion	362047	4890570	Wigwam swim area at dock storage/next to paddle shack	12'x24'	Enlarge natural existing sediment pool, add mulch/erosion control mix, other improvements to road to waterfront will help this site	Low	Low
1C	Commercial	Severe surface erosion, shoreline erosion	362085	4890621	Wigwam beach in front of brown sail shack	70'x15'	Reshape/mono slope upper road, fill gully w/stone to level of pavement	Medium	Medium
2D	Driveway	slight surface erosion	360061	4892130	Very end of Mutiny Brook Road #136 Farm Road crosses stream for pasture access	70'x13'	Stop adding fill w/in 75' of stream, install runoff diverters/rubber razor/waterbar to roads/driveways	Low	Low
3D	Driveway	Moderate surface erosion	362365	4891386	Sweden Rd.	12'x80'	Add new surface material(recycled asphalt/pave) to road/driveway, remove unused part and revegetate	Low	Medium
4D	Driveway	Moderate surface erosion	362717	4890966	#340 Waterford Road	50'x3'	Roads/Driveways- add gravel/recycled asphalt/pave, reshape crown and add waterbar	Low	Medium
1D	Driveway	moderate surface erosion to driveway, roof runoff erosion	362131	4890118	Driveway directly across from Bear Pond Road, CMP pole #16	40'x15'	Monoslope driveway to downslope vegetation, install runoff diverters to driveways, add infiltration trench @ roof dripline	Medium	Low

*GPS Coordinates may be off as much as 90 feet due to limitations of satellite positioning.

Bear Pond Watershed Survey Data
Collected: May 2013

Map_Site	Land_Use	Problem	UTM_East*	UTM_ North*	Location	Area	Recommend	Impact	Cost
5D	Driveway	Moderate surface erosion	362989	4892134	Off Waterford Road, ruin of old mill	100'x2'	Install ditch turnouts, add gravel to roads /driveways	Medium	Medium
6D	Driveway	Moderate surface erosion	362795	4891521	Driveway off Rte 37, across from Kimball's Hardware	70'x4'	Add waterbar to roads/driveways	Medium	Low
1M	Mun/Pub	Slight surface erosion, slight road shoulder erosion, bare soil,lack of shoreline vegetation/erosion of shoreline	363350	4889444	Town of Waterford/ Bear Pond Park	15'x20'	Define foot path/install runoff diverter (waterbar) to paths/trails, add mulch/erosion control mix	Medium	Low
1PR	Private Road	Moderate surface erosion	362773	4889556	Rainbow Pass	500 sq. ft.	Add new gravel to roads/driveways & reshape crown, install runoff diverters w/rubber razer	High	Medium
2PR	Private Road	Slight surface erosion	359348	4891566	Pole #4 on Bell Road, stream crossing	50' X 20'	Install runoff diverter along roadside/waterbar (x3) on roads/driveways	Low	Low
3PR	Private Road	Moderate surface erosion, moderate road shoulder erosion, inadequate shoreline vegetation, and shoreline erosion, stream bank eroding near bridge	362212	4890906	Bridge access to red house off Cemetary Road	8'x4'	Riprap north slope, add mulch/erosion control mix	Low	Low
1R	Residential	Roof Runoff Erosion	362424	4889897	Bear Pond Rd.	250 ft2	Define and stabilize foot path, Infiltration trench @roof dripline	Low	Low
2R	Residential	Shoreline slumping	362817	4889747	Rainbow Pass between 28 -23	22 ft2	Install runoff diverter, establish buffer	Low	Low
6R	Residential	Slight surface erosion, inadequate shoreline vegetation, stream overflow contribution	362292	4889989	Brown house w/green roof, tax map and lot 28-001	6'x30'	Move felled tree/log to redirect stream flow, install runoff diverter to path/trail, add to buffer of vegetation	Low	Low
7R	Residential	Clogged and undersized culvert	363169	4890003	210 Rt. 35/37, on property line	20'x8'	Enlarge culvert and install plunge pool	Low	Medium
8R	Residential	Roof runoff erosion	363162	4890046	210 Rt. 35/37	15'x2'	Add infiltration trench @ roof dripline	Low	Low
9R	Residential	Slight surface erosion, bare soil	362815	4890767	1st house on north side past guardrail with gray shingles	15'x40'	Add mulch, no raking of vegetation	Low	Low
3R	Residential	Bare soil	362834	4889652	Rainbow Pass	201.3 ft2	Add erosion control mix, establish buffer, no raking, reseed bare soil	Medium	Low
4R	Residential	Moderate Surface Erosion	362857	4889637	Rainbow Pass	300 ft2	Stabilize Footpath, Eroison Control Mix mulch, Add to Buffer	Medium	Low
5R	Residential	Moderate Surface Erosion/Shoreline erosion	362853	4889617	Rainbow Pass	300 sq. ft.	Stabilize foot path/install runoff diverter on path, add mulch/erosion control mix	Medium	Low
1SR	State Road	Unstable outlet at culvert	361766	4890994	Mutiny Brook crossing on Sweden Road. By house #177	8'x7'	Armor outlet at culvert	High	High

*GPS Coordinates may be off as much as 90 feet due to limitations of satellite positioning.

Bear Pond Watershed Survey Data
Collected: May 2013

Map_Site	Land_Use	Problem	UTM_East*	UTM_ North*	Location	Area	Recommend	Impact	Cost
4SR	State Road	Moderate erosion/undersize ditch,moderate road shoulder erosion	362329	4891339	Shoulder along Nelson field	200'x4-5'	Install ditch and armor with stone	High	High
8SR	State Road	Severe erosion to ditch, severe road shoulder erosion	362704	4891686	22 Sweden Road ditch west, CMP pole #505	250'x8'	Armor with stone and reshape ditch, remove grader/plow berms and add gravel to roads/driveways	High	High
11SR	State Road	Moderate surface erosion, clogged culvert, moderate road shoulder erosion, bare soil and winter sand	363357	4889510	intersection of 35/37, CMP pole #1	120'x15'	Remove clog at culvert, armor bank with stone, build up shoulder of road/driveway	High	High
22SR	State Road	Severe surface erosion, severe road shoulder erosion, bare soil	362879	4890704	Across from CMP pole #J133	2 sites- 15'x10' each	Riprap bank, establish buffer of vegetation	High	Medium
23SR	State Road	Severe surface erosion, severe road shoulder erosion, bare soil	362866	4890716	Between CMP poles J133 & J134	3 sites-15'x10' each	Riprap bank, establish buffer of vegetation	High	Medium
6SR	State Road	Slight surface erosion, slight road shoulder erosion, uncovered pile of soil/winter sand	362482	4891457	Firehouse	20'x12'	Cover or revegetate soil pile	Low	Low
7SR	State Road	Crushed/broken culvert, slight ditch erosion, winter sand	362716	4891746	South of fork at Sweden Road/Rt. 37, CMP pole # 504	60'x1'	Remove clog/replace/install plunge pool at culvert	Low	High
12SR	State Road	Moderate surface erosion, Bare soil and winter sand	363365	4889558	35 side of 35/37, CMP pole # 87	30'x5'	Install ditch, install catch basin to roads/driveways	Low	Medium
14SR	State Road	Slight surface erosion, bare soil, inadequate shoreline vegetation	363226	4889894	from #110 and #111	2 sites- 20'x20'	Establish and add buffer vegetation	Low	Low
16SR	State Road	Unstable inlet/outlet culvert	363179	4890012	Across road from CMP pole #114 and south of 35/37 residence	10'x10'	Install plunge pool at culvert	Low	Medium
18SR	State Road	Unstable culvert inlet/outlet	363061	4890448	Pole#125-126, Rte 35/37	10' X10'	Armor Inlet/Outlet of Culvert, Install Plunge Pool	Low	Medium
19SR	State Road	Slight surface erosion, bare soil/winter sand, shoreline-lack of shoreline vegetation/inadequate shoreline vegetation/erosion/unstable access	363050	4890461	Across from CMP pole #126 on 35/37	20'x15'	Add mulch/erosion control mix, add to buffer vegetation and reseed bare soil & thinning grass	Low	Low
2SR	State Road	Moderate surface erosion, moderate road shoulder erosion, winter sand	362244	4891254	Stream/bridge- at CMP pole #8	15'x4'	Build up/ riprap/add new surface gravel/install runoff diverters to roads/driveways	Medium	Medium
3SR	State Road	Severe road shoulder erosion, winter sand in soil	362279	4891329	North of snowmobile bridge at CMP pole #6	12'x8'	Stabilize shoulder riprap, add new surface material to roads/driveways	Medium	Medium

**GPS Coordinates may be off as much as 90 feet due to limitations of satellite positioning.*

Bear Pond Watershed Survey Data
Collected: May 2013

Map_Site	Land_Use	Problem	UTM_East*	UTM_ North*	Location	Area	Recommend	Impact	Cost
5SR	State Road	Undersized/clogged culvert, moderate ditch erosion, winter sand	362429	4891410	78 Sweden Road	45'x6'	Remove clog/enlarge culvert, armor with stone and reshape ditch	Medium	Medium
9SR	State Road	Slight surface erosion, slight road shoulder erosion,bare soil/winter sand	363369	4889362	Rt.37 bridge abutments, bridge # 3245-DOT	10'x15'	Remove grader/plow berms & stabilize/vegetate roads/driveways	Medium	Medium
10SR	State Road	Moderate surface erosion, slight road shoulder erosion, roadside plow/grader berm, bare soil	363370	4889385	CMP pole #5 (by guardrail)	15'x8'	Riprap, remove grader/plow berms and vegetate/stabile shoulder of roads/driveways	Medium	Medium
13SR	State Road	Severe soil erosion, bare soil, shoreline erosion	363296	4889691	35/37- 75' south of "Recycle" sign	10'x9'	Establish and add buffer vegetation	Medium	Low
15SR	State Road	Unstable culvert outlet,	363219	4889921	North end of guardrail, next to brown shed	15'x15'	Install inlet/outlet to culvert/replace/enlarge/lengthen/install plunge pool, stabilize erosion above outlet	Medium	High
17SR	State Road	Moderate to Severe surface erosion, bare soil, shoreline erosion	363110	4890280	35/37, opposite CMP pole #121	30'x18'	Establish buffer vegetation	Medium	Low
21SR	State Road	Severe surface erosion, bare soil	362912	4890642	Across from CMP pole #131 & #132, pull-off area	80'x20'	Stabilize foot path of Paths/Trails, add mulch/erosion control mix, reseed bare soil & thinning grass of vegetation	Medium	Medium
24SR	State Road	Moderate surface erosion, moderate road shoulder erosion, bare soil	362858	4890727	Across from CMP pole #J134	25'x10'	Add mulch/erosion control mix, establish buffer of vegetation	Medium	Medium
25SR	State Road	Moderate surface erosion, severe road shoulder erosion, bare soil	362777	4890856	Just south of house #330	100'x2'	Stabilize shoulder and riprap bank	Medium	Medium
26SR	State Road	Moderate road shoulder erosion, failed bank	362711	4891257	Across from house #385	50'x3'	Stabilize shoulder and riprap bank	Medium	Medium
27SR	State Road	Moderate road shoulder erosion, failed bank	362750	4891501	Just south of Kimball's Hardware, road shoulder 35/37	12'x2'	Stabilize shoulder and riprap bank	Medium	Medium
28SR	State Road	Severe road shoulder erosion, failed bank	362840	4891792	Westside of Sweden Road & 35/37, road shoulder	40'x2'	Install turnouts, riprap existing bank	Medium	Medium
9TR	Town Road	Moderate erosion to ditches on both sides of road above stream, slight road shoulder erosion	359254	4892159	Pole #23 on Blackguard Road at stream crossing near #370 Blackguard Road	20' of ditches on both sides	Armor ditches with stone, ditches on both sides of road need riprap	High	High
12TR	Town Road	Severe ditch erosion and bank failure, severe road shoulder erosion, bare soil	362672	4891570	Town road, corner of Werner Park	50'x6'	Reshape ditch, add gravel shoulder to roads/driveways	High	Medium

**GPS Coordinates may be off as much as 90 feet due to limitations of satellite positioning.*

Bear Pond Watershed Survey Data
Collected: May 2013

Map_Site	Land_Use	Problem	UTM_East*	UTM_ North*	Location	Area	Recommend	Impact	Cost
15TR	Town Road	Severe ditch erosion, winter sand	362644	4891261	Town Road-Cross Street, CMP pole #149	250'x10'	Ditch-armor w/stone/install ditch/install check dams/install sediment pools, install detention basin to roads/driveways	High	High
2TR	Town Road	Moderate surface erosion,clogged & crushed/broken culvert, moderate erosion to ditch, Roadside Plow/Grader Berm, winter sand	362682	4889587	Bear Pond Road at driveway	50 ft.	Remove clog/replace& enlarge culvert, reshape ditch, remove grader/plow berms on roads/driveways	Low	Medium
6TR	Town Road	Severe backslope erosion on backslope of ditch	361740	4890487	Slumping backslope by CMP pole #8	10'x25'	Install plunge pool at both inlet & outlet of culvert, vegetate the backslope of the ditch	Low	Medium
8TR	Town Road	28" culvert outlet eroded	360092	4892075	136 Mutiny Brook Stream crossing before mailbox	5'x4'	Armor outlet at culvert and add plunge pool	Low	Low
13TR	Town Road	Slight ditch erosion, slight road shoulder erosion, winter sand	362688	4891567	36 Sweden Road at Back Street	20'x4'	Install ditch and sediment pools, install catch or detention basin to roads/driveways	Low	Medium
1TR	Town Road	Culvert- Crushed/Broken, Moderate Erosion	362320	4889764	Bear Pond Rd. at Lewis Pike Rd.	137.6 sq. ft.	Replace/ Lengthen Culvert, Armor with Stone, Reshape Ditch,Vegetate	Medium	High
3TR	Town Road	Moderate surface erosion, moderate erosion to ditch, Grader berm	362277	4889661	Lewis Pike Road	600'	Reshape/install turnouts on ditch, remove grader/plow berms& install runoff diverters on roads/driveways	Medium	Medium
4TR	Town Road	Slight surface erosion contributed to by Lewis Pike Road, clogged & crushed culvert, severe erosion on backslopes of ditch, moderate road shoulder erosion,	362201	4889853	Bear Pond Road-between CMP poles 702-20 & 19	400'x8' on uphill side, 300'x8' on downhill side	Armor inlet/outlet, remove clog & install plunge pool on both sides of culvert, vegetate backslope of ditch & install turnouts on culvert outlet side, improve shoulder where slumping	Medium	High
5TR	Town Road	Slight surface erosion, slight road shoulder erosion, winter sand	361635	4890754	Bear Pond Road-north end at bridge over Scoggins Brook	40'x20'	Clean up winter sand	Medium	Low
7TR	Town Road	Outlet of culvert hanging/undersized, stream & roadside runoff overflow road & wash out every spring	360257	4891776	88 Mutiny Brook Road stream crossing	10' X 20'	Armor inlet/outlet, replace w/larger culvert	Medium	Medium
14TR	Town Road	Unstable outlet at culvert, winter sand	362720	4891567	Fire Dept. plug at Back Street	25'x8'	Armor outlet at culvert, do regular maintenance of catch basin	Medium	Medium
16P	Trail/Path	Moderate surface erosion	362032	4890169	200' NW of property abutting 102 Bear Pond Rd.	6'x125'	Install at least one runoff diverter, no more tree cutting	Medium	Low

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Glossary of Erosion Control Terms

Armor: Reinforcement of ditches, lake shore, culvert inlets or outlets, or embankments with angular rocks to resist erosion.

Berm: As used in this report, “berm” refers to the build-up of road gravel, winter sand or other material on the sides of a road that prevents storm water from flowing off the road into a ditch or the forest. Berms can be formed during road grading or plowing.

Check Dam: A small dam made of small angular stones placed in steep ditches for the purposes of reducing water velocity in the ditch and trapping eroded material.

Crown: Creating a high point that runs lengthwise along the center of a road. Either side of this high point is sloped gently away from the center toward the outer edge of the road. Crowning is the quickest way to get water off the road to prevent erosion and development of potholes.

Culvert: A closed pipe or other conduit, other than a bridge, that allows water to pass under a road.

Ditch: A small, artificial channel for conveying water along the side of a road.

Erosion: The wearing away of natural (earth) and human-made (ditch, road, embankment) surfaces by the action of external forces such as water and wind.

Infiltration: Passage of water through the soil surface into the ground.

Mulch: A natural protective covering over the land surface that conserves moisture, holds soil in place, aids in establishing vegetation, and reduces temperature fluctuations. **Erosion Control Mulch** prevents erosion from steep slopes.

Plunge Pool: Also known as a **Sediment Basin**, a plunge pool is a drainage structure that collects water before it flows into a stream or lake. Plunge pools are usually located at the lowest end of a ditch. They slow runoff so that storm water flowing down a ditch has a chance to drop out its sediment before entering a stream or lake.

Turnout: Turnouts are used to direct ditch water away from the road into a vegetated buffer area or sediment basin. A turnout should have a flared end section that is level and lined with rock to spread out the flow.

Vegetated Buffer: A natural or planted area of trees, shrubs, or other vegetated ground cover located between developed areas (such as roads, driveways, or residences) and a lake or stream. These are excellent at removing sediment and nutrients from storm water runoff. A **Rain Garden** is a type of buffer that collects storm water runoff in a low area and traps contaminants.

Water Bar: Water bars can be used on roads and driveways to divert water off the surface during a storm. A water bar is a ridge (like a speed bump) that runs diagonally off the road or driveway, typically at a 30° angle. It stops water from running down the road and diverts it to the side. Common types of water bar seen on roads and driveways around Bear Pond include **Rubber Razors** and **Open-top Culverts**.

Conservation Practices for Homeowners

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

The MDEP and Portland Water District completed a series of fact sheets that answer many common how-to questions. The fact sheets profile common conservation practices and include detailed instructions, diagrams and color photos about installation and maintenance.

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 from the MDEP's *Buffer Handbook* and small color photos of each plant to make plant selection easier.


DRIPLINE TRENCH

~managing roof runoff on homes without gutters~

Also Called: Roof Dripline Trench, Infiltration Trench

Purpose: Dripline Trenches collect and infiltrate stormwater, and control erosive runoff from the rooftop. The trench will collect roof runoff and store it until it soaks into the soil. These systems will also minimize wear on your house by redirecting back splash.

Installation: Dig a trench that is 18" wide and at least 6" deep along the drip line. Slope the bottom away from the house so that water will drain away from the foundation. Make sure to dispose of the soil in a flat area where it cannot be washed into the lake. Fill the trench with ½"-1½" crushed stone. The front and sides of the trench may be edged with stone or with pressure-treated lumber to hold the stones in place.

Extend the life of the dripline trench by lining the sides with non-woven geotextile fabric and filling to within 2" of the ground level with stone. Fold a flap of non-woven geotextile fabric over the top of the trench and top off with additional stone.

Note: Dripline trenches work best in sand and gravel soils that can quickly disperse a large volume of water. They should not be used on structures with improperly sealed foundations, as flooding may result.

Materials: Crushed stone can be purchased at your local gravel pit. Other geotextiles, including landscaping weed barrier, can be substituted for smaller projects. Contact your local Soil and Water Conservation District for suppliers of non-woven geotextile fabric.

Maintenance: To maintain these structures, periodically remove accumulated debris and weeds from the surface. Trenches lined non-woven geotextile fabric will require less frequent maintenance; however, they will still clog over time and the stone will need to be removed and washed to clean out the accumulated sediment and debris.

Drip line

12" min

6" min

2" Crushed Stone

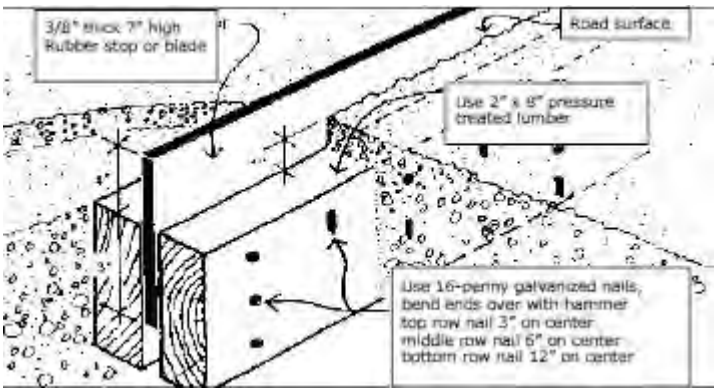
2" Crushed Stone

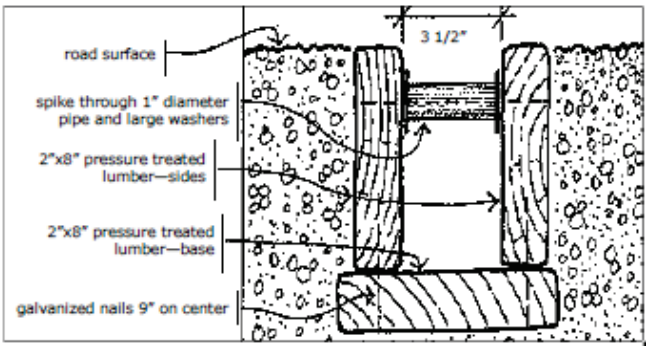
18" min

Non-woven Geotextile Fabric

Fact sheets are available to help you install conservation practices on your property. Download at http://www.maine.gov/dep/land/watershed/materials.html

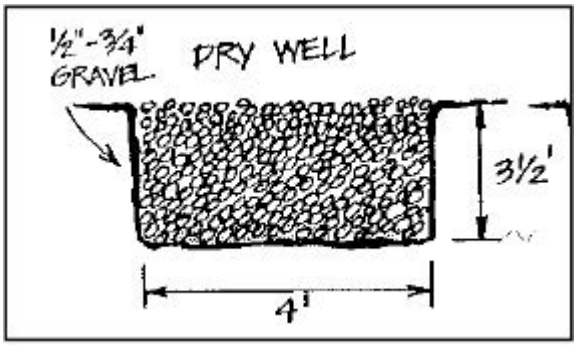
Rubber Razor—Use this structure in a gravel driveway or camp road. It can be plowed over only if the plow operator is aware of its presence and lifts the plow blade slightly. Place it at a 30 degree angle to the road edge and direct the outlet toward a stable vegetated area.





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.

Drywell—Use a drywell to collect runoff from roof gutter downspouts. Drywells can be covered with sod or left exposed for easy access and cleanout. Drywells and infiltration trenches work best in sandy or gravelly soils.



Permitting ABCs

Protection of Maine's watersheds is primarily ensured through laws and ordinances created and enforced by the State of Maine and local municipalities, as well as through the goodwill of lake residents. The following laws and ordinances require permits for activities adjacent to wetlands and water bodies.

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 Boards.

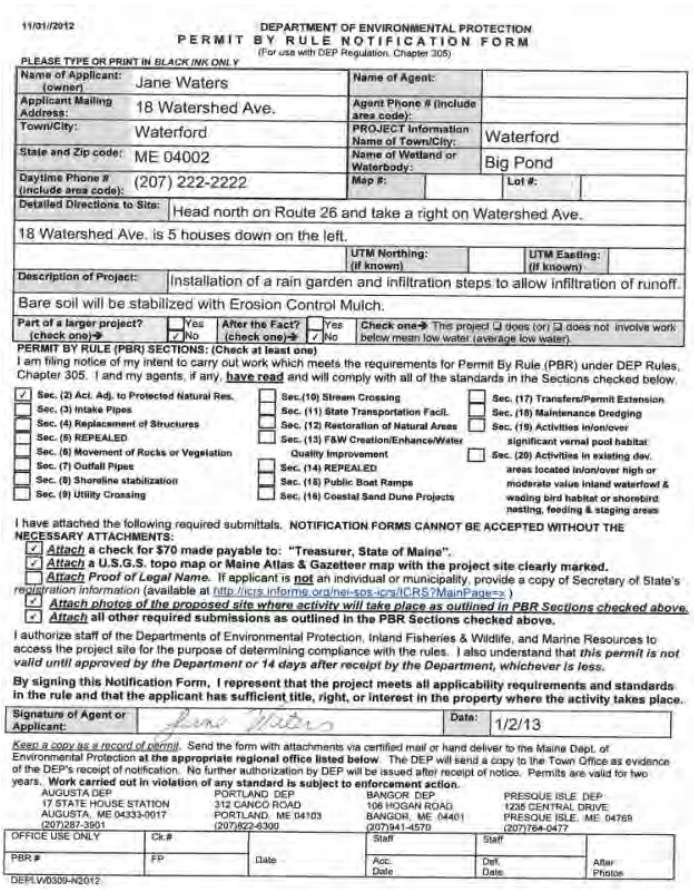
***Natural* Resources Protection Act (NRPA)—**

Soil disturbance & other activities within 75 feet of the lakeshore or tributary stream also falls under the NRPA, which is administered by the MDEP. Contact MDEP and the 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 MDEP and town to be sure.

How to apply for a Permit by Rule with MDEP—

To ensure that permits for small projects are processed swiftly, the MDEP has established a streamlined permit process called **Permit by Rule**. These one page forms (shown here) are simple to fill out and allow the MDEP to quickly review the project.

- Fill out a notification form before starting any work. Forms are available from the town code enforcement officer, MDEP offices, or online at http:// www.maine.gov/dep/land/nrpa/pbrform.pdf
- The permit will be reviewed by MDEP within 14 days. If you do not hear from MDEP 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.



11/01/2012

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)	Jane Waters	Name of Agent:	
Applicant Mailing Address:	18 Watershed Ave.	Agent Phone # (include area code):	
Town/City:	Waterford	PROJECT Information Name of Town/City:	Waterford
State and Zip code:	ME 04002	Name of Wetland or Waterbody:	Big Pond
Daytime Phone # (include area code):	(207) 222-2222	Map #: / Lot #:	
Detailed Directions to Site:	Head north on Route 26 and take a right on Watershed Ave.		
18 Watershed Ave. is 5 houses down on the left.			
		UTM Northing: (if known) / UTM Easting: (if known)	
Description of Project:	Installation of a rain garden and infiltration steps to allow infiltration of runoff.		
Bare soil will be stabilized with Erosion Control Mulch.			
Part of a larger project? (check one)→	☐ Yes ☑ No	After the Fact? (check one)→	☐ Yes ☑ No
Check one→ This project ☐ does (or) ☐ does not involve work below mean low water (average low water).			

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

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

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

- ☑ *Attach* a check for $70 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 Proof of Legal Name*. If applicant is not an individual or municipality, provide a copy of Secretary of State's registration information (available at http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x)
- ☑ *Attach photos of the proposed site where activity will take place as outlined in PBR Sections checked above.*
- ☑ *Attach* all other required submissions as outlined in the PBR Sections checked above.

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

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

Signature of Agent or Applicant:	Jane Waters	Date:	1/2/13

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

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

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

DEP/LW0309-N2012

Where to Go For More Information

Oxford County Soil & Water Conservation District

17 Olson Rd. Ste 3
South Paris, ME 04281
207-743-5789 X101

Michele Windsor, Project Manager
michele.windsor@me.nacdnet.net

Oxford County SWCD is an agency of the state of Maine that provides conservation education and technical assistance to landowners in Oxford County to help prevent erosion, conserve natural resources and protect water quality.

Lakes Environmental Association

230 Main Street
Bridgton, ME 04009
207-647-8580

Colin Holme, Assistant Director
colin@leamaine.org
www.mainelakes.org

LEA is a non-profit, membership organization. Programs include water testing on 37 lakes and ponds, technical assistance to landowners and contractors in preventing erosion, watershed education programs, invasive plant prevention, and GIS mapping for town comprehensive planning.

Fiddlehead Environmental Consulting

P.O. Box 783
Harrison, ME 04040
207-627-3126

Jeff Stern, Watershed Specialist
sternjm@hotmail.com

Fiddlehead Environmental Consulting assists property owners, lake and river protection associations, and towns, with watershed planning and survey work, reports, water quality testing, environmental education, training, and grant writing.

Maine Department of Environmental Protection

17 State House Station
Augusta, ME 04333
207-215-3461
1-888-769-1036 (toll free)

Kristin Feindel, Watershed Manager
kristin.b.feindel@maine.gov
www.maine.gov/dep

MDEP provides technical assistance, reference materials, permitting, environmental education, project funding opportunities, and stewardship activities for streams, lakes and marine waters.

Portland Water District

1 White Rock Road
Standish, ME 04084
207-523-5405

Brie Holme, Water Resources Specialist
bholme@pwd.org
www.pwd.org

The Portland Water District provides drinking water from Sebago Lake to more than 200,000 people in southern Maine. PWD supports surveys and erosion control activities in areas that supply Sebago Lake, which includes the Bear Pond Watershed.

Maine Nonpoint Source Training and Resource Center

17 State House Station
Augusta, ME 04333
207-287-7726

Bill Laflamme
william.n.laflamme@maine.gov
www.maine.gov/dep/land/training

Offers courses in erosion control for contractors, including a primer and exam for Certified Professional in Erosion and Sediment Control, camp road maintenance, and storm water management.