

McWAIN POND WATERSHED SURVEY



**Lakes Environmental Association
McWain Pond Association
Maine Department of Environmental Protection**

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Acknowledgments

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

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Cover photo of McWain Pond taken by Colin Holme.
Photo on Table of Contents page taken by Steve Edwards.



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1 Introduction

Is there a water quality problem in the McWain Pond Watershed?

McWain Pond – also known as Long Pond – lies nestled in the hills of Waterford in Oxford County, Maine. McWain Pond’s watershed sprawls across 3.9 square miles, and is an important asset to the quality of life and economy in Waterford. The shoreline is fringed with 75 seasonal and year-round residences. Two summer youth camps, Camp Waziyatah and Birch Rock Camp, annually attract 215 and 78 campers, respectively. McWain Pond drains to the Crooked River which flows to Sebago Lake. Sebago Lake is the public drinking water source for more than 190,000 people in southern Maine.

Since 1978, Lakes Environmental Association (LEA), the Maine Department of Environmental Protection (MDEP) and the McWain Pond Association (MPA) have monitored water quality in McWain Pond. Testing has found bottom waters are experiencing oxygen depletion. Analysis of a lake bottom core in 2006 found a high percentage of organic matter in the sediments indicating excess algae growth. In addition to habitat degradation, prolonged periods of low oxygen often result in phosphorus being re-suspended in the water column from the bottom sediments. This cycle can cause rapid algae growth and a dramatic drop in water quality.

Based on observations at other Maine lakes, these conditions forecast a future decline in water quality. MDEP placed McWain Pond on its list of *Nonpoint Source Priority Watersheds*. The biggest culprit is **nonpoint source pollution** found in storm water runoff, from rain and snowmelt, and soil erosion (see box). During and after storms, soil washes into lakes from the surrounding landscape via streams, ditches and overland flow; **phosphorus** attaches to soil particles. Toxic chemicals are also carried in storm water runoff.



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.

treatment the forest once provided.

Phosphorus attached to soil in runoff can be bad news for lakes. Phosphorus is a plant nutrient common on land but naturally limited in Maine’s lakes and ponds and is a favorite food of **algae**.

When lakes and ponds receive extra phosphorus from the watershed, algae increases dramatically. Sometimes algae growth explodes into 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 and ponds.

WATERSHED

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

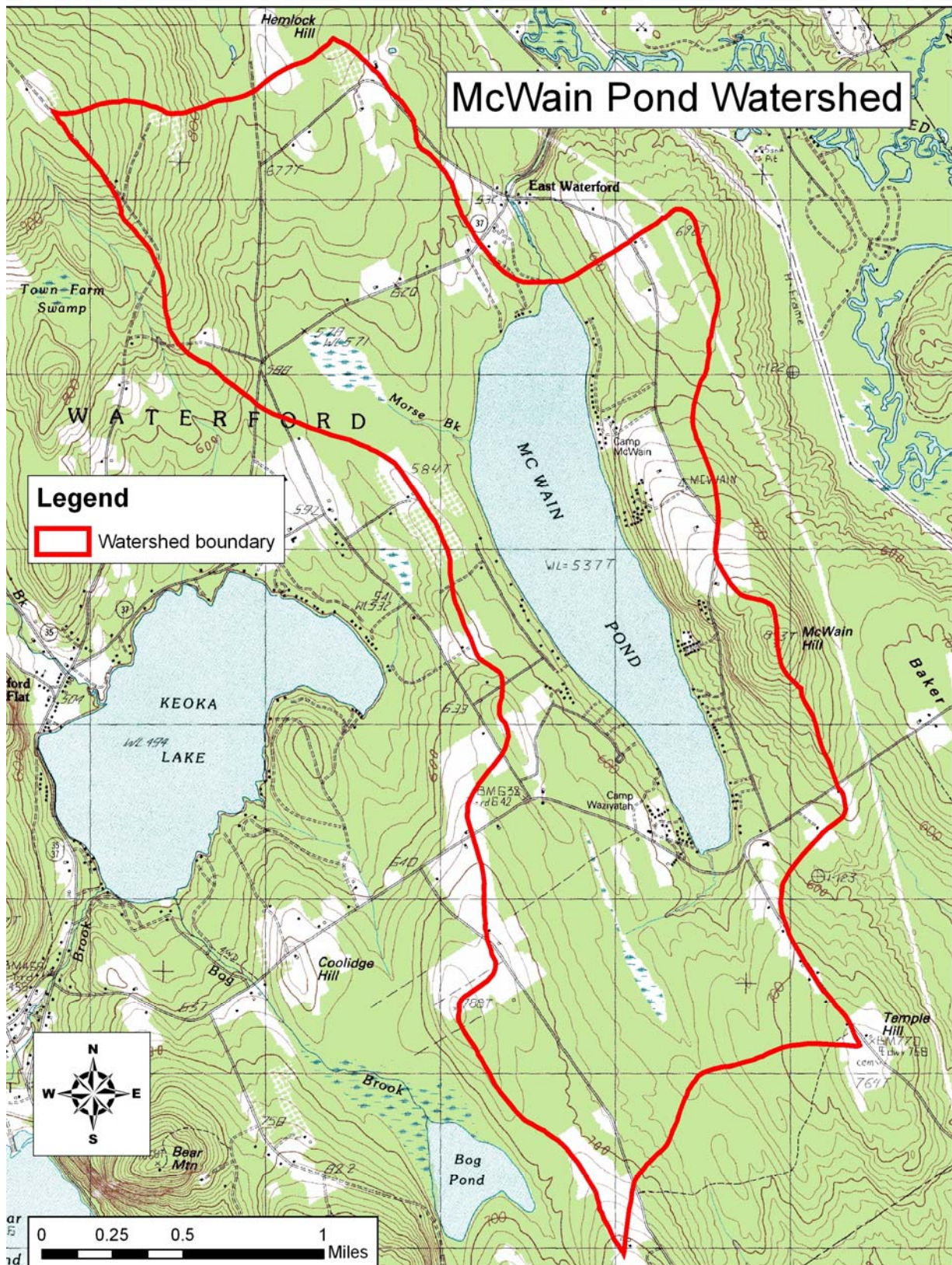
The McWain Pond Watershed is 3.9 square miles (Figure 1).

In an undeveloped, forested watershed, storm water runoff is slowed and filtered by trees, shrubs and other vegetation. It then filters through the soil and soaks into the uneven forest floor. But in *developing* watersheds, the velocity of runoff increases on impervious surfaces like rooftops, compacted and bare soil, gravel roads and pavement, and does not receive the filtering



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

Figure 1



Why is it important to protect the McWain Pond Watershed from polluted runoff?

- ◊ McWain Pond provides recreational opportunities to watershed residents and to visitors. It is an important contributor to the local economy.
- ◊ McWain Pond contains 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 landowners as well as the tax revenue of the entire community.
- ◊ Once a lake experiences water quality problems, it can be difficult or impossible to restore.



What is being done to protect the McWain Pond Watershed?

Lakes Environmental Association and the McWain Pond Association test water quality in McWain Pond as part of the Maine Volunteer Lake Monitoring Program. Both associations also work with agencies and watershed residents to promote environmental stewardship.

Volunteer watershed surveys have been found to be one of the most effective ways to protect lake water quality by getting citizens involved in identifying existing and potential sources of polluted runoff. During the spring and summer of 2006, Lakes Environmental Association and the McWain Pond Association worked with the Maine Department of Environmental Protection to conduct a watershed survey.

This report is specifically designed for citizens living in the McWain Pond Watershed. It contains a summary of the survey findings and recommendations to protect the health of the lake.

LEA and MPA applaud the erosion control efforts which watershed landowners have already undertaken to protect McWain Pond. An excellent example of stewardship is featured on page 12 of this report.

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 McWain Pond Watershed. However, of equal importance was to:

- Raise public awareness of the connection between land use and water quality, and the impact of polluted runoff.
- Inspire people to become active stewards of the watershed.
- Use the information gathered as one component of a long term 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 McWain Pond Association, 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.



Numerous 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.

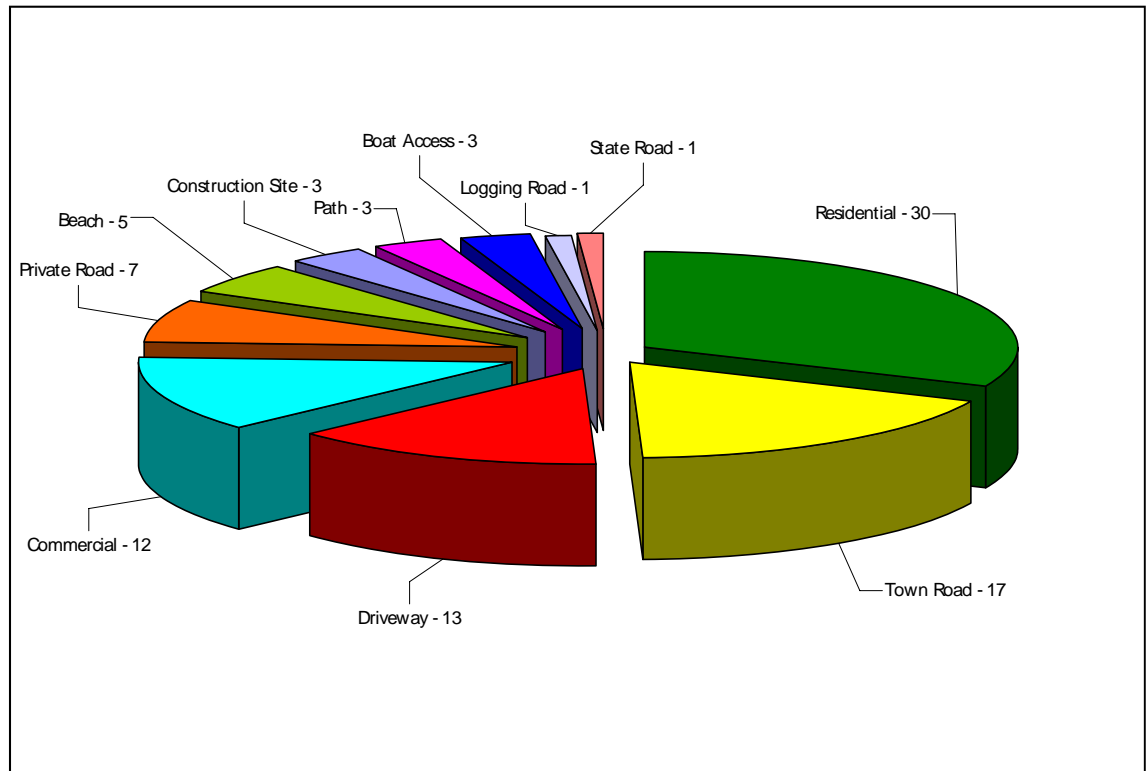
Buffers can be installed inexpensively. You can either stop mowing, stop raking to the water's edge and let plants grow up naturally (as in the picture on the right). Or you can plant the area with native trees and shrubs.

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



Watershed Survey Findings

Volunteers and technical staff identified **95 sites** that may have an impact on McWain Pond.



Statistics

Sites by Land Use:

Residential	30
Town Road	17
Driveway	13
Commercial	12
Private Road	7
Beach	5
Construction site	3
Path	3
Boat Access	3
Logging Road	1
State Road	1
TOTAL	95

Sites by Sector:

Sector 1	3
Sector 2	13
Sector 3	16
Sector 4	40
Sector 5	23
TOTAL	95

Sites by Impact:

High	7
Medium	32
Low	56
TOTAL	95

A total of 11 land uses were associated with the identified sites. Detailed descriptions of **residential, town road, driveway, commercial, private road, boat access** and **beach** sites are on the following pages.

Residential

Of the 30 sites associated with residential areas, 20 were low impact, 9 were medium and 1 was high. Most can be fixed with little technical expertise and at low cost.

Common Problems Identified:

- Slight or moderate surface erosion
- Bare or sparsely vegetated soil
- Inadequate vegetation along shoreline
- Roof runoff causing erosion
- Direct flow of runoff to lake
- No erosion control at construction sites

Recommended Solutions:

- Seed and mulch bare soil
- Establish or enhance buffer
- Limit foot traffic in eroding areas, place mulch or stone on heavily used paths
- Use dripline trench to catch roof runoff
- Install waterbar, open-top culvert, rubber razor or other runoff diverters



Problems:

- No erosion control at construction site
- Bare soil with potential erosion to the pond

Solutions:

- Properly install and maintain erosion control measures such as silt fence
- Seed and mulch bare areas

Problems:

- Lack of buffer along shoreline
- Bare soil with direct flow to pond
- Roof runoff causes erosion

Solutions:

- Establish buffer along shoreline
- Seed and mulch bare areas
- Install dripline trench to catch roof runoff



Residential areas were associated with 32% of the identified sources of polluted runoff to McWain Pond. These problems pose a significant threat to water quality. Fortunately most can be corrected with easy fixes.

Town Roads

17 town road sites were found. Of these sites, 8 were low impact, 4 were medium, and 5 were high.

Common Problems Identified:

- Slight to moderate shoulder erosion
- Severe ditch erosion
- Direct flow of sediment to stream or ditch
- 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

Problems:

- Winter sand runs off shoulder
- Bare soil on ditch backslope
- Ditch poorly shaped
- Direct flow of sediment to stream
- Runoff from shoulder and unstable culvert outlet



Solutions:

- Install plunge pool to catch winter sand and eroding soil before it enters stream
- Reshape ditch
- Vegetate bare backslope
- Install rock or plant grass to stabilize ditch
- Armor culvert outlet
- Lengthen culvert to allow gentler slope for shoulder and plant grass or shrubs on bare soil

Working with the Town of Waterford to fix and maintain town road sites will improve water quality by keeping eroding soil out of McWain Pond.

Driveways

13 driveway sites were found. Of these sites, 11 were low impact and 2 were medium. Most of these sites can be fixed with low to medium cost and technical expertise.

Common Problems Identified:

- Moderate to severe surface erosion
- Poor shaping
- Direct flow of sediment to ditch, tributary or McWain Pond
- Poor surface material (too sandy)

Recommended Solutions:

- Crown driveway so that water flows to buffer on either side
- Build up driveway with cohesive surface material
- Install diverters such as waterbars, open-top culverts or rubber razors to get water off driveway

Problems:

- Berm keeps water on driveway where it can erode surface
- Poor shaping causes water to concentrate which forms ruts
- Direct flow of sediment to tributary

Solutions:

- Add new surface material
- Reshape driveway so water moves quickly from the surface
- Install diverters such as waterbars, open-top culverts or rubber razors to move water off driveway
- Remove berm



To preserve water quality and save wear and tear on your vehicle, crown the driveway, use adequate surface material and add diversions to direct runoff into buffers.

It's great for watershed residents and it's great for McWain Pond!

Commercial

12 commercial sites were found. Of these sites, 5 were low impact, 6 were medium, and 1 was high. About half of these sites involve easy, low cost fixes.

Common Problems Identified:

- Slight to moderate surface erosion
- Bare soil
- Direct flow of sediment to McWain Pond or tributary
- Minimal vegetated buffer along shoreline
- Heavy foot traffic

Recommended Solutions:

- Establish or enhance buffer
- Seed and mulch bare soil
- Turn out runoff into vegetated buffer
- Define pathway and reinforce heavily trafficked areas with bark mulch or stone steps
- Create winding pathway to replace path that heads directly to pond

Problems:

- Exposed roots and soil indicate erosion
- Heavy foot traffic
- Lack of buffer along shoreline
- Pine needles are better than bare soil at preventing erosion but only offer minimal protection. Don't rake!

Solutions:

- Confine and define winding pathway
- Establish buffer along shoreline
- In areas of heavy foot traffic, reinforce pathway with bark mulch or stone steps
- Seed and mulch soil to minimize bare areas



DID YOU KNOW?...

Even the most ambitious erosion control efforts may fail over time if they are not properly maintained. Periodic inspection and upkeep is necessary to make sure erosion controls remain effective.

Protecting McWain Pond makes good business sense!

Private Roads

7 private road sites were found. Of these sites, 5 were low impact and 2 were medium. All of these sites can be fixed with low to medium cost and technical expertise.

Common Problems Identified:

- Poor shaping
- Slight to moderate surface erosion
- Direct flow of sediment to McWain Pond or tributary
- Severe ditch erosion

Recommended Solutions:

- Reshape road (crown or monoslope) to allow it to shed water
- Install waterbars, open-top culverts or rubber razors to divert flow off road
- Clean, reshape and armor ditches with stone rip-rap or plant grass

Problems:

- Ruts trap water in road which allows surface erosion to occur
- Poor shaping

Solutions:

- Crown road in middle
- Install waterbars, open-top culverts or rubber razors to divert flow off road and into buffer



Unpaved roads are a big source of pollution to Maine lakes. Doing it right the first time will save money in the long run by reducing water pollution and maintenance costs on your road, ditches and vehicle.

Remember...

It is the cumulative impact of all small, medium and large erosion sites that causes problems in the watershed.

Boat Access & Beach

5 beach sites were found. Of these sites, 1 was low impact and 4 were medium. 3 boat access sites were found. Of these sites, 1 was low impact and 2 were medium.

Common Problems Identified:

- Shoreline erosion
- Bare soil
- Slight surface erosion
- Inadequate shoreline vegetation

Recommended Solutions:

- Establish or enhance buffer
- Seed and mulch bare soil to minimize bare areas
- Stabilize eroding beach area

Beach



Problems:

- Collapsing shoreline
- Lack of vegetation

Solutions:

- Plant buffer above collapsing rock wall to stabilize shoreline

Boat Access



Problems:

- Direct flow of sediment to pond
- Lack of vegetation
- Slight surface erosion

Solutions:

- Minimize exposed soil
- Define and narrow boat launch area
- Establish and enhance buffer
- Install waterbars or open-top culverts to divert runoff into buffer

Important Points!

- ◊ A full summary of all erosion sites identified in the survey are contained in a spreadsheet 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. 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 McWain 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 McWain 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 even if the site is large or a small site with no evidence of rills or gullies (channels cut into the soil). 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 a stream, lake 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.

A Case Study in Erosion Control

McWain Shores is a settlement of about 40 individually-owned residences on the western shore of McWain Pond. The community has a management committee for its North and South beaches. Both beaches were established 30 years ago as recreational facilities for residents and their guests.

The beaches have sandy areas for children, picnic tables, boat racks, grass and moss. It has been a challenge to keep sand from washing into the pond. The watershed survey found both beaches present “medium” erosion impacts to McWain Pond. In the past, sand was added to replace eroded material. McWain Shores residents recognize this practice is no longer allowed by state law and has, perhaps, contributed to the degradation of the pond.

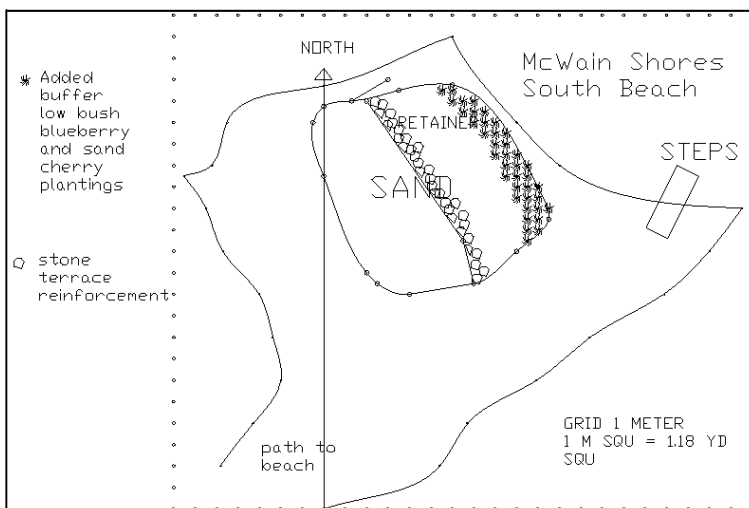


McWain Shores South Beach in May 2006.

The management committee’s objective is to reduce the environmental impact of the beaches while retaining traditional activities. To start with, the committee evaluated South Beach, prepared a design and consulted with Waterford’s code enforcement officer, LEA and MDEP. The accepted design (see sketch below) includes reinforcement of the retaining wall, which is rotting in places, and buffer enhancement.

The untreated wooden retaining wall will be repaired and raised slightly to hold sand back better. The retaining wall will be reinforced with a layer of fabric and rock (fitted to minimize exposed jagged edges). Work will begin in Spring 2007.

In addition, the shore buffer, currently subject to erosion during spring melt and torrential rains, will be widened by adding a band of low bush blueberry and eastern sand cherry. Both species are native, hardy, attractive and relatively unobtrusive. Mulch will be added to stabilize the plantings. The area of bare soil adjacent to the shore will be minimized. All these measures should significantly reduce sand movement from the upper sandy area to the pond.



In the near future, the management committee will provide information on the various options and approximate costs for improving North Beach. At the time of publication of this report, a preliminary plan has already been completed at North Beach.

Thank you Earl Morse for providing the text and sketch for this page!

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 the lakes. Detain runoff in depressions or divert flow to vegetated areas. Call LEA or MDEP for free technical assistance.
- ◊ 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. Use erosion control around construction projects which involve excavation.
- ◊ Don't bring in sand or rebuild beaches. Call 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.
- ◊ Join the MPA and LEA. MPA's purpose is to protect the pond. LEA conducts water testing and provides erosion control assistance land owners and the town.

McWain Pond Association

- ◊ Develop an active membership, provide educational materials and guidance to members of the McWain 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 about pond issues and work cooperatively to find solutions.

Road Associations and Private Roads without associations

- ◊ Form a road association if one does not already exist to properly maintain your road and reduce erosion.
- ◊ Minimize road runoff by doing regular, comprehensive maintenance.
- ◊ Decrease water velocity in steep ditches by installing check dams.
- ◊ Get a copy of "*Camp Road Maintenance Manual – A Guide for Landowners.*" This reference is a must for anyone managing a gravel road. (Call MDEP at 207-822-6300 to order a free copy.)
- ◊ For more extensive problems, seek technical help. Contact LEA, Fiddlehead Environmental Consulting or MDEP to request technical assistance. Contact information is on back page of this report.

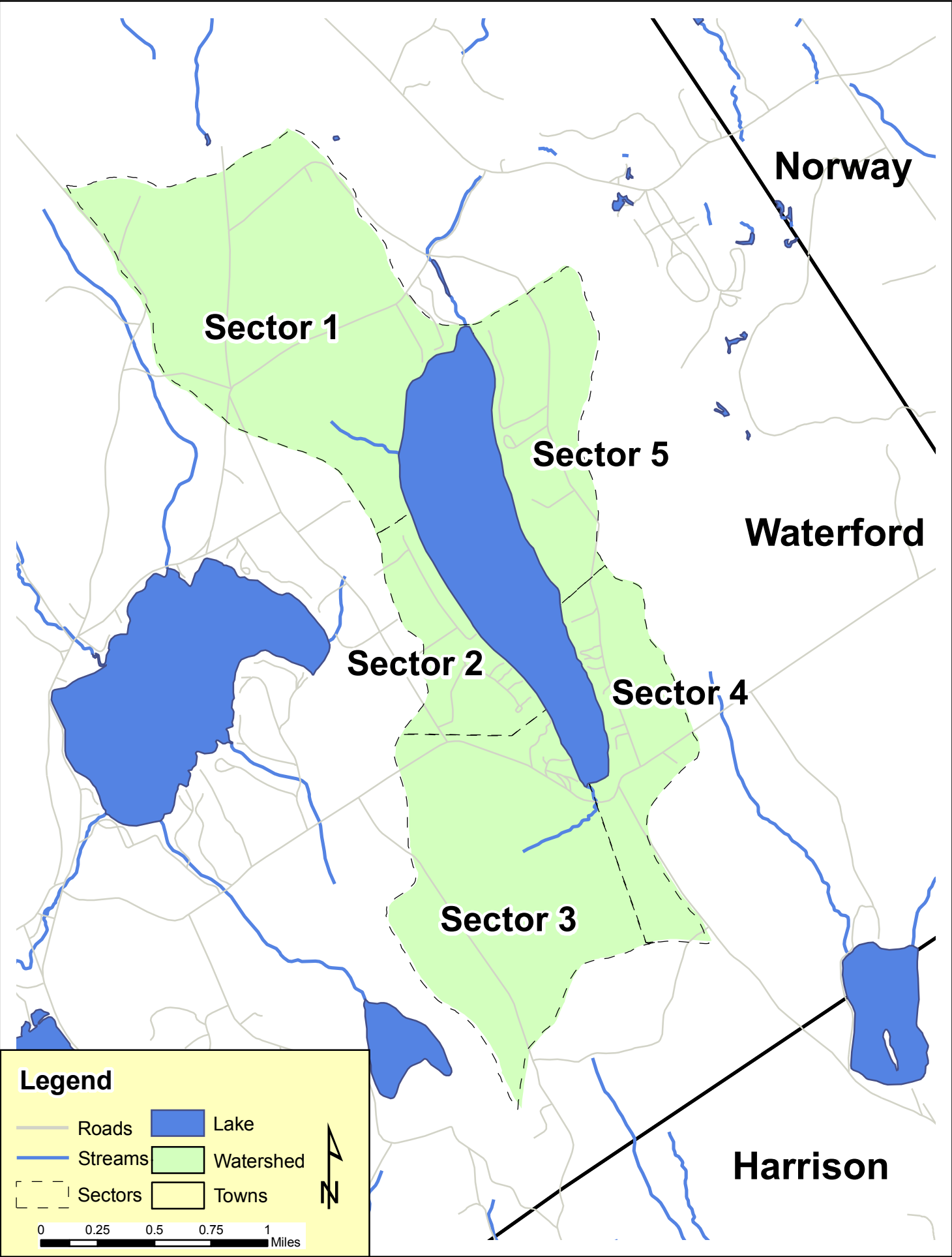
Municipal Officials

- ◊ Enforce shoreland zoning standards to assure full protection of McWain 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, planning boards and conservation commissions.
- ◊ Decrease water velocity in steep road ditches by installing check dams.

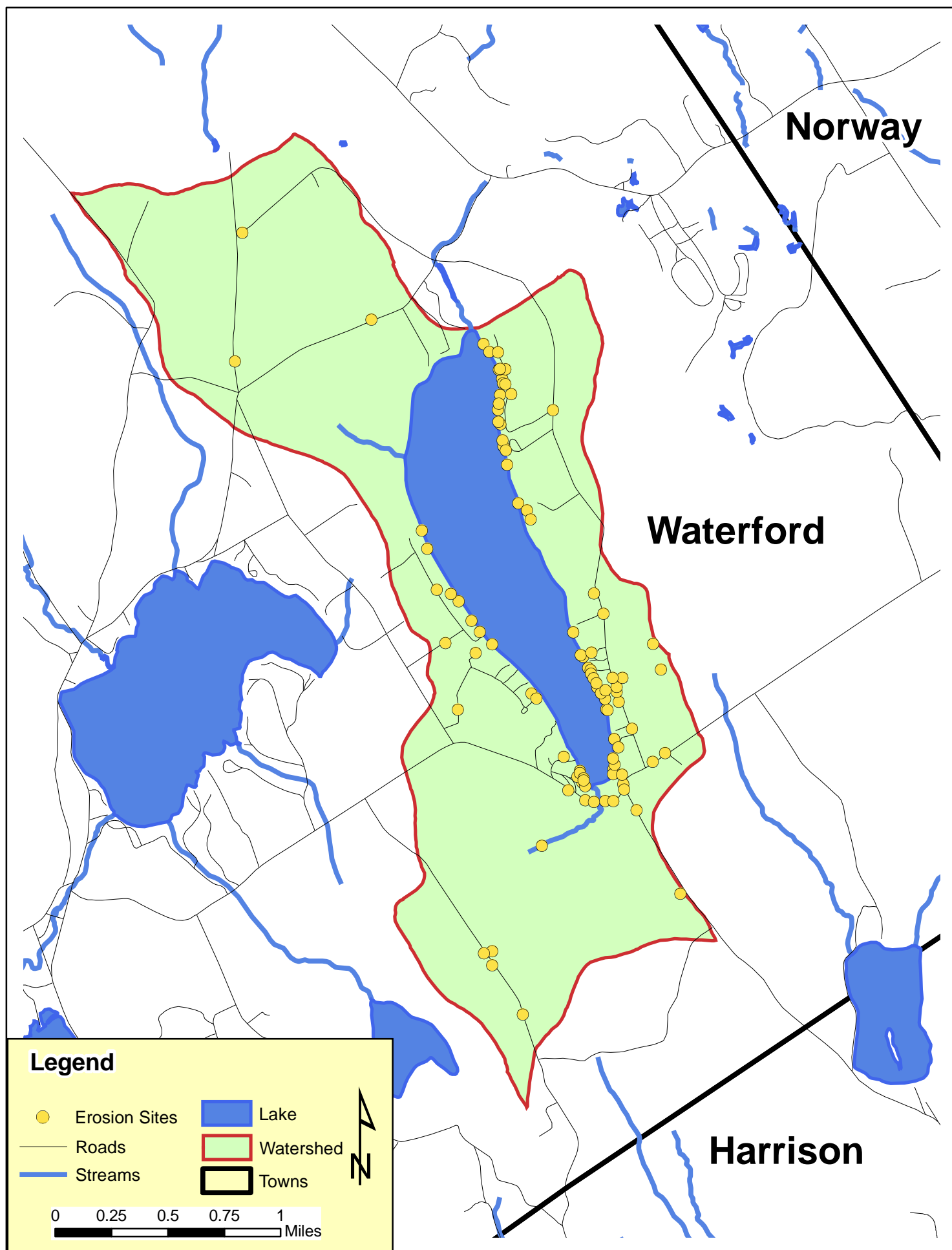
Appendix

- Map of Survey Sectors (Figure 2)
- Site Location Maps
- Spreadsheet
- Conservation Practices for Homeowners
- Permitting ABCs
- Where To Go For More Information

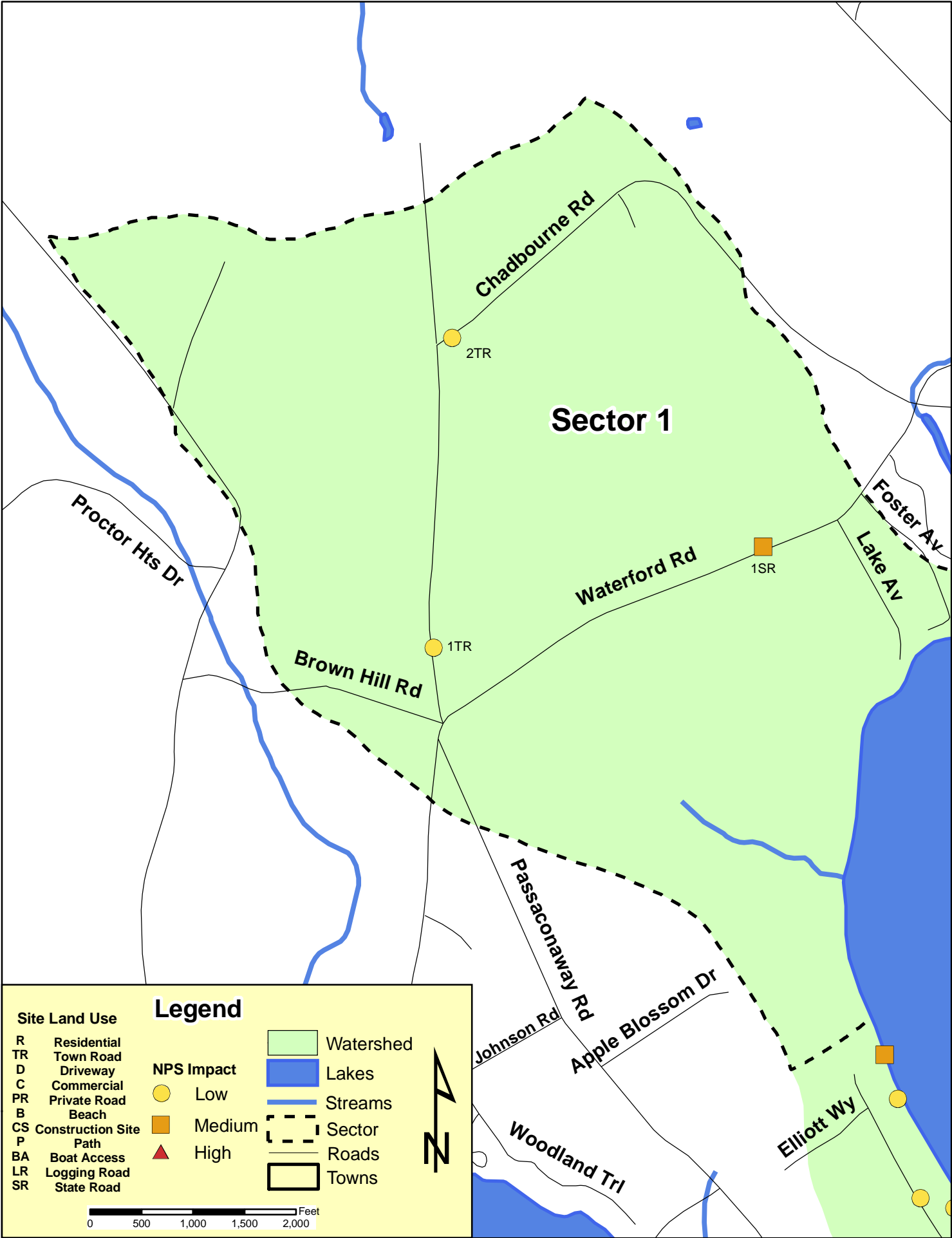
Figure 2. McWain Pond Survey Sectors



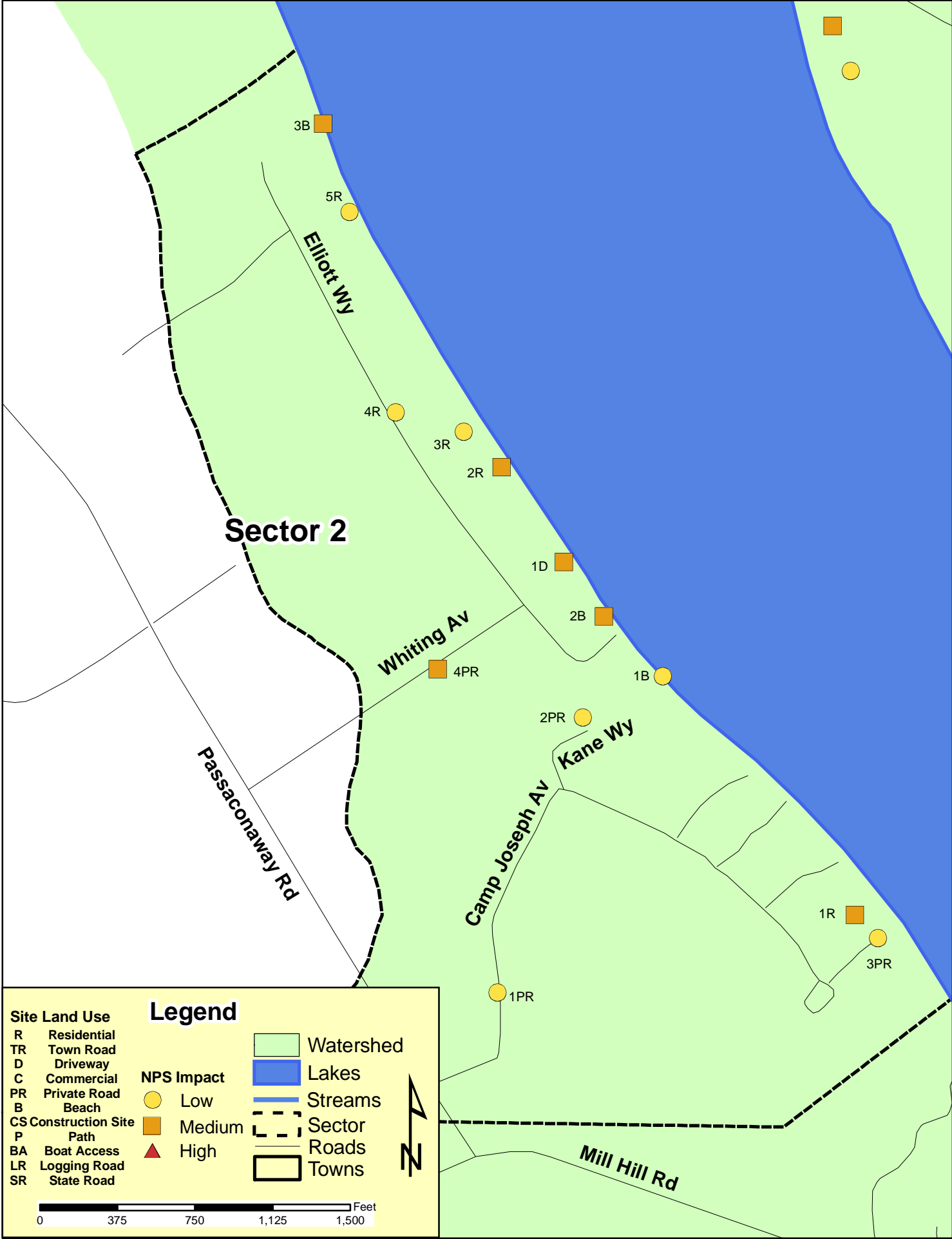
McWain Pond Watershed Erosion Sites



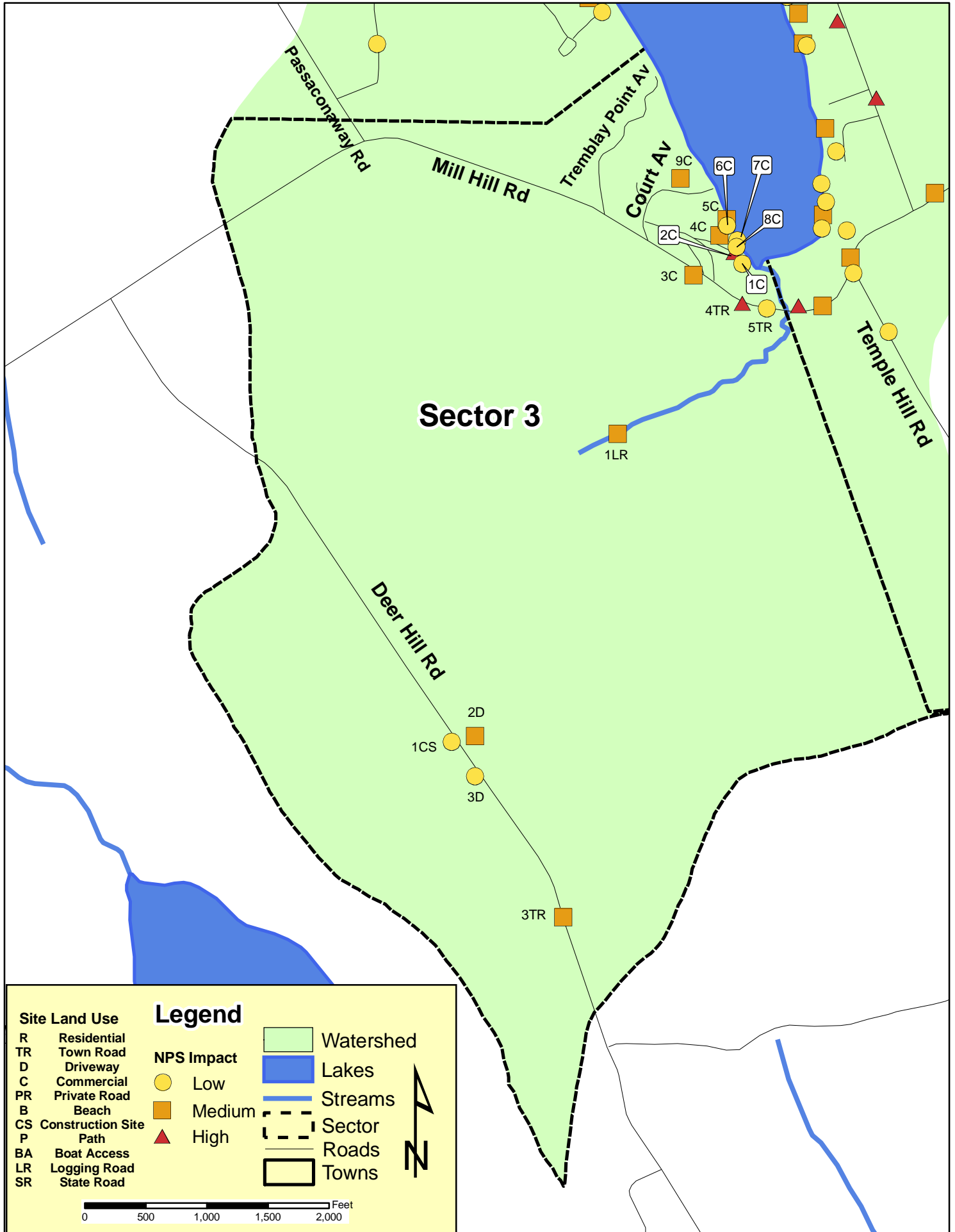
McWain Pond Watershed Sector 1



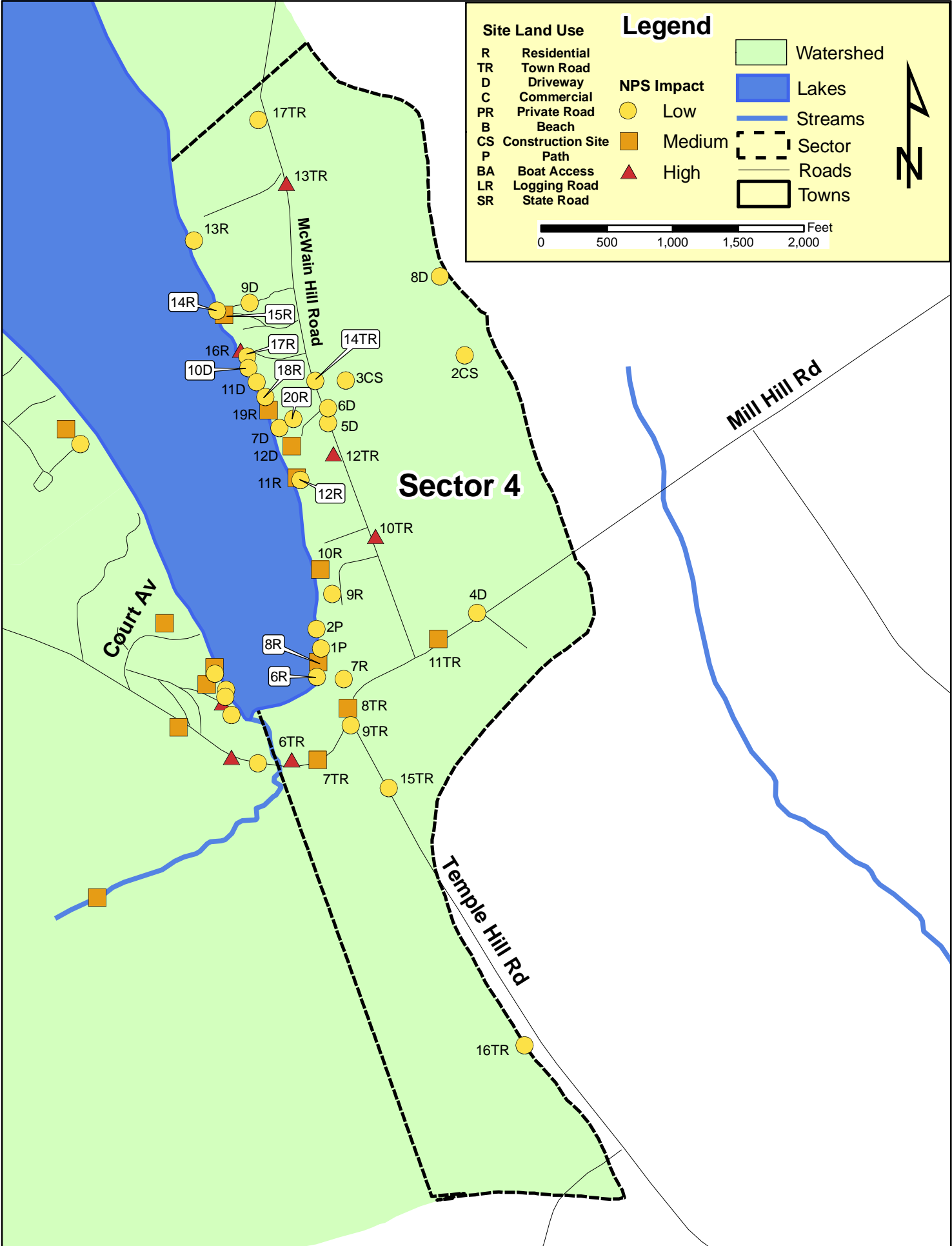
McWain Pond Watershed Sector 2



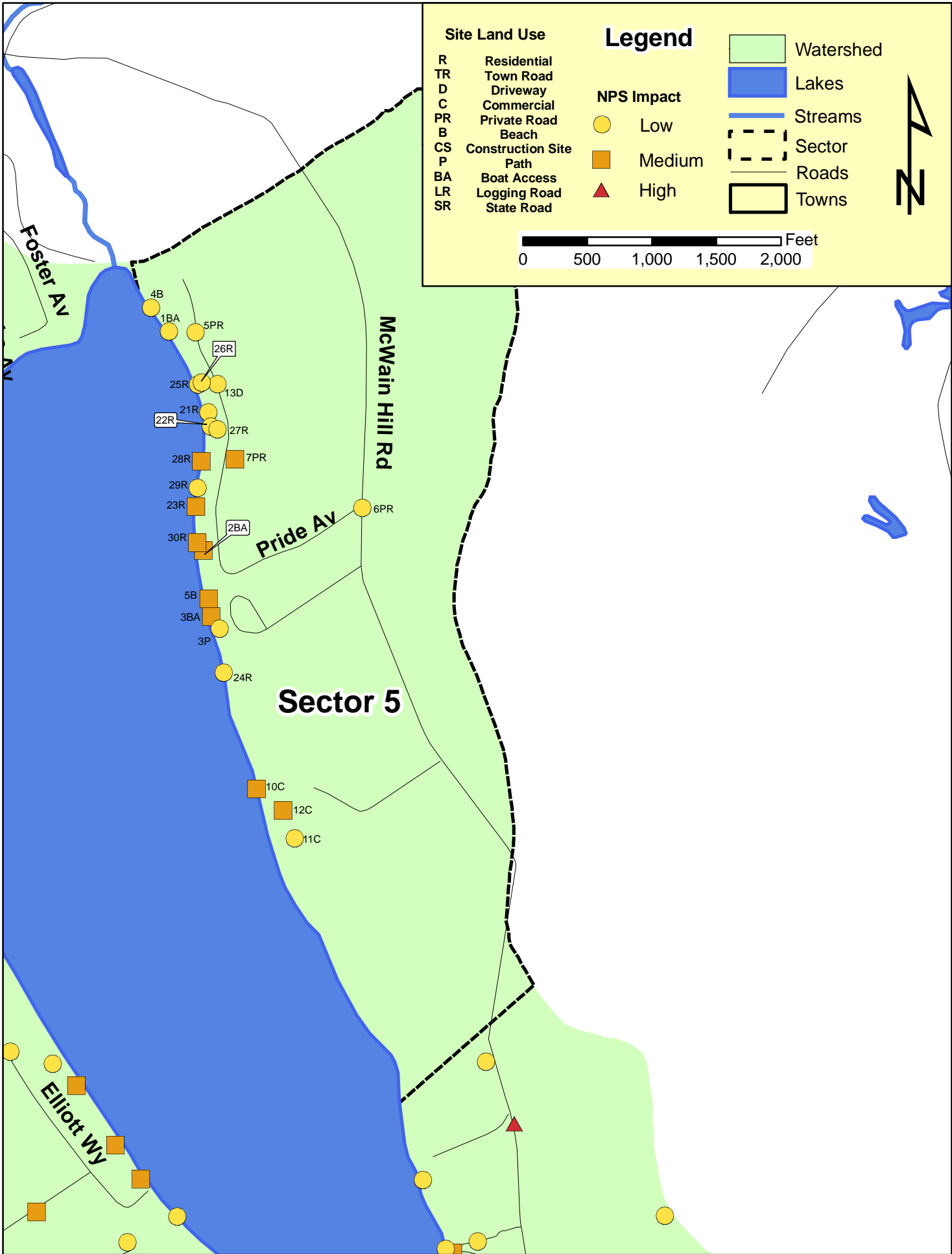
McWain Pond Watershed Sector 3



McWain Pond Watershed Sector 4



McWain Pond Watershed Sector 5



McWain Pond Watershed Survey Spreadsheet

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
1	1 TR	Town Road	Slight surface erosion, unstable culvert inlet and outlet, grader berm, delta in stream, direct flow to stream.	First major culvert on Chadbourne Road. 19T 0364001 4895524	36' x 6' on both sides of road	Armor culvert inlet and outlet, remove grader berm.	Low	Low
1	2 TR	Town Road	Slight surface erosion, unstable culvert inlet and outlet, undersized ditch (no ditch on one side), grader berm, delta in stream, direct flow to stream.	Chadbourne Road @ pole #22. 19T 0364056 4896442	36' x 6' on both sides of road.	Armor culvert inlet and outlet, reshape ditch.	Low	Low
1	1 SR	State Road	Unstable culvert inlet and outlet, severe shoulder erosion, winter sand, direct flow to stream.	Route 37 in front of mailbox #1134. 19T 0364977 4895822	150' x 6'	Armor inlet of culvert that goes across driveway at mailbox #1134, install plunge pool, install check dams in ditch.	Medium	Medium
2	1 PR	Private Road	Ditch bank failure.	Camp Joseph Road, ditch after first home. 19T 0365594 4893037	200'	Reshape and vegetate ditch.	Low	Medium
2	2 PR	Private Road	Slight surface erosion and tire ruts.	Camp Joseph north road. 19T 0365720 4893442	75' x 10'	Add new surface material (gravel), reshape and grade road.	Low	Medium
2	1 B	Beach	Slight surface erosion, direct flow to lake.	Camp Joseph beach. 19T 0365838 4893503	40' x 12'	Apply mulch/erosion control mix, establish buffer.	Medium	Low
2	1 R	Residential	Slight surface erosion from construction, no erosion control.	Camp Joseph Road 19T 0366121 4893151	50' x 20'	Apply mulch, install silt fence.	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
2	3 PR	Private Road	Slight surface erosion – rutted road.	Access below turnaround. 19T 0366155 4893117	200' x 2'	Add new surface material (gravel), reshape and crown road, install water bar, rubber razor or open top culvert.	Low	Medium
2	4 PR	Private Road	Slight surface erosion, clogged culvert, moderate road shoulder erosion.	Whiting Ave. @ utility pole 20.4. 19T 0365394 4897446	45' x 1'	Unclog culvert, install turnouts and check dams, reshape (crown) and grade road.	Medium	Medium
2	2 B	Beach	Bare sand, inadequate shoreline vegetation, shoreline erosion, direct flow to lake.	McWain Shores south beach. 19T 0365807 4893648	25' x 25'	Enhance buffer, minimize bare area, install water retention swales or infiltration steps.	Medium	Medium
2	1 D	Driveway	Moderate surface erosion, erosion from new fill around wellhead.	Elliott Way @ CMP pole #20. 19T 0365692 4893671	20' x 20'	Vegetate driveway shoulder, install water bar, apply mulch/erosion control mix on eroding area.	Medium	Low
2	2 R	Residential	Lack of shoreline vegetation, inadequate shoreline vegetation, direct flow to lake.	Elliott Way @ pole # 24. 19T 0365600 4893811	100' x 50'	Establish and enhance buffer.	Medium	Medium
2	3 R	Residential	Slight surface erosion, lightly mulched bare soil.	39 Elliott Way. 19T 0365544 4893863		Apply mulch/erosion control mix, enhance buffer.	Low	Low
2	4 R	Residential	Slight surface erosion, bare soil fertilized within 75' of lake, direct flow to lake.	41 Elliott Way. 19T 0365444 4893892 (GPS readings taken at top of driveway)	75' x 40'	Establish and enhance buffer, no raking.	Low	Low
2	5 R	Residential	Moderate surface erosion, roof runoff, direct flow to lake.	81 Elliott Way. 19T 0365376 4894187	30' x 50'	Install infiltration trench and runoff diverter(s).	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
2	3 B	Beach	Moderate surface erosion, bare soil, shoreline erosion, retaining wall inadequate, direct flow to lake.	McWain Shores north beach. 19T 0365337 4894317	35'	Enhance buffer, strengthen retaining wall and/or build terraces, reduce bare area.	Medium	Medium
3	3 TR	Town Road	Unstable culvert inlet and outlet, moderate ditch and road shoulder erosion, grader berm.	Deer Hill Road @ pole #528. 19T 0366058 4890859		Armor culvert inlet and outlet, vegetate ditch, remove grader berm, vegetate shoulder.	Medium	High
3	2 D	Driveway	Slight surface erosion.	185 Deer Hill Road. 19T 0365780 4891297	90'	Add new surface material (gravel) and crown.	Low	Low
3	1 C	Commercial	Slight surface erosion, exposed roots, direct flow to lake.	Camp Waziyatah amphitheater. 19T 0366505 4892489	75'	Define foot path, apply mulch/erosion control mix.	Low	Low
3	4 TR	Town Road	Unstable culvert inlet and outlet, severe ditch erosion, ditch bank failure, slight road shoulder erosion, direct flow to stream.	Mill Hill Road and cross-culvert @ pole #89. 19T 0366505 4892390	343'	Armor culvert inlet and outlet, vegetate ditch or armor it with stone, reshape ditch, install check dams.	High	High
3	5 TR	Town Road	Severe ditch erosion, ditch bank failure, bare soil.	Mill Hill Road @ pole #90 downhill to turnout near Waziyatah Brook. 19T 0366633 4892381	200' x 4'	Vegetate and reshape ditch, maintain turnout near Waziyatah Brook to keep sediment from entering brook.	Low	Low
3	1 LR	Logging Road	Moderate surface erosion, clogged stream passage under slab bridge, direct flow to stream.	Old road behind Camp Waziyatah rifle range. 19T 0366194 4892065	10' x 300'	Unplug stream passage under slab bridge and install culvert, reshape (crown) road, install runoff diverters (water bars).	Medium	High
3	2 C	Commercial	Moderate surface erosion, crushed culvert, direct flow to lake. (This site linked to 4 C)	Camp Waziyatah on side of theater building (gym). 19T 0366484 4892516	25' x 16'	Replace culvert, reshape (crown) road, install catch basin and runoff diverter(s).	High	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
3	3 C	Commercial	Moderate surface erosion. (Owner reports driveway washouts here are a recurring problem. Linked to 4 TR)	Camp Waziyatah stables. 19T 0366383 4892460	200' x 14'	Add new surface material, install two rubber razors (one by gate, the other ½ way down driveway), install rain garden.	Medium	Medium
3	4 C	Commercial	Moderate to severe surface erosion, delta in stream, direct flow to stream. (Site linked to 2 C)	Main driveway into Camp Waziyatah. 19T 0366448 4892559	175' x 33'	Install rubber razor(s) to divert flow into buffer, buildup log berm at bottom.	Medium	Medium
3	5 C	Commercial	Moderate surface erosion, bare soil, inadequate shoreline vegetation, direct flow to lake.	Camp Waziyatah slope to water skiing area (near office). 19T 0366466 4892599	25' x 40'	Define foot path, install infiltration steps, apply mulch/erosion control mix, establish buffer, rebuild retaining walls by benches.	Medium	Medium
3	6 C	Commercial	Slight surface erosion, inadequate shoreline vegetation, direct flow to lake.	Camp Waziyatah on side and back of office. 19T 0366467 4892584	20' x 3'	Establish buffer below rip-rap, rip-rap edge of pavement.	Low	Low
3	7 C	Commercial	Undercut shoreline, lack of shoreline vegetation, unstable access, direct flow to lake.	Camp Waziyatah behind sign for canoeing area. 19T 0366506 4892547	50' x 4'	Establish buffer, hand place rip-rap on eroded parts of shoreline.	Low	Medium
3	8 C	Commercial	Slight surface erosion, bare soil on paths, inadequate shoreline vegetation, direct flow to lake.	Camp Waziyatah path from canoe area past gym and swimming area. 19T 0366491 4892531	300' x 10'	Apply mulch/erosion control mix, enhance buffer, clearly identify foot path and restrict lake access.	Low	Low
3	3 D	Driveway	Moderate surface erosion.	197 Deer Hill Road. 19T 0365838 4891211	50' x 15'	Install water bar and turnout.	Low	Low
3	1 CS	Construction Site	Severe surface erosion, bare soil, cement and debris in stream, no erosion control, direct flow to stream. (This is the privately-owned companion to 3 TR)	Deer Hill Road, new construction next to pole #528.	100' x 100'	Install silt fence/erosion control berms, seed and mulch bare areas, rip-rap slopes leading to stream.	Medium	Medium

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
3	9 C	Commercial	Severe surface erosion, undersized culvert, direct flow to lake.	Camp Waziyatah road from "Grove 5" building at top down to "Ledge" building. 19T 0366350 4892701	252' x 10'	Enlarge culvert, remove broken pavement, crown and grade road after pavement removed, enhance buffer.	Medium	High
4	6 TR	Town Road	Severe ditch erosion, moderate road shoulder erosion, direct flow to stream.	Mill Hill Road @ pole #91 by Waziyatah Brook. 19T 0366633 4892384	4' x 300'	Vegetate backslope of ditch, armor ditch with stone, install check dams, reshape ditch, vegetate shoulder, install catch basin.	High	High
4	7 TR	Town Road	Unstable culvert inlet and outlet, undersized culvert, moderate ditch erosion, slight road shoulder erosion.	Mill Hill Road @ pole #92. 19T 0366705 4892384	4' x 375'	Armor culvert inlet and outlet, enlarge culvert.	Medium	Medium
4	8 TR	Town Road	Unstable culvert inlet and outlet, undersized culvert, slight erosion on ditch backslope.	Corner of Temple Hill and Mill Hill Roads. 19T 0366782 4892465	5' x 75'	Armor culvert inlet and outlet, enlarge culvert, vegetate ditch, install check dam, install plunge pools at culvert inlet and outlet.	Low	Medium
4	9 TR	Town Road	Unstable culvert inlet and outlet, moderate ditch erosion & ditch bank failure.	Corner Temple Hill & Mill Hill Roads. 19T 0366775 4892504	5' x 444'	Armor culvert inlet & outlet, install plunge pool at culvert outlet, vegetate ditch & reshape ditch backslope.	Medium	High
4	6 R	Residential	Slight surface erosion, inadequate shoreline vegetation, direct flow to lake (former boat access for Camp Waziyatah)	592 Mill Hill Road 19T 0366695 4892577	15' x 25'	Enhance buffer.	Low	Low
4	7 R	Residential	Slight surface erosion.	594 Mill Hill Road. 19T 0366766 4892572	35' (total of 3 separate areas)	Install infiltration steps, install runoff diverter.	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
4	8 R	Residential	Slight to moderate surface erosion, lack of shoreline vegetation, exposed tree roots, minimal ground cover, direct flow to lake.	Lot 2, Map 18. 19T 0366706 4892611	50' x 130'	Define foot path, install runoff diverter, establish buffer, seed and hay bare soil, clean out and build up existing water bars.	Medium	Low
4	1 P	Path	Slight surface erosion, direct flow to lake.	Lot 4, Map 18. 19T 0366713 4892643	3' x 120'	Install runoff diverter across path.	Low	Low
4	2 P	Path	Slight surface erosion, inadequate shoreline vegetation.	Lot 6, Map 18. 19T 0366700 4892688	2' x 75'	Install runoff diverters across path, apply mulch/erosion control mix to enhance grass growth, enhance buffer.	Low	Low
4	9 R	Residential	Slight to moderate surface erosion, bare soil. (There is a small bathroom and shower room with its own leach field near shore.)	Lot 7, Map 18. 19T 0366739 4892769		Install infiltration steps around side of house, apply mulch/erosion control mix on bare areas, install dry well at gutter outlet.	Low	Medium
4	10 R	Residential	Moderate surface erosion, driveway has ruts, inadequate shoreline vegetation.	Lot 9, Map 18. Compound of five camps. 19T 0366711 4892826	12' x 75'	Reshape (crown) driveway, clean out and enlarge existing water bar at base of driveway, install runoff diverter, install rain garden or enhance buffer.	Medium	Medium
4	10 TR	Town Road	Direct flow of winter sand (primarily) to lake, delta in lake.	McWain Hill Road 150' south of Tucker driveway. 19T 0366839 4892902		Lengthen culvert and install plunge pools at inlet and outlet.	High	Medium
4	11 TR	Town Road	Unstable culvert inlet and outlet, undersized culvert, winter sand, undercut stream bank, shoulder collapsing over culvert outlet. (This site contributes to problem at 10 TR.)	Mill Hill Road @ 1 st brook crossing after passing turnoff to McWain Hill Rd. 19T 0366985 4892665	2' x 35'	Armor culvert inlet and outlet, enlarge culvert, install plunge pool, use "chop and drop" method across stream in woods between this site and 10 TR to trap sediment.	Medium	High

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
4	4 D	Driveway	Severe surface erosion, clogged & undersized culvert, water runs over end of driveway and causes massive erosion.	640 Mill Hill Road. 19T 0367075 4892725	30'	Unclog & enlarge culvert, reshape (crown) & grade driveway.	Low	Medium
4	11 R	Residential	Moderate surface erosion, lake of shoreline vegetation, exposed roots, direct flow to lake.	CMP pole #74. 19T 0366656 4893038	75' x 150'	Install new runoff diverters (water bars), establish buffer, apply mulch to cover bare soil where there is only a thin covering of pine needles.	Medium	Medium
4	12 R	Residential	Slight surface erosion, roof runoff erosion, inadequate shoreline vegetation, direct flow to lake.	Lot 15, Map 18. 19T 0366665 4893033	5' x 45'	Enhance buffer on right of stairs as face lake.	Low	Low
4	12 TR	Town Road	Unstable culvert inlet and outlet, delta in stream and lake, winter sand, direct flow to lake.	McWain Hill Road @ brook crossing between Ort & Dukane driveways. 19T 0366742 4893094	300'	Armor culvert inlet and outlet, lengthen culvert, install plunge pool.	High	High
4	5 D	Driveway	Severe surface erosion.	483 McWain Hill Road. 19T 0366729 4893165	10' x 85'	Reshape (crown) driveway, install runoff diverters, establish buffer by beach.	Low	Medium
4	6 D	Driveway	Severe surface erosion.	488 McWain Hill Road. 19T 0366729 4893165 (GPS reading same as for 5 D.)	10' x 100'	Reshape (crown) driveway, install runoff diverters.	Low	Low
4	7 D	Driveway	Slight surface erosion, bare soil, lack of shoreline vegetation.	477 McWain Hill Road. 19T 0366616 4893154	10' x 250'	Install 2 water bars across driveway, seed and mulch bare soil, establish buffer.	Low	Low
4	8 D	Driveway	Slight to moderate surface erosion, slight road shoulder erosion.	End of David Rd. in Settler's Knoll where driveway comes down. 19T 0366989 4893505	14' x 120'	Crown driveway, install 2 water bars across driveway, vegetate road shoulder.	Low	Medium

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
4	2 CS	Construction Site	Severe surface erosion, bare soil, no erosion control at site.	Settler's Knoll, Lot 31-10, Map 18. 19T 0367046 4893322	1 acre	Install silt fence/EC berms, seed and hay (mulch) bare soil.	Low	High
4	3 CS	Construction Site	Moderate surface erosion, bare soil, no erosion control at site.	Settler's Knoll, Lot 31-7, Map 18. 19T 0366770 4893264	Bare area: 30' x 80'; Driveway: 10' x 200'	Install silt fence/EC berms, seed and mulch bare areas, crown driveway, vegetate shoulder, install culvert under top of driveway.	Low	High
4	13 R	Residential	Slight surface erosion, inadequate shoreline vegetation, unstable access, exposed roots at end of driveway, direct flow to lake.	Shorefront at Camp Waganaki. 19T 0366418 4893589	40' along shoreline, not continuous	Reshape (crown) driveway and install runoff diverters, enhance buffer.	Low	Medium
4	13 TR	Town Road	Moderate ditch erosion, asphalt in ditch and along shoulder crumbling, moderate road shoulder erosion, winter sand, direct flow to lake.	McWain Hill Road just uphill from entrance to Camp Buck. 19T 0366633 4893721	Road ditch: 3' x 600'; Road to lake: .13 mile	Install plunge pools at culvert outlet and halfway between road and lake, install cross-culvert near top of hill.	High	High
4	14 R	Residential	Slight surface erosion, roof runoff erosion, erosion on side of boat ramp, direct flow to lake.	Lot 29, Map 18. 19T 0366425 4893426	3' x 10'	Install runoff diverter, install dry well at base of downspout, shore up eroding sides of boat ramp.	Low	Low
4	9 D	Driveway	Severe surface erosion, direct flow to stream.	Lot 27, Map 18. 19T 0366547 4893444	10' x 20'	Install runoff diverter, build up berm.	Low	Low
4	15 R	Residential	Moderate surface erosion, bare soil, roof runoff, exposed roots, direct flow to lake.	Lot 27-B, Map 18. 19T 0366488 4893416	3' x 100'	Reshape (crown) driveway, install steps to beach & infiltration trench, install runoff diverter, enhance buffer.	Medium	Medium

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
4	16 R	Residential	Slight surface erosion, roof runoff, inadequate shoreline vegetation, exposed roots, shoreline erosion, direct flow to lake.	Lot 26, Map 18. 19T 0366526 4893334	Lakefront: 50' x 50'; "McDaniel" Brook: 300' x 3'	Install infiltration trench to catch roof runoff, maintain runoff diverters on driveway, install steps to lake, enhance buffer along lake and along "McDaniel" Brook, use chop and drop to trap sediment in brook.	High	Medium
4	17 R	Residential	Slight surface erosion, roof runoff, inadequate shoreline vegetation, exposed roots, direct flow to lake.	457 McWain Hill Road. 19T 0366542 4893320	30' x 30'	Define foot path, enhance buffer along lake and along "McDaniel" Brook, install infiltration trench to catch roof runoff.	Low	Low
4	10 D	Driveway	Slight surface erosion.	Lot 24, Map 18. 19T 0366544 4893293	10' x 300'	Reshape (crown) driveway, install runoff diverters, enhance buffer.	Low	Low
4	11 D	Driveway	Slight surface erosion, exposed roots.	Lot 23, Map 18. 19T 0366564 4893260	Driveway: 10' x 300'; Shoreline: 25'	Install runoff diverter to divert water from driveway into new rock trench that goes around leachfield, stabilize/replace old steps, enhance buffer.	Low	Low
4	18 R	Residential	Slight surface erosion, roof runoff erosion.	Lot 22, Map 18. 19T 0366584 4893226	5' x 50'	Install infiltration trench to catch roof runoff, install infiltration steps, establish buffer around beach area.	Low	Low
4	19 R	Residential	Brook creates delta in lake, direct flow to lake.	Manco Ave. Lot 21, Map 18. 19T 0366591 4893195	300' of brook	Install check dams (rock or tree) across brook to trap sediment, establish buffer between house and brook.	Medium	Medium
4	20 R	Residential	Roof runoff erosion.	Lot 20, Map 18. 19T 0366649 4893175		Install infiltration trench.	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
4	12 D	Driveway	Moderate surface erosion, roof runoff erosion, lack of shoreline vegetation, direct flow to lake.	Lot 19, Map 18. 19T 0355503 4893142	12' x 300'	Reshape (crown) driveway, install runoff diverters, install infiltration trenches on both sides of house to catch roof runoff, establish buffer.	Medium	Medium
4	14 TR	Town Road	Unstable culvert outlet, undersized culvert.	McWain Hill Road btwn Hanson & Sandau driveways. 19T 0366700 4893263	1' x 4'	Armor culvert outlet, lengthen and stabilize culvert, clean out "natural" plunge pool.	Low	High
4	15 TR	Town Road	Severe ditch erosion, moderate road shoulder erosion, bare soil.	Temple Hill Road across from pole #2. 19T 0366870 4892319	5' x 300'	Vegetate ditch or armor with stone, reshape ditch.	Low	Medium
4	16 TR	Town Road	Clogged culvert, severe ditch erosion and ditch bank failure, slight road shoulder erosion, bare soil.	Temple Hill Road a short distance uphill from mailbox #117. 19T 0367220 4891738	4' x 200'	Unclog and enlarge culvert, vegetate ditch, install check dams.	Low	Medium
4	17 TR	Town Road	Moderate ditch erosion, slight road shoulder erosion.	McWain Hill Road across from 13 TR at upper end of hill. 19T 0366567 4893868	150' x 5'	Clean out existing catch basin where road ditch turns out, install rain garden on flat section of private land where road runoff drains.	Low	Medium
5	4 B	Beach	Slight surface erosion, bare soil, direct flow to lake.	Pride Ave., Lot 16F, Map 36. 19T 0365776 4895648	40' x 60'	Define foot path, apply mulch/erosion control mix to bare area, no raking.	Low	Low
5	1 BA	Boat Access	Slight surface erosion, bare soil, unstable access, spring near shore, direct flow to lake.	Pride Ave., Lot 16-B, Map 36. 19T 0365818 4895592	25' x 8'	Install runoff diverter, establish buffer, seed and hay bare soil, re-locate path.	Low	Low
5	5 PR	Private Road	Unstable culvert inlet and outlet, clogged culvert, slight road shoulder erosion.	Pride Ave., next to 16-C, Map 36, no building. 19T 0365881 4895590	3' x 12'	Stabilize culvert inlet and outlet.	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
5	21 R	Residential	Slight surface erosion, bare soil, exposed roots, direct flow to lake.	98 Pride Ave. 19T 0365911 4895401	40' x 10'	Define foot path, seed and hay bare soil, enhance existing broad-based dip on side of house.	Low	Low
5	22 R	Residential	Slight surface erosion, bare soil, lack of shoreline vegetation, unstable access, direct flow to lake.	Pride Ave., Lot 15A, Map 36. 19T 0365917 4895367	25' x 25'	Install runoff diverter, apply mulch/erosion control mix to bare area, establish buffer.	Low	Low
5	23 R	Residential	Moderate surface erosion, bare soil, unstable beach, direct flow to lake.	Pride Ave., brown house. 19T 0365882 4895178	30' x 30'	Minimize beach area, do not bring in new beach material, establish buffer at upper edge of beach, install runoff diverter at base of driveway.	Medium	Low
5	2 BA	Boat Access	Moderate surface erosion, bare soil, inadequate shoreline vegetation, unstable access, direct flow to lake.	Pride Ave., community boat access. 19T 0365899 4895074	12' x 125'	Define boat launch area, grade driveway, install runoff diverters, enhance buffer.	Medium	Medium
5	10 C	Commercial	Severe surface erosion, unstable path downhill to fish hatchery, unstable culvert inlet and outlet, undersized culvert, severe ditch erosion, bare soil, roof runoff erosion, direct flow to lake.	Birch Rock Camp @ Fish Hatchery. 19T 0366017 4894512	100' x 8'	Armor culvert inlet and outlet, enlarge culvert, stabilize and reshape ditch, stabilize path by crowning, install infiltration trench to catch roof runoff, apply mulch/erosion control mix, enhance buffer.	Medium	High
5	11 C	Commercial	Moderate surface erosion on path, bare soil.	Birch Rock Camp foot path leading down to Cabin 8. 19T 0366115 4894395	100' x 4'	Reshape (crown) path, install runoff diverters (water bars), apply mulch/erosion control mix.	Low	Low
5	12 C	Commercial	Severe surface erosion, unstable culvert inlet and outlet, undersized culvert, severe ditch erosion, moderate road shoulder erosion.	Birch Rock Camp steep "main" road leading down from hall. 19T 0366088 4894461	100' x 10'	Armor ditch with stone, reshape and vegetate ditch backslope, remove grader berm, crown road, vegetate shoulder, enlarge culvert and armor culvert inlet and outlet.	Medium	High

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
5	24 R	Residential	Slight surface erosion, bare soil, inadequate shoreline vegetation, direct flow to lake.	Camp McWain in front of owner's house with green metal roof. 19T 0365946 4894786	20' x 8'	Apply mulch/erosion control mix, establish buffer by steps, establish buffer.	Low	Low
5	3 P	Path	Slight surface erosion.	Camp McWain path along lakeshore to beach. 19T 0365938 4894890	75' x 3'	Apply mulch/erosion control mix on path, install catch basin at culvert outlet up the hill off of circle driveway.	Low	Low
5	3 BA	Boat Access	Moderate surface erosion, bare soil, delta in lake, direct flow to lake.	Camp McWain boat launch. 19T 0365918 4894919	45' x 10'	Define foot path, install catch basin and rain garden, enhance buffer, restrict foot and vehicle traffic to boat launch, install geo-web.	Medium	Medium
5	5 B	Beach	Collapsing rock wall, unstable shoreline access.	Camp McWain in front of slide. 19T 0365912 4894961	3' x 60'	Stabilize wall, establish buffer.	Medium	Low
5	6 PR	Private Road	Unstable culvert outlet, bottom of culvert rusted out, severe ditch erosion.	Intersection Pride Ave. & McWain Hill Road. 19T 0366275 4895175	50' x 5'	Replace and armor culvert outlet, stabilize ditch banks with stone.	Low	Low
5	7 PR	Private Road	Unstable culvert inlet and outlet, undersized culvert, culvert is bowed in middle, slight road shoulder erosion, direct flow to lake.	Pride Avenue @ brook crossing diagonally across from 84 Pride Ave. 19T 0365974 4895290	6' x 21'	Stabilize culvert inlet and outlet, enlarge, straighten and lengthen culvert, install plunge pools at inlet and outlet.	Medium	High
5	25 R	Residential	Moderate surface erosion, bare soil, direct flow to lake.	Pride Avenue @ "Simplicity" house. 19T 0365887 4895466	20' x 10'	Apply mulch/erosion control to cover bare soil by sitting area, seed and hay bare soil elsewhere.	Low	Low

Sector	Map site #	Land Use	Type of Problem	Location	Area	Recommendations	Impact	Cost
5	13 D	Driveway	Moderate surface erosion, direct flow to lake. (Flows from paved driveway across Pride Ave. contribute to problems here.)	Pride Avenue @ "Simplicity" house. 19T 0365933 4895467	15' x 75'	Install berm across lower edge of driveway, grade driveway, install runoff diverter to direct flow into low area on side of driveway.	Low	Low
5	26 R	Residential	Bare soil, sand added to beach, direct flow to lake.	Pride Avenue gray house with blue trim. 19T 0365896 4895471	15' x 25'	Seed and hay bare soil, do not add sand to beach.	Low	Low
5	27 R	Residential	Bare soil, roof runoff erosion, direct flow to lake.	Pride Avenue. 19T 0365933 4895361	40' x 15'	Minimize beach area, do not add new material, seed and hay bare soil.	Low	Low
5	28 R	Residential	Eroding stream bank, direct flow to lake. (This is the same brook that's in 7 PR.)	84 Pride Avenue. 19T 0365890 4895285	23'	Establish buffer along stream bank to strengthen bank, shore-up bank with rock rip-rap.	Medium	Medium
5	29 R	Residential	Slight surface erosion, bare soil, direct flow to lake.	Pride Avenue. 19T 0365886 4895222	34' x 10'	Define foot path, seed and hay bare soil, minimize beach area, install runoff diverters.	Low	Low
5	30 R	Residential	Moderate surface erosion, bare soil, exposed roots, direct flow to lake.	Pride Ave., CMP pole #6.1 in yard on lakeside of house. 19T 0365885 4895093	200' x 20'	Grade driveway, define foot path, install infiltration steps and runoff diverters, seed and hay bare soil, fill deep hole with stone, define and minimize parking area, extend log at top of beach to intercept runoff.	Medium	Medium

NOTE: For purposes of this spreadsheet, site 16 R includes "McDaniel" Brook even though it may be on the property line between 16 R and 17 R. Determining ownership of the brook at the time of the survey was not possible. This brook pops up as a spring about half way between McWain Hill Road and McWain Pond. From the point where it surfaces and flows downhill to the pond, there is a heavy amount of sediment in the brook. It is not clear where this sediment originates. One of the recommendations for both sites 16 R and 17 R is to enhance the buffer along the brook. Another possibility to minimize the sediment loading to McWain Pond from the brook includes using the "chop and drop" method of cutting small trees that fall across the brook at strategic spots. These trees will act as dams to trap sediment while allowing clean water to pass. Another possibility is to install a plunge pool and/or barrier across the brook as it crosses the path between the two properties to catch sediment before the brook tumbles into McWain Pond.

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 a challenge.

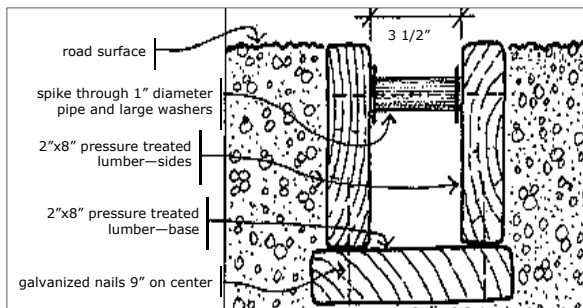
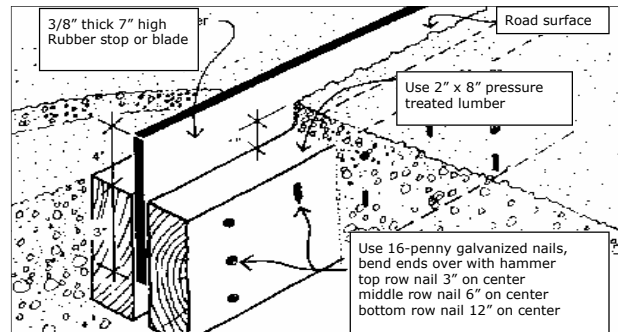
The MDEP and Portland Water District recently completed a series of fact sheets that answer many common how-to questions. The fact sheets profile 20 common conservation practices and include detailed instructions, diagrams and color photos about installation and maintenance.

The series also includes four 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.



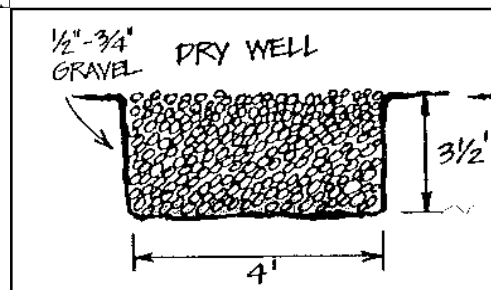
Fact sheets are available to help you install conservation practices on your property
Download at <http://www.maine.gov/dep/blwq/docwatershed/materials.htm>

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 ensured through the goodwill of lake residents and through laws and ordinances created and enforced by the State of Maine and local municipalities. The following laws and ordinances require permits for activities adjacent to wetlands and waterbodies.

Shoreland Zoning Law—

Construction, clearing of vegetation and soil movement within 250 feet of lakes, ponds, and many wetlands, and within 75 feet of most streams, falls under the Shoreland Zoning Act, which is administered by the Town through the Code Enforcement Officer and the Planning Board.

Natural Resources Protection Act (NRPA)—

Soil disturbance & other activities within 75 feet of the lakeshore or tributary stream also falls under the NRPA, which is administered by the MDEP. Contact the MDEP and Town Code Enforcement Officer if you have any plans to construct, expand or relocate a structure, clear vegetation, create a new path or driveway, stabilize a shoreline or otherwise disturb the soil on your property. Even if projects are planned with the intent of enhancing the environment, contact the 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 your town code enforcement officer, MDEP offices, or online at <http://www.state.me.us/dep/blwq/docstand/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.

5/2005

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

PLEASE TYPE OR PRINT IN BLACK INK ONLY

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

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

I am filing notice of my intent to carry out work which meets the requirements for Permit by Rule (PBR) under DEP Rules, Chapter 305. I and my agents, if any, have read and will comply with all of the standards in the Sections checked below.

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

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

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

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

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

Signature of Agent or Applicant:	Sandy Waters	Date:	3/4/06
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Keep a copy of this notification of intent. Send the form with attachments via certified mail to the Maine Dept. of Environmental Protection at the appropriate regional office listed below. The DEP will send a copy to the Town Office as evidence of the DEP's receipt of notification. No further authorization by DEP will be issued after receipt of notice. Permits are valid for two years. Work carried out in violation of any standard is subject to enforcement action.

AUGUSTA DEP STATE HOUSE STATION 17 AUGUSTA, ME 04333-0017 (207) 287-2111	PORTLAND DEP 312 CANCO ROAD PORTLAND, ME 04103 (207) 852-6300	BANGOR DEP 106 HOGAN ROAD BANGOR, ME 04401 (207) 941-4570	PRESQUE ISLE DEP 1235 CENTRAL DRIVE PRESQUE ISLE, ME 04769 (207) 764-0477
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OFFICE USE ONLY	CL#	Date	Staff	After
PBR #	PP		Acc. Date	Def. Date

DEPLW0306-02005

Where To Go For More Information

Lakes Environmental Association

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

Colin Holme, Technical Services Director

colin@leamaine.org
www.minelakes.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 547
Norway, ME 04268
207-583-2723

Jeff Stern, Watershed Specialist

sternjm@hotmail.com

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

Maine Department of Environmental Protection

312 Canco Road
Portland, ME 04103
207-822-6300
1-888-769-1036 (toll free)

Wendy Garland, Watershed Manager

Wendy.Garland@maine.gov
www.maine.gov/dep/blwq

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 (PWD) provides drinking water from Sebago Lake to more than 190,000 people in southern Maine. PWD supports surveys and erosion control activities in areas that supply Sebago Lake, which includes the McWain Pond Watershed.

Maine Nonpoint Source Training and Resource Center

17 State House Station
Augusta, ME 04333

www.state.me.us/dep/blwq/training/index

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.

Additional Information

<http://pearl.maine.edu/resources.htm>

<http://www.mlci.org/Students/default.aspx>

<http://www.mainevolunteerlakemonitors.org/waterquality/indicators.php>

http://www.avcog.org/documents/Phosphorus%20_and_Landowners.pdf