MINNEHONK LAKE & HOPKINS POND WATERSHED SURVEY REPORT




Mount Vernon Community Partnership Corp.

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Mount Vernon Community Partnership Corporation, Inc.

MINNEHONK LAKE & HOPKINS POND

WATERSHED SURVEY REPORT

Prepared by:
FB Environmental Associates
97A Exchange St., Suite 305
Portland, ME 04101
www.fbenvironmental.com

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Project partners *include the Mount Vernon Community Partnership Corporation, the Greater Minnehonk Lake Association, the 30 Mile River Watershed Association, and the Town of Mount Vernon. Technical support was provided by FB Environmental Associates and the Maine Department of Environmental Protection.*

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Watershed Survey Volunteers

Linda Fish	Dick McKeen	Paul Whittier
Liz Hayes	David Pollock	Chuck Wright
Tim Kinney	Tom Ward	Sandy Wright

Steering Committee

Linda Fish	Greater Minnehonk Lake Association
Malcolm Hardy	Town of Mount Vernon
Jennifer Jespersen	FB Environmental Associates/ Mount Vernon CPC
Christine Merchant	Greater Minnehonk Lake Association
Dick McKeen	Mount Vernon CPC
Lidie Robbins	30 Mile River Watershed Association
Tom Ward	Greater Minnehonk Lake Association/ Mount Vernon CPC
Paul Whittier	Mount Vernon CPC
Sandy Wright	Mount Vernon CPC

Technical Staff

Kristen Feindel	Maine Department of Environmental Protection
Jennifer Jespersen	FB Environmental Associates
Lidie Robbins	30 Mile River Watershed Association

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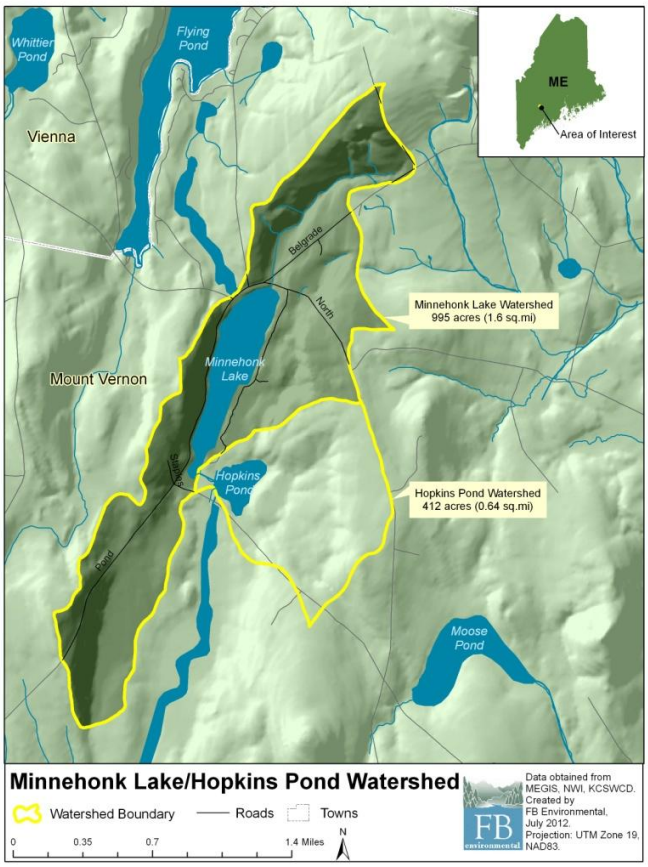
INTRODUCTION

Minnehonk Lake, located in the Village of Mount Vernon, Maine, is a peaceful home to locals, and a favored summer destination for many. During the summer months, it is used extensively for swimming, fishing, and boating. Located around the lake are public swimming areas, a boat launch, and many lakefront homes and camps. The quality of the lake's water is important to the local economy of thearea. Additionally, the area is considered valuable habitat for plant and wildlife communities.



Minnehonk Lake and Hopkins Pond Watershed

The Mount Vernon Community Partnership Corporation (CPC), in cooperation with the Greater Minnehonk Lake Association, the 30 Mile River Watershed Association, and the Maine Department of Environmental Protection, conducted its first ever watershed survey in October of 2012. This is part of a long-term effort to keep Minnehonk Lake and Hopkins Pond clean and clear for future generations. Watershed surveys have been used successfully throughout Maine to document potential pollution sources affecting water quality in Maine lakes. This survey identified 50 sites with uncontrolled soil erosion and polluted runoff to the lake.

MINNEHONK LAKE WATER QUALITY – WHY IS WATER QUALITY AT RISK?

The biggest pollution culprit in Minnehonk Lake and Hopkins Pond, as in other Maine lakes, is **polluted runoff** or nonpoint source (NPS) pollution. Stormwater runoff from rain and snowmelt picks up soil, nutrients and other pollutants as it flows across the land, and washes into the lake.

POLLUTED RUNOFF

Also called NPS or nonpoint source pollution. Soil, fertilizers, septic waste and other pollutants from diffuse sources across the landscape that are carried into a waterbody by rainfall.

In an undeveloped, forested watershed, stormwater runoff is slowed and filtered by tree and shrub roots, grasses, leaves, and other natural debris on the forest floor. It then soaks into the uneven forest floor and filters through the soil.

In a developed watershed, however, stormwater does not always receive the filtering treatment the forest once provided. Rain water picks up speed as it flows across impervious surfaces like rooftops, compacted soil, gravel camp roads and pavement, and it becomes a destructive erosive force.

The Minnehonk Lake and Hopkins Pond watersheds are moderately developed by rural residential development along roadways, and concentrated commercial and residential development in the Village along Main Street in the northern portion of the Minnehonk Lake watershed. Though seasonal residents increase the population significantly in summer months, in recent years there has been an increase in single family homes in Mount Vernon, as it is quickly becoming a popular suburb of the Capital City of Augusta (www.MtVernonMe.org). If new development is not managed properly, the increased stormwater runoff from this development can have a negative impact on local water quality.

Minnehonk Lake is surrounded by a network of state, town, and private roads. The care of these roads is insufficient compared to the amount of use they receive. The steep slopes and sandy soils of the area exacerbate problems associated with stormwater runoff from the developed areas within the watershed.

WHY IS RUNOFF A PROBLEM?

Excess phosphorus can lead to algal blooms; decreasing water quality and damaging the ecology and aesthetics of a lake.

The problem with runoff is not necessarily the water by itself, but the sediment and nutrients in the runoff that can be bad news for Maine lakes. The nutrient, **phosphorus**, is food for algae and other plants and is found in soils, septic waste, pet waste and fertilizers.

In natural conditions, the scarcity of phosphorus in a lake limits algae growth. However, when a lake receives extra phosphorus, algae growth increases dramatically. Sometimes this growth causes choking blooms, but more often it results in small changes in water quality that, over time, damage the ecology, aesthetics and economy of lakes.

Soil is the biggest source of phosphorus in Maine lakes. As every gardener knows, phosphorus and other nutrients are naturally present in the soil. So, we are essentially "fertilizing" Minnehonk Lake with the soil that erodes from our driveways, roads, ditches, pathways and beaches. Studies have shown that runoff from developed areas has 5 to 10 times the amount of phosphorus compared to runoff from forested areas.

MINNEHONK LAKE & HOPKINS POND

Minnehonk Lake and Hopkins Pond are located in western Kennebec County, in the small Village of Mount Vernon, Maine about 20 miles northwest of Augusta (Figure 1). Minnehonk Lake has a watershed of 997 acres (1.6 sq. mi.) and stretches about 2.5 miles from north to south between Route 41 and North Road. The lake has a maximum depth of 73 feet. Water flows from Minnehonk Lake into Hopkins Stream and through the inlet of Hopkins Pond just southeast of Minnehonk Lake. The pond's watershed covers an area of 412 acres (0.6 sq. mi.) and has a maximum depth of 22 feet.

WATERSHED

The area of land around a lake that drains (or sheds) its water into the lake through streams, ditches, as overland flow, or through groundwater.

The direct watershed refers to the area of land that drains directly into a waterbody through many different means (e.g., streams, ditches, groundwater). Runoff moves through a watershed and ultimately into a lake, pond, or stream. Therefore, it is important to document all land use activities and erosion sites throughout the entire watershed that may currently, or have the potential to affect water quality.

Minnehonk Lake and Hopkins Pond are used for all forms of recreation (swimming, boating, fishing, snowmobiling). The watershed contain beaches, boat launches, homes, farms and businesses as well as natural areas such as forests and wetlands that help filter runoff from these developed areas.

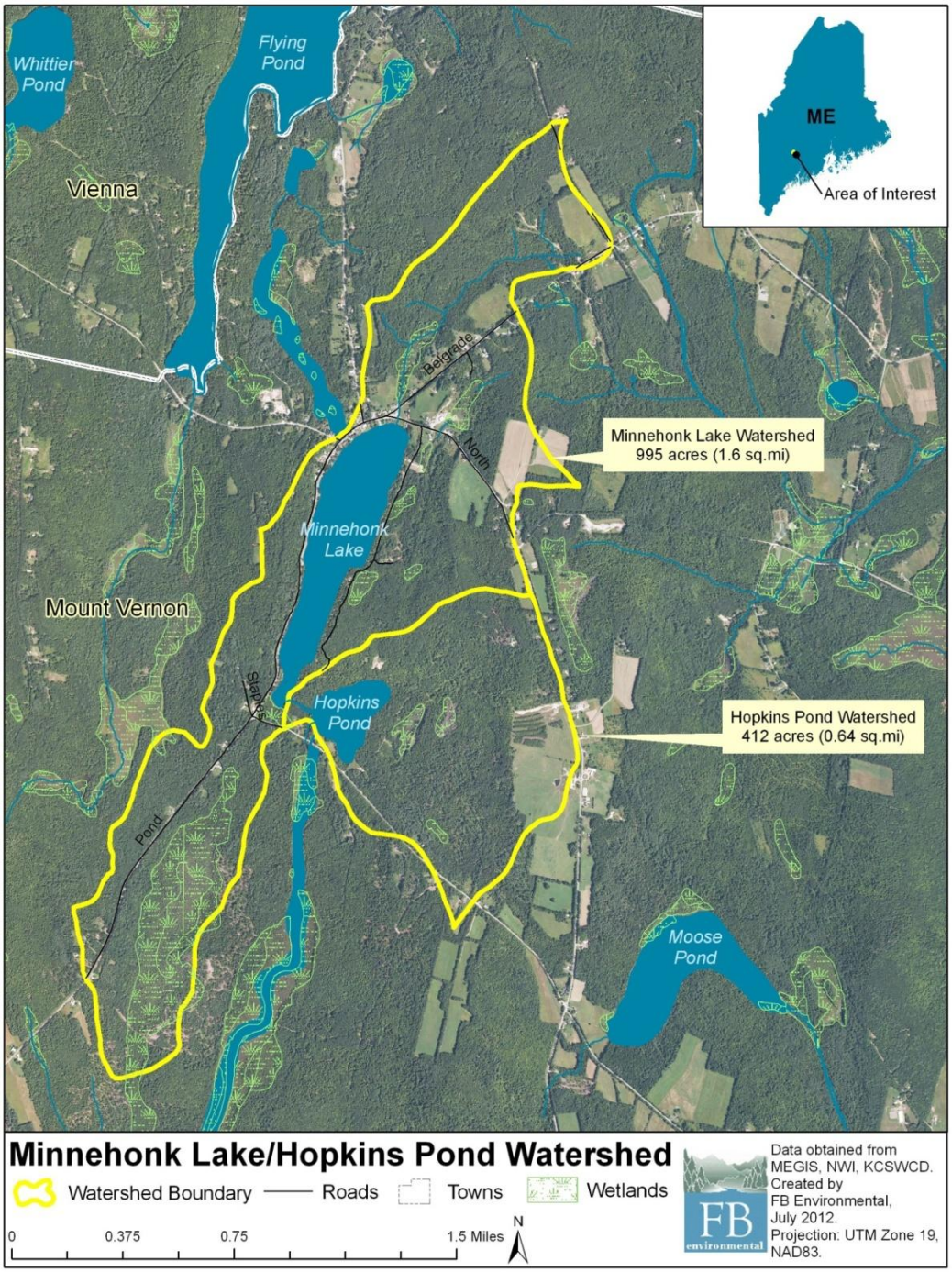


Figure 1. *Aerial view of the Minnehonk Lake and Hopkins Pond watershed*

WHY PROTECT MINNEHONK LAKE & HOPKINS POND FROM POLLUTED RUNOFF?

- Once a lake becomes polluted, it can be difficult or impossible to restore. Prevention is the key.
- Our lakes and ponds serve as valuable habitat for fish, birds and other wildlife.
- Minnehonk Lake supports various cold water fisheries. Species found in the lake include landlocked salmon, large and smallmouth bass, brook trout, brown trout and splake- a brook trout/lake trout hybrid introduced in 1981, and currently supporting a popular fishery. Splake is most commonly caught in the winter months. Hopkins Pond is known by bass fisherman.
- According to the Maine Audubon's *Maine Loon Project*, there are only two adult Common Loons that call Minnehonk Lake their home. Sadly, in 2012, one of these adults reportedly died of lead poisoning, likely from ingesting lead fishing gear.
- Minnehonk Lake provides excellent recreational opportunities for local residents and to visitors. It is an important contributor to the local economy, and a centerpiece of the Village.
- A 1996 University of Maine study found that lake water quality affects property values. For every three foot decline in water clarity, shorefront property values can decline as much as 10 to 20%! Declining property values affect individual landowners as well as the entire community.
- Sediment deposited into lakes and ponds from erosion creates the ideal environment for invasive species. These species can be transported via boats to other lakes and ponds.

WHAT IS BEING DONE TO PROTECT MINNEHONK LAKE & HOPKINS POND?

Over the past few years, local residents identified Minnehonk Lake as a high priority for water quality protection. Water quality in Minnehonk Lake and Hopkins Pond has been monitored since 2006 through the Maine Department of Environmental Protection's Volunteer Lake Monitoring Program (VLMP). In addition to water quality monitoring, certified aquatic plant patrollers have also been inspecting for invasive aquatic plant species in Minnehonk Lake and Hopkins Pond. A volunteer has been monitoring Minnehonk Lake for invasive species since 2009, and Hopkins Pond since 2011.

In 2010, 2011 and 2012, the Mount Vernon Community Partnership Corp. (CPC) organized meetings with members of the Greater Minnehonk Lake Association (GMLA), 30 Mile River Watershed Association (30MRWA), Mount Vernon Board of Selectmen, Mount Vernon Fire Department, the Beach Committee, and interested citizens to begin the process of protecting the lake from polluted runoff from nonpoint source (NPS) pollution within the lake's watershed.

These partnerships helped to establish two shoreline buffers on Minnehonk Lake; including the installation of more than 50 bushes and perennials by local volunteers and the Youth Conservation Corps

(YCC) at the Town Beach in 2010. The second buffer was installed behind the Mount Vernon Country Store in 2012 as part of a Maine DEP watershed protection grant awarded to the Mount Vernon Elementary School. The buffer planting was coupled with hands-on watershed education activities for 4th and 5th grade students in coordination with Maine DEP and the 30 MRWA.

In 2011, a volunteer stream corridor survey was conducted for the unnamed stream (referred to as the "Fire Department Stream") that flows into Minnehonk Lake by the town beach. The survey was led by Jennifer Jespersen (FB Environmental/ CPC), with support from several local volunteers. Volunteers assessed both physical (temperature, oxygen, stability) and biological (bugs, fish, wildlife) characteristics of the stream, and determined that the greatest impacts to the stream and the lake are the portion of the stream between the Fire Department and the lake. Excess sediment and associated pollutants from road sand, and erosion in ditches and stream banks are entering the stream and therefore, the lake downstream. A large delta in the lake at the outlet of the stream is a clear indication of these impacts. The group agreed that making improvements along the stream would help enhance habitat for fish and other aquatic life, and reduce the pollutants entering the lake near the public beach.

Following the stream survey, the Maine Department of Environmental Protection (Maine DEP) visited with the survey volunteers to provide technical guidance for reducing erosion and nutrients entering the stream and lake, and agreed with the survey findings. It was determined that additional information was needed to identify and prioritize other potential sources of pollution to determine if financial resources should be directed to the Fire Department Stream, or if there were other problems in the watershed that might be a higher priority.

In 2012, the CPC applied for, and was awarded a $7,000 grant from the Davis Foundation to conduct a watershed survey to document all potential sources of NPS pollution entering Minnehonk Lake. The CPC enlisted the technical support of FB Environmental to help organize and lead the survey of the entire Minnehonk Lake watershed. Other components of the project include community outreach and education, including a public presentation of the survey results in January 2013, and development of an educational poster for the town beach bulletin board.

Mount Vernon Elementary School students help install a shoreline buffer at the Country Store in 2012 (Photo: 30MRWA)

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 Minnehonk Lake and Hopkins Pond watersheds.
- Raise public awareness about the connection between land use and water quality, and the impact of soil erosion in Minnehonk Lake and Hopkins Pond.
- Inspire people to become active watershed stewards.
- Provide the basis to obtain additional funds to assist in fixing NPS sites throughout the watershed.
- Use the information gathered as one component of a long-term lake protection strategy.
- Provide general recommendations to landowners for addressing erosion problems on their properties.

2012 Minnehonk Lake and Hopkins Pond Watershed Survey Team

The purpose of the survey was NOT to point fingers at landowners with a documented NPS site, nor was it to seek enforcement action against landowners not in compliance with local ordinances. It is the hope that through future projects, the CPC, GMLA, and 30MRWA can work together with landowners to solve erosion problems on their property, and/or teach them how to implement solutions to help improve water quality on their own.

Local citizen participation was essential in completing the watershed survey and will be even more important in upcoming years. With the leadership of the CPC and GMLA and assistance from agencies concerned with lake water quality, the opportunities for stewardship are limitless. The CPC hopes that you will think about your own property as you read this report, and then try some of the recommended conservation measures. Everyone has a role to play in lake protection!

SURVEY METHODS

The Minnehonk Lake and Hopkins Pond watershed survey was conducted by volunteers with the help of trained technical staff from the Maine DEP, the 30MRWA and FB Environmental. Nine volunteers were trained in survey techniques during a two-hour classroom workshop on October 4th, 2012 at the Mount Vernon Community Center. Following the classroom training, volunteers and technical staff spent the remainder of the day documenting sources of nonpoint source (NPS) pollution on roads, residential and commercial properties, driveways, and trails using cameras, GPS units and standardized forms. Volunteers were assigned to one of three survey sectors (Figure 2): Sector 1-Belgrade Rd., Carr Hill Rd., Mount Vernon Village and North Rd. to Mooar Hill Rd.; Sector 2- Minnehonk Lake Rd. and North Rd. between Mooar Hill Rd. and Cogswell Rd.; and Sector 3- Rt. 41/Pond Rd. from Tower Rd. south and Black Hill Rd. (Figure 2). Sources of NPS problems were identified within each sector and documented,

potential solutions were recommended, and rough estimates were made for the cost of labor and materials for improving the sites.

The data collected during the survey was entered into a computer database to create a spreadsheet, and the documented NPS sites were plotted on maps. The sites were broken out into categories (driveways, roads, private residences, etc.) and presented based on their impact to the lake. A description of NPS sites, recommended actions, and associated costs are discussed in the next section, and a table with a description of the NPS sites is located in Appendix A.

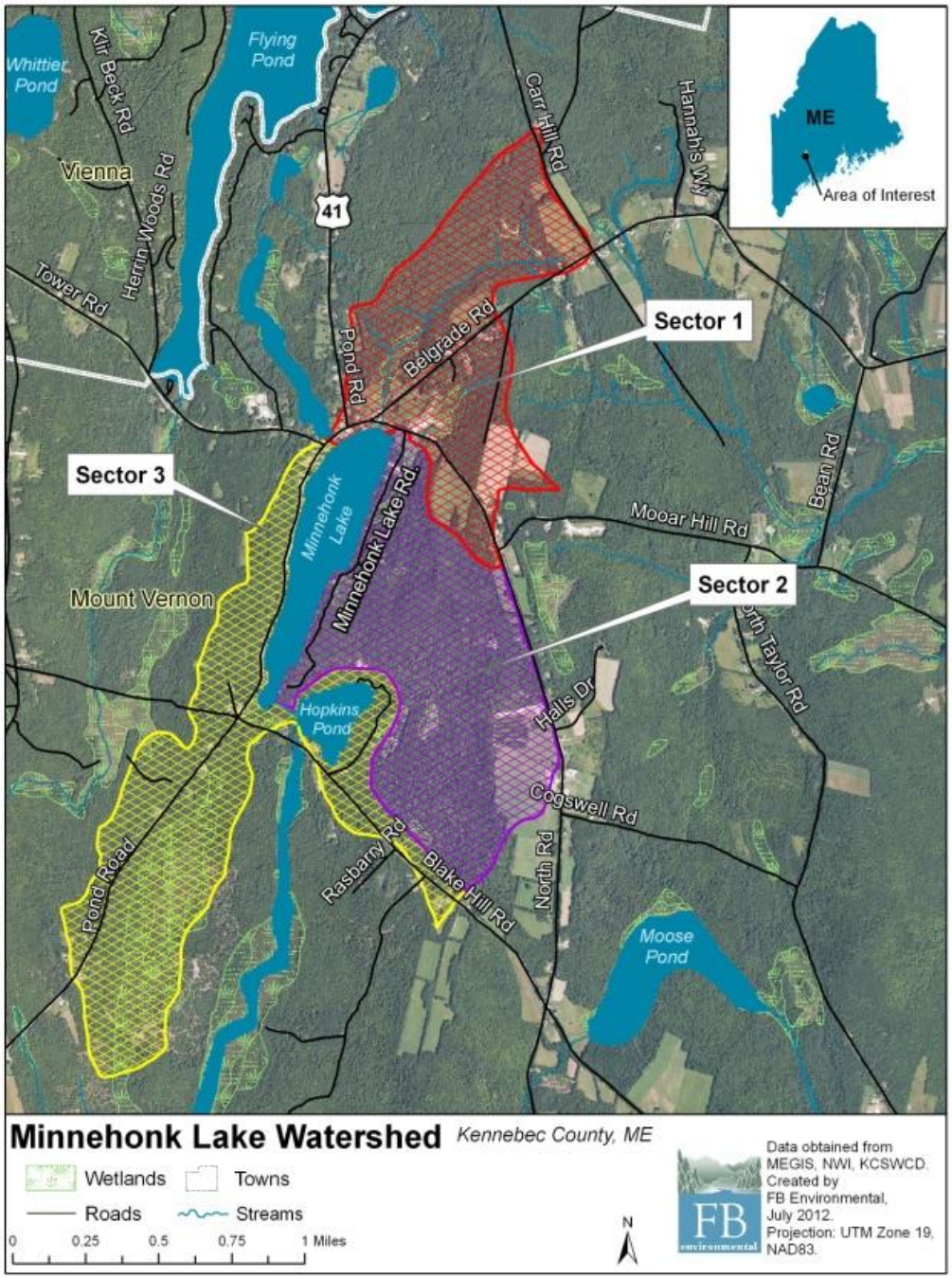


Figure 2. *Survey Sectors for the Minnehonk Lake and Hopkins Pond Watershed Survey*

SUMMARY OF SURVEY FINDINGS

Volunteers and technical staff identified 54 sites in the Minnehonk Lake and Hopkins Pond watershed that are currently, or have the potential to negatively affect the water quality in Minnehonk Lake or Hopkins Pond. Some key conclusions from the survey include:

- **Everyone has a role to play in lake protection**. That's because NPS sites were identified across a variety of different land uses throughout the watershed (Figure 3, Table 1). The Town of Mount Vernon, shorefront property owners, business owners, road associations, lake-front landowners and even people living far from the lake can all take measures to reduce lake pollution.

- Twelve (12) of the identified sites were documented on state roads. Including private roads and driveways, there are 24 road-based sites (44%). These sites generally have larger erosion problems which in turn result in a more significant impact on the water quality of the lake.

- NPS pollution from residential land accounted for 30% of all identified NPS sites. Residential NPS sites are often less severe and less costly to fix. Additionally, landowner support and assistance from a local Youth Conservation Corps (YCC) can be instrumental in addressing these problems.

- The potential impact that the documented NPS site may have on the lake was determined in the field based on the proximity of the erosion to the waterbody and magnitude of the erosion. Results of this ranking indicate that there is a relatively even mix of high, medium and low impact sites spread across the watershed (Table 1), with most high impact sites associated with state roads, and most medium and low impact sites caused by runoff from residential properties. The majority of sites are clustered along Main Street in Mount Vernon Village (Figure 4).

- The cost of fixing the documented NPS sites was determined for all 54 sites (Figure 5). Ten (19%) of these sites will incur a high cost (over $2,500). These high-cost sites are predominantly road related. Twenty-four sites (44%) are estimated to cost between $500 - $2,500, which includes driveways, residential sites and road related issues. Twenty sites (37%) will incur a low cost (under $500), and are primarily associated with driveways.

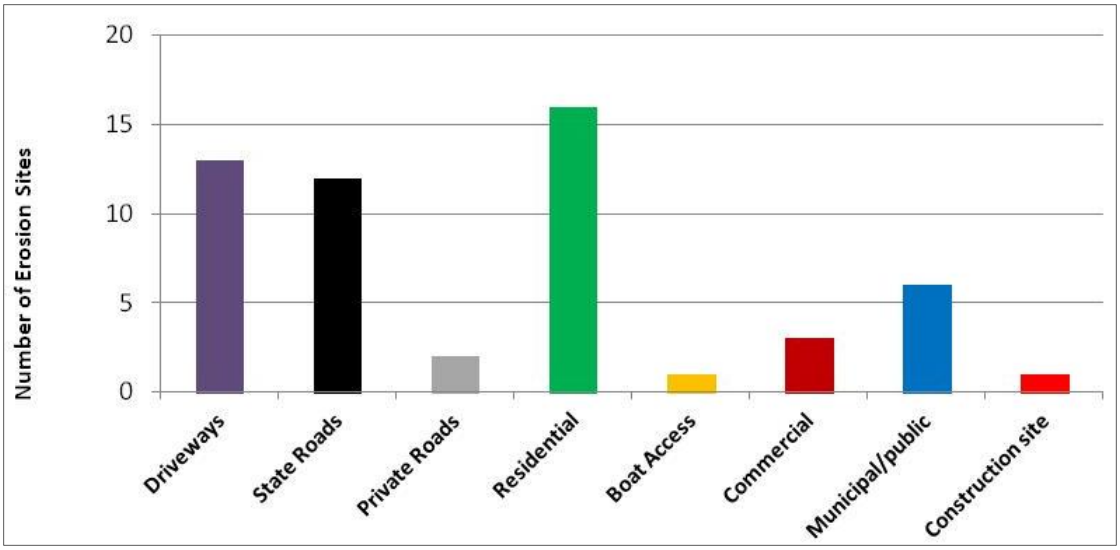
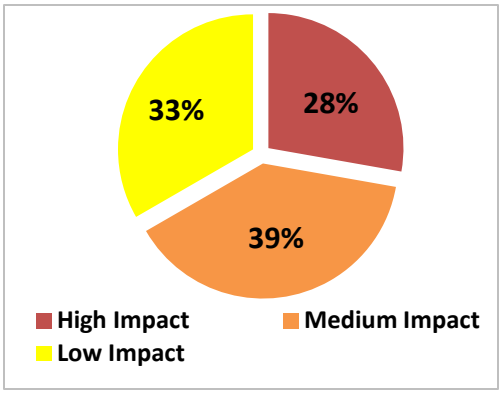


Figure 3. *NPS sites in the Minnehonk Lake & Hopkins Pond watershed by land use type*

Table 1. *Summary of NPS sites by land use and impact*

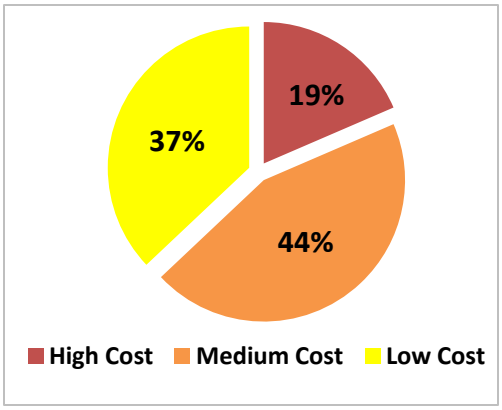
Land Use	High Impact	Medium Impact	Low Impact	Total
State Road	7	4	1	12
Private Road	0	0	2	2
Residential	1	9	6	16
Boat Access	1	0	0	1
Driveway	3	6	4	13
Commercial	0	0	3	3
Municipal/Public	3	2	1	6
Construction Site	0	0	1	1
Total	**15**	**21**	**18**	**54**

Impact to Lake/Pond – Each site was rated for its potential impact to waterbodies. Just under half of the surveyed sites were determined to have a medium impact on water quality. Impact is based on slope, soil type, amount of eroding soil, buffer size and proximity to water.



- **"Low"** impact sites are those with limited transport of soil off-site.
- "**Medium"** impact sites exhibit sediment transportation off-site, but the erosion does not reach high magnitude.
- **"High"** impact sites are those with large areas of significant erosion and direct flow to water.

Cost of Materials and Labor – Recommendations were made for fixing each site, and the associated cost of labor and materials was estimated. Cost is an important factor in planning for restoration and the associated costs of BMP application.



- **"Low"** cost sites were estimated to cost less than $500.
- **"Medium"** cost sites range from $500 to $2,500.
- **"High"** cost refers to sites estimated to cost more than $2,500.

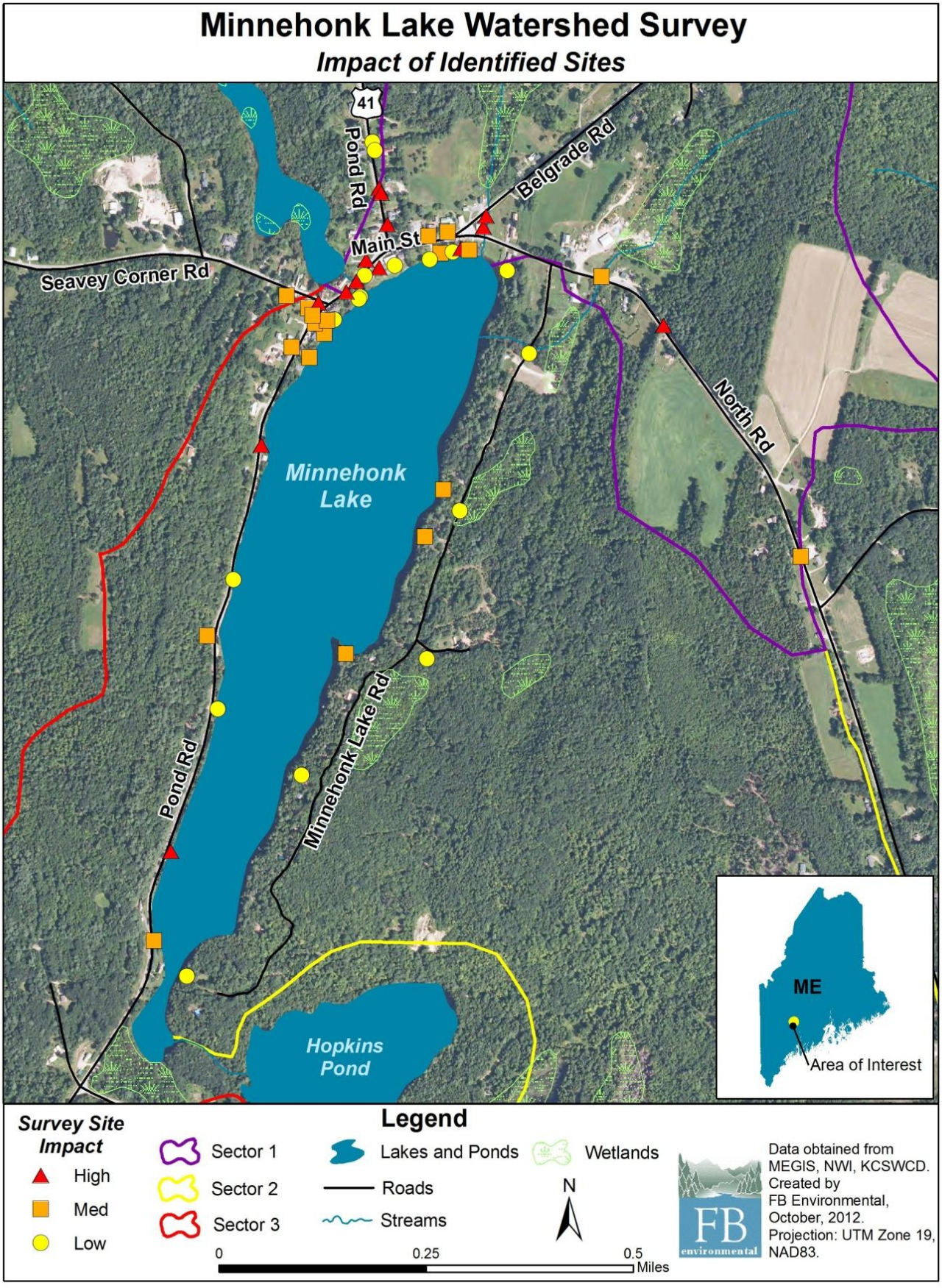


Figure 4. *Impact rating of NPS sites in the Minnehonk Lake and Hopkins Pond watershed*

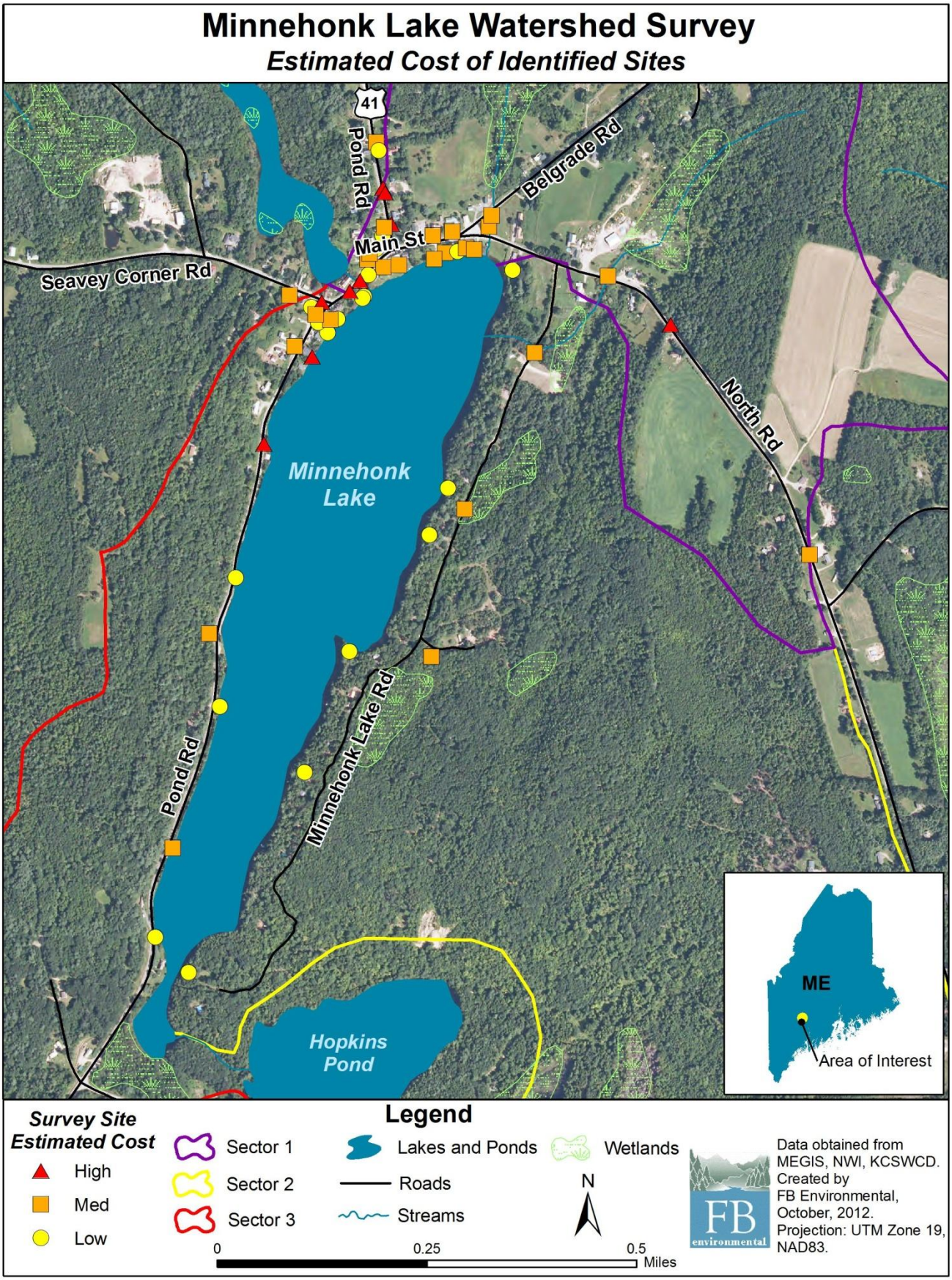


Figure 5. *Estimated cost of NPS sites in the Minnehonk Lake and Hopkins Pond watershed*

SECTOR SUMMARIES

Sector 1

The high impact sites in Sector 1 are primarily located on town or state owned properties including the public beach, library, fire department, town office and ditches along the state road. The majority of other sites were determined to be low or medium impact and are most often associated with eroding driveways or roof drip lines. There are many driveways in Sector 1 in which the lower ten feet or so had some minor erosion with potential to drain to a ditch during a significant rain event, but were not written up based on the professional judgment of the technical leader. In most cases, residents living in the Village were home during the survey, walked the property with the volunteers, and were receptive to potential solutions for addressing the problems. According to Town Selectmen, at least two of the high impact sites in this sector (Library and Masonic Hall) are currently in the process of being addressed.

Stormwater and wash water from the Fire Department and roadway has resulted in erosion at the beach.

Sector 2

The majority of sites in Sector 2 are located on residential properties, and were rated either low or medium impact. In contrast to Sector 1, very few Sector 2 landowners were home during the survey. This may be because many of the homes are along the lake shore and are used seasonally by out of town owners. Most residential sites could be easily fixed with the additional of simple runoff diversions and/or erosion control mulch (ECM). Many residences were not documented as official sites, but could benefit from planting more native vegetation along the shoreline, defining walking paths, and putting ECM on compacted soil areas. There was one construction site in this sector.

Example of a low-impact residential NPS site on Minnehonk Lake Road lacking an adequate shoreline buffer.

Multiple NPS sites were observed along Minnehonk Lake Road, though several locations were not included in the survey since they seemed to drain to a vegetated area. Minnehonk Lake Road has a road association known as the Minnehonk Pines Association. Dues are collected from residents to help pay for the expense of road maintenance. In 2009, Clyde Walton of the 30MRWA, a retired landscape engineer for the Maine DOT conducted a survey of the road. Following that assessment, improvements were made to the road including widening, crowning and ditching. However, additional work was needed to extend a culvert near the central part of the road and add additional culverts and ditches near the center of the road where a substantial amount of runoff comes off of the hillside, across the road, and down into the lake. These

areas result in culverts being blown out. Several culverted stream crossings on the road were documented as NPS sites during the watershed survey due to evidence of road material washing into the streams at these crossings.

There did not appear to be issues concerning the portion of North Road in Sector 2 at this time. However, the farm at the top of the hill was not surveyed, because the team felt that based on topography, lack of streams, and proximity to the lake, it was unlikely that any NPS sources would reach the lake. However, it may be a good idea to talk with the farmer, to ensure that drainage ditches from the fields are not discharging to a stream connected to the lake, and that manure is not spread in fields adjacent to waterbodies.

Sector 3

The majority of moderate and high-impact residential sites in Sector 3 are located in the Village area. Most sites were very close to the water, with a few driveway problems on the west (uphill) side of Rt. 41. In addition to observed erosion problems, many properties were also in need of more adequate shoreline buffers. In most cases, village residents were home during the survey, walked their properties with the volunteers, pointed out issues they were aware of, and discussed recommended actions to address the problems. All of the landowners were receptive to suggestions and many were already concerned about the known problems on their properties, and care about protecting Minnehonk Lake. In the Village, there are two storm drains that discharge water directly into the lake. A large delta in the lake at one of these outfalls was documented during the survey, indicating that large volumes of sediment are getting into the lake from the road, likely as a result of winter sanding and runoff from unpaved driveways.

Example of shoulder erosion and lack of shoreline vegetation on State Rt. 41 at the infamous "rope swing" (Site 3-16).

Outside of the village, the largest issue is Rt. 41, which runs next to the west shore of Minnehonk Lake with no place for winter sand to go other than directly into the lake. Solutions to this problem are likely complex due to involvement with the State, narrow treatment area between the road and the lake, and potential need for engineered designs to address the problems. One of the highest impact sites along Rt. 41 is the rope swing area. Because of the high use of this area and public visibility, this area is recommended as a high priority for future restoration (see Table 2, Prioritized NPS Sites). The majority of the documented NPS sites in Sector 3 (with the exception of sites associated with Rt. 41), could be fixed with the help of the 30MRWA Youth Conservation Corps.

A comparison of NPS sites across the three sectors is presented in Figures 5-7 (below).

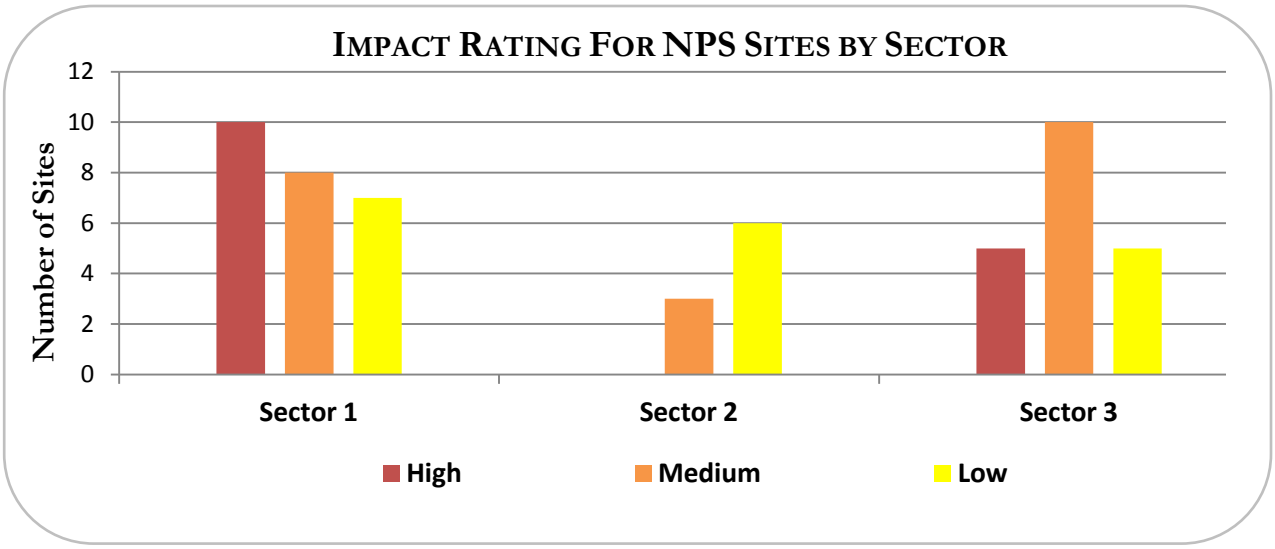


Figure 6. *NPS sites in the Minnehonk Lake/Hopkins Pond watershed by impact rating and sector*

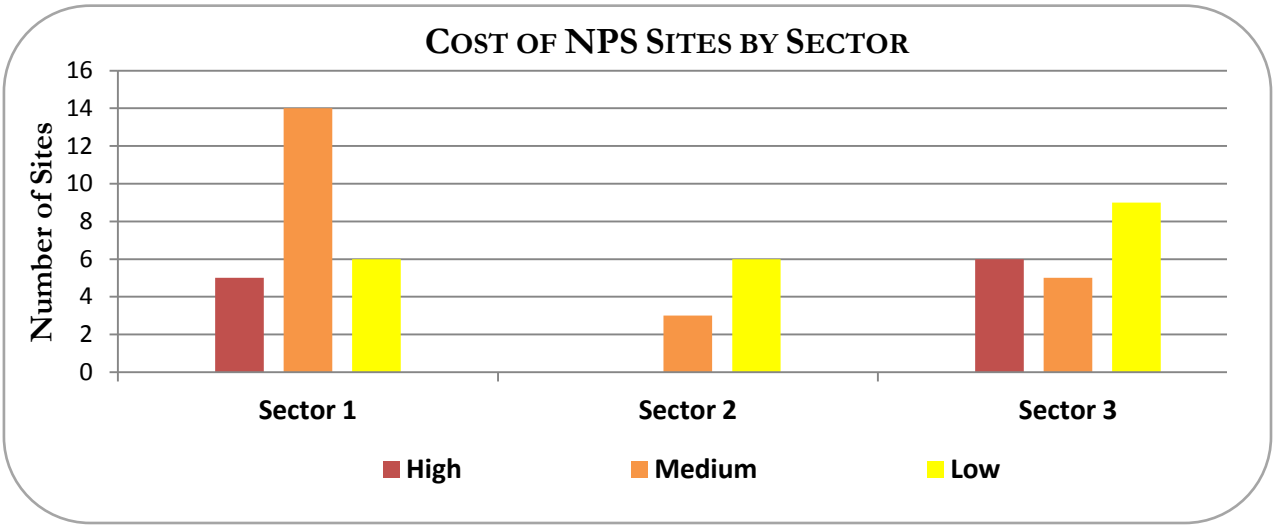


Figure 7. *NPS sites in the Minnehonk Lake/Hopkins Pond watershed by cost and sector*

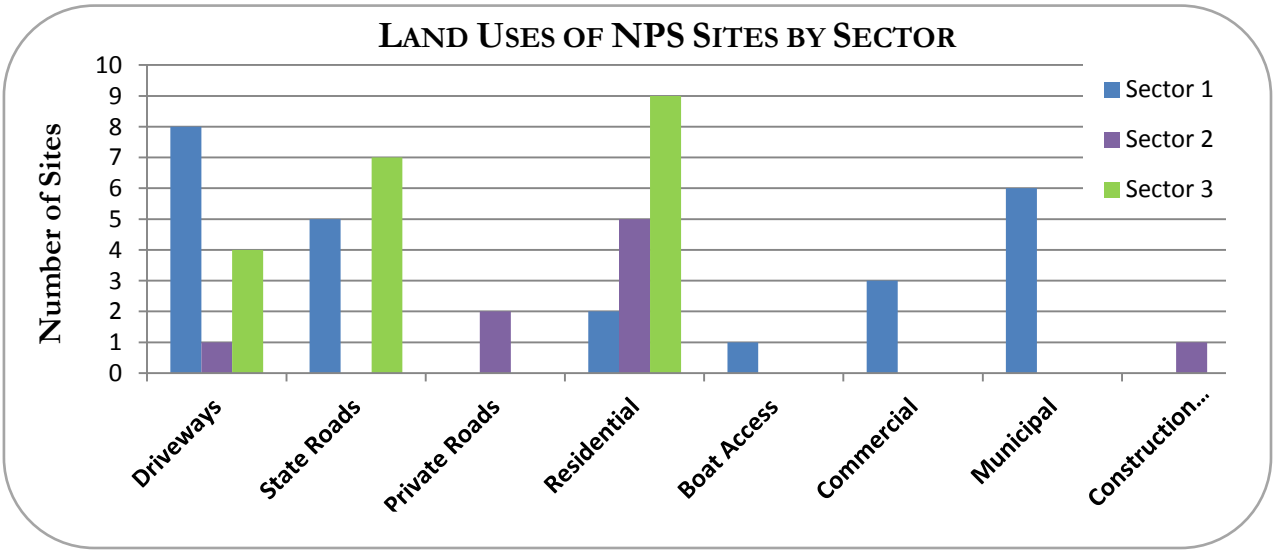


Figure 8. *NPS sites in the Minnehonk Lake/Hopkins Pond watershed by land use and sector*

RESIDENTIAL AREAS

Residential areas accounted for 30% of identified sources of polluted runoff. 6 out of 16 of the residential sites were determined to be low impact sites. 9 of the sites were of medium impact, and only 1 residential site was assessed as high impact. 3 sites were estimated as "medium" cost, 11 of the sites had an estimated low cost, and 2 sites were considered high cost. Below are examples of the most common problems seen at these sites and recommended conservation practices to lessen impact to Minnehonk Lake and Hopkins Pond.

Problem: GULLY EROSION
Solution: Control runoff from impervious surfaces. Install an infiltration trench at roof driplines. Vegetate ditches or armor with stone. Use erosion control mulch in areas with exposed soil.

Sector 3: Site 6

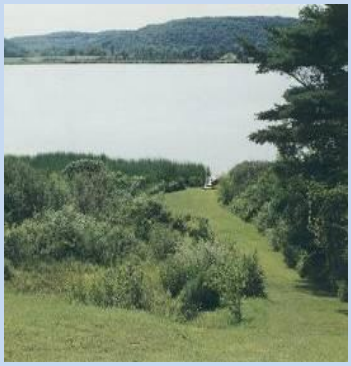
Infiltration Trench

Erosion Control Mulch

Problem: UNSTABLE SHORELINE ACCESS
Solution: Place water diverters uphill of the waterbody to trap sediments and reduce the velocity of flow. Establish buffers at the shoreline, and define walking paths and common areas.

Sector 3: Site 1

Water bars prevents sedimentation to Lake



Vegetated buffers filter out pollutants

ROADS

Twelve state road sites and two private road sites were identified during the watershed survey. These account for 26% of all documented sites. There were seven high-impact sites, four medium-impact sites, and two low-impact sites. Six of these sites were estimated to be medium cost, while six sites were estimated to be high cost. Only one state road site was considered low cost. The photos below provide examples of the most common road problems documented during the survey and recommended practices for addressing these problems.

Problem: SEVERE ROAD SHOULDER EROSION
Solution: Install erosion controls such as rip rap to protect bare soil and infiltration devices such as a media filter strips adjacent to the lake. Drainage swales and plunge pools will help manage stormwater at vehicle pull-offs and capture pollutants prior to discharging to the lake.

Sector 3: Site16

Rock riprap armoring the road shoulder

Plunge Pool collecting runoff

Problem: SEVERE DITCH EROSION, UNSTABLE OR UNDERSIZED CULVERTS, AND ROAD EROSION
Solution: Replace undersized culverts; line ditches with rock and vegetate for stability; Install turnouts directing water into forested buffer.

Sector 2: Site 2

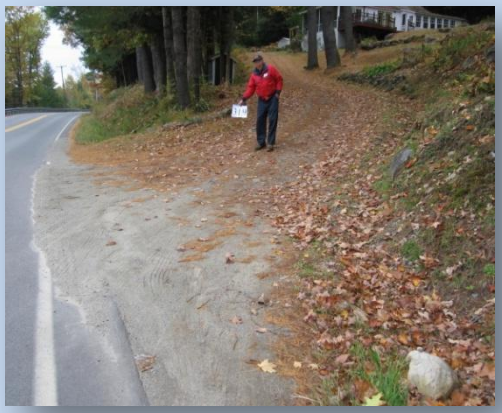
Armored Culvert

Reshaped road with berms removed and new surface added

DRIVEWAYS

Driveway sites account for 24% of surveyed NPS sites in the Minnehonk Lake and Hopkins Pond watershed. Thirteen driveway sites were documented during the survey, primarily along located on Pond Road (Rt. 41). Only three of the ten sites were determined to be high impact. Six driveway sites were determined to be medium impact, while four sites were determined to be low impact. Nine driveway sites were estimated to cost between $500 and $2,500 in the medium cost category, while the remaining four sites were estimated as low cost (less than $500). The photo below provides an example of the most common driveway problems observed during the survey, and some recommended fixes.

Problem: SURFACE EROSION
Solution: Re-grade driveway. Install rubber razors or water bars.



Sector 3: Site 19

Rubber razors direct water off driveways and into vegetation

Resurfacing driveways with hard-packing, cohesive surface material prevents erosion.

PRIORITIZING NPS SITES

On December 12, 2012, the Minnehonk Lake Watershed Steering Committee and members of the Mount Vernon CPC met to prioritize the list of NPS pollution sites identified during the October watershed survey. Thirteen community members participated in this process. In addition to prioritizing NPS sites (Table 2), the group developed a list of values and threats in regard to the water quality of Minnehonk Lake and Hopkins Pond (Table 3), identified roles and responsibilities for implementing recommendations to address pollution sources (Table 4), and began working on an Implementation Plan (Table 5).

Table 2. *Prioritized list of NPS sites in the Minnehonk Lake & Hopkins Pond watershed*

Site ID	Description
1-17, 1-18	Fire Department Stream & runoff from parking & building
3-16	Rope Swing
1-15, 1-16	Town Beach- boat launch & runoff from fire department access road
1-9, 1-10, 1-11, 1-22	Pond Road from the Library to Main Street
3-3, 3-4	State road sites w/winter sand accumulation in storm drains/lake
2-1 through 2-9	All 9 NPS sites identified in Sector 2 (focus on 2-3, 2-5 and 2-6)
1-3	*Mount Vernon Country Store*
3-8	*Residential property w/landowner interest*
3-11	*Residential property w/landowner interest*

Table 3. *Values of and threats to Minnehonk Lake water quality as identified by steering committee members*

# Votes	Values	# Votes	Threats
4	*Centerpiece of Village*	5	Pollution (salt, septic, leaves, winter sand)
1	Swimming, boating and fishing	3	Lack of education/knowledge of effects of actions
1	Community togetherness	2	Route 41
1	Beauty and Aesthetics	2	Invasive species (aquatic and Japanese knotweed)
1	Common values		*Sediment deltas*
1	Youth activities (rope swing, swim program, fishing)		*Poorly planned new developed and poorly maintained existing development*
1	*Property value increase*		*Trash*
1	Tax revenue		*Lack of municipal sewer*
1	Educational opportunities		*Lead poisoning*
	Economic/Business		
	Draw to Community		
	High flushing rate		
	Energy that it imparts		
	Recreation & wildlife (loons)		
	Value to Town/Village		
12		**12**	

Table 4. *Roles & responsibilities of Minnehonk Lake partners*

GMLA	Mount Vernon CPC	30MRWA	Town	Consultants
▪ Education & Outreach	▪ Funding/Grant Writing ▪ Partnerships ▪ Communication ▪ Education ▪ Rallying volunteers ▪ Organizing events	▪ Youth Conservation Corps (YCC) ▪ Grant Writing ▪ Staff ▪ Project Management ▪ Education ▪ Experience with watershed surveys and 319 projects ▪ Technical expertise	▪ Long-term interest in lake ▪ Education (newsletter, website) ▪ Grant support & $3K match ▪ Septic system improvement ▪ Library improvement	▪ Technical Expertise ▪ Engineering support ▪ Site design & project management ▪ Community planning & education ▪ Riparian habitat restoration ▪ Experience implementing 319 projects & contacts at DEP

Table 5. *2012 Minnehonk Lake Watershed Implementation Plan*

Action	Who	When	Estimated Cost
Send letters with information about the survey results to all property owners with an identified NPS site.	CPC	January 2013	$50 for mailing
Present results of watershed survey to the public.	CPC/FBE, 30MRWA	January, April, June 2013	$550
Develop a list of potential YCC sites for 2013 and beyond.	30MRWA, CPC, GMLA	March/April 2013	N/A
Develop an education plan that will get the word out about the survey results and prompt landowners to take action on private property (bulletin board, website, meet w/FD, demo sites, etc.)	CPC/GMLA/30MRWA	Beginning March/April 2013	TBD
Develop cost estimates for High Priority NPS Sites	CPC/30MRWA	2013 - 2014	N/A
Coordinate on grant development and funding requests to implement high priority sites	CPC/30MRWA, GMLA, Town	Ongoing 2013-2018	$0 - $500

**The action plan will be further refined by a subcommittee consisting of members of the CPC, GMLA, and 30MRWA.*

NEXT STEPS - WHERE DO WE GO FROM HERE?

Improving the NPS sites identified during the watershed survey will require efforts by individual landowners, the CPC, GMLA, road associations and state, and local municipal officials. The prioritized list of NPS sites (Table 2) and Action Plan (Table 5), along with the interest from the community provides a good basis for getting started with addressing these problems, and will help the project partners acquire funding to accomplish these goals.

In addition to the actions identified by the steering committee, there are many things that individual landowners and municipal officials can start doing now to help with this effort.

Individual Landowners

- If you have a documented NPS site on your property, call the Mount Vernon CPC, GMLA, or 30MRWA for advice about how to get started.
- Stop mowing and raking your shoreline and other parts of your property to bare soil. Let lawn and raked areas revert back to natural vegetation. Deep shrub and tree roots help hold the soil in place and help prevent erosion.
- Avoid exposing bare soil. Seed and mulch bare areas. Use erosion control mulch.
- Read "Permitting ABCs" on page 20 and call the Town Code Enforcement Officer and DEP before starting doing any cutting or soil disturbance projects.
- Maintain septic systems properly. Pump septic tanks (every 2 to 3 years for year round residences; 4-5 years if seasonal) and upgrade marginal systems.
- Participate in local workshops and volunteer "work parties" to help address identified NPS problems and learn how to fix similar problems on your own property.
- Become LakeSmart! Apply for a LakeSmart awards by joining together neighbors, road and local lake associations and establishing best practices on your properties. Call Maine COLA for information.
- Join the CPC, GMLA or 30MRWA and get involved with their programs and activities including the GMLA annual meeting and the 30MRWA Youth Conservation Corps.

Municipal Officials

- Enforce shoreland zoning and other ordinances to ensure protection of Minnehonk Lake and Hopkins 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 education and training for road crews, the code enforcement officer, selectmen, planning board members and other decision makers.

CONSERVATION PRACTICES FOR HOMEOWNERS

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

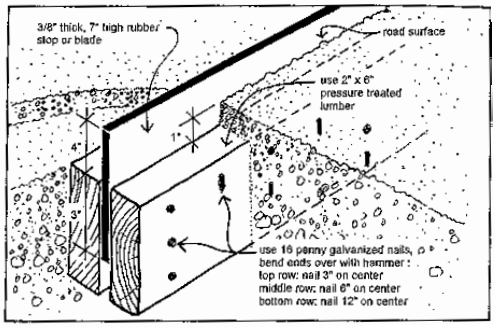
The Maine DEP and Portland Water District recently completed a series of fact sheets that answer many common how-to questions. The fact sheets profile 20 common conservation practices and include detailed instructions, diagrams and color photos about installation and maintenance. The series includes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

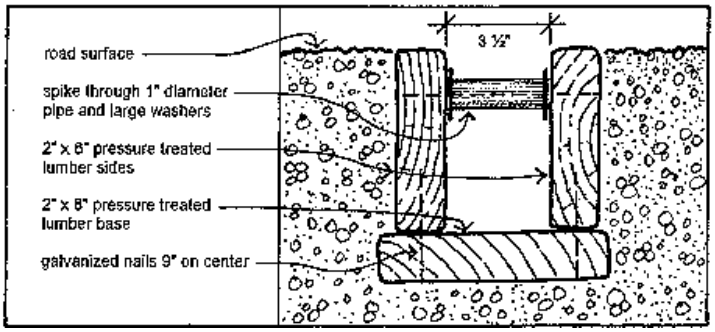
Fact sheets are available to help you install conservation practices on your property. Download at: http://www.maine.gov/dep/blwq/docwatershed/materials.htm

Construction BMPs	Infiltration Trench	Rain Barrels
Dripline Trench	Native Plant Lists (4)	Rain Gardens
Drywells	Open-Top Culverts	Rubber Razors
Erosion Control Mix	Paths and Walkways	Turnouts
Infiltration Steps (2)	Permitting	Waterbars

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

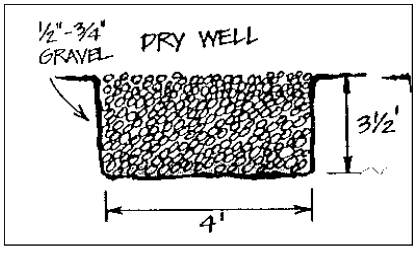
Rubber Razor Blade: Use this structure in a gravel driveway or camp road. It can be plowed over only if the plow operator is aware of its presence and lifts the plow blade slightly. Place it at a 30 degree angle to the road edge and direct the outlet toward a stable vegetated area.





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

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 ABC'S

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 stream also fall under the NRPA, which is administered by the DEP.

Contact the Maine DEP and Town Code Enforcement Officer if you have any plans to construct, expand or relocate a structure, clear vegetation, create a new path or driveway, stabilize a shoreline or otherwise disturb the soil on your property. Even if projects are planned with the intent of enhancing the environment, contact the DEP and town to be sure.

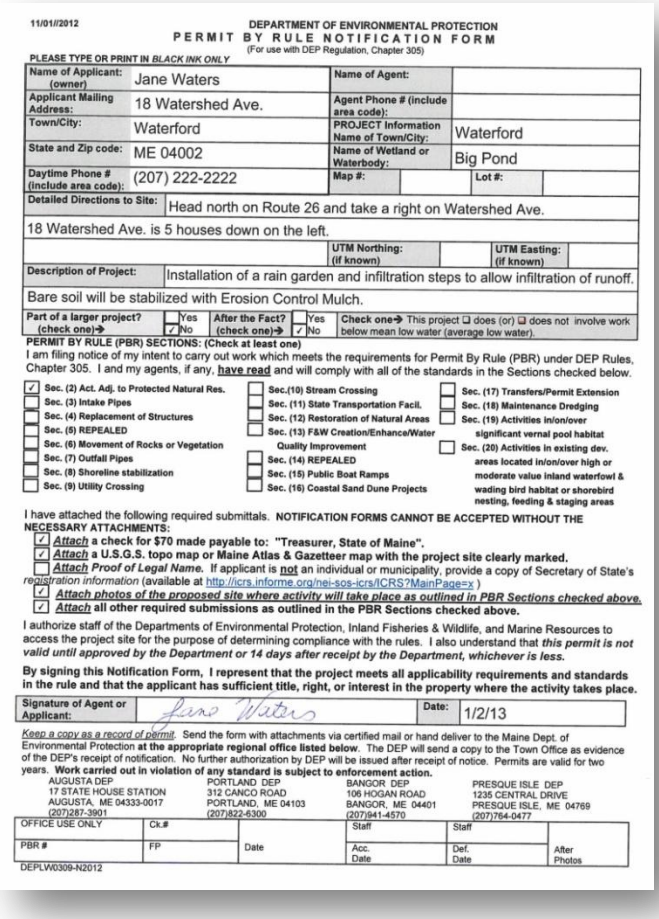
HOW TO APPLY FOR A PERMIT BY RULE WITH THE MAINE DEP

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

- Fill out a notification form before starting any work. Forms are available from your town code enforcement officer, Maine DEP offices, or online at http://www.state.me.us/dep/land/nrpa/pbrform.pdf.

- The permit will be reviewed by DEP within 14 days. If you do not hear from DEP in 14 days, you can assume your permit is approved and you can 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

DEPLW0309-N2012

WHERE DO I GET MORE INFORMATION?

Mount Vernon Community Partnership Corporation
Sandy Wright, President
(207) 293-2582 or scwright@fairpoint.net

Greater Minnehonk Lake Association
Christine Merchant, President
(207) 293-4855 or clm@gwi.net

30 Mile River Watershed Association
P.O. Box 132; Mount Vernon, ME 04352
(207) 670-7298 or info@30mileriver.org

FB Environmental Associates
97A Exchange Street; Portland, ME 04101
(207) 221-6699 or info@fbenvironmental.com

Kennebec County Soil and Water Conservation District
21 Enterprise Dr., Suite 1, Augusta, ME 04330
(207) 622-7847 ext. 3
Offers assistance with watershed planning and surveys, environmental education, engineering support, seminars and training sessions, and education on the use of conservation practices.

Remember – the long term health of the Minnehonk Lake & Hopkins Pond watershed depends on you. Help us protect the Lake for future generations to come!

Maine Congress of Lake Associations (COLA)
171 Main Street, Belgrade Lakes, ME 04918
Toll free: (855) 4-ME-COLA, www.mainecola.org
As of January 1, 2013, Maine COLA will be administering the LakeSmart Program. LakeSmart shares good land use techniques on a one-to-one basis with homeowners and recognizes those who adopt conservation practices. Handsome blue and white Award signs identify homes where steps have been taken to prevent nutrient loading to lakes. Posted by the lake shore and roadside, the Awards communicate a demonstration site from which others can learn. With these concrete examples as models, the idea of doing the right thing by the lake spreads through the community.

Maine Department of Environmental Protection
17 State House Station, Augusta, Maine 04333
Toll Free in Maine (800) 452-1942 **or** (207) 287-7688
Provides permit applications and assistance, numerous reference materials, environmental education, funding opportunities, and stewardship activities for lakes.

Publications

Gravel Road Maintenance Manual: A Guide for Landowners. Kennebec County SWCD and Maine DEP. 2010. http://www.maine.gov/dep/land/watershed/camp/road/gravel_road_manual.pdf

Conservation Practices for Homeowners. Maine DEP and Portland Water District. 2006. 20 fact sheets. http://www.maine.gov/dep/land/watershed/materials.html

Maine Shoreland Zoning—A Handbook for Shoreland Owners. Maine DEP. 2008. DEPLW0674-D08. 37 pgs. http://www.maine.gov/dep/land/slz/citizenguide.pdf

A Guide to Forming Road Associations. York County SWCD and Maine DEP. 2009. 21 pgs. & appendices. http://www.maine.gov/dep/land/watershed/roadassociation.htm

APPENDIX A: LIST OF NPS SITES

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
1-1	Lake	Driveway	Driveway carries sediment laden runoff from roadway, under house and directly into lake without treatment.	35'x25'	n/a	n/a	Add new surface material; Reshape (grade one way)	2	2
1-2	Lake	Residential	Roof runoff erosion; Inadequate shoreline vegetation	~90' length	n/a	n/a	Add to buffer; Infiltration trench at drip line to prevent runoff	1	2
1-3	Lake	Driveway	Moderate surface erosion; bare soil	200'x20'	n/a	n/a	Install water diverter (broad-based dip OR water bar); Add erosion control mulch to parking area below where soil is exposed; Install rain garden to right of driveway.	3	2
1-4	Lake	Commercial	Roof runoff erosion; Inadequate shoreline vegetation		n/a	n/a	Infiltration trench at roof drip line; Add to buffer	1	2
1-5	Lake at shoreline; Stream at driveway	Commercial-Parking Area	Slight surface erosion; Inadequate shoreline vegetation	10'x10'	n/a	n/a	Drywell at edge of parking area to capture runoff; Mulch areas of exposed soil with erosion control mix; Add to buffer at shoreline.	1	1
1-6	Stream	Driveway	Moderate surface erosion;	65'x10'	n/a	n/a	Add new surface material (pave?); Install runoff diverters	3	2
1-7	Ditch	State Road	Unstable inlet/outlet; Undersized culvert; Moderate shoulder erosion	3'x5'	n/a	n/a	Enlarge culvert; armor inlet/outlet	1	2
1-8	Ditch	Driveway	Slight surface erosion; Bare soil	20'x10'	n/a	n/a	Add new surface material (Gravel or Recycled Asphalt)	1	1
1-9	Ditch	State Road	Clogged and undersized culvert	n/a	n/a	n/a	Remove clog; Armor inlet and outlet; Enlarge culvert; Reshape ditch; Install Check dams	3	3

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
1-10	Ditch	Municipal/ Public	Moderate surface erosion; Bare soil	65'x40'	n/a	n/a	Add new surface material; Install runoff diverters; Engineered design needed for driveway/parking lot runoff; Install runoff diverters	3	3
1-11	Ditch	State Road	Sediment build-up in ditch; Undersized/clogged/unstable inlet and outlet; Bare soil	n/a	n/a	1-10	Remove clog; Armor inlet/outlet; Enlarge culvert; Vegetate ditch; Reshape ditch; Install turnouts and check dams; Vegetate road shoulder	3	3
1-12	Stream/storm drain	Driveway	Moderate surface erosion;	50'x15'	n/a	n/a	Add new surface material (gravel); Reshape/crown driveway; Install a broad-based dip; Install dry well at gutter down spout on back of home; Install rain garden and end of runoff diverter.	2	2
1-13	Ditch	State Road	Culvert undersized and clogged with sediment; Ditch is undersized.	50' long	n/a	n/a	Remove clog and enlarge culvert; Armor culvert inlet and outlet; reshape and clean out ditch.	2	2
1-14	Lake	Municipal/ Public	Slight surface erosion; Roof runoff erosion;	50'x18'	n/a	n/a	Infiltration trench at roof drip line	1	1
1-15	Lake	Boat Access	Severe surface erosion; Bare soil	15'x8'	n/a	n/a	Add new surface material; Install new material or structure at lower portion of boat launch area.	3	2
1-16	Lake	Municipal/ Public	Moderate surface erosion; Bare soil; Moderate road shoulder erosion; Winter sand; Inadequate shoreline vegetation	50'x1'	n/a	n/a	Infiltration trench along paved Fire Dept. access leading to a rain garden; Add to buffer at shoreline.	2	2

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
1-17	Stream	Municipal/Public	Severe surface erosion; Unstable inlet/outlet; Severe road shoulder erosion; Roof runoff erosion; Inadequate shoreline erosion		n/a	n/a	Armor culvert inlet/outlet; Install infiltration trench at roof drip line; Install drywell at gutter down spout; Mulch areas of exposed soil with erosion control mulch; establish and add to buffer at shoreline.	3	2
1-18	Stream	Municipal/ Public	Moderate surface erosion; Unstable inlet and outlet; Bare soil exposed; Winter sand present; Plowing sediment into ditch and stream.	10'x10'	n/a	n/a	Remove clog and armor culvert inlet and outlet; Install plunge pool; Add to buffer; limit plowing to at least 20' from stream.	3	2
1-19	Stream/Ditch	State Road	Severe erosion & down cutting (2.5' deep x 18" wide); Sediment flows into woods to stream.	500'x2'	n/a	n/a	Reshape ditch; Install check dams; Install sediment pools	3	3
1-20	Ditch	Municipal/ Public	Moderate surface erosion on parking lot; bare soil exposed	120'x100'	n/a	n/a	Add new surface material - pave parking lot (porous pavement); Install runoff diverter	2	3
1-21	Stream	Residential	Moderate surface erosion; Bare soil; Roof runoff erosion	250'x20'	n/a	1-19	Define parking lot area and vegetate areas of bare soil	2	2
1-22	Lake (via storm drain)	driveway	Moderate surface erosion; moderate road shoulder erosion; Bare soil	30'x10'	1-22a & 1-23	n/a	Add new surface material (gravel for parking lot & pavement at road shoulder); vegetate shoulder.	3	2
1-22A	Lake (via storm drain)	Commercial	Slight surface erosion; Bare soil	dripline at side of building		1-22a; 1-23	Install an infiltration trench and a drywell at the gutter downspout.	1	1
1-23	Lake (via storm drain)	Driveway	Moderate surface erosion	50'x2'	n/a	1-22	Add new surface material to driveway (gravel; pavement at road)	2	1

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
1-24	Lake (via storm drain)	Driveway	Moderate surface erosion	50'x5'	n/a	n/a	Add new surface material to driveway (gravel; pavement at road); install runoff diverters (open top culvert or rubber razors.	2	2
2-01	Lake	Construction Site	Moderate surface erosion; Bare soil	80'x20'	n/a	n/a	Maintain silt fence; Seed and hay bare areas; Install infiltration trench at roof drip line; Establish buffer.	1	1
2-02	Stream	Private Road	Moderate surface erosion; Unstable culvert inlet/outlet	150'x6'	n/a	n/a	Armor culvert inlet and outlet; Reshape/crown road; Install runoff diverters (broad-based dip)	1	2
2-03	Lake	Residential	Moderate surface erosion	20'x80'	n/a	n/a	Install runoff diverters/water bar; Mulch bare areas with erosion control mix; Add to buffer	2	1
2-04	Stream	Private Road	Slight surface erosion; Undersized culvert	n/a	n/a	n/a	Enlarge culvert; Armor inlet/outlet	1	2
2-05	Lake	Residential	Moderate surface erosion; Bare soil; Shoreline erosion.	15'x80'	n/a	n/a	install runoff diverter; Mulch bare areas with erosion control mix; Add to buffer.	2	1
2-06	Lake	Residential	Moderate surface erosion; Bare soil; inadequate shoreline erosion	200'x100'	n/a	n/a	Define parking area; Mulch bare areas with erosion control mix; Add to buffer	2	1
2-07	Lake	Residential	Slight surface erosion	80'x20'	n/a	n/a	Install runoff diverters at end of driveway; Install runoff diverter on path; Mulch bare areas with erosion control mix.	1	1
2-08	Lake	Residential	Slight surface erosion	30'x10'	n/a	n/a	Install runoff diverters; Mulch bare areas with erosion control mix	1	1

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
2-09	Ditch	Driveway	Moderate surface erosion; Bare soil	500'x20'	n/a	n/a	Add new surface material (gravel); Grade driveway; Install runoff diverter;	1	2
3-01	Lake	Residential	Slight surface erosion; Bare soil; Inadequate shoreline vegetation.	4'x5'	n/a	3-03	Establish buffer; Mulch Bare areas with erosion control mix	1	1
3-02	Lake	Residential	Roof runoff erosion; undercut shoreline; Inadequate shoreline vegetation	60'x3'	n/a	n/a	Install infiltration trench at roof drip line; Establish buffer.	1	1
3-03	Lake	State Road	Winter sand and salt runs into storm drain and culvert with direct flow to lake - Sediment delta		n/a	n/a	Install catch basin	3	3
3-04	Stream	State Road	Storm drain with direct flow to stream		n/a	n/a	Install catch basin	3	3
3-05	Stream	Residential	Roof runoff erosion	15'x20'	n/a	n/a	Rip/rap rock barrier	2	1
3-06	Lake	Residential	Moderate surface erosion; man-made ditch/drainage picks up sediment and flows to lake	50'x1'	n/a	n/a	remove ditch/drainage or stabilize with stone	2	1
3-07	Lake	Residential	Roof runoff erosion	120'x5'	n/a	n/a	Install gutters	2	3
3-08	Stream	Residential	Bare soil; Shoreline erosion and inadequate shoreline vegetation.	20'x10'	n/a	n/a	Establish Buffer	2	1
3-09	Lake	Residential	Bare soil (gardens)	30' diameter	n/a	n/a	Install barrier around gardens	1	1
3-10	Stream	Residential	Moderate surface erosion; Bare soil; Roof runoff erosion	10'x15'	n/a	n/a	Install Infiltration trench; Install Drywell at down spout	2	2
3-11	Stream	Residential	Severe surface erosion; Bare soil under buildings	10'x10'	n/a	n/a	TBD	3	3
3-12	Stream	State Road	Moderate surface erosion; Moderate road shoulder erosion; Bare soil	20'x10'	n/a	n/a	Armor ditch with stone; Install runoff diverters	2	2
3-13	Stream	Driveway	Moderate surface erosion; Bare soils	75'x15'	n/a	3-14	Add new surface material; Install runoff diverters; Rubber razors	2	2

Sector & Site #	Direct Flow to? (Lake, stream, ditch, veg)	Land Use	Problems	Area	Cause of site #	Result of site #	Recommendations	Impact Low - 1 Medium - 2 High - 3	Cost of Materials & Labor Low - 1 Medium - 2 High - 3
3-14	Ditch	Driveway	Moderate surface erosion; Bare soil	200'x20'	3-13	n/a	Add new surface material or pave; Install runoff diverters; Install ditch	2	2
3-15	Lake	State Road	Winter sand build-up		n/a	n/a	TBD	3	3
3-16	Lake	State Road	Severe surface erosion; Severe road shoulder erosion; Bare soil; Winter sand accumulation; Shoreline erosion; unstable shoreline access	20'x20'	n/a	n/a	Armor road shoulder with stone; Define footpath; Stabilize footpath; Install Infiltration steps	3	2
3-17	Ditch	Driveway	Moderate surface erosion; Undersized ditch	15'x50'	n/a	n/a	Install ditch	1	1
3-18	Lake	State Road	Moderate surface erosion; bare soil; winter sand accumulation	15'x50'	n/a	n/a	Armor banks with stone; Vegetate road shoulder; reseed bare soil and thinning grass	2	2
3-19	Vegetation	Driveway	Moderate surface erosion	15'x50'	n/a	n/a	Reshape ditch; Install rubber razors and water bar	1	1
3-20	Lake	State Road	Unstable culvert inlet and outlet	5'x20'	n/a	n/a	Armor inlet and outlet with stone	2	1