

Phillips Lake

Watershed-based Protection Plan



April 2014

Prepared by:

**Megan Facciolo, Hancock County Soil & Water Conservation District
with assistance from the Phillips Lake Association and
the Lucerne-in-Maine Village Corporation**

1. Background Information

A. Document Purpose and Scope

The purpose of this Watershed Based Plan, herein after referred to as the “plan”, is to lay out a strategy and schedule for NPS mitigation and water quality protection efforts for the Phillips Lake watershed over the next ten years (2014 to 2024). The Hancock County Soil and Water Conservation District (HCSWCD) prepared the plan with assistance and input from the Phillips Lake Association (PLA), Lucerne-in-Maine Village Corporation (LIMVC), Maine Department of Environmental Protection (MDEP), and United States Environmental Protection Agency (EPA).

The plan was developed to satisfy national watershed planning guidelines provided by the U.S. Environmental Protection Agency (EPA). EPA requires *nine-element* plans for impaired watersheds, but allows *alternative* plans in several cases including protection of high quality or unimpaired waters. MDEP accepts alternative plans for unimpaired lakes that have completed a recent watershed survey provided that the plans follow EPA and MDEP guidance and include minimum planning elements. Phillips Lake meets these eligibility criteria.

Note: Information collected during the original 2010 and the updated 2012 Phillips Lake Watershed Surveys forms the basis for much of this plan. As such, the *Phillips Lake Watershed Survey Report* is attached to the plan as Appendix A and the updated Roads list is attached as Appendix B. Also attached is Appendix C, *The Phillips Lake Education and Outreach Plan*, which will identify and guide what education activities will be implemented to further protect Phillips Lake. Both of these documents are very valuable tools for the PLA, residents, municipal officials, and road commissioners to work together to protect the watershed.

Watershed Background

Phillips Lake (also called Lucerne Lake) is an 828 acre lake located in the town of Dedham (which includes the Village of Lucerne) in the County of Hancock, Maine. The lake has a direct drainage area of 17.25 sq. mi. all within the town of Dedham (See Attachment A). There are five small inlets scattered around the lake that come from smaller ponds (all less than 65 acres) or drain out of marshes. The lake has a maximum depth of 98 feet, a mean depth of 40 feet, and a flushing rate of only 0.52 flushes per year (the average flushing rate for Maine lakes is 1-1.5 flushes per year). The low flushing rate of Phillips Lake makes the lake more sensitive to changes in its nutrient loading because it gives nutrients a chance to settle to the bottom and be recycled within the water column. The lake has two major outlets: Mill Stream in the northern end of the lake which connects to Alamoosook Lake, and a second outlet in the southwestern end of the lake, Mann Brook, which flows into Green Lake. Phillips Lake is currently listed on Maine DEP’S Nonpoint Source Priority Watersheds List due to heavy development pressure in the watershed. The town of Dedham recently updated its Comprehensive Plan in 2008 and both Dedham and the Lucerne-in-Maine-Village Corporation have strong Zoning Ordinances in place to help protect their natural resources, including Phillips Lake.

With its proximity to Bangor and Ellsworth, Phillips Lake is a popular recreation destination with a public boat launch and beach not far from the heavily traveled Route 1A. Swimming, boating, and fishing are enjoyed by many residents who live on the lake and those that come to visit. The lake receives heavy fishing pressure, especially in the winter and early spring, for coldwater sport fish like lake trout and landlocked salmon. The Department of Inland Fisheries and Wildlife has stocked Phillips Lake since 1989 with landlocked salmon and lake trout.

The Lucerne Beach Club, a private beach club, is situated on the lake and is open during the summer months. Also the famous Lucerne Inn, one of the area’s premier wedding destinations, overlooks Phillips Lake.

Camp Capella, a year-round lake front facility that offers recreational and educational programs for children and adults with disabilities is on Phillips Lake. Camp Capella offers a variety of experiences that might not otherwise be available to people with disabilities including swimming, boating, and nature study. The facility hosts around 430 people with disabilities annually!

The lake is also home to several families of loons and bald eagles. According to the Maine Audubon Society Loon Count, there was an average of approximately 8 adult loons and 1 chick yearly from 1988 to 2010, with 21 reported adults in 2010. The Maine Natural Areas Program has a large section of the lake marked as bald eagle nesting areas and a few sections of the watershed are listed as a special area of concern for inland waterfowl/wading bird habitat. The town of Dedham has 30 acres in conservation easement including 6 islands in Phillips Lake. The watershed also contains prime farmland and farmland of statewide importance.

The lakeshore is estimated to be 90% developed with a combination of summer camps and year-round residences, with an estimated 51% increase from seasonal camps to year-round residences in the last 10 years. The increasing development around the lake over the last 50 years has created many changes in the shoreline and access roads. As the shoreline has become more developed and more camps are being turned into year-round residences, the roads have experienced more traffic than they were designed to handle, which has led to significant erosion issues around the lake.

According to the "Summary Report of Conditions in Hancock County", prepared by the Hancock County Planning Commission, from 1970-2000 Dedham's population grew by over 172%. The projected population for 2000-2015 predicts Dedham's population to continue to grow by over 18%. This report also shows that from 2000-2015, the projected number of new homes that will be constructed in Dedham will increase by almost 31%. With this population and development increase, there is an obvious high potential for increased stress to the water quality of Phillips Lake.

B. Summary of Prior Watershed Work

Stewardship efforts in the Phillips Lake watershed remain on a steady rise due in large part to a very dedicated group of volunteers who live around the lake. Phillips Lake Watch (PLW), the original name of the lake association for Phillips Lake, was originally formed in 1981 and then lost momentum in 2005 when the long-time President passed away. The group re-formed in 2011 and is regaining its membership with over 40 members, a strong Board of Supervisors, and they have started to create sub-committees including Boat Inspection, Nonpoint Source Pollution, and Water Quality Monitoring. The PLW is also currently working on putting together a website and their first newsletter which they plan to send out to all watershed residents, not just PLW members. Activities of the Phillips Lake Association include invasive aquatic plant surveying, island and lakeshore clean-ups, and courtesy boat inspections during heavy boating times. Since 1974, watershed volunteers have been active annually in water quality monitoring and starting in 2003, they have also been annually monitoring for invasive aquatic plants. In 2008 and 2009, they participated in e-coli bacteria testing of 2 sites around the lake.

In 2010, a watershed survey was completed of the entire watershed (done without grant funds), which identified 60 NPS sites and a Watershed Survey Report was generated (*Phillips Lake Watershed Survey Report*). In 2012, the roads portion of the watershed survey was updated by volunteers and District staff (again without grant funds). Using this new information, an EPA section 319 implementation grant was submitted to Maine DEP and selected for funding. The *Phillips Lake Watershed Protection Project* is currently ongoing through the spring of 2015. Important achievements from this project to date include the creation of the Phillips Lake Education and Outreach Plan and the improvements to

over 21 NPS sites. Funding for this project, in part, was provided by the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act. The funding is administered by the Maine Department of Environmental Protection in partnership with EPA.

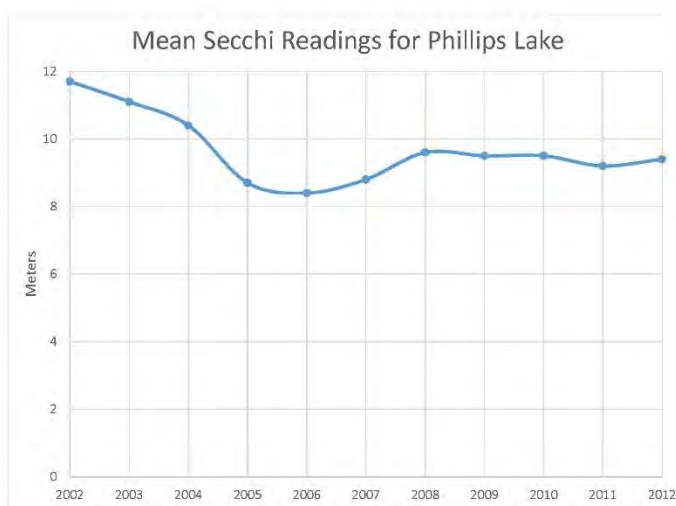
The Town of Dedham, including the Village of Lucerne, annually reserves approximately \$105,000 per year towards road projects in the watershed and there are numerous private road associations around Phillips Lake regularly contributing significant voluntary NPS mitigation work. Since the *Phillips Lake Watershed Survey Report 2010* was developed, Dedham has used this document to plan and implement road projects to improve their roads and help protect the lake by installing simple repairs like replacing culverts and super-elevating roads.

2. Identification of the Causes and Sources of the NPS Threat

A. Water Quality Summary

Water quality data has been periodically collected by DEP and members of the Maine Volunteer Lake Monitoring Program (VLMP) since 1974. The water quality of Phillips Lake is considered to be above average and the potential for nuisance algae blooms is low. However, recorded secchi readings from the last 10 years show a 2 meter decline in water clarity.

As mentioned earlier, Phillips Lake also has a very slow flushing rate of only 0.52 flushes per year which makes the lake more sensitive to changes in its nutrient loading because it gives nutrients a chance to settle to the bottom and be recycled within the water column.



B. Watershed NPS Threats

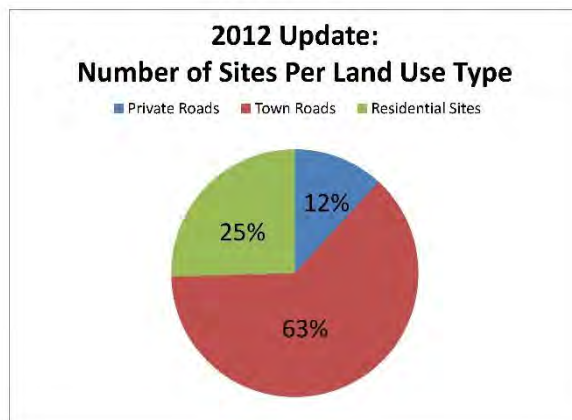
The greatest threat to water quality in Phillips Lake is polluted runoff. During and after storms, soil and nutrients like phosphorus and nitrogen wash into the lake from the surrounding landscape via ditches, streams and overland flow. Excessive nutrients in stormwater runoff is very detrimental to water bodies like Phillips Lake. Phosphorus, a nutrient that is common on land, is a primary food for all plants, including algae. In natural conditions, the scarcity of phosphorus in a lake limits algae growth. However, when a lake receives extra phosphorus from the watershed, algae growth increases dramatically.

Sometimes this growth causes choking algae blooms but more often it results in small negative changes in water quality that, over time, damage the ecology, aesthetics, and economy of lakes. Phosphorus is found attached to soil particles, and by documenting soil erosion in the watershed, we can gain an understanding of sources of phosphorus to the lake. Other sources of phosphorus may include agricultural runoff, fertilizers (on agricultural land and on residential lawn areas), and malfunctioning septic systems.

In 2010, a watershed survey was completed of the entire watershed, which identified 60 NPS sites and a Watershed Survey Report was generated (*Phillips Lake Watershed Survey Report*). Out of these 60 sites, 11 were located on Private

Roads, 34 were located on Town Roads, and 15 sites were classified as Residential problems. The town has a limited budget to work with and since the Watershed Survey Report came out in 2010, they have asked for and received free technical assistance from the District to start looking at the issues identified in the Report.

The District re-surveyed all road sites in the Phillips Watershed in the spring of 2012. We found 44 total road sites, 7 of which were on Private Roads and 37 on Town Roads. A majority of the sites that were identified in the 2010 Survey were still issues, but some had been fixed and new NPS sites were documented. Out of the 44 road sites identified in the 2012 update, 27 were considered high or medium priority sites due to the amount of erosion, the proximity of that erosion to a ditch, stream, or the lake, and evidence that eroded soil is moving off site toward the water. Of these 27 medium and high priority sites, 6 were on Private Roads and 21 were on Town Roads.



While there is active agriculture and logging in the watershed, we did not find that these areas were contributing phosphorus and sediment runoff issues to Phillips Lake during either survey in 2010 or 2012. Survey volunteers did review these areas and no NPS issues were found during either survey. Therefore, we focused on other developed areas of the watershed because this was the area of high concern for sediment and phosphorus exports. We will continue to monitor agricultural and logging areas in the watershed in case NPS issues do arise.

3. Watershed Plan Goals and Objectives

Overall Goal: The overall goal of this plan is to maintain or improve Class GPA water quality standards in Phillips Lake by reducing phosphorus and sediment loading to the lake. This will be achieved through the following actions over the coming ten year period (2014-2024):

- **Reduce current sources of phosphorus loading** by fixing 55 of the 60 sites identified in the watershed survey (40 road sites and 15 residential sites). This will be achieved by providing targeted outreach, technical assistance, and cost-sharing assistance to install conservation practices at NPS sites identified in the watershed survey and at other NPS issues found in the watershed.
- **Prevent new sources of phosphorus loading** by facilitating and demonstrating improved land use practices. This objective will be met by conducting outreach and providing technical assistance to residents, road associations, and municipal officials.
- **Educate watershed residents on NPS pollution issues** by implementing the Education and Outreach Plan for the Phillips Lake Watershed. This document will help us identify outreach priorities by developing specific, measurable outreach objectives.
- **Conduct ongoing assessment of lake and watershed conditions** by maintaining and utilizing the NPS Site Tracker. Site Tracker is an excel spreadsheet that can be used to monitor sites identified in the watershed survey, to add new sites as they are discovered in the watershed, and to mark sites as completed when they are fixed.

4. Schedule and Milestones to Guide Plan Implementation

A. Action Plan and Schedule

Action items, an estimated schedule, and milestones were developed to address existing NPS sites with the highest impact and phosphorus loading to Phillips Lake and to prevent new NPS problems. The number and types of sites targeted in the plan was based on local knowledge about potential funding sources, landowner cooperation and other considerations. The plan is designed to be implemented over a ten year period, and an estimated schedule is provided for each action (Table 1). Potential funding sources and key partners were also identified for each action (Table 2).

Table 1 – Estimated Schedule

2014 – 2015	<ul style="list-style-type: none"> Facilitate the Phillips Lake Watershed Protection Project, Phase I Set up the NPS Site Tracker for identified sites in the Phillips Lake Watershed Survey and new sites that are found. Apply for a second (Phase II) EPA Section 319 Clean Water Act grant through MDEP. Notify landowners about the availability of funds for residential sites projects to fix NPS pollution issues.
2015 – 2017	<ul style="list-style-type: none"> Conduct Phase II EPA 319 project (if funded) with targeted cost sharing and matching grants for high priority sites. Continue to implement activities described in the Education and Outreach Plan.
2014 – 2024	<ul style="list-style-type: none"> Phillips Lake Association continues to do water quality monitoring to check transparency readings. Phillips Lake Association conducts annual meetings, outreach, and raises funds for ongoing stewardship. Landowners self-funded BMPs installation and maintenance at NPS sites. Phillips Lake Association utilizes the NPS Site Tracker.

Table 2 – Action Items and Milestones	Schedule	Who	Potential Funding Sources
<i>Reduce current sources of phosphorus loading to the lake by addressing NPS sites identified</i>			
Self-funded BMP installations at NPS sites to set an example for others around the lake and create a new social norm			
Residential Sites- Inadequate/No Buffer sites (3)	2014-2019	Landowners	Private
Other Residential sites (3 sites)	2014-2019	Landowners	Private
Provide opportunity for cost sharing assistance to install BMPs at NPS sites			
Private Roads (10 sites)	2014-2024	Private	EPA (319), Private
Town Roads (24 sites)	2014-2016	LIMVC	EPA (319), LIMVC
Residential sites (15 sites)	2014-2016	Landowners	EPA (319), Private
Conduct outreach & technical assistance	Ongoing	HCSWCD, PLA	HCSWCD, PLA
<i>Prevent new sources of phosphorus loading to the lake</i>			
Hold tours to highlight conservation practices	2014-2016	PLA	EPA (319)
Work with road associations and Towns to prompt ongoing road maintenance	2015-2025	HCSWCD, PLA	LIMVC, Private
<i>Educate watershed residents on NPS pollution issues</i>			
Develop an Education and Outreach Plan	2014	HCSWCD, PLA	EPA (319)
Implement action items from the Education and Outreach Plan	2014-2024	HCSWCD, PLA	EPA (319), PLA
Conduct PLA annual meetings	Ongoing	PLA	PLA
Raise funds to support ongoing lake stewardship work	Ongoing	PLA	Private, LIMVC
<i>Conduct ongoing lake and watershed assessment</i>			
Conduct lake water quality monitoring	Ongoing	PLA, MDEP	PLA, Private
Maintain and utilize NPS Site Tracker	Ongoing	PLA	PLA

B. Plan Oversight and Partner Roles

The Phillips Lake Watershed-based Plan will be carried out by the Phillips Lake Association with strong support from the Lucerne-in-Maine Village Corporation and the Hancock County Soil and Water Conservation District. Other partners include MDEP, the Town of Dedham, MDOT, private road associations, and landowners.

- **Phillips Lake Association (PLA)** will conduct water quality monitoring (through the Volunteer Lake Monitoring Program), facilitate outreach activities, promote watershed stewardship through its website and newsletter, and raise funds for stewardship work. They will also utilize the NPS Site Tracker to identify new NPS sites and prompt ongoing maintenance.
- **Lucerne-in-Maine Village Corporation (LIMVC)** will support the PLA with Plan implementation and funding for town road projects following technical assistance from the HCSWCD.
- **Hancock County Soil and Water Conservation District (HCSWCD)** will support the PLA with Plan implementation, provide technical assistance, will administer the Phase I EPA Section 319 Clean Water Act grant, and will write and administer the proposed Phase II EPA Section 319 Clean Water Act grant.
- **Maine Department of Transportation (MDOT), private road associations, and landowners** will address NPS issues on their properties and conduct ongoing maintenance of BMPs.
- The **Town of Dedham** will work to address NPS problems and conduct regular maintenance on town road sites.
- **Maine Department of Environmental Protection (DEP)** will conduct water quality monitoring (in partnership with the Volunteer Lake Monitoring Program) and technical assistance and provide the opportunity for financial assistance through the NPS Grants Program.
- **Environmental Protection Agency (EPA)** may provide CWA Section 319 funds and guidance.

C. Plan Outputs and Milestones

Organizational Outputs

- PLA utilizes and maintains the NPS Site Tracker
- Development of an Education and Outreach Plan for the Phillips Lake Watershed
- Contact made with all property owners and road associations with sites identified in the watershed survey
- HCSWCD applies for a second (Phase II) 319 grant

NPS Mitigation Outputs

- Number of NPS sites fixed by voluntary landowner initiative
- Number of high and medium impact NPS sites fixed with cost-sharing assistance
- Number of technical assistance visits
- Estimated pollutant load reductions achieved by installed BMPs

Water Quality Outcomes

- Phillips Lake continues to meet lake GPA standards set by MDEP
- Stable or improved trend for lake water clarity (secchi readings)

5. Proposed Management Measures

The *Phillips Lake Watershed Survey Report* (Appendix A) was developed in 2010 and the roads portion of the sites list was updated in 2012 (Appendix B). This report lists all identified erosion sites in the watershed that are contributing sediment and phosphorus to the lake. Typical problems for the land uses identified in the watershed survey are described in the sections below. Recommendations follow guidelines found in MDEP publications including the *Gravel Road Maintenance Manual*, *Conservation Practices for Homeowners* fact sheet series, and *Erosion and Sediment Control Manual*. The recommended BMPs accomplish the plan goal of reducing phosphorus and sediment loading to the lake by stabilizing bare soil and erosion and diverting, infiltrating or filtering polluted runoff before it reaches the lake.

In addition to structural BMPs recommended for each problem, public education and outreach efforts will also be needed to promote responsible stewardship and ongoing maintenance activities. The NPS Site Tracker will be used by the Phillips Lake Association on an ongoing basis to identify new problems and to prompt maintenance of sites fixed through the plan.

A. Residential Sites

The original watershed survey identified 15 residential erosion sites. When the road sites were updated, other residential sites were also noted around the lake. Common problems included inadequate or lack of vegetated buffers, shoreline/bank erosion, lake access/driveway erosion, new construction issues, and large areas of open soil. Based on the survey results, the most common BMPs will include:

- Installing or enhancing vegetated buffers
- Installing rain gardens
- Mulching or planting open areas
- Installing runoff diverters on driveways and lake access points
- Stabilizing shoreline/bank erosion with a combination of fabric and rip rap and plantings

The plan aims to address 21 residential erosion problems, including the 15 identified in the watershed survey. These sites will be fixed by providing landowners with small matching grants for plants, erosion control mulch or other materials. Since many of the low impact sites are low cost and easy to fix, we believe that once a good example of appropriate fixes has been demonstrated, other homeowners will see the benefits and will independently fix their identified problems after recommended solutions are brought to their attention through targeted outreach and/or technical assistance visits.

B. Private Roads

The updated watershed survey identified 7 private road sites. 6 of the identified sites were listed as high or medium priority for the lake. Common problems included unstable culverts (inadequate size, not functioning, unstable inlets and outlets), ditch and shoulder erosion, and surface erosion. The most common BMPs recommended in the survey included:

- Installing new culverts and stabilizing the ends with stone
- Clean, reshape, and armor ditches with angular stone or vegetation
- Crown and reshape roads to allow for proper drainage

- Turnouts to push water away from the road and road edges

The plan aims to address all 7 private road sites found in the watershed survey, plus 3 more sites that have identified by HCSWCD since the survey was completed. Sites will be addressed by providing cost-sharing funds to road associations. Technical assistance will also be provided to road associations when additional sites are found.

Ongoing maintenance (e.g., grading, removing accumulated sediment from culvert inlets and outlets and turnouts) is critical to long term performance of these BMPs and prevention of new NPS problems. As a result, the plan calls for periodic inspections of implemented BMPs through the NPS Site Tracker. Follow up contact will be made by the Phillips Lake Association to road associations and landowners for any maintenance needs.

C. Town Roads

The updated watershed survey identified 37 private road sites. 21 of the identified sites were listed as high or medium priority for the lake. Common problems included unstable culverts (inadequate size, not functioning, unstable inlets and outlets), ditch and shoulder erosion, and surface erosion. The most common BMPs recommended in the survey included:

- Installing new culverts and stabilizing the ends with stone
- Clean, reshape, and armor ditches with angular stone or vegetation
- Crown and reshape roads to allow for proper drainage
- Turnouts to push water away from the road and road edges

The plan aims to address all 21 town road sites found in the watershed survey, plus 3 more sites that have identified by HCSWCD since the survey was completed. Sites will be addressed by providing technical assistance and cost-sharing funds to the Lucerne-in-Maine Village Corporation. Free technical assistance will also be provided to the town by the HCSWCD for remaining sites and when requested as additional sites are found.

Ongoing maintenance (e.g., grading, removing accumulated sediment from culvert inlets and outlets and turnouts) is critical to long term performance of these BMPs and prevention of new NPS problems.

6. Pollutant Load Reductions

Preliminary estimates of the top 27 NPS road sites identified estimate that just fixing these road sites alone will prevent at least 74 lbs. of phosphorus and 86 tons of sediment per year from entering the lake.

Pollutant load reductions will be estimated and reported to DEP for any work funded by 319 grants using methods approved and recommended by the DEP and EPA.

7. Water Quality Results Monitoring

The PLA will continue to annually monitor Phillips Lake twice a month from May through September for Secchi disk transparency, temperature, and dissolved oxygen. DEP also conducts baseline monitoring on Phillips Lake about every five years for transparency and other water quality parameters.

Every two years, DEP evaluates transparency data to assess trends in water quality conditions of the lake. The results of the transparency readings (positive, negative or stable) and DEP's assessment of the trends will assist in determining whether the plan meets its goal of having stable or improving water quality over time.

Attachment A- Phillips Lake Watershed



Phillips Lake Watershed Survey Report



January 2010



**Hancock County
Soil and Water
Conservation
District**



Acknowledgements

This survey was a volunteer project undertaken by the Phillips Lake Watershed Stewards. The Watershed Stewards Program (University of Maine Cooperative Extension) provides 20 hours of education related to lake and watershed protection. Watershed Stewards are then requested to serve an equivalent amount of time in service to help protect their lake



The following people were instrumental in the success of the Phillips Lake Watershed survey project:

Volunteer surveyors:

*Vicki Riley
Anne Faucet
Chuck McClead
Gloria Drummond
Tom Drummond
Bill Baron
John Wedin
Kristen Wedin*

Technical Staff:

*Laura Wilson, University of Maine Cooperative Extension
Megan Facciolo, Hancock County SWCD*

Questions? Contact Laura Wilson @ (207) 581-2971

Introduction

Why conduct a watershed survey?

Benefits of a watershed survey include:

- ◆ Increased awareness of threats to the lake
- ◆ Better knowledge of those threats
- ◆ Beginnings of a plan to address such threats

One of the greatest threats to Maine's lakes is stormwater pollution. Stormwater is runoff created by rain and melting snow. The runoff travels across hard and compacted surfaces on its way to Maine's lakes, rivers, and streams. While on its journey, stormwater runoff collects nutrients, sediment and other pollutants (such as engine oil or antifreeze), and carries these pollutants into Maine's water bodies.

The Phillips Lake Watershed was surveyed in order to document changes to the landscape caused by stormwater runoff. Through the survey, both erosion and damaged or clogged culverts were documented. Blocked culverts often pose a bigger threat to water quality than one would think; they often result in pools of standing water along the roadside, causing a diversion in the runoff's path and increasing the degree and variance of erosion.



Erosion along the shore of Phillips lake

Polluted storm water runoff can also have detrimental effects on a lake's water quality and ecosystem. Excess **phosphorus** attached to the eroded soil can cause algae blooms that suffocate native aquatic species by drastically lowering available oxygen in the water. Runoff is also heated by the sun as it makes its way to the water body. This heat absorption changes the temperature of the tributary stream. Though it is incremental, a slight change in water temperature can harm native species.

Why should we work to protect Phillips Lake ?

- ◆ Phillips Lake provides recreational opportunities to local families and visitors from away. These recreational opportunities provide important contributions to the local economy.
- ◆ A 1996 University of Maine study demonstrated that lake water quality affects property values. **For every meter (3 ft) decline in water clarity, shoreline property values can decline as much as 10 to 20 percent!** Declining property values affect individual landowners as well as the economics of the entire community.
- ◆ A lake is a dynamic source of habitat for fish, fowl and other wildlife.
- ◆ Once lake water quality has declined it is very hard or near impossible to restore. Most efforts to restore water quality are very costly, time consuming, and render little improvement.



Watershed volunteers made this project happen!

Volunteers walked the roadways and shoreline throughout the watershed and documented sources of erosion and pollution to the lakes. Sites were classified by severity, feasibility to correct and cost, and recommendations were made, to correct these erosion problems.



Purpose of Survey

The primary objective of this survey was to identify and prioritize existing sources of pollution within the Phillips Lake watershed. In addition to making these identifications, the survey also served 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, and
- ◆ Identify areas where lakefront buffers need to be installed or enhanced.

Local citizen participation was essential in completing the watershed survey and will be even more important in upcoming years.

Methods

The following steps were taken by our volunteers:

- ◆ Walk the watershed,
- ◆ Look for eroding soil,
- ◆ Trace the eroding soil to the lake, tributary stream, or ditch,
- ◆ Document the problem, and
- ◆ Suggest solutions.

Surveyors also documented shorefront properties that lacked adequate shorefront buffer zones. Buffers provide one last chance for pollution to be intercepted before reaching the lake.

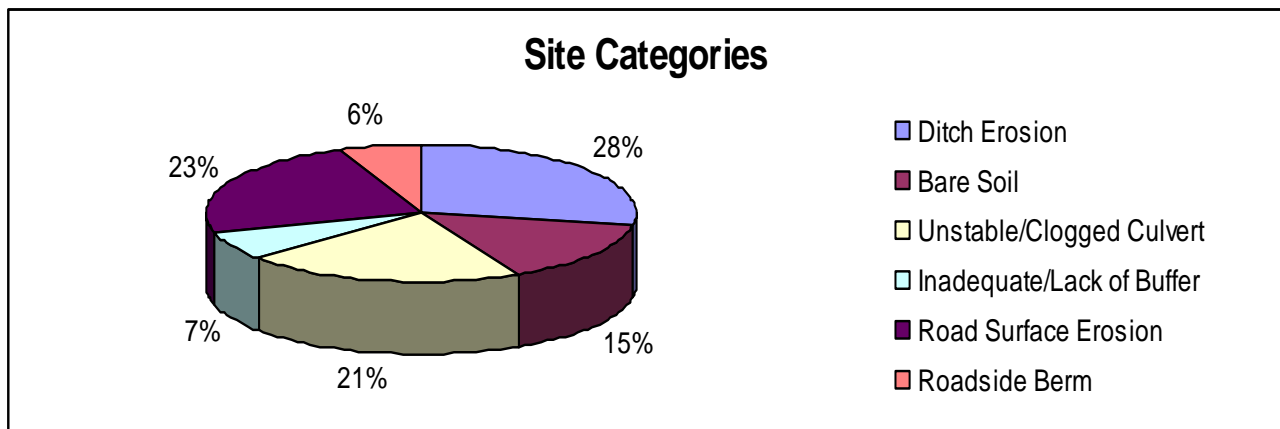


Survey Results Summary

Volunteers and Technical Staff recorded 60 sites within the Phillips Lake Watershed that are potentially jeopardizing the lake's water quality.

Description of Sites

Several categories of problem sites were identified within the Phillips Lake Watershed through the watershed survey, including ditch erosion, bare soil, unstable/clogged culvert, inadequate/lack of buffer, roadside erosion, and roadside berm. Ditch and road surface erosion together account for 51% of the sites reported. Unstable/clogged culverts and bare soil also were often recurring issues. Though inadequate buffers were less common (7%), these sites pose a serious threat to water quality as buffer zones are the last, and often most efficient means of filtering runoff.



Ditch and Road Surface Erosion

Many of the properties visited during the survey showed evidence of both ditch and road surface erosion. Volunteers classified each eroding site as slight, moderate, or severe erosion.

These sites often were found to have other problems as well, such as lack of buffers, which would help to hold soils in place and prevent erosion. Unstable or clogged culverts were also common on these sites. Culverts that are not



working properly cause water to pool and form new runoff pathways. These alternative paths are often the site of moderate to severe soil erosion. *Fifty-eight percent of all sites that recorded ditch erosion and 50% of all sites that recorded road surface erosion also had clogged or unstable culverts.*

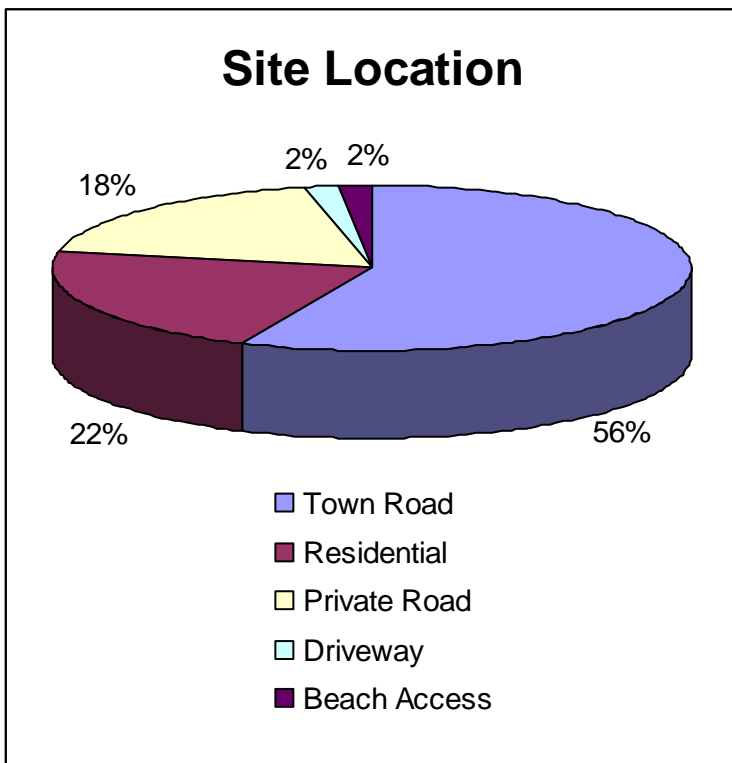
Unstable/Clogged Culverts

Of all problem sites documented, 21% had unstable or clogged culverts. The majority of these sites (67%) were located on Town Roads. All but two of the 27 recorded unstable/clogged culverts also showed evidence of other problems, such as ditch and road surface erosion. This suggests that the repair or replacement of dysfunctional culverts could drastically reduce stormwater pollution in the Phillips lake watershed.



Location of Sites

Volunteers found most problem sites occurred on town roads, responsible for 56% of the sites documented. The most common problems found on town road sites were :



- ◆ Ditch erosion (74%)
- ◆ Clogged/unstable culverts (50%)
- ◆ Bare soil (38%)

Residential lots accounted for 22% of sites documented. On residential lots, the most common problems were:

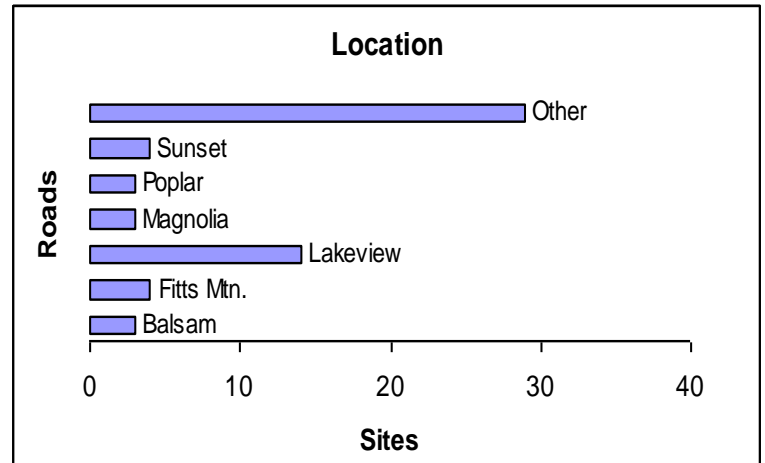
- ◆ Bare soil (54%)
- ◆ Surface erosion (54%)
- ◆ Ditch erosion (46%)

There were eleven sites identified on Private roads, making up 18% of total problem sites. On private roads our volunteers found:

- ◆ Surface erosion (64%)
- ◆ Clogged/Unstable culverts (55%)
- ◆ Ditch erosion (55%)

Town and Private Roads

This graph depicts the number of sites that were recorded for each road. “Other” refers to any road that had less than three reported sites. Roads included in “Other” are: Larkspur, Maple, Oak, Hemlock, and Clear Lake.



Lakeview road accounted for fifteen (or roughly 25%) of the reported sites. The most common reported issues were unstable/clogged culverts and moderate to severe ditch erosion. The most common sites on Sunset road were unstable culverts and inadequate ditch size/ditch bank failure. On Fitts Mountain road, surveyors found a construction site that had no evident erosion control.

Town roads and private roads together accounted for 74% of all sites that were reported to have issues that are detrimental to Phillips lake water quality. Most of these issues, however, could be fixed by unclogging or replacing damaged culverts.



Recommendations for Town and Private Roads:

- ◆ Unclog culverts
- ◆ Stabilize culverts
- ◆ Build up or crown road
- ◆ Vegetate ditch
- ◆ Remove roadside berms
- ◆ Armor ditch

Issues with Town and Private Roads:

- ◆ Ditch erosion
- ◆ Road surface erosion
- ◆ Unstable/clogged culverts
- ◆ Bare soil
- ◆ Roadside berms



Residential Properties

Residential properties composed 22% of all locations that were found to have problem sites. This is an opportunity for outreach, as residents do not consistently apply best management practices or new technologies on their properties. This outreach to individual residential land owners should be the focus of the lake association and partners.



Issues with Residential Properties:

- ◆ Bare soil
- ◆ Unstable/clogged culverts
- ◆ Ditch erosion
- ◆ Road surface erosion
- ◆ Lack of buffer

Recommendations for Residential Properties:

- ◆ Install runoff diverters
- ◆ Establish buffers
- ◆ Stabilize/unclog culverts
- ◆ Replace culverts
- ◆ Vegetate/reshape ditches



Next Steps: Where Do We Go From Here?

Repairing the problem sites identified in this survey will require efforts by individuals, road associations, and municipal offices.

Individuals

- ◆ Prevent runoff from washing sediment into the lakes. Detain runoff in depressions or divert flow to vegetated areas. Call the Hancock County SWCD or DEP for 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 in place and prevent erosion.
- ◆ Avoid exposing bare soil. Seed and mulch bare areas.
- ◆ Call your Code Enforcement Officer before cutting vegetation within 250 feet of the shore.
- ◆ Maintain septic systems properly. Pump septic tanks (every 2 to 3 years for year round residences; 4-5 years if seasonal) and upgrade marginal systems.

Road Associations (or private roads without associations)

- ◆ Minimize road runoff by doing regular, comprehensive maintenance. Form a road association if one does not already exist. Call the Maine DEP at 287-3901 for more information.
- ◆ Get a copy of “Camp Road Maintenance Manual – A Guide for Landowners.” This reference is a must for anyone managing a gravel road. Call the Maine DEP at 822-6300 to order a copy, or download a PDF at <http://www.state.me.us/dep/blwq/docwatershed/camroad.pdf>.
- ◆ For more extensive problems, seek free technical help. Contact the Hancock County SWCD or Maine DEP to request technical assistance.

Municipal Officials

- ◆ Enforce shoreland zoning ordinances to assure full protection of Phillips Lake.
- ◆ 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.

For More Information

Contacts

University of Maine Cooperative Extension

Water Quality Office—495 College Ave, Orono, Maine 04473
(207) 581-2971

Provides water/nonpoint source pollution-related education programs for lakefront residents statewide.

Hancock County Soil and Water Conservation District

190 Bangor Road, Ellsworth, Maine 04605
(207) 667-8663

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

Maine Department of Environmental Protection (local office)

106 Hogan Road, Bangor, Maine 04401
Phone: (207) 941-4570

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

Publications

Kennebec County SWCD and Maine DEP. June, 2000. *Camp Road Maintenance Manual: A Guide for Land-owners*. 54 pgs. Available online at <http://www.state.me.us/dep/blwq/docwatershed/camroad.pdf>

Portland Water District. 2006. Brochures and Environmental Fact Sheets. Available online at <http://www.pwd.org/news/publications.php>

University of Maine Cooperative Extension. *Gardening to Conserve Maine's Native Landscape: Plants to Use and to Avoid*. Bulletin #2500. June, 1999. Folded leaflet. Available online at <http://www.umext.maine.edu/onlinepubs/htmpubs/2500.htm>

University of Maine Cooperative Extension. *Lake*A*Syst*. Bulletin #7111. 2001. 24 pgs. Available online at <http://extension.umaine.edu/waterquality/lake-a-syst/>

York County SWCD and Maine DEP. October, 2009. *A Guide to Forming Road Associations*. 24 pgs. Available online at http://www.maine.gov/dep/blwq/docwatershed/road_association_guide.pdf

Phillips Lake Watershed Survey Site List 2010

Sector & Site	Location	Road	Land Use	Description	Recommendations
A- 1	Cottage Rd. Culvert under 1-A to lake	Cottage	Private Road	Soil - Delta in lake. Severe surface erosion	Remove berms on roadways. Divert water
A- 2	Dailey Rd.	Dailey	Private Road	Steep pitch with no turnout or culverts. Severe ditch and surface erosion.	Install driveway culverts. Establish buffer zone. Reshape crown of road. Install / reshape ditch.
A- 3	Hobby farm Rd. off Thompson Rd.	Hobby Farm Road	Private Road	Unstable culvert. Moderate ditch erosion and inadequate ditch size. Slight to moderate road shoulder and surface erosion	Unclog culvert. Armor and reshape ditch
A- 4	Thompson Rd. at intersection w/ Hobby farm Rd.	Thompson	Town Road	Clogged culvert. Moderate ditch erosion.	Unclog culvert. vegetatee / reshape ditch
B- 1	Fitts mountain Rd. on left	Fitts Mountain	Residential	Severe ditch erosion. Lack of buffer. Dog run within 25 feet of shore	Establish buffer.
B- 2	Driftwood Dr. #10	Driftwood	Residential	Unstable culvert. Delta in stream. Severe ditch, road shoulder and surface erosion. Shoreline erosion	Stabilize culvert. Armor / reshape ditch. Build up, crown and grade road. vegetatee shoulder. Install detention basin. Establish buffer. Rip rap erosion control
B- 3	Peake's mountain Rd. #95	Peake's	Residential	lack of buffer	Establish buffer
B- 4	Peake's mountain Rd. #77	Peake's	Residential	Bare soil. Lack of buffer	Establish buffer. Install runoff diverter.
B- 5	Murray Rd.	Murray	Private Road	Unstable, clogged culvert. Moderate ditch erosion.	Stabilize, unclog culvert. Reshape or re-install ditch.
B- 6	Fitts mountain Rd.	Fitts Mountain	Residential	Bare soil. Construction site with no erosion controles.	Erosion controles (silt fence, hay bales, EC berms.
B- 7	Fitts mountain Rd. - Driftwood up hill	Fitts Mountain	Private Road	Moderate surface erosion	Remove roadway berms.
B- 8	Intersection of Driftwood and Fitts mntn.	Driftwood and Fitts Moun	Private Road	Unstable culvert inlet	Unclog culvert inlet
C- 1	Intersection or Lakeview and Chestnut rd.	Lakeview Ave	Town Road	Unstable culvert. Bare soil and delta in stream/lake. Moderate ditch erosion. Road side berm from sand.	Stabilize culvert. vegetatee and armor ditch. Remove berms. Install catch basin.
C- 2	Lakeview Ave camp 323	Lakeview Ave	Town Road	Unstable/clogged culvert. Bare soil. Moderate ditch and surface erosion.	Stabilize and unclog culvert. Vegetate and armor ditch. vegetatee shoulder. Install catch/detention basin and runoff diverters.
C- 3	Lakeview Ave camp 363	Lakeview Ave	Town Road	Unstable culvert. Bare soil. Moderate ditch erosion. Ditch bank failure	Install plunge pool. Vegetate/armor ditch. Install check dams/sediment pools. Vegetate shoulder. Enhance buffer, use dips for water retention.
C- 4	Lakeview Ave sandpit opposite camp 427	Lakeview Ave	Town Road	Large area of bare soil.	Vegetate
C- 5	Lakeview Ave camp 516	Lakeview Ave	Town Road	Moderate ditch erosion	Vegetate ditch. Also vegetate around new culvert
C- 6	Lakeview Ave camp 570	Lakeview Ave	Town Road	Moderate ditch erosion. Bare soil	Vegetate/reshape ditch.
C- 7	Lakeview Ave camp 587	Lakeview Ave	Town Road	Unstable culvert. Bare soil. Moderate ditch erosion.	Stabilize culvert. Vegetate ditch. Install catch basin. Dips for water retention.
C- 8	Lakeview Ave camp 655	Lakeview Ave	Town Road	Clogged culvert. Delta in lake	Remove clog. Build up road. (Bridge may be cheaper alternative in long run)

Phillips Lake Watershed Survey Site List 2010

C- 9	Lakeview Ave camp 701	Lakeview Ave	Town Road	Moderate ditch and surface erosion.	Vegetate ditch. Add new surface material to road, crown road.
C- 10	Lakeview Ave camp 733	Lakeview Ave	Town Road	Clogged culvert. Bare soil. Severe ditch erosion. Moderate road shoulder and surface erosion.	Remove clog. Build up/crown road. Uninstall catch and detention basins.
C- 11	Lakeview Ave camp 739	Lakeview Ave	Residential	Lack of buffer, shoreline erosion. Slight surface erosion.	Install runoff diverters. Open top culvert. Establish buffer.
C- 12	Lakeview Ave Telephone pole #37	Lakeview Ave	Town Road	Delta in stream/lake. Inadequate buffer. Surface and shoreline erosion.	Install catch and detention basins. Install runoff diverter. Apply mulch or erosion control.
C- 13	Lakeview Ave Telephone pole #37	Lakeview Ave	Town Road	Clogged culvert. Bare soil. Severe ditch erosion. Moderate road shoulder and surface erosion.	Armor ditch. Vegetate shoulder.
E- 1	Lakeview Ave	Lakeview Ave	Town Road	Bare soil. Moderate ditch, road shoulder and surface erosion. Road side berm from sand	Install new, or reshape ditch. Enhance buffer.
E- 2	Intersection of Mulberg and Lakeview ave	Mulberg	Town Road	Bare soil. Moderate ditch, road shoulder and surface erosion. Road side berm from sand/grader.	Install or reshape ditch. Rip rap
E- 3	Beaver circle #103	Beaver Circle	Town Road	Bare soil. Unstable culvert. Moderate ditch and road shoulder erosion.	Stabilize culvert. Erosion control
E- 4	Mullberg Rd.	Mulberg	Town Road	Bare soil. Moderate ditch, road shoulder and surface erosion. Road side berm from sand. Inadequate ditch size, bank failure.	Stabilize culvert. Vegetate/reshape ditch. Add new surface material to road. Grade/crown road. Other erosion control.
F- 1	Maple St.	Maple	Town Road	Unstable culvert inlet. Moderate ditch erosion.	Stabilize culvert inlet. Armor ditch.
F- 2	Intersection of Maple and Pearl Point	Maple	Town Road	Moderate ditch erosion.	Reshape / vegetate ditch along Maple St.
F- 3	Lot 50 + 51 (Camp capella + Beach club)	Camp Capella/Beach Clu	Residential	Lack of shoreline buffer	Establish buffer between grassy area and beach front.
F- 4	Boat launch and parking lot	Boat Launch	Town Road	Moderate road shoulder and surface erosion. Unstable shoreline access	Install turnouts. Crown road. Install runoff diverters.
F- 5	Poplar Rd	Poplar	Town Road	Unstable / clogged culvert. Moderate ditch erosion	Stabilize / unclog culvert. Vegetate and armor ditch.
F- 6	Poplar Rd.	Poplar	Town Road	Unstable / clogged culvert. Moderate ditch erosion	Stabilize / unclog culvert. Vegetate and armor ditch.
F- 7	Poplar Rd. # 34	Poplar	Town Road	Unstable / clogged culvert. Moderate ditch erosion. Bank failure.	Stabilize / unclog culvert. Armor ditch.
F- 8	Balsam Rd. # 45	Balsam	Residential	Clogged culvert. Bare soil	Stabilize / unclog / lengthen culvert. Armor ditch. Install runoff diverter. Vegetate ditch
F- 9	Balsam Rd. # 49	Balsam	Residential	Unstable / clogged culvert. Bare soil. Slight ditch and surface erosion.	Replace culvert. Vegetate and reshape ditch.
F- 10	Balsam Rd. # 47	Balsam	Residential	Clogged culvert. Bare soil. Moderate ditch erosion. Slight surface and road shoulder erosion.	Unclog culvert. Vegetate ditch. Enhance buffer.

Phillips Lake Watershed Survey Site List 2010

F- 11	145	Balsam	Residential	Slight erosion from parking lot.	Install runoff diverters.
F- 12	Lily Rd. # 39	Lily Road	Residential	Bare soil. Severe ditch erosion and bank failure.	Install plunge pool. Armor ditch
F- 13	Oak Rd lot 11	Oak Road	Residential	Bare soil, erosion	Install runoff diverter in place of natural steps.
F- 14	Lot 67 # 61	Oak Road	Private Road	Lack of buffer. Surface erosion	Build up/grade road. Install buffer. Install runoff diverter.
F- 15	Lot # 69	Oak Road	Residential	Slight surface erosion. Inadequate buffer.	Install runoff diverters.
F- 16	Park Drive # 12	Park Drive	Residential	Roof runoff erosion. Lack of buffer	Install buffer. Install runoff diverter for roof runoff.
G- 1	Clear lake Rd.	Clear Lake Road	Town Road	Slight road surface erosion.	Install ditch turnouts. Crown road.
G- 2	Magnolia Rd.	Magnolia Road	Town Road	Road side berm from winter sand. Slight road surface erosion.	Remove roadway berms. Crown road. Install runoff diverters.
G- 3	Magnolia Rd.	Magnolia Road	Town Road	Inadequate ditch size. Moderate road surface erosion	Install ditch. Build up / crown road.
G- 4	Private Rd. between Magnolia and Hornbeam	Private road between Magnolia and Hornbeam	Private Road	Clogged culvert. Road side berm from grader	Unclog culvert. Remove roadway berm. Install runoff diverters
G- 5	Magnolia Rd.	Magnolia Road	Town Road	Clogged culvert. Road side berm from grader. Slight ditch, surface and road shoulder erosion.	
G- 6	Larkspur Rd.	Larkspur	Town Road	Clogged culvert. Severe ditch, road shoulder and surface erosion.	Armor / reshape ditch. Install sediment pools. Remove roadway berms. Crown road.
G- 7	Hornbeam Rd.	Hornbeam	Town Road	Clogged culverts. Moderate ditch and road shoulder erosion. Roadside berm.	Unclog culvert. Remove berm. Crown road.
G- 8	Sunset Rd.	Sunset	Private Road	Moderate ditch erosion. Ditch bank failure	Armor ditch. Terrace buffer. Rip rap
G- 9	Sunset Rd.	Sunset	Private Road	Slight ditch and road shoulder erosion	Stabilize, replace, enlarge culvert. Reshape / vegetate ditch.
G- 10	Sunset Rd.	Sunset	Private Road	Clogged culvert. Inadequate ditch size. Slight road shoulder erosion.	Replace / relocate culvert. Install plunge pool. Reshape ditch.
G- 11	Larkspur Rd.	Larkspur	Town Road	Moderate Road surface erosion	Install frequent turnouts. Build up / replace road. Crown road.
G- 12	Hemlock Rd.	Hemlock	Town Road	Clogged culvert	Unclog culvert. Install new cross culvert.
G- 13	Bay willow Rd.	Bay Willow	Town Road	Moderate ditch erosion.	Armor ditch with rip rap
G- 14	Sunset Rd.	Sunset	Town Road	Unstable / crushed culvert. Moderate ditch and road shoulder erosion.	Replace culvert. Reshape ditch.
G- 15	Allen brook Rd.	Allen Brook Road	Town Road	Bare soil. Inadequate ditch size with slight erosion. Slight road shoulder and surface erosion.	reshape or re-install ditch. Remove road way berms. Crown road. Install runoff diverters.

**Phillips Lake Watershed Survey Site List
Road Site Update- 2012**

Site	Road	Location	Land Use	Description	Recommendations	Impact
1	Balsam Road	Spruce Drive/Balsam Road Intersection	Town Road	Surface erosion	Ditching, tilt road	Medium
2	Balsam Road	Lily Road/Balsam Road Intersection	Town Road	Surface erosion	Culvert, ditching	Medium
3	Bay Willows Road	West side	Town Road	Moderate ditch erosion	Stabilize ditch	Low
4	Beaver Circle	Near #103-#109	Town Road	Surface erosion	New culvert, ditching, tilt the road	Medium
5	Brentwood Drive	Intersection with Maple	Town Road	Unstable culvert	Replace culvert	Low
6	Clear Lake Road	Route 1A to Magnolia	Town Road	Surface erosion	Turnouts	Medium
7	Cottage Road	Beginning of road	Private Road	Ditch and surface erosion	Turnouts, check dams, stabilize ditch	Medium
8	Cottage Road	End of road	Private Road	Ditch and surface erosion	Retilt parking area	High
9	Daley Road	Near #34	Private Road	Surface erosion and ditch issues	Tilt road, stabilize ditch, new culvert	Medium
10	Fitts Mountain Road	From 1A side- hill to bridge	Private Road	Unstable culvert	Plunge pools, ditching	High
11	Fitts Mountain Road	Near #34	Private Road	Unstable culvert, severe surface erosion	New culvert, ditching, tilt the road	High
12	Fitts Mountain Road	Intersection with Dritwood	Private Road	Unstable culvert, surfac erosion	Culvert, ditching	High
13	Hornbeam	From Privet Road to 1A	Town Road	Road shoulder erosion, ditch erosion	Install new ditching, tilt road	Low
14	Hornbeam	Privet to telephone pole BHE BD 50	Town Road	Clogged culvert, ditch erosion	Clean out culvert, stabilize ditch	Low
15	Hurd Point Road	Near #15	Town Road	Surface erosion, inadequate culvert	New culvert, ditching	Medium
16	Hurd Point Road	After #133	Town Road	Unstable culvert, surface erosion	Retilt, plunge pools and culvert stabilization	Medium
17	Lakeview Ave	Near #32	Town Road	Inadequate culvert	Replace culvert, reshape ditch	Low
18	Lakeview Ave	Near #348	Town Road	Inadequate culvert	Replace culvert	Medium
19	Lakeview Ave	Near #461	Town Road	Surface erosion	Stabilize culvert inlets and outlets	Medium
20	Lakeview Ave	Near #490	Town Road	Inadequate culvert	Replace culvert	Medium
21	Lakeview Ave	Afer Dragon Road intersection	Town Road	Inadequate culvert	Replace culvert	Medium
22	Lakeview Ave	Before #558	Town Road	Unstable culvert	Stabilize inlet culvert bank	Medium
23	Lakeview Ave	Marshy area, 2.8 miles from the Lily Road/Lakeview intersection	Private Road	Inadequate culvert, surface erosion	New culvert, stabilize banks	Medium
24	Lakeview Ave	double arch culverts	Private Road	Surface erosion on roadway, beaver blocking up culverts	Stabilize banks, remove beavers	High
25	Lakeview Ave	Before #693 to #701	Private Road	Steep hill with severe surface erosion	Tilt the road, install new cross culverts, new ditching	Medium
26	Lakeview Ave	Near #767	Private Road	Inadequate culvert	Replace culvert, install rain garden	Medium
27	Lakeview Ave	Point Road/Lakeview Ave intersection	Town Road	Surface erosion, large puddle in road	Build up road, crown	Low

**Phillips Lake Watershed Survey Site List
Road Site Update- 2012**

Site	Road	Location	Land Use	Description	Recommendations	Impact
28	Lakeview Ave	Near Point Road intersection	Town Road	Surface erosion, unstable culvert	New culvert	Medium
29	Larkspur	Larkspur Rd.	Town Road	Clogged culvert. Ditch, road shoulder and surface erosion.	Armor / reshape ditch. Install sediment pools. Remove roadway berms. Crown road.	Low
30	Larkspur	Larkspur Rd.	Town Road	Moderate Road surface erosion	Install frequent turnouts. Build up / replace road. Crown road.	Low
31	Magnolia Road	Magnolia Rd.	Town Road	Inadequate ditch size. Moderate road surface erosion	Install ditch. Build up / crown road.	Low
32	Magnolia Road	Magnolia Rd.	Town Road	Clogged culvert. Road side berm from grader. Slight ditch, surface and road shoulder erosion.	Stabilize culvert inlets and outlets	Low
33	Pine Trail	Hilltop/Pine Trail intersection	Town Road	Inadequate culvert, blocked culvert	New culvert, clean out other culvert	Medium
34	Pine Trail	Between #65-#73	Town Road	Inadequate culvert	New culvert	Medium
35	Pleasant Drive	Before #24	Town Road	Inadequate ditching, surface erosion	New culvert	Medium
36	Pleasant Drive	Right after #12	Town Road	Surface erosion, sink holes	Stabilize / unclog culvert. Vegetate and armor ditch.	Medium
37	Poplar Road	Near # 34	Town Road	Unstable / clogged culvert. Moderate ditch erosion. Bank failure.	New culvert	Low
38	Poplar Road	Near #48	Town Road	Unstable / clogged culvert. Moderate ditch erosion	New culvert	Low
39	Poplar Road	Near #64	Town Road	Unstable / clogged culvert. Moderate ditch erosion	New culvert	Medium
40	Poplar Road	Corner of Maple/Poplar	Town Road	Unstable / clogged culvert. Moderate ditch erosion. Bank failure.	Clean out culvert, ditching	Low
41	Privet	Between Magnolia and Hornbeam	Town Road	Clogged culvert, road berm	Clean out culvert, remove grader berm	Low
42	Sunset	North of Norwood Road	Town Road	Ditch erosion, bank failure	Stabilize ditch	Low
43	Sunset	Sunset Rd. corner	Town Road	Ditch erosion, road shoulder erosion	Reshape and vegetate ditch	Low
44	Sunset	End of road	Town Road	Clogged culvert, ditch erosion	Unclog culvert. vegetate / reshape ditch	Low

Education & Outreach Plan for the Phillips Lake Watershed



October 2013

Hancock County Soil & Water Conservation District



This outreach plan was developed by the Phillips Lake 319 Steering Committee and residents of the Phillips Lake watershed with guidance from Megan Facciolo of the Hancock County Soil and Water Conservation District and Laura Wilson, an Education and Outreach Consultant.

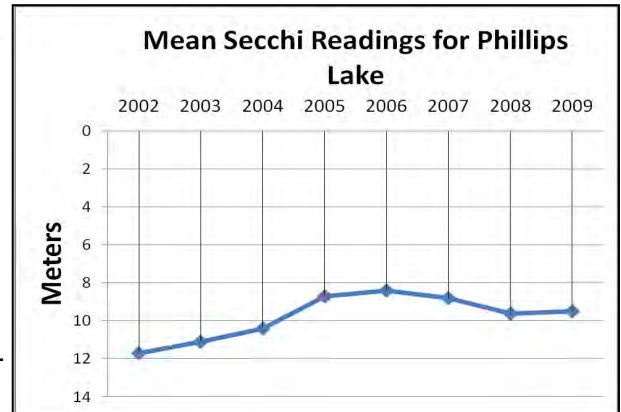


Hancock County Soil & Water Conservation District
185 State Street, Suite B, Ellsworth, ME 04605
207-667-8663
hancockcountyswcd@outlook.com
www.hancockcountyswcd.org

Funding for this project and the Phillips Lake Watershed Protection Project “319” grant, in part, was provided by the U.S. Environmental Protection Agency under Section 319 of the Clean Water Act. The funding is administered by the Maine Department of Environmental Protection in partnership with EPA. EPA does not endorse any commercial products or services mentioned.

Introduction:

Phillips Lake (also called Lucerne Lake) is an 828 acre lake located in the town of Dedham (which includes the Village of Lucerne) in the County of Hancock, Maine. The lake has a direct drainage area of 17.25 sq. mi. all within the town of Dedham. There are five small inlets scattered around the lake that come from smaller ponds (all less than 65 acres) or drain out of marshes. The lake has a maximum depth of 98 feet, a mean depth of 40 feet, and a flushing rate of only 0.52 flushes per year (the average flushing rate for Maine lakes is 1-1.5 flushes per year). The lake has two major outlets: Mill Stream in the northern end of the lake which connects to Alamoosook Lake, and a second outlet in the southwestern end of the lake, Mann Brook, which flows into Green Lake. Phillips Lake is currently listed on Maine DEP'S Nonpoint Source Priority Watersheds List due to heavy development pressure in the watershed. The town of Dedham recently updated its Comprehensive Plan in 2008 and has strong Zoning Ordinances in place to help protect its natural resources, including Phillips Lake.

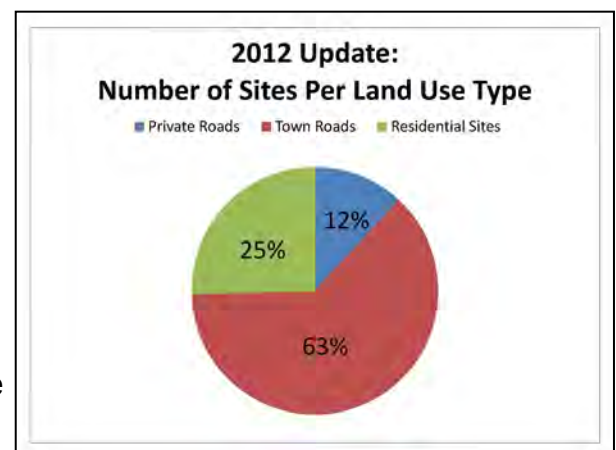


With its proximity to Bangor and Ellsworth, Phillips Lake is a popular recreation destination with a public boat launch and beach not far from the heavily traveled Route 1A. Swimming, boating, and fishing are enjoyed by many residents who live on the lake and those that come to visit. The lake receives heavy fishing pressure, especially in the winter and early spring, for cold water sport fish and the Department of Inland Fisheries and Wildlife has stocked Phillips Lake since 1989 with landlocked salmon and lake trout.

Stewardship efforts in the Phillips Lake watershed remain on a steady rise due in large part to a very dedicated group of volunteers who live around the lake. Phillips Lake Watch (PLW), the lake association for Phillips Lake, was originally formed in 1981 and then lost momentum in 2005 when the long-time President passed away. The group re-formed in 2011 and is regaining its membership with 35+ members, a strong Board of Supervisors, and they have started to create sub-committees including Boat Inspection, Nonpoint Source Pollution, and Water Quality Monitoring. Activities of the Phillips Lake Watch include invasive aquatic plant surveying, island and lakeshore clean-ups, and courtesy boat inspections during heavy boating times. Since 1974, watershed volunteers have been active annually in water quality monitoring and starting in 2003, they have also been annually monitoring for invasive aquatic plants. In 2008 and 2009, they participated in e-coli bacteria testing of 2 sites around the lake. Volunteers also helped to conduct the 2009 watershed survey of the entire watershed.

Water quality data has been periodically collected by DEP and members of the Maine Volunteer Lake Monitoring Program (VLMP) since 1974. The water quality of Phillips Lake is considered to be above average and the potential for nuisance algae blooms is low. However, recorded secchi readings from the last 10 years show a 2 meter decline in water clarity.

In 2009, a watershed survey was completed of the entire watershed, which identified 60 NPS sites and a Watershed Survey Report was generated (*Phillips Lake Watershed Survey Report*). Out of these 60 sites, 11 were located on Private Roads, 34 were located on Town Roads, and 15 sites were classified as Residential problems. The District re-surveyed all roads in the Phillips Watershed in the spring of 2012. 44 total road sites were found, 7 of which were on Private Roads and 37 on Town Roads. Out of the 44 road sites identified in the 2012 update, 27 were considered high or medium priority sites due to the amount of erosion, the proximity of that erosion to a ditch, stream, or the lake, and evidence that eroded soil is moving off site toward the water. Of these 27 medium and high priority sites, 6 were on Private Roads and 21 were on Town Roads.



Outreach Planning:

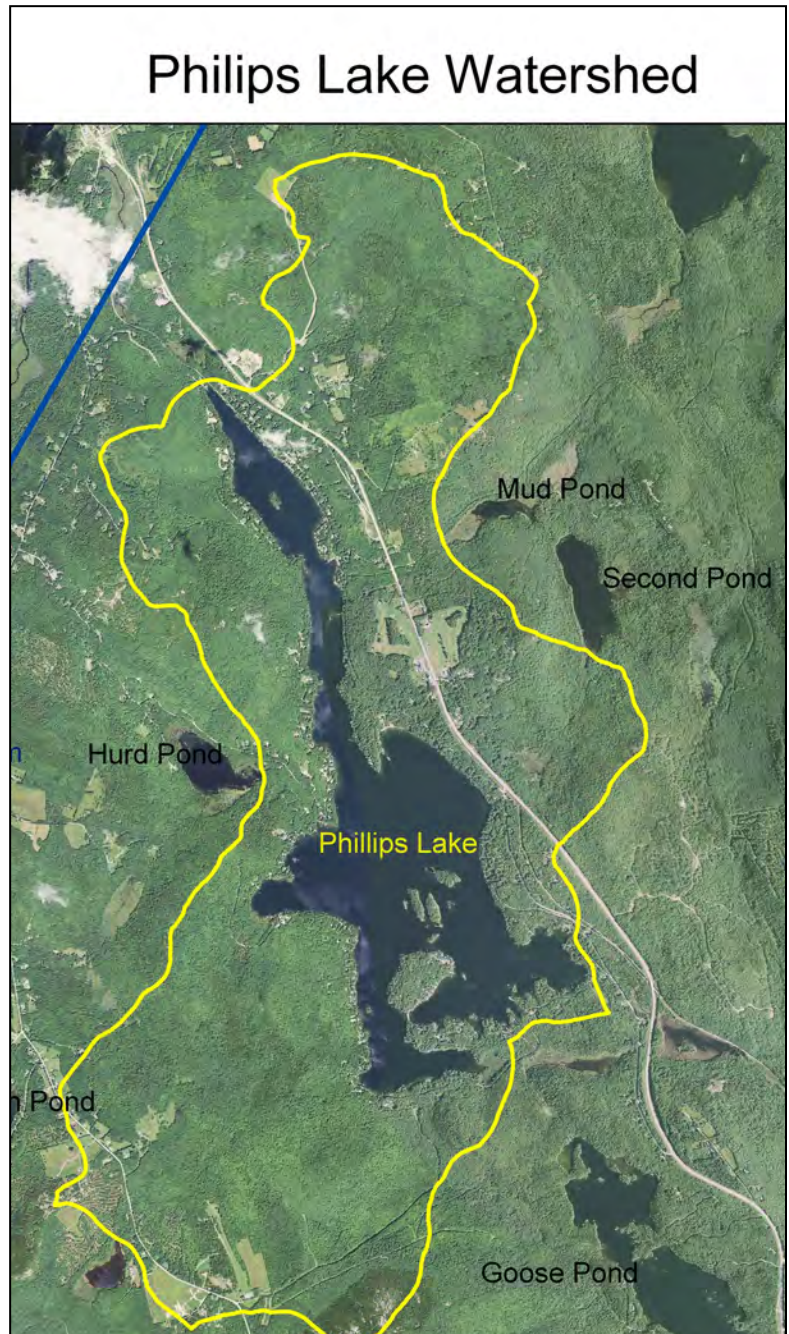
The development of this plan is a task in the *Phillips Lake Watershed Protection Project* “319” grant , awarded to the Hancock County Soil and Water Conservation District (HCSWCD) in 2013. In addition to nonpoint source pollution mitigation projects on private roads and residences in the watershed, the Steering Committee that was formed to guide the grant understands that education and outreach are necessary for long-term protection of Phillips Lake.

Purpose and Use:

This outreach plan should be used to guide partners in the Phillips Lake watershed protection effort. The outreach efforts described in this document should not be viewed as the only ones necessary to protect the lake— other outreach needs will likely evolve from these efforts, and be necessary for long-term protection. Other priorities will be identified in the future— therefore, this outreach plan is to be viewed as a living document, to be updated at least biannually, and to be changed if deemed necessary by the Steering Committee.

Outreach Planning Process:

This plan was developed through the “Outreach Planning Process” developed by the New Hampshire Department of Environmental Services and New Hampshire Sea Grant for their Natural Resources Outreach Coalition, and amended by the University of Maine Cooperative Extension for their Lake Education and Action Project. This process is based on the US EPA’s program “Getting in Step”. In order to better understand their target audience and outreach needs, the Steering Committee conducted a Knowledge Survey in 2013. There were 75 total responses on questions designed to gauge respondents knowledge of water quality and shoreland zoning regulations. Using the information gathered from this survey and Steering Committee members’ personal knowledge of issues around Phillips Lake, we came up with three priority situations that should be addressed:



- **Desired Result (Objective) 1:** As a result of our efforts, residents of the Town of Dedham and the Lucerne-In-Maine Village Corporation will have a better understanding of who is affected by shoreland zoning and where to get information on shoreland zoning ordinances.
- **Desired Result (Objective) 2:** As a result of our efforts residents will better understand the impact of development on the water quality of Phillips Lake.
- **Desired Result (Objective) 3:** As a result of our efforts there will be increased membership in the Phillips Lake Association.

These three desired results are listed out in detail on the following pages.

Desired Result (Objective) 1: As a result of our efforts, residents of the Town of Dedham and the Lucerne-In-Maine Village Corporation will have a better understanding of who is affected by shoreland zoning and where to get information on shoreland zoning ordinances.



Audience: Property owners (seasonal and year round) who are affected by shoreland zoning.

Message: “If you live within 250’ of Phillips Lake or within 75’ of a stream, shoreland zoning regulations apply to you. Know how to protect Phillips Lake. For information on shoreland zoning regulations call Rick Leavitt, the Dedham/Lucerne Code Enforcement Officer, at 949-6775.

Method of communicating the message to the target audience:

- Town Newsletter article on cutting vegetation in the shoreland zone written by Rick Leavitt
- Dedham and Lucerne website
- Town calendar
- Phillips Lake Association newsletter

Action Plan: Town newsletter article, town/village website, town calendar, and Lake Association newsletter.

1. Town newsletter article planning details: Megan Facciolo has asked Rick Leavitt to write an article that can be used in the town newsletter. John Wedin will coordinate the placement of information into the town newsletter(s).

2. Dedham and Lucerne website planning details: this same article will be placed on the town websites. John Wedin will take the lead on placing articles in the town newsletter and on the website.



3. Town calendar planning details: an abbreviated version of Rick Leavitt’s article will be placed at the back of the town calendar. Megan is working with the town to accomplish this task.

4. Lake Association newsletter planning details: John, Ann and Nancy will coordinate a lake association meeting this fall to generate information for a spring 2014 newsletter. Please see Objective 3 for more information.

Desired Result (Objective) 2: As a result of our efforts residents will better understand the impact of development on the water quality of Phillips Lake.

Audience: Residents (both lakefront residents and watershed residents)

Message: “Preserve what you love about being on Phillips Lake.” Then add one of the bullet points below for more information:

Where does your muddy water go?

- Pump your septic system regularly
- Limit use of fertilizers and pesticides
- Maintain a buffer zone on your shore (importance of having a buffer, why a lawn is not a buffer, let people know you can have a buffer and not lose your view)
- Maintain motors on recreational vehicle to limit pollution
- Know your tree removal rules
- Pull your dock each year

Method of communicating the message to the target audience: Lake Association newsletter articles.

Action Plan: Lake Association newsletter

1. Lake Association newsletter planning details: John, Ann and Nancy will coordinate a lake association meeting this fall to generate information for a spring 2014 newsletter. Please see Objective 3 for more information.

Desired Result (Objective) 3: As a result of our efforts there will be increased membership in the Phillips Lake Association.

Audience: Lakefront residents and watershed residents

Message: "Preserve what you love about being on Phillips Lake."

Method of communicating the message to the target audience: Membership drive through lake association newsletter and annual meeting.

Action Plan: Newsletter, lake association website, and hold annual meeting. John will coordinate lake association meetings to develop these three outreach tools.

1. Newsletter planning details: The lake association will develop a regular newsletter schedule. A meeting will be held in the fall of 2013 to begin planning for the spring newsletter, and other activities. Nancy has volunteered to summarize some information on buffers, etc. for a newsletter article if this information is provided to her. Megan will write an article about the current grant. Chuck will provide an article on water quality, and invasive plant monitoring. Janet will do an article about the island, or about camping near the lake. Larry will assist as needed. April and October will be the newsletter publishing dates in the future. The first newsletter printing and mailing costs can be covered by the grant if done during 2014.

2. Website planning details: A lake association website will be developed by the lake association. John will find a webmaster for the lake association. Downeast.net will host nonprofit webpages for free. On the website will be links to lake information and links to the town and village.

3. A lake association annual meeting will be held in summer of 2014. It will be at the school, on a weeknight to increase participation. The association will find a speaker who has broad appeal.



Objective #1: Shoreland Zoning knowledge and where to find information			
Task	When	Needs?	Partners/Notes
Town Newsletter Article	Winter 2013-2014	Article from Rick Leavitt	Megan, John Wedin, Lucerne, Dedham
Dedham Website	Winter 2013-2014	Above article from Rick Leavitt	John will take the lead on getting this added to the website
Town Calendar	Winter 2014	Megan will draft information	Lucerne, Dedham
Lake Association Newsletter	Spring 2014	Lake Association meeting to get volunteers to write articles	John Wedin, Ann Fossett, Nancy Connolly
Evaluate outreach	Fall 2014	Steering Committee Members	After Knowledge Survey

Objective #2: Impact of development on water quality			
Task	When	Needs?	Partners/Notes
Lake Association Newsletter	Spring 2014	Lake Association meeting to get volunteers to write articles	John Wedin, Ann Fossett, Nancy Connolly
Evaluate outreach	Fall 2014	Steering Committee Members	After Knowledge Survey

Objective #3: Increased Lake Association membership			
Task	When	Needs?	Partners/Notes
Lake Association Newsletter	Spring 2014	Lake Association meeting to get volunteers to write articles	John Wedin, Ann Fossett, Nancy Connolly
Lake Association Website	Winter 2013-2014	Webmaster to host the site	John Wedin
Lake Association Annual Meeting	Summer 2014	Date, time, location, speaker	John Wedin, Lake Association members
Evaluate outreach	Fall 2014	Steering Committee Members	After Knowledge Survey

Hancock County Soil & Water Conservation District & Phillips Lake Watch



Working With You to Keep Phillips Lake Clean