



## Maine Department of Environmental Protection

# Nonpoint Source Management Program 2008 Annual Report



**April 2009**

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STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI

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April 6, 2009

To the Reader:

In the world of nonpoint source (NPS) pollution prevention and abatement, progress often seems painfully slow. Due to the nature of our work, we rarely see dramatic results in the short term. And yet, when we step back and look to measure progress made in Maine's NPS program, there is a lot to highlight. Real progress is being made due to the efforts of a wide array of dedicated people. As in past years, this report offers a glimpse of great work being done all over the State of Maine to help protect and restore what is arguably our greatest asset: Clean water.

As in the past, this report summarizes the many accomplishments of program activities funded, in part, under Section 319 of the Federal Clean Water Act in partnership with EPA. DEP provides technical and financial help to watershed groups that assess water quality problems and take action to reduce nonpoint sources to protect or improve Maine's clean water. Highlights include:

- 24 NPS projects completed in 2008. Please read our brief "outcome summaries" for more information.
- Pollutant reductions estimated at 763 pounds of phosphorus and 1,249 tons of sediment per year as a result of NPS project in 2008. This is roughly equivalent to 107 (8 yard) dump truck loads of sediment kept out of Maine's waters.
- The restoration of Madawaska Lake, a 1,600-acre lake in Aroostook County valued for boating, fishing and swimming, was highlighted on the EPA's "Nonpoint Source Program Success Stories" website.

The Report is posted at [http://www.maine.gov/dep/blwq/docgrant/319\\_files/reports/index.htm](http://www.maine.gov/dep/blwq/docgrant/319_files/reports/index.htm).

DEP thanks our many valued partners described in this report for their support, cooperation and leadership. Together we are proudly serving to protect Maine's clean waters for future generations.

Respectfully,

Don Witherill, Director  
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# Table of Contents

<b>A. <u>Nonpoint Source Management Program Summary</u></b>	<b>1</b>
<b>B. <u>2008 Highlights - Maine DEP NPS Program</u></b>	<b>1</b>
<b>C. <u>Nonpoint Source Management Program</u></b>	<b>3</b>
1. Overview - Maine NPS Management Program	
2. Protecting Clean Waters	
3. Restoring Impaired Waters	
<b>D. <u>DEP NPS Program &amp; Work Activities</u></b>	<b>9</b>
1. Overview	
2. Watershed Initiatives in 2008	
3. Summaries of Statewide Programs	
<b>E. <u>NPS Grants Program</u></b>	<b>17</b>
1. Overview of NPS Water Pollution Control Projects	
2. NPS Water Pollution Control Projects Funded in 2008	
3. Results: Request for Proposals - FY 2008 Grants for NPS Pollution Control Projects	
4. WIFAP - Watershed Improvement Financial Assistance Partnership	
<b>F. <u>Summaries of NPS Water Pollution Control Projects Completed in 2008</u></b>	<b>20</b>



The Maine Department of Environmental Protection acknowledges that preparation and publication of this report was funded, in part, with monies provided by the U.S. Environmental Protection Agency under Section 319 of the Federal Clean Water Act.

## A. Nonpoint Source Management Program Summary

Nonpoint Source Pollution (NPS), also known as polluted stormwater runoff, is one of today's biggest threats to healthy lakes, rivers, streams, estuaries and wetlands. When it rains or the snow melts, the water running off our driveways, parking lots, yards, farm fields, forestry operations and industrial sites carries with it small hitch-hiking pollutants. The pollutants include soil particles, nutrients from fertilizers or animal waste, bacteria from failing septic systems or animal waste, toxics from dripped or spilled petroleum products or household hazardous waste all washed during a storm event into your local water way. Due to NPS pollution, over 250 lakes in Maine do not meet water quality standards or may be impaired in future years because of increasing development in their watershed. NPS pollution also impairs the water quality of many streams and coastal waters.



DEP helps watershed groups assess water quality problems and take action to reduce NPS water pollution.

Since 1990, the United States Environmental Protection Agency (EPA) has provided funds under Section 319(h) of the Clean Water Act to help states and Tribes address their most pressing NPS pollution problems. States are obliged to use funds according to National NPS Program Guidelines published by EPA. Section 319(h)(11) requires States to report annually on progress in their nonpoint source management programs, report available information on reductions of nonpoint source pollutant loadings and report on improvements to water quality resulting from implementation of NPS management programs.

The Maine Department of Environmental Protection (DEP) administers and has overall coordination responsibility for Maine's Nonpoint Source Pollution Program (38 MSRA 410), a significant portion of which is funded with Section 319 Clean Water Act grants. NPS program services are guided by the *Maine Nonpoint Source Program: Program Upgrade & 15 Year Strategy*, which was adopted in 1999. DEP helps communities and watershed groups assess water quality problems and take action to reduce or remove nonpoint source pollution. DEP especially values and relies on Section 319 funds to provide financial assistance for locally-driven watershed projects to help protect or improve Maine's lakes, streams, rivers and coastal waters.

This report summarizes Maine DEP's Nonpoint Source Program activities and accomplishments in 2008.

## B. 2008 Highlights - Maine DEP NPS Program

In 2008 DEP received \$2,247,537 from EPA under Section 319(h) of the Clean Water Act. These funds were used for programs designed to identify, prevent or reduce NPS pollution problems. DEP provided technical assistance to local watershed groups and education and outreach programs for various audiences including developers, building contractors, municipal officials, teachers and the general public. About 49% of Fiscal Year 2008 Section 319 funds were passed through to organizations for NPS projects or programs. DEP provided technical and financial assistance for 60 active NPS Watershed Projects to help protect or improve lakes, streams and coastal waters. Also, DEP used Section 319 funds to support the Maine Volunteer Lake Monitoring Program, Nonpoint Education for Municipal Officials (NEMO), the Maine Clean Marina and Boatyards Program and other DEP programs.

## 2008 Highlights - Maine DEP NPS Program

1. The restoration of Madawaska Lake, a 1,600-acre lake in Aroostook County valued for boating, fishing and swimming, was highlighted on the EPA's "Nonpoint Source Program Success Stories" website ([www.epa.gov/owow/nps/Success319](http://www.epa.gov/owow/nps/Success319)).
2. Twenty-four (24) NPS projects funded through the NPS 319 program in previous years were successfully brought to completion. See page 20 for the list of projects. Local match from these projects totaled almost \$1,396,519, which exceeds the actual grant awards of \$1,212,281.
3. Implementation of conservation practices (BMPs) was accomplished in thirteen (13) lake and three (3) stream watersheds:
 

Lakes – China Lake, Cobbossee Lake, East Pond, Highland Lake (Bridgton), Highland Lake (Windham), Little Madawaska Lake, Little Ossipee Lake; Long Lake, Meduxnekeag Lake, Panther Pond; Pleasant Pond, Pushaw Lake and Unity Pond.

Streams – Libby Brook, Narraguagus River and Perley Brook.
4. NPS Watershed Projects completed in 2008 reported estimated reductions in the amount of sediment and phosphorus loading to lakes or streams. In total, pollutant loading was reduced by about 763 pounds of phosphorus and 1,249 tons of sediment per year, which is equivalent to about 107 (8 yard) dump truck loads of sediment.
5. NPS Watershed Surveys describing nonpoint pollution sources were completed for eight watersheds: Berry Pond, Dexter Pond, Duckpuddle Pond, Parker Pond, Piscataqua River – West Branch, Piscataquis – East Branch, Pleasant Lake and Wilson Pond.
6. Watershed-based management plans were completed for five impaired waterbodies: Spruce Creek (Kittery), Hart Brook (Lewiston), Penjajawoc Stream (Bangor), Togus Pond (Augusta) and Pleasant Pond (Gardiner).
7. Fourteen (14) new NPS Water Pollution Control Projects were funded through DEP's annual NPS Grants request for proposals competitive grant process.
8. Over 1300 people (contractors, engineers, consultants, site evaluators, municipal officials and landowners) participated in training programs to learn methods to prevent NPS pollution sponsored by DEP's Nonpoint Source Training and Resource Center. Seventy-nine (79) new individuals were certified in erosion and sediment control practices in the Volunteer Contractor Certification Program.
9. The Maine Volunteer Lake Monitoring program reached a level of 574 certified volunteer water quality monitors monitoring 465 lake basins covering 398,720 lake acres - 40% of Maine's lake surface area.
10. Maine NEMO, which provides outreach to municipal officials on how land use decisions are linked to water quality in their towns, provided 25 presentations to 866 people from 89 towns. Numerous examples of Low Impact Development (LID) projects in northern New England were added to the UNH LID website to promote LID in Maine.
11. The Maine Lakes Biomanipulation Project continued work to reduce algal blooms on East Pond, an impaired lake in the Belgrade Lakes chain, by removing excessive perch populations. The removal will enhance zooplankton populations and ultimately result in higher water transparencies due to increased consumption of blue-green algae by the zooplankton.

12. DEP developed and presented two reports to the Natural Resources Committee of the Maine Legislature. The Lakes Report and Lake Camp Road Report were developed with input gathered from two stakeholder groups and included recommendations about how to protect water quality in Maine lakes. Both reports prompted legislative action and new initiatives and projects by DEP staff and partners.
13. Substantial progress was made toward a comprehensive watershed management plan to restore the Long Creek watershed, which includes the Maine Mall area in South Portland. This effort brought together a diversity of interested parties, including four municipalities. The project took on greater urgency as stormwater discharges in the Long Creek watershed received preliminary designation by EPA as needing permits. The watershed management plan has been seen by participants in the planning process as providing a more cost-effective and more environmentally effective alternative to site by site stormwater treatment. The plan is expected to move into the implementation phase in 2009.
14. DEP completed and received EPA approval of Phosphorus Control Action Plans (PCAPs) and Total Maximum Daily (Annual Phosphorus) Loading (TMDL) report for Long Pond (Belgrade). These reports are a first step towards restoration of water quality.

## C. Nonpoint Source Management Program

### 1. Overview: Maine NPS Management Program

Maine's Nonpoint Source (NPS) Water Pollution Management Program (38 M.R.S.A. §410-I) helps restore and protect water resources from NPS pollution. The basic objective of the NPS program is to promote the use of state agency-defined "best management practice guidelines" (BMPs) to prevent water pollution. The overall aims of Maine's NPS Water Pollution Control Program are as follows:

- **Clean Water.** Prevent, control, or abate water pollution caused by nonpoint sources so that beneficial uses of water resources are maintained or restored and waters meet or exceed their classification standards.
- **Using Best Management Practices.** Best Management Practices are widely used in all Maine's watersheds to minimize transport of pollutants or excessive runoff from the land into surface or ground waters.
- **Locally Supported Watershed Stewardship.** Local community awareness results in commitment to maintaining or improving the condition of local water resources through citizen action. Watershed stewardship meets community needs and maintains beneficial uses of local water resources.
- **Compliance with Applicable Laws.** Regulated activities comply with existing State and Federal laws and rules that relate to control of nonpoint source water pollution.

DEP administers the NPS Program in coordination with other State, federal, and local governmental agencies as well as non-government organizations. Seven other State agencies share responsibility for coordinating and implementing NPS programs: Maine Departments of Agriculture Food & Rural Resources; Conservation, Maine Forest Service; Transportation; Economic & Community Development; Health & Human Services, Division of Environmental Health; Marine Resources; and the State Planning Office. This report focused on work accomplished by the DEP and does not cover NPS work by the seven other state agencies.

State agencies conduct programs that: (1) implement State laws or rules requiring people to comply with performance standards governing certain land use activities to protect water quality; and (2) promote voluntary usage of best management practices. Maine's NPS agencies have working arrangements with other State and federal agencies, municipalities, non-governmental organizations, and business sector associations to help control or prevent nonpoint source water pollution.

Statewide regulatory programs implement several laws that control potential sources of NPS pollution, including: the Stormwater Management Law; the Site Location of Development Law; Erosion and Sedimentation Control Law; the State Subsurface Wastewater Disposal Rules; the Natural Resources Protection Act; Land Use Regulation in Unorganized Territories; Pesticide Control laws; the Mandatory Shoreland Zoning Law; the Nutrient Management Act; the Forest Practices Act and others.

Maine's lead NPS agencies encourage voluntary actions by governments, organizations, industry and individuals to prevent or minimize the discharge of NPS pollutants. Program resources are assigned to support efforts to improve and protect waters that are threatened or impaired by NPS pollution. Maine's lead NPS agencies provide technical assistance and information about BMPs to agencies, municipalities, businesses and individuals. The NPS Training and Resource Center at DEP provides information and technical training on usage of BMPs. DEP administers grants to help fund NPS Water Pollution Control Projects to prevent or reduce water pollution caused by nonpoint sources.

## 2. Protecting Clean Waters

Maine has significant water quality protection and restoration challenges and relatively limited resources for NPS programs. DEP prioritizes and balances the use of available NPS resources to protect or restore lakes, streams and coastal waters. Prevention of water pollution is a daunting challenge as our watersheds face increased development pressures over the years. DEP has learned that prevention of water pollution is far more feasible and less expensive than restoration of an already impaired waterbody. Therefore, DEP has invested a considerable portion of available NPS resources into protecting vulnerable threatened waters.

Protecting Maine's clean waters can be accomplished by local residents of a watershed with technical and financial assistance from DEP and other partners. Local watershed stewardship groups are needed for any project, plan or outreach effort to really take hold because they can increase local involvement in watershed management activities.

Maine has many capable and determined watershed stewardship groups and Soil and Water Conservation Districts working to protect watersheds and clean water. DEP invests considerable staff resources into supporting these groups and helping them carry out their goals and objectives. Some of the activities and projects that DEP supported in 2008 include the following:



Building capacity for local watershed stewardship offers the best hope for sustaining action to protect Maine's lakes streams, rivers and coastal waters.

- **Watershed Surveys** – DEP provided technical assistance and project oversight to local groups that conducted volunteer watershed surveys without 319 grant funding. In 2008, surveys were conducted in the Saturday Pond (Otisfield) and Thompson Lake (Otisfield) watersheds. DEP staff also helped organize and carry out watershed surveys for Horn Pond (Acton) and Lovell Lake (Wakefield, NH), which both flow into the Salmon Falls River on the New Hampshire border. These two surveys were funded, in part, with a 319 grant from the New Hampshire Department of Environmental Services and were the first “Maine-style” watershed surveys conducted in New Hampshire.

- **Watershed Roundtable** – Over 60 watershed managers from state agencies, towns, watershed organizations and SWCDs attended the DEP’s annual Watershed Managers’ Roundtable. This informal, day-long event provides an opportunity for networking, sharing lessons learned and discussing common problems in both rural and urban watersheds across the state.
- **Youth Conservation Corps** – The DEP provided assistance and training to several of the 11 YCC programs throughout Maine. These YCC programs hire high school students to install buffers, erosion controls and other conservation practices in lake and river watersheds. Most of these programs originally started as part of 319 grant projects, but communities often work to find local funding to continue the programs after the grants end. In 2008, the DEP provided training to several YCC crews and helped organize the first YCC Jamboree, which brought together over 100 YCC members for a day of celebration and accolades from the DEP Commissioner and legislators.

### 3. Restoring Impaired Waters

State and federal water quality laws require that waters meet or exceed their water quality standards. DEP monitors water quality conditions of Maine’s rivers, lakes and coastal waters to determine if the public can use the waters for designated uses, such as recreation, swimming, fishing, shellfish harvesting, and drinking water supply, and the waters can support healthy habitats for fish and wildlife. DEP places waters that are found to be degraded (i.e., not supporting its designated uses and not attaining water quality standards) on a list of impaired waters. Restoring impaired waters is a major priority and involves three steps:

- **Assessment.** DEP must establish a pollution allocation (Total Maximum Daily Load - TMDL) for each impaired waterbody, in accordance with Section 303(d) of the Clean Water Act. A Total Maximum Daily Load assessment provides an estimate of how much pollution from point sources (e.g., industrial and municipal wastewater treatment plants) and nonpoint sources (e.g., runoff from urban land use, agriculture, roads, forestry, etc.) needs to be reduced in order meet state water quality standards.
- **Watershed-Based Planning.** Preparation of a watershed-based plan is needed to describe overall actions needed in a watershed to help restore water quality. A watershed-based plan meeting EPA’s nine minimum elements of watershed planning is required before receiving 319 funds for a NPS Watershed Project to help restore an impaired waterbody.
- **Implementing Pollution Reduction Measures.** Communities, agencies and individuals take action to apply conservation practices or best management practices (BMPs) to eliminate or control sources of nonpoint source pollution. Usually work needs to be conducted over 5 to 10 years or more to restore an impaired waterbody. DEP provides technical and limited financial assistance to help communities improve watersheds and restore waters.

#### TMDL Assessments

In 2008 DEP completed and received EPA approval of the Phosphorus Control Action Plan (PCAPs) and Total Maximum Daily (Annual Phosphorus) Loading Report for Long Lake in Belgrade. TMDL Assessments are now complete for 43 waterbodies. Of these, 31 lakes and five streams are impaired primarily due to nonpoint sources. Seven rivers and streams are impaired primarily by point sources. For more information, go to [www.maine.gov/dep/blwq/docmonitoring/tmdl2.htm](http://www.maine.gov/dep/blwq/docmonitoring/tmdl2.htm).

#### Watershed-Based Plans

DEP used 319 funds to help communities develop watershed-based plans meeting EPA NPS guidance for 10 NPS impaired watersheds. A watershed-based plan is intended to be a strategic plan for actions needed over a 5 to 10 year time-frame to achieve the load reductions called for in a TMDL to restore an

NPS impaired waterbody. The plan is not a detailed tactical work plan, such as a 2-year work plan for a NPS Watershed Project.

- Watershed-based plans were completed for five impaired waterbodies: Spruce Creek (Kittery), Hart Brook (Lewiston), Penjajawoc Stream (Bangor), Togus Pond (Augusta) and Pleasant Pond (Gardiner).
- Watershed-based plans were being prepared and will be completed in 2009 for Birch Stream (Bangor), China Lake (China), Long Pond (Belgrade), Wilson Pond (Monmouth) and Long Creek (South Portland).

**Implementation**

DEP allocates a portion of Section 319 funds for NPS Watershed Projects to implement BMPs that reduce pollutant loads to help restore impaired waters. During 2008, Section 319 funds helped sustain or startup NPS Watershed Projects to apply conservation practices (BMPs) in the following 10 watersheds to help restore impaired waters that have an approved TMDL assessment report:

Annabessacook Lake	Highland Lake (Windham)	Togus Lake
China Lake	Pleasant Pond	Unity Pond
Duckpuddle Pond	Sabattus Pond	Webber Pond
East Pond		

**Restoring Impaired Lakes**

In 2006, DEP removed Madawaska Lake and five other lakes from the impaired waters (TMDL) list. In 2008, the restoration of Madawaska Lake was highlighted on the EPA’s webpage “Section 319 Nonpoint Source Program Success Stories” (<http://www.epa.gov/owow/nps/Success319>). This site features NPS-impaired waterbodies around the country that have achieved documented water quality improvements due Section 319 or other funding sources dedicated to solving NPS impairments. Madawaska Lake’s Success Story is included in this report on the following page. Other Maine Success Stories on the EPA site include Cobbossee Lake and Mousam Lake.

**Pat Baldwin Receives EPA Lifetime Achievement Award  
for her Work Restoring Mousam Lake’s Water Quality**

On Earth Day 2008, Mousam Lake resident, Pat Baldwin, was presented with EPA’s Lifetime Achievement Award at a ceremony at Faneuil Hall in Boston. Pat was one of seven recipients of this prestigious award in the New England region.



In 1998 Maine DEP designated Mousam Lake as impaired due to decreased water clarity. Pat Baldwin began collecting water samples from the lake in the 1970s. After observing disturbing trends, Pat was launched into her role as an advocate for the lake. "Since the lake can't speak for itself, I feel the need to speak on its behalf," she has often said. Pat spoke at many of ‘septic socials’ workshops, monitored the lake's loon population, helped associations form on neighboring lakes, created a 16-page booklet called "Mousam Lake Needs Your Help" and tirelessly advocated for town and lake association support of lake protection projects. After a decade of restoration work funded by 319 grants and the local community, Mousam Lake’s water quality improved, and it was removed from the impaired list in 2006. This was possible largely because of Pat's persistent advocacy and lifetime devotion.



## Section 319

# NONPOINT SOURCE PROGRAM SUCCESS STORY

# Maine

## Improved Forestry Practices Help Restore Lake

### Waterbody Improved

Located in northern Maine's vast forest, Madawaska Lake experienced declining water quality beginning in the 1980s when increased timber harvesting and shoreland development in the watershed contributed excess phosphorus and sediment to the lake. As a result, Maine Department of Environmental Protection (MDEP) added Madawaska Lake to the state's 1988 Clean Water Act section 303(d) list of impaired waters. The lake's water quality began improving in the mid-1990s, due to changes in state-wide forestry standards, improved regulatory oversight of development and the implementation of forestry best management practices (BMPs). MDEP removed Madawaska Lake from its section 303(d) impaired waters list in 2006.

### Problem

Madawaska Lake is located in the town of Westmanland and in one of Maine's unorganized townships, T16 R4. The 1,600-acre lake is valued for boating, fishing and swimming and is composed of two basins: Big Madawaska Lake and Little Madawaska Lake. The watershed is primarily forested, with residential development concentrated along the shoreline (Figure 1).

In the 1980s extensive timber harvest activity (including clearcuts and road building) and a surge in shoreline development increased the export of sediment and phosphorus from the watershed into the lake. A 1993 summary of watershed land use conditions reported that 21.8 percent of the watershed was harvested (13.5 percent clear cut; 8.3 percent selective cut). Until about 1982, most of the land was owned and managed by one forestland company for commercial timber production, and the lakeshore was leased for seasonal camp lots. After the land was sold in 1982, the new owner built new forest access roads and increased timber harvest activity including both selective cuts and clear cuts. Lake shoreland properties were sold to former lease holders, many of whom decided to upgrade camps into year-round homes. The result was a small building boom around Big Madawaska Lake.

Erosion and sediment from timber harvest operations, roads and shoreland development, and



Figure 1. Madawaska Lake's watershed is forested with numerous homes along the shoreline.

septic systems contributed excess phosphorus to the lake, which spurred the growth and overabundance of noxious blue-green algae. From 1987 to 1992 the lake suffered four nuisance algae blooms, and water clarity was reduced to less than 2.0 meters, meeting MDEP's definition of a culturally induced nuisance algal bloom that impairs swimming and aquatic life. In 1988 MDEP designated Madawaska Lake as impaired for aquatic life support due to the observed decline in trophic status and added the lake to Maine's 303(d) list.

In 1994 MDEP completed an EPA section 314-funded Diagnostic Feasibility study of the water quality problem. In 2000 MDEP completed the Madawaska Lake total maximum daily load for total phosphorus.

## Project Highlights

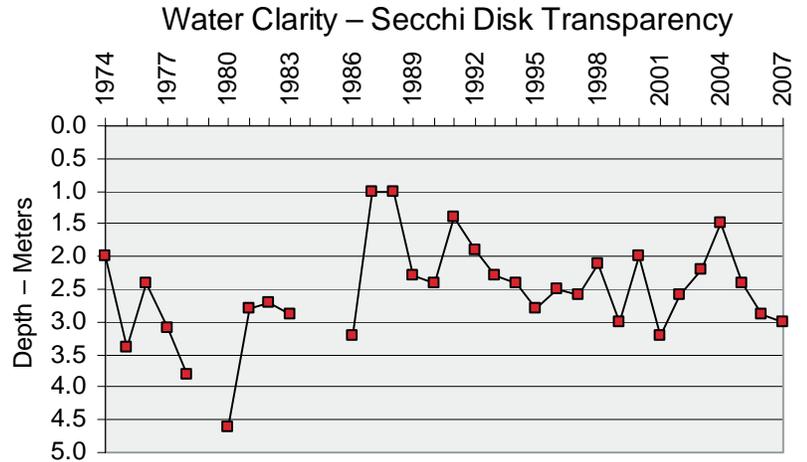
MDEP worked with the new owners of the timberlands to install BMPs on new roads and harvested areas. In addition, a 1990 EPA-funded section 319 project was undertaken to identify problem sites in the watershed and provide technical assistance for forestry and shoreland development practices. The Maine Forest Service produced statewide guidelines for forestry BMPs with financial assistance from MDEP and a section 319 grant. In 1999 the Maine Legislature passed the Forest Practices Act, which improved regulation of timber harvesting.

The Maine Land Use Regulatory Commission (LURC) opened an office in Presque Isle in 1989 to improve land use regulation services in the region. LURC staff services helped control new development to meet standards. In 1990 LURC staff used section 319 funds to inspect and evaluate the use of timber harvesting BMPs in the Madawaska Lake watershed.

The town of Westmanland and the Aroostook County government used MDEP's Small Community Grant Program to help replace failing septic systems at homes in lake shore areas. In addition, MDEP successfully encouraged residents to adopt practices that reduce erosion and sedimentation. Residents conducted a section 319-funded watershed survey in 2003 with the help of an Americorps Volunteer working for MDEP.

## Results

Phosphorus loads to the lake have been steadily declining due to watershed improvements such as the gradual reforestation of timber harvest sites; reduced timber harvest and road building activity, use of timber harvest BMPs and better erosion control in developed shoreland areas. Madawaska Lake now meets water quality standards—it has a stable or improving



*Water clarity abruptly declined in 1987. From 1987 to 1992 the lake suffered four nuisance algae blooms (SDT < 2.0 meters). Since 1993 water clarity has improved, and the lake has been free of algae blooms for 14 of the past 15 years. (Note: no data were collected in 1979, 1984 and 1985.)*

Figure 2. Big Madawaska Lake Minimum Secchi Disk Transparencies (SDT) 1974 to 2007.

trophic state and has been free of culturally induced algae blooms for more than 5 of the past 10 years (Figure 2). Therefore, MDEP removed Madawaska Lake from the state's 2006 303(d) list of impaired waters.

## Partners and Funding

MDEP, Maine Forest Service, and LURC provided services to help the large forestland owner and homeowners understand and comply with state land use laws and BMPs. EPA provided funds under the Clean Lakes (\$88,830) and section 319 programs for lake diagnostic studies and MDEP and LURC staff services. Westmanland and the Aroostook County government worked with landowners to replace failing septic systems. Central Aroostook County Soil and Water Conservation District completed land use surveys and provided technical assistance to landowners. In addition, the Maine Volunteer Lakes Monitoring Program has assisted MDEP in assessing the lake's water quality since the mid-1970s.

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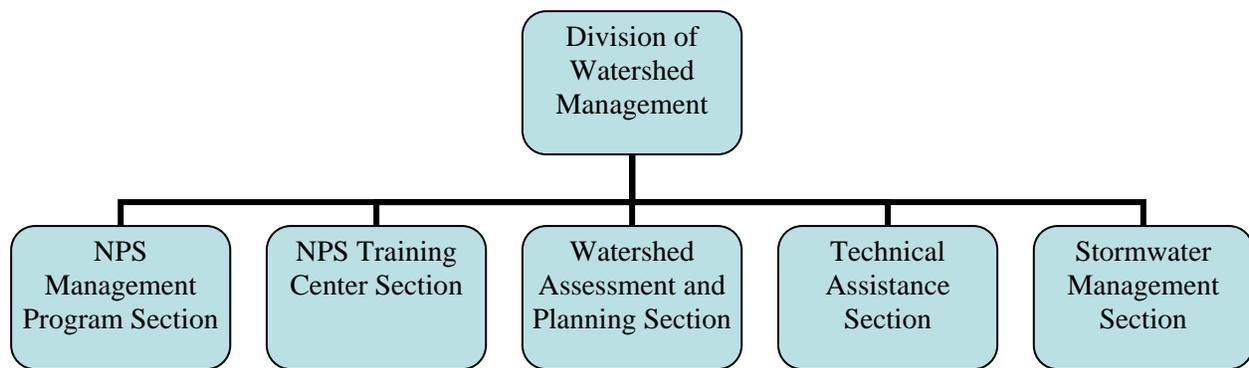
U.S. Environmental Protection Agency  
Office of Water  
Washington, DC

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## D. DEP NPS Program & Work Activities in 2008

### 1. Overview of Division Structure

DEP's Division of Watershed Management administers NPS program services and watershed management. The Division is organized into five sections. The Nonpoint Source Management Program section administers the 319 grant program. The Nonpoint Source Training Center provides training to contractors, consultants and others and provides education and outreach. The Watershed Assessment and Planning section provides stormwater technical assistance and watershed management planning and assistance, and manages the Stream Team Program. The Technical Assistance section provides technical review of permit applications and maintains or develops Best Management Practices guidelines. The Stormwater Management section provides coordination for implementation of the federally delegated Maine Pollutant Discharge Elimination System (MEPDES) program.



### 2. Watershed Initiatives in 2008

The Division led or participated in several significant NPS initiatives in 2008. The following section highlights some of these efforts.

#### Long Creek Residual Designation Authority Petition

In March 2008, the Conservation Law Foundation (CLF) filed a petition with the Environmental Protection Agency, asking that the agency use a provision of the Clean Water Act known as Residual Designation Authority (RDA) to designate stormwater discharges in the Long Creek watershed as needing permits because they are contributing to impairment of the stream. Long Creek flows through a very urbanized area that includes the Maine Mall and surrounding development, located mostly in South Portland. CLF cited monitoring results and findings in a couple of studies of Long Creek as the basis for their petition. Maine DEP staff provided much of the data in those studies and did not dispute that stormwater runoff is the principal reason that Long Creek is impaired. In December 2008, EPA issued a preliminary decision to designate discharges of stormwater from property of one acre or more of impervious area as needing a NPDES stormwater permit.

The proposed designation would normally require each of the 110 affected properties to provide on-site treatment of stormwater, a proposition seen as expensive. Even before the petition was filed, however, an alternative approach was being developed in the form of the Long Creek Watershed Management Plan. The City of South Portland, along with Portland, Westbrook and Scarborough, began collaborating with other private and public entities on development of a comprehensive watershed management plan. This plan, largely funded by the 319 program, has identified many opportunities for restoration work around the watershed, including habitat restoration in the stream itself and in the riparian corridor. By the end of 2008, development of the plan was approaching its final stages and is expected to form the basis for a

Long Creek General Permit, to be offered as a more cost-effective way to restore the stream than through individual permits requiring expensive stormwater treatment systems on each designated property. Much more progress is expected in 2009 on how the Long Creek Management Plan will be put in to action. Stay tuned for further updates in next year's report and beyond.

Long Creek Information available at <http://www.restorelongcreek.org>

## **Lakes Report**

In February 2008, the DEP presented its report, "*An Evaluation of Ways to Protect and Improve Lake Water Quality by Addressing Development Impacts*" to the Natural Resources Committee of the Maine Legislature. The report was required as part of a 2007 bill concerning restrictions on the sale of fertilizer containing phosphorus and was developed with input from a diverse stakeholder group. The report included several recommendations to address NPS from development, road and new construction in lake watersheds. Several recommendations were adopted as part of LD 2249, An Act to Protect Lake Water Quality, which was signed by the Governor on April 10th and is now Public Law Chapter 593. The law includes the following provisions:

- Contractors involved in earth-moving activity in the shoreland zone must be certified by the DEP in the use of erosion control measures. This will take effect January 1, 2013 to ensure that contractors have adequate time to take the required training and to become certified.
- The Stormwater Management Law was amended to increase the phosphorus compensation fee rate from \$10,000 to \$25,000 per pound of phosphorus to better reflect the actual cost of phosphorus mitigation projects.
- The Legislature required the DEP to further evaluate "strategies to diminish the impact of private roads, driveways and boat ramps on lake water quality" and submit a report by January 15, 2009.

Lakes Report available at [http://www.maine.gov/dep/blwq/report/2008/lake\\_report.pdf](http://www.maine.gov/dep/blwq/report/2008/lake_report.pdf).

## **Lake Camp Road Report**

There are over 12,000 miles of private camp roads in watersheds of Maine's Great Ponds. A great many of these roads are poorly maintained and are eroding into our lakes. As part of the Act to Protect Lake Water Quality (above), the Legislature required the DEP to report back on ways to reduce the impact of camp roads, driveways and boat launches on lake water quality. The Maine DEP and stakeholders from around the state worked together for six months to evaluate this widespread, expensive and complex problem. In the report to the Legislature, the DEP presented 11 recommendations about ways to address runoff problems associated with lake camp roads. The Natural Resources Committee of the Maine Legislature was scheduled to review the report and discuss the following three recommendations requiring legislative approval in spring 2009.

- The Maine Legislature should provide limited and appropriate statutory liability protection to road association directors, commissioners and volunteers;
- Amend the Private Ways Law to clarify road association purpose, meeting procedures, duration and easements; and
- Create enabling legislation to clarify conditions in which municipalities may assist with camp road repairs.

Lake Camp Road Report available at [http://www.maine.gov/dep/blwq/report/2009/camp\\_roads.pdf](http://www.maine.gov/dep/blwq/report/2009/camp_roads.pdf)

### 3. Summaries of Statewide NPS Programs

DEP directly funds several ongoing programs and projects using 319 funding. Some of these programs are carried out by DEP staff and others are implemented by partner organizations. The following pages include descriptions of each of the following programs and accomplishments in 2008.

#### DEP NPS Program and Project Activities

LakeSmart
Maine Clean Marinas and Boatyards Program
Maine Lakes Biomanipulation
Maine Nonpoint Education for Municipal Officials "NEMO"
Maine Nonpoint Source Training and Resource Center
Maine Stream Team Program
Maine Volunteer Lake Monitoring Program
Statewide NPS Outreach

#### LakeSmart

The LakeSmart program was established in 2002 to promote a new norm for shorefront and watershed development by rewarding property owners who stop erosion, manage stormwater, maintain their septic system, leave native vegetation or plant vegetation along shorelines, minimize lawns and open recreation areas, and reduce fertilizer and pesticide use. Trained LakeSmart evaluators from local watershed groups or Soil and Water Conservation Districts visit properties and evaluate four categories. Properties that score high in all four categories are certified as LakeSmart properties and receive signs to place prominently on the shorefront and/or road frontage. Properties that score high in one to three categories receive recognition certificates and are encouraged to work toward full LakeSmart status.



#### Major accomplishments in 2008:

- Issued **52** LakeSmart awards and another **25** recognition certificates to individuals that received high marks in at least one to three of the four evaluation categories. Total LakeSmart properties in Maine to date is **219**.
- Three lakes have now met the goal of having over 15% of shorefront properties certified as LakeSmart. These include Lake Anasagunticook (Hartford), Long Pond (Parsonsfield) and Wilson Lake (Wilton).
- Conducted training on Lakesmart principles for **36** landowners and evaluators.
- Due to high demand to participate in the program and limitations in DEP's resources, an annual application process was established for new groups.

- LakeSmart article, *From Pilot to Statewide* appeared in Fall 2008 issue of *LakeLines* magazine. Available at <http://www.maine.gov/dep/blwq/doclake/lakesmart/lakeline.pdf>

### **For More Information:**

Barb Welch, Maine DEP, (207) 287-7682, [Barb.Welch@maine.gov](mailto:Barb.Welch@maine.gov)  
LakeSmart website - <http://www.maine.gov/dep/blwq/doclake/lakesmart/index.htm>

## **Maine Clean Boatyards and Marinas Program**

The Clean Boatyards and Marinas Program is a partnership between the Maine State Planning Office, Maine Marine Trades Association and other industry, state and federal agencies and environmental organizations. The program promotes best management practices in boatyards and marinas. Participants conduct a facility self-assessment in five areas of concern: stormwater runoff management, erosion, sedimentation control; boat maintenance and repair/ fueling activities/petroleum control; waste recycling, disposal and storage; and boat pumpouts and sewage. The program provides technical assistance to facilities, conducts verification visits and publicly recognizes facilities that meet award standards.

### **Major accomplishments in 2008:**

- Recertified four facilities and designated one new facility. Conducted verification visits at two additional facilities that will continue to work towards certification.
- Distributed transient boater education packets and helped update the 2008 Maine Pumpout Station Guide.
- Distributed educational materials at Maine Boats, Homes and Harbors Show in August.
- Presented information about the program at three Maine Marine Trades Association (MMTA) regional meetings and distributed informational packets.
- Designed and exhibited new Clean Marinas display at MMTA Annual Conference and distributed informational packets.



### **For More Information:**

Paula Thomson, State Planning Office, 207-287-1482, [Paula.Thomson@Maine.gov](mailto:Paula.Thomson@Maine.gov)  
Clean Marinas Website - [www.mainemarinetrades.com/clean\\_marinas/default.asp](http://www.mainemarinetrades.com/clean_marinas/default.asp)

## **Maine Lakes Biomanipulation**

The project aims to improve water quality on East Pond, an impaired lake in the Belgrade Lakes chain, by removing perch and crappie fish populations in the pond. This targeted removal will enhance zooplankton populations and ultimately result in higher water transparencies due to increased consumption of blue-green algae by the zooplankton. Phase I of the project assessed water quality conditions and fish assemblages on the ponds. Phase II started in East Pond following ice-out in 2007 and continued after ice-out in 2008. Year-three targeted fish removal/disposal will again be carried out during spring of 2009.



## **Accomplishments in 2008**

- Removed a total of 2.3 tons of targeted fish species (90% perch and crappie) via trap netting, which was significantly less than the 10 tons removed in 2007. 57% of the fish removed (4,026) were adult white perch, along with 30% yellow perch (2,179) and 13% black crappie (902). Non-target fish species (golden shiner, white sucker, and chain pickerel) comprised 10% of the catch (compared with 2% of the catch in 2007).
- Completed bi-weekly water quality sampling (May to October) for total phosphorus, chlorophyll-*a*, water transparency, dissolved oxygen-temperature profiles, and phytoplankton and zooplankton assemblages in both East and North Ponds with help from University of Maine, Orono graduate student, Kristin Ditzler.
- Assessed fish assemblages in East and North Ponds on a monthly basis (June to September) using a combination of active fishing gears including: pre-dusk sinking gill netting, expert baitfish angling, and night-time beach seining. Quenton Tuckett, a Ph.D. graduate student from University of Maine Orono, and fish technicians tagged and released 1,450 white perch for mark-recapture and estimated the adult white perch population as 11,200 in 2008 (77,000 in 2007). The percentage of adult white perch was then recalculated as 36% in 2008 (45% in 2007).

### **For More Information:**

David Halliwell, Maine DEP, [david.halliwell@maine.gov](mailto:david.halliwell@maine.gov), (207) 287-7649

Bio-manipulation Project Website - [www.maine.gov/dep/blwq/doclake/bio-manipulation/index.htm](http://www.maine.gov/dep/blwq/doclake/bio-manipulation/index.htm)

## **Maine Nonpoint Education for Municipal Officials (NEMO) Program**

Maine NEMO provides outreach to municipal officials on how land use decisions are linked to water quality in their towns. NEMO is based at the office of the Partnership for Environmental Technology Education (PETE) in South Portland. The Maine State Planning Office Coastal Program and the Department of Health and Human Services Drinking Water Program also provide program funding.



LID Conference feedback - *“This was very helpful in its emphasis on applications at the local level.” “If Rite Aide decides to build in Waterboro, it may be our first LID application.”*

### **Accomplishments in 2008:**

- Planned and co-hosted four Low Impact Development (LID) conferences in cooperation with EPA, VT NEMO, NH Natural Resource Outreach Coalition and Maine Cooperative Extension. Three conferences (one in each participating state) were designed for municipal officials, and 98 people attended the Maine conference. 170 people attended the final conference in Concord, NH that was designed for the development community.
- Conducted 25 NEMO presentations to 866 people from 89 towns and worked with municipalities on the following on-going projects:

- Working with the **Town of Bristol** to improve the planning board's subdivision review and help control the impacts that development is having on water quality and town infrastructure.
  - **South Portland** is currently reviewing town zoning and requested a second chapter 500/LID presentation for the review committee. South Portland is a City that relies on Maine NEMO to educate their municipal officials. They have hosted three presentations in the last two years.
  - **The City of Ellsworth** is revising its stormwater regulations to incorporate the newer LID techniques, while keeping its preference for detention in some cases. After a NEMO LID presentation, staff members began working with a consulting engineer and a committee to formulate an LID approach for Ellsworth.
  - The **Town of Holden** is working on an Open Space Plan and used the Maine NEMO presentation as a way to get local involvement from both officials and interested townspeople to weigh in on what constitutes community character.
- Completed an eight-month effort to populate the UNH LID website with LID projects in northern New England. This increase in local projects listed on the website is an important tool to promote LID in the region. The Maine NEMO AmeriCorps intern submitted 45 project write ups and solicited another 116 from other sources. FMI - [www.erg.unh.edu/stormwater/index.asp](http://www.erg.unh.edu/stormwater/index.asp)

### **For More Information:**

LaMarr Cannon, PETE – (207) 771-9020, [lcannon@maine.rr.com](mailto:lcannon@maine.rr.com)  
Don Witherill, DEP – (207) 287-7725, [Donald.t.witherill@maine.gov](mailto:Donald.t.witherill@maine.gov)  
Maine NEMO Website – [www.mainenemo.org](http://www.mainenemo.org)

## **Maine Nonpoint Source Training and Resource Center**

The Maine Nonpoint Source Training and Resource Center's primary focus is to provide training to various groups throughout the state to help them prevent nonpoint source pollution. In addition, the Center maintains a publications and videotape library and acts as a clearinghouse for information on nonpoint source pollution and best management practices.

### **Accomplishments in 2008:**

- Provided training to **495** participants in erosion control practices for contractors and certified **79** new individuals in the Volunteer Contractor Certification program.
- Provided exam review training to **17** candidates for the Certified Professional in Erosion and Sediment Control program, which resulted in **9** new Certified Professionals in Maine.
- Helped coordinate the Northeast Chapter of the International Erosion Control Association Conference on Erosion Issues: **66 participants**.
- Coordinated training on installation and inspection of septic systems and plumbing inspection: **436 participants**.
- Coordinated training in stormwater management and biofilters for engineers: **262 participants**.
- Distributed over **55** copies of publications and **19** videotapes.



**For More Information:**

Bill Laflamme, DEP- (207) 287-7726, [william.n.laflamme@maine.gov](mailto:william.n.laflamme@maine.gov)  
 NPSTC Website - [www.maine.gov/dep/blwq/training/index.htm](http://www.maine.gov/dep/blwq/training/index.htm)

**Maine Stream Team Program**

The Maine Stream Team Program (MSTP) is dedicated to assisting local citizens and grassroots organizations interested in being stewards of their local stream resources. The program serves as a clearinghouse of stream-related information, acts as a catalyst for networking and partnering amongst local stream and river groups, and provides reference materials and training opportunities to advance stream protection efforts throughout the state. A “stream team” is a group of individuals that have banded together to learn about and protect their local stream or river.

**Accomplishments in 2008:**

- Distributed three issues MSTP Newsletter in electronic form (see website below).
- Helped coordinate and run three rapid stream habitat/geomorphology survey trainings.
- Continued to work with municipalities, SWCDs and other partners to develop watershed management and restoration strategies for Long Creek (South Portland), Sunday River (Newry), Mill Brook (Westbrook) and Pleasant River (Windham).
- Continued to develop a statewide volunteer water quality monitoring program, which will be launched in Spring 2009.
- Provided technical assistance and educational outreach to a variety of stream teams and watershed councils and coalitions around the state.
- Continued to finalize an official stream survey guidance document for stream watershed surveys and rapid stream habitat/geomorphology assessments (Volume 1) and a stream ecology primer (Volume 2). Anticipated official release is in Spring 2009.



**For More Information:**

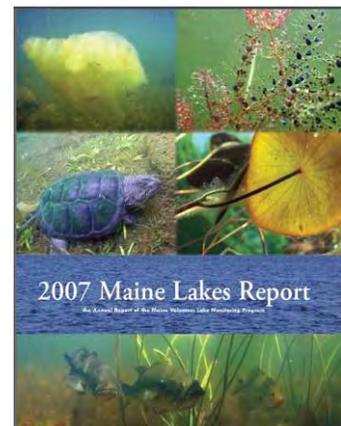
Jeff Varricchione, DEP – (207) 822-6317, [jeffrey.t.varricchione@maine.gov](mailto:jeffrey.t.varricchione@maine.gov)  
 Stream Team Website - [www.maine.gov/dep/blwq/docstream/team/streamteam.htm](http://www.maine.gov/dep/blwq/docstream/team/streamteam.htm)

**Maine Volunteer Lake Monitoring Program (VLMP)**

319 funding primarily supports the educational aspects of the VLMP including training volunteer monitors to collect quality data, producing three newsletters and one Annual Report per year and holding an annual meeting to share information about lake water quality issues. Volunteers monitor assigned lakes twice a month for 5-6 months of each year, enter data into electronic format and assist in the local coordination of VLMP activities. The total match generated by the volunteers more than doubles the 319 funding level.

**Accomplishments in 2008:**

- Produced the *2007 Maine VLMP Annual Report*, which reported that during 2007 volunteers obtained 3,567 Secchi transparency readings,



15,192 dissolved oxygen readings, 957 total phosphorus samples, and 468 chlorophyll-a samples. These data were collected from 387 lake stations representing 398,720 lake acres which amounts to 40% of Maine's lake surface area.

- Produced three newsletters and convened the 2008 Annual Meeting, which was attended by more than 100 people.
- Trained more than 50 new volunteers for transparency and 20 for dissolved oxygen. Recertified more than 65 volunteers for transparency and more than 70 volunteers for dissolved oxygen. Recertified 71 volunteers using the recently launched Virtual Secchi Recertification option on the website.
- Encouraged collection of transparency readings on days that the Landsat satellite passed Maine.
- Reached a level of 574 certified volunteer water quality monitors in the program monitoring 465 lake basins in Maine at the end of 2008.

### **For More Information:**

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Scott Williams, VLMP - (207) 783-7733, [Scott.Williams@MaineVLMP.org](mailto:Scott.Williams@MaineVLMP.org)

VLMP Website - [www.mainevolunteerlakemonitors.org/](http://www.mainevolunteerlakemonitors.org/)

## **Statewide NPS Outreach**

This NPS Outreach program disseminates information to raise awareness and move people toward more environmentally friendly behaviors. The program partners with organizations with similar target audiences and similar BMPs such as LakeSmart, YardScaping and ThinkBlueMaine as well as youth and educators through the Children's Water Festivals. The program taps social marketing techniques to increase effectiveness.



### **Accomplishments in 2008:**

- Supported the Southern and Northern Maine Children's Water Festivals, which reached approximately 1,400 students and their teachers. AmeriCorps educators reached an additional 1000 students with watershed protection messages in classroom presentations, Lake Days and other events.
- Worked with a market research firm to collect information on social issues related to unpaved private camp roads, one of the largest sources of pollution to Maine lakes. The data was used to develop recommendations in a report to the Legislature and will also help craft approaches to address NPS soil erosion around Maine lakes. Focus group report available at [www.maine.gov/dep/blwq/doclake/593/private\\_roads\\_report.pdf](http://www.maine.gov/dep/blwq/doclake/593/private_roads_report.pdf), and statewide phone survey report available at [www.maine.gov/dep/blwq/doclake/593/phone\\_survey.pdf](http://www.maine.gov/dep/blwq/doclake/593/phone_survey.pdf).
- Distributed four issues of the Nonpoint Source Times, which recently completed its 17<sup>th</sup> year of publication. Available at [www.maine.gov/dep/blwq/newslet/npstarchiv.htm](http://www.maine.gov/dep/blwq/newslet/npstarchiv.htm)

### **For More Information:**

Kathy Hoppe, DEP - (207) 760-3134, [kathy.m.hoppe@maine.gov](mailto:kathy.m.hoppe@maine.gov)

NPS Outreach Website - [www.maine.gov/dep/blwq/doceducation/nps/](http://www.maine.gov/dep/blwq/doceducation/nps/)

## E. NPS Grants Program

### 1. Overview of Nonpoint Source Water Pollution Control Projects

DEP administers a NPS grants program to offer Section 319 grant funds for watershed-based projects that take actions to help restore or protect lakes, streams, or coastal waters that are impaired or considered threatened by polluted runoff. Through the NPS Grant Program, DEP issues grants to local project sponsors who provide a minimum of a 40% match to the grant funds. NPS projects help local communities identify water pollution sources in watersheds and take action to restore or protect clean water. In 2008, DEP issued grants to help fund three types of watershed-based projects:

- **NPS Watershed Project.** Project focuses on implementing actions within an entire watershed to improve or protect a waterbody. The project is designed so that BMPs are implemented in a manner that leads to a significant reduction in NPS pollutant load to a waterbody. The load reduction is intended to improve or protect water quality of a waterbody. A NPS Watershed Survey (or other NPS assessment of equivalent detail) is needed to design and implement this type of project.
- **NPS Watershed Survey.** Project focuses on finding, describing and prioritizing NPS pollution sources in a watershed, and recommending BMPs for treating identified NPS sites. NPS Watershed Surveys provide essential information for planning and implementing NPS Watershed Projects.
- **Watershed-Based Plans.** A watershed-based plan is intended to be a strategic plan for actions needed over a 5 to 10 year timeframe to achieve the load reductions called for in a TMDL to restore an NPS impaired waterbody.

### 2. NPS Water Pollution Control Projects Funded in 2008

DEP provided grants to start-up or continue 17 NPS projects. Fourteen projects received grants as an outcome of the annual NPS request for proposals issued in April 2007.

Project Title	Grantee	Project #	Grant	Match
Birch Stream NPS Watershed Management Plan	City of Bangor	2008RT28	90,000	60,268
Brandy Pond Watershed Survey	Cumberland County SWCD	2008PP08	12,870	9,915
China Lake NPS Reduction, Phase 2	China Region Lakes Alliance	2007RT28	102,590	77,620
Cove Brook NPS Pollution Control Project	Cove Brook Watershed Council	2008RR02	91,759	63,638
Dexter Lakes NPS Watershed Project, Phase 2	Penobscot County SWCD	2008RR05	70,000	47,000
Hart Brook Unified Subwatershed and Site Recon Assessment	City of Lewiston	2008RT10	12,980	12,624
Highland Lake (Windham) Conservation Project, Phase III	Cumberland County SWCD	2008RT27	114,229	97,875
McLean Brook Watershed Survey	St. John Valley SWCD	2007RR26	6,115	4,083
McWain Pond Watershed Improvement Project	McWain Pond Association	2008RR04	42,509	28,831
Nequasset Lake Watershed Improvement Project, Phase 1	Androscoggin Valley SWCD	2007RR27	67,225	44,839
Pleasant Pond NPS Abatement, Phase 2	Kennebec County SWCD	2008RT06	64,160	43,090

Pleasant Pond NPS Abatement, Phase 3: Agricultural BMPs	Cobbossee Watershed District	2008RT31	46,080	30,928
Pleasant River Watershed Survey	Presumpscot River Watch	2008PP09	17,690	14,290
Sabbathday Lake Watershed Survey	Cumberland County SWCD	2008RR14	9,711	6,875
Spruce Creek Watershed Improvement Project, Phase 1	Town of Kittery	2008RR01	69,670	156,326
Square Pond Watershed Improvement, Phase 1	York County SWCD	2008RR11	68,657	72,109
Togus Watershed NPS Reduction Project, Phase 2	City of Augusta	2008RT03	79,000	66,200
<b>Total</b>			<b>\$965,245</b>	<b>\$836,511</b>

**3. Results: Request for Proposals:  
FY 2009 Grants for NPS Pollution Control Projects**

DEP issued its annual Request for Proposals (RFP) in April, 2008 and received 22 proposals requesting about 1.2 million dollars. This response demonstrates that local community-based partnerships value clean water and are recognizing and finding solutions to NPS problems. A review committee evaluated and scored the proposals. In July DEP announced the 10 highest ranked projects that will be funded with FFY 2009 319 funds. DEP worked with grantees to adjust work plans as needed to secure final approval. Grants were planned to enable start-up of projects for March 2009. For more information, contact Norm Marcotte at (207) 287-7727 or [norm.g.marcotte@maine.gov](mailto:norm.g.marcotte@maine.gov).

**Results - Request For Proposals  
FFY 2009 Grants for Nonpoint Source Water Pollution Control Projects**

Project Type	Funds Requested	Funds to be Awarded April 2009
Watershed Project	\$1,088,322 16 proposals	\$467,645 7 proposals
Watershed Survey	\$94,921 6 proposals	\$32,921 3 proposals

**NPS Projects to be Awarded NPS Grants in March 2009**

Project	Grantee	Grant	Match
<b>NPS Watershed Projects</b>			
Panther Pond Conservation Project - Phase II	Town of Raymond	63,289	51,845
Green Lake Watershed Imp. Project - Phase I	Hancock County SWCD	50,685	33,990
Sebago Lake Conservation Project Phase I	Portland Water District	86,080	99,274
Wilson Pond Water Quality Improvement Project	Cobbossee Watershed District	62,130	70,705
Pleasant Lake-Parker Pond Conservation Project	Pleasant Lake-Parker Pond Association	80,711	55,397
Pushaw Lake NPS Watershed Project Phase II	Penobscot County SWCD	75,000	50,760
Long Pond Water Quality Protection Phase I	Belgrade Regional Conservation Alliance	49,750	33,200
Subtotal		467,645	395,171

<b>NPS Watershed Surveys</b>			
Cochnewagon Lake Watershed Survey Proposal	Cobbossee Watershed District	8,731	6,072
Thompson Lake Watershed Survey – Southern	Thompson Lake Environmental Association	16,190	11,110
Cobbossee Stream NPS Survey	Kennebec County SWCD	8,000	5,400
Subtotal		32,921	22,582
<b>Total</b>		<b>\$500,566</b>	<b>\$417,753</b>

#### **4. WIFAP - Watershed Improvement Financial Assistance Partnership**

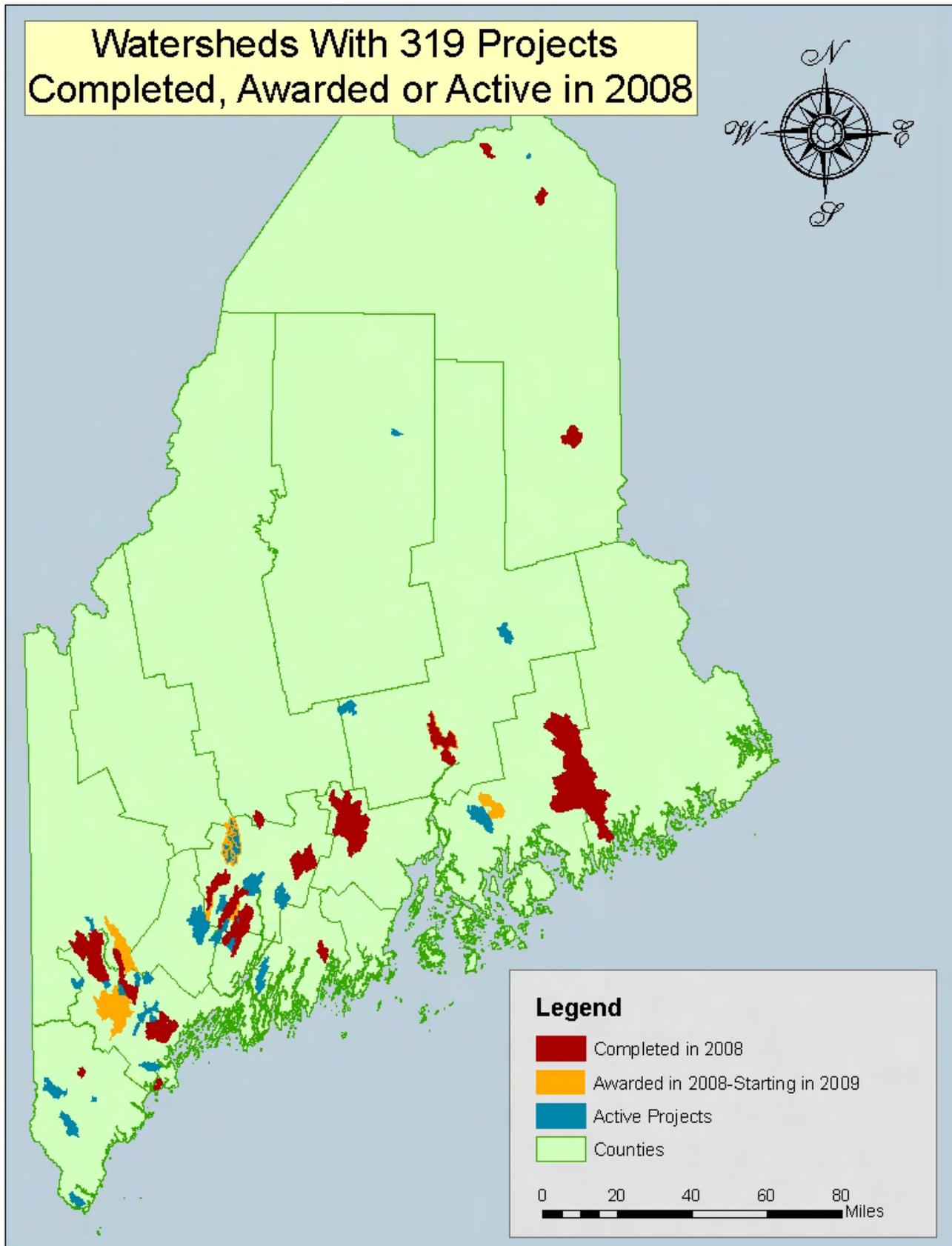
In 2008 Watershed Improvement Financial Assistance Partnership (WIFAP) funding (\$80,000 per year) was cut from the Maine Department of Agriculture biennial budget as part of State government budget reductions necessary to balance the budget. As a result, the WIFAP) grant-making program was closed due to lack of funding.

Annually from 2000 to 2007, WIFAP provided grants to Maine Soil and Water Conservation Districts for *Nonpoint Source Watershed Projects* to help restore or protect lakes, streams or coastal waters. Maine's 16 Districts organized into four watershed regions for this partnership. SWCDs forged local partnerships to apply conservation measures at significant NPS sites in watersheds to reduce pollutant loading to waterbodies. Funding for WIFAP grants was from the State of Maine Department of Agriculture and EPA 319 funds administered by Maine DEP. In 2000 WIFAP program annual funding started at \$400,000 (State \$160,000; EPA \$240,000). By 2005-2007 annual funding had declined to \$200,000 (State \$80,000; EPA \$120,000).

## F. Summaries of NPS Water Pollution Control Projects Completed in 2008

Twenty (24) projects funded through the NPS grants program were successfully completed in 2008. Concise two-page summaries of each project are included in the following pages and will also be uploaded to the PEARL database along with summaries of past 319 grant projects ([www.pearl.maine.edu](http://www.pearl.maine.edu)). Additional project information can be obtained from the DEP or the project sponsor. See Figure 1 for locations of watersheds with NPS projects completed, started, awarded or already underway in 2008.

<b>NPS Project Title</b>	<b>Page</b>
China Lake NPS Reduction Project	22
Cobbossee Lake Water Quality Protection – Phase I	24
Duckpuddle Pond Watershed Survey	26
East Branch Piscataqua River Watershed Survey	28
East Pond Watershed Restoration Project - Phase III	30
Hart Brook Watershed Management Plan	32
Highland Lake Conservation Project II (Windham)	34
Highland Lake Watershed Improvement Project (Bridgton)	36
Libby Brook Conservation Project	38
Little Madawaska Lake Conservation Project	40
Little Ossipee Lake Improvement Project - Phase I Implementation	42
Long Lake Watershed Improvement Project	44
Maranacook Lake Watershed Management Plan Development	46
Meduxnekeag Lake Shoreline Erosion Project	48
Narraguagus River Protection Project - Phase 1	50
Panther Pond Conservation Project - Phase I	52
Penjawoc Stream Watershed Management Plan Development	54
Perley Brook Watershed Project - Phase III	56
Pleasant Lake / Parker Pond Watershed Survey	58
Pleasant Pond NPS Abatement Project	60
Pushaw Lake NPS Watershed Project - Phase 1	62
Unity Pond Watershed Restoration – Phase II	64
West Branch Piscataqua River Watershed Survey	66
Wilson, Dexter and Berry Ponds Watershed Survey	68



# China Lake NPS Reduction Project

## #2003R-37

Waterbody Name: China Lake

Location: China and Vassalboro – Kennebec County

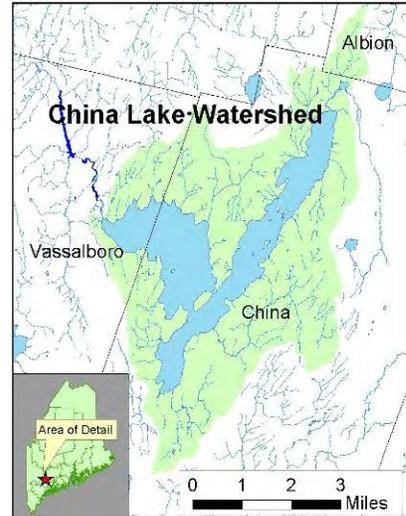
Waterbody Status: Impaired, NPS Priority Watershed, Most at Risk

Project Grantee: China Region Lakes Alliance

Project Duration: March 2006 – March 2008

319 Grant Amount: \$60,905

Local Match: \$165,852



**PROBLEM:**

China Lake was once a crystal clear waterbody well known for its cold water fishery of salmon and trout. In 1983 the lake suffered a rapid decline in water quality due to cultural eutrophication with the onset of seasonal nuisance algae blooms, loss of its cold water fishery and a decline in property values. The lake was subsequently placed on the State’s list of impaired waters due to nonattainment of water quality standards. Overall, the water quality of China Lake has only slightly improved over the past decade, with intense blue-green nuisance algae blooms prevalent during most summers since the mid-1980s. The lake is the community and economic focal point for the Town of China and the public drinking water supply for the greater Waterville area. The lake has three public boat launches and is heavily used for recreation, boating, fishing and swimming.

China Lake covers 3,848 acres, and it has a 32 square mile watershed. According to the lake’s TMDL report, which was completed in 2001, the primary sources of NPS pollution are nutrient enrichment and excess phosphorus loading from watershed soil erosion and internal phosphorus recycling. Major land uses contributing to the external phosphorus load in lakes include residential and commercially developed areas, roadways, agriculture and commercial forestry. The China Region Lakes Alliance (CRLA) and China Lake Association have carried out 319 grant projects and a summer Youth Conservation Corps (YCC) program that have installed hundreds of BMPs on watershed erosion sites.

**PROJECT DESCRIPTION:**

The project focused on reducing sediment and phosphorus loading to China Lake with the goal of improving water quality. Cost sharing assistance helped fix 23 high priority NPS sites. Watershed property consultations and technical assistance was provided to 91 landowners and site-specific recommendations encouraged landowners to adopt appropriate BMPs. Watershed stewardship was promoted through lake association meetings, summer boat tours (100 people attended), an Annual Lake Awareness Day involving 5<sup>th</sup> grade students and articles in the local newspapers and annual newsletters.



## PROJECT OUTCOMES:

- Over \$195,000 was invested in on-the-ground construction of needed conservation practices. This greatly exceeded the planned amount of \$61,960.
- BMPs were installed to address high priority erosion sites on ten camp roads in the watershed. The CRLA's Youth Conservation Corps continued to help landowners install BMPs at many additional residential sites.
- Tarybelu Lane (3,500 feet) was substantially rebuilt to stabilize the road surface. Ditches, ditch turnouts directing runoff into buffers, and a stream crossing were installed in order to stop the chronic excessive erosion that was delivering sediment and phosphorus to China Lake. All 22 lot owners approved the work and each contributed \$5,000. In total, \$156,000 (319 grant, \$32,479; local match, \$123,521) was spend on these projects. See photos below.
- Technical assistance visits were provided to 91 property owners – far exceeding the project goal of 40 visits. These visits prompted many of the landowners to then install recommended BMPs.
- Pollutant loading to the lake from watershed sources was reduced by about 61 tons of sediment and 43 lbs of phosphorus per year (WEPP Model).



Tarybelu Lane – before construction, silt eroded from road and into lake tributary



Tarybelu Lane – construction in progress

## PROJECT PARTNERS:

Town of China  
Town of Vassalboro  
Kennebec Water District  
Kennebec County SWCD  
CRLA Youth Conservation Corps  
China Lake Association

## CONTACT INFORMATION:

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David Landry, China Region Lakes Alliance – (207) 445-5021, [lakesalliance@yahoo.com](mailto:lakesalliance@yahoo.com)

# Cobbossee Lake Water Quality Protection, Phase I

## #2007RR06

Waterbody Name: Cobbossee Lake

Location: Winthrop, Manchester, West Gardiner, Readfield, Litchfield, Monmouth – Kennebec County

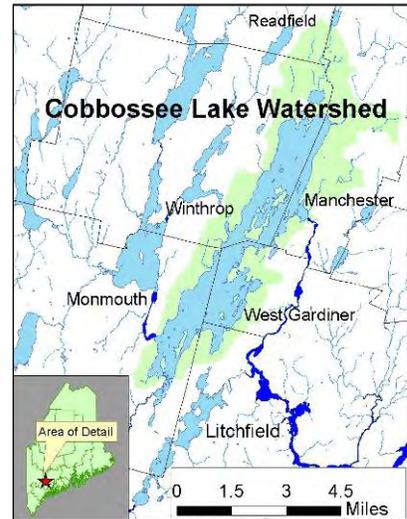
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Kennebec County SWCD

Project Duration: April 2007 – December 2008

319 Grant Amount: \$72,609

Local Match: \$79,072



### PROBLEM:

Cobbossee (or Cobbosseecontee) Lake is a large lake with a surface area of approximately 5,238 acres and direct watershed of 26.9 square miles. The lake supports a large recreational fishery and recreational boating, and is a backup drinking water supply for the City of Augusta. The lake has been continuously monitored by the Cobbossee Watershed District (CWD) for over 30 years and the CWD has implemented a number of water quality improvement projects over the years. From 1996 to 2002 Cobbossee Lake experienced a gradual increase in water clarity and the minimum secchi disk reading did not fall below two meters. Due to this sustained improvement, Cobbossee Lake was removed from the impaired list in 2006. While the lake has been delisted, its water quality is still sensitive and continued NPS abatement work is needed to protect it.

### PROJECT DESCRIPTION:

The purpose of this project was to protect the recovering water quality of Cobbossee Lake by reducing the phosphorus load through the treatment of NPS pollution sites such as camp roads and shorefront property. To work towards this goal, the major entities working in the watershed collaborated in a project that combined education, outreach, technical assistance and construction.

The Friends of the Cobbossee Watershed (Friends) conducted ‘LakeSmart-Start!’ visits with interested landowners and the Friends’ Youth Conservation Corps (YCC) installed conservation practices such as bank stabilization and buffers. CWD staff presented information about low impact development to the planning boards of the four watershed towns. Kennebec County SWCD spearheaded the construction of BMPs on roads and provided overall project management and outreach. Completed construction projects included a large buffer planting at a public beach, stabilization of a major causeway in collaboration with the Maine Department of Transportation, and installation of frequent check dams in a 2,500 foot long ditch.



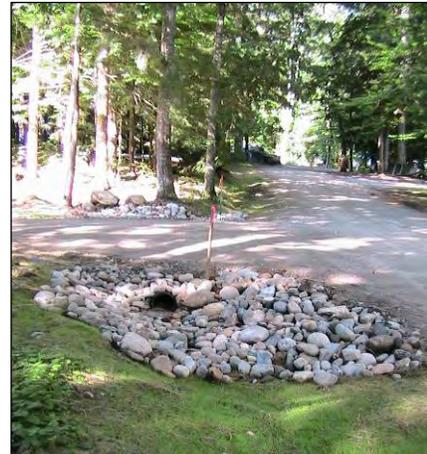
Friends' YCC take a break while installing a buffer

## PROJECT OUTCOMES:

- The project installed 29 BMPs at eight different locations. BMPs included road crowning and rebuilding, creating and stabilizing ditches, constructing plunge pools, planting buffers, installing and armoring culverts, and stabilizing the shoreline of an eroding causeway.
- The Friends's YCC completed another 12 projects and installed BMPs including shoreline riprap, vegetated buffers, erosion control mulch and a dripline trench.
- Annual pollutant loading to Cobbossee Lake was reduced by an estimated 33 tons of sediment, 33 pounds of phosphorus, and 65 pounds of nitrogen per year (EPA Region 5 Method and WEPP Model).
- The project carried out workshops on gravel road maintenance and proper ditch stabilization; low impact design presentations to four town planning boards; and 26 'LakeSmart-Start!' visits.



Stabilization of eroding causeway banks



Culvert stabilization project

## PROJECT PARTNERS:

Friends of the Cobbossee Watershed

Friends of the Cobbossee Watershed Youth Conservation Corps

Cobbossee Watershed District

Maine Department of Transportation

## CONTACT INFORMATION:

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John Blais, Kennebec County SWCD – (207) 622-7847 ext 3, [john@kcsxcd.org](mailto:john@kcsxcd.org)

# Duckpuddle Pond Watershed Survey

## #2006RR32

Waterbody Name: Duckpuddle Pond

Location: Nobleboro, Waldoboro – Lincoln County

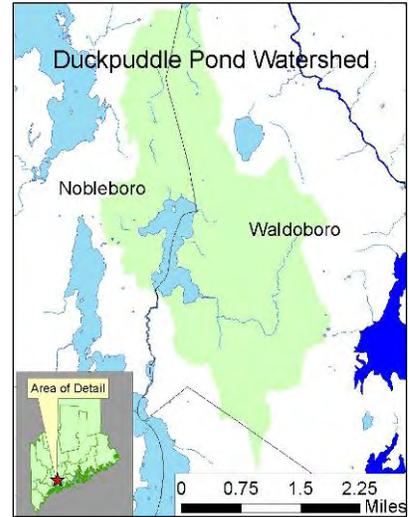
Waterbody Status: Impaired, NPS Priority Watershed, Most at Risk

Project Grantee: Knox - Lincoln SWCD

Project Duration: May 2008 – December 2008

319 Grant Amount: \$1,575

Local Match: Undetermined, but high given volunteer time on steering committee and during survey



**PROBLEM:**

Duckpuddle Pond is a 242-acre waterbody with a watershed of 8.5 square miles. The pond, which flows into Pemaquid Pond, has below average water quality and had prevalent algal blooms in the early to mid 1990’s. While the water quality improved in the early 2000’s, blooms recurred in 2005, 2006 and 2007. With high dissolved oxygen depletion in deep areas of the pond, the potential for internal loading is high.

Unlike most lakes in mid-coast Maine, existing development on the immediate shoreline is not intense. A 1995 watershed survey indicated that phosphorus-laden runoff was entering the pond and its tributaries from several land uses, including state and town roads. Several farms in the upper watershed seemed to be major sources as well. A TMDL report for the pond was approved in 2005.

**PROJECT DESCRIPTION:**

The Duckpuddle Pond watershed survey was administered by Knox Lincoln SWCD with strong support from the Pemaquid Watershed Association (PWA) and the Maine DEP. The purpose of the survey was to identify, document, and prioritize soil erosion sites in the Duckpuddle Pond watershed and to recommend conservation practices for each of those sites.

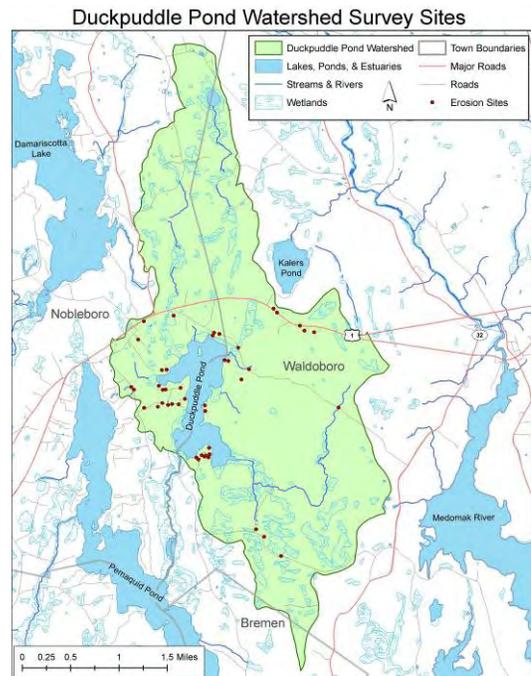
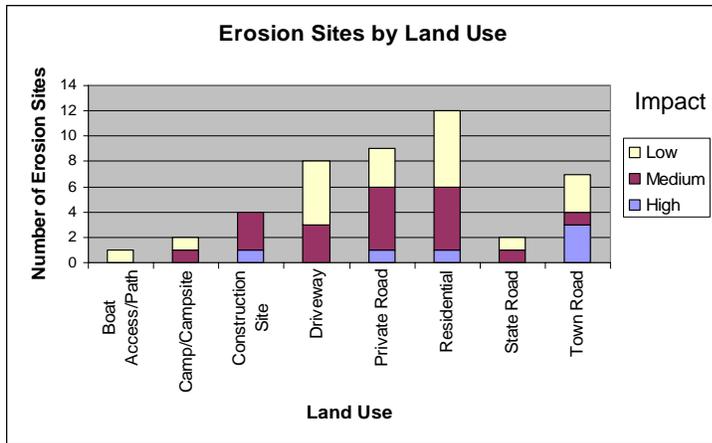
Survey methods were based on those outlined in the DEP publication, *Citizen’s Guide to Lake Watershed Surveys*. The steering committee, which included members of the PWA Duckpuddle Ponders, planned the survey, coordinated a watershed-wide mailing, and reviewed the survey results and report. The survey and volunteer training were conducted on April 19, 2008. Fourteen volunteers and six technical leaders surveyed the majority of the developed areas in the watershed that day, and follow-up was completed during the summer and fall. Larger agricultural operations were not included in the survey area because the Knox - Lincoln SWCD was already working with local farms to reduce nonpoint source pollution as part of a separate project.



Duckpuddle Watershed Survey Volunteers

**PROJECT OUTCOMES:**

- Technical staff and 14 local volunteers surveyed the developed sections of the entire Duckpuddle Pond watershed and documented 45 erosion sites.
- Survey findings and general site descriptions and recommendations were summarized in the *Duckpuddle Pond Watershed Survey Summary Fact Sheet* and the *Duckpuddle Pond Watershed Survey Report* (December 2008).
- The Steering Committee plans to conduct outreach by hand-delivering or mailing a summary letter to landowners with identified high and medium sites. General outreach will also occur through a final press release and posting of the survey report on the PWA website.



**PROJECT PARTNERS:**

Pemaquid Watershed Association  
 Town of Nobleboro  
 Town of Waldoboro

**CONTACT INFORMATION:**

Kristin Feindel, DEP – (207) 287-5586, [kristin.b.feindel@maine.gov](mailto:kristin.b.feindel@maine.gov)  
 Kathy Ward, Knox-Lincoln SWCD – (207) 273-2005 ext 101, [kathy.ward@me.nacdnet.net](mailto:kathy.ward@me.nacdnet.net)

## East Branch Piscataqua River Watershed Survey #2004P-10

Waterbody Name: East Branch Piscataqua River

Location: Yarmouth, Cumberland, Falmouth – Cumberland County

Waterbody Status: NPS Priority Watershed

Project Grantee: Presumpscot River Watch

Project Duration: April 2004 – March 2008

319 Grant Amount: \$14,020

Local Match: \$9,850



### PROBLEM:

The East Branch of the Piscataqua River has a 20.1 square mile watershed and includes the town center of Cumberland and a portion of the Yarmouth town center. The East Branch joins the West Branch in Falmouth and then flows into the Presumpscot River. The watershed's population of 15,000 residents has been expanding at a rate of nearly 15% per decade over the last 30 years.

The Piscataqua River is listed as impaired by the DEP due to high levels of bacteria. The DEP's statewide bacteria TMDL, which includes the Piscataqua River, is currently in draft form. Volunteers from the Presumpscot River Watch (PRW) have conducted water quality monitoring on the East Branch since 1989. Data indicates that the East Branch of the Piscataqua River suffers from low dissolved oxygen levels, high turbidity and high bacteria levels. Potential sources of these problems are not known since the sample stations are located at the lower reaches of the river. The Piscataqua River was identified as a high priority tributary in the *Presumpscot River Management Plan (2003)* due to water quality concerns and the 2002 removal of the Smelt Hill Dam, which will allow migratory fish passage into the Piscataqua River and other tributaries.

### PROJECT DESCRIPTION:

The purpose of this project was to conduct a survey to identify and prioritize sources of polluted runoff in the East Branch Piscataqua River watershed. Technical staff trained 22 volunteers (including 17 students from Waynflete School) in April 2005. Seven of the eight sectors were completed in May 2005, and the final sector was completed by PRW staff in November 2006. A stream corridor survey was also conducted along over two miles of the river in August 2006. Reports for both surveys were completed in May 2008.

The survey was publicized in three local papers, and postcards about the survey were mailed to about 500 watershed landowners. Project staff reviewed and mapped municipal stormwater systems and presented findings to the Towns of Cumberland, Falmouth and Yarmouth.



## PROJECT OUTCOMES:

- 73 NPS sites were documented and rated according to water quality impact and the technical level and cost needed to fix each site. 44% of the sites were associated with town roads, 15% were residential areas and the remaining sites were evenly split between nine other land uses.
- Survey findings were summarized in the *East Branch Piscataqua River Watershed Survey Report* (May 2008), which includes a list and maps of all documented NPS sites. Staff also developed a scoring matrix and prioritized 24 sites for remedial action.
- The project strengthened the working relationship between PRW and the volunteers that participated in the survey. The community involvement helped raise the profile of the river and strengthened the interest in watershed stewardship.
- Project staff worked with the Towns of Cumberland and Falmouth to develop a detailed assessment of the stormwater conveyance and/or treatment systems for the East Branch of the Piscataqua River. Data was entered into GIS format to more accurately define the boundaries of the watershed and to evaluate streets and residences adversely impacting the river and its tributaries.



## PROJECT PARTNERS:

Towns of Cumberland, Falmouth and Yarmouth  
Presumpscot River Watershed Coalition  
Cumberland County SWCD  
Casco Bay Estuary Project  
USDA Natural Resource Conservation Service  
Waynflete School  
Maine Department of Inland Fisheries and Wildlife  
Maine Department of Marine Resources

## CONTACT INFORMATION:

Don Kale, DEP – (207) 822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
Forrest Bell, Presumpscot River Watch, (207) 221-6699, [prw@maine.rr.com](mailto:prw@maine.rr.com)

## East Pond Watershed Restoration Project, Phase III

### #2007RR-08

Waterbody Name: East Pond

Location: Smithfield, Oakland – Kennebec County

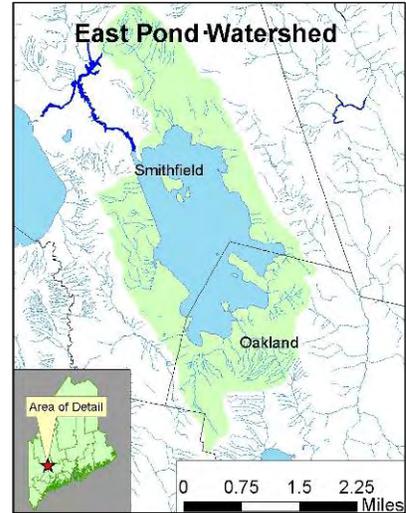
Waterbody Status: Impaired, NPS Priority Watershed, Most at Risk

Project Grantee: Kennebec County SWCD

Project Duration: April 2007 – December 2008

319 Grant Amount: \$50,456

Local Match: \$43,307



**PROBLEM:**

East Pond, which is at the top of the Belgrade Lakes chain, has a surface area of 1,670 acres and watershed of 4.2 square miles. The pond has important bass and brown trout sport fisheries, a public boat launch, two youth camps, one commercial cabin operation, and approximately 400 residences (65% of which are seasonal). There are approximately 18 miles of roads in the watershed, eight miles of which are unimproved.

Listed as an impaired waterbody, East Pond has regular algal blooms and consistently high phosphorus levels. According to the TMDL report (2001), the main cultural phosphorus sources are roads (20%), shoreline development (31%), non-shoreline development (10%), and septic systems (10%). The high level of mixing due to the shallow depth of the pond (average 18 feet) and a slow flushing rate (once every four years) exacerbate phosphorus and algal problems in East Pond. Phase I and Phase II 319 grant projects (2001 – 2007) fixed 35 eroding roads and driveways in the watershed. The pond is currently undergoing a DEP biomanipulation project which removes targeted fish in an attempt to reduce algae populations in the pond.

**PROJECT DESCRIPTION:**

As with the previous phases of 319 projects, this project implemented practices recommended by the TMDL in order to reduce the external phosphorus loading, thereby helping to restore water quality of East Pond. BMP installations focused primarily on roads, but were also installed on driveways and a large recreational area in the watershed. The Belgrade Regional Conservation Alliance Conservation Corps also installed shoreline BMPs at several lower-tech sites.

Outreach to the local community and municipal officials was also an important part of the project. A local lawyer who specializes in legal issues concerning road associations led a well-received workshop on forming road associations. Project staff conducted site visits with town public works and private road commissioners to stress the importance of road maintenance and how poor maintenance leads to high maintenance cost and nonpoint source pollution. The East Pond Association continued to be an active partner by assisting in locating potential BMP sites and providing outreach to their membership.



## PROJECT OUTCOMES:

- The project addressed 28 sites in the watershed, including work on six roads, two long driveways, and a large recreational area. BMPs included road crowning and rebuilding, creating and stabilizing ditches, constructing plunge pools, and installing and armoring culverts.
- The Belgrade Regional Conservation Alliance Conservation Corps completed another four projects, including shoreline rip-rap installation and drainage ditch stabilization.
- The project hosted a Road Association Development Workshop, which was led by a lawyer specializing in road association formation and function. The workshop was attended by residents representing five private roads in the East Pond Watershed.
- Pollutant loading to East Pond was reduced by an estimated reduction 20 tons of sediment, 20 pounds of phosphorus, and 27 pounds of nitrogen per year (EPA Region 5 Method and WEPP Model).



Final touches on a shoreline stabilization project.



Installation of riprap-lined ditch and plunge pool

## PROJECT PARTNERS:

East Pond Association

Belgrade Regional Conservation Alliance

Belgrade Regional Conservation Alliance Youth Conservation Corps

## CONTACT INFORMATION:

Kristin Feindel, DEP – (207) 287-5586, [kristin.b.feindel@maine.gov](mailto:kristin.b.feindel@maine.gov)

John Blais, Kennebec County SWCD – (207) 622-7847 ext 3, [john@kcsxcd.org](mailto:john@kcsxcd.org)

## Hart Brook Watershed Management Plan Development

### #2004R-32

Waterbody Name: Hart Brook

Location: Lewiston – Androscoggin County

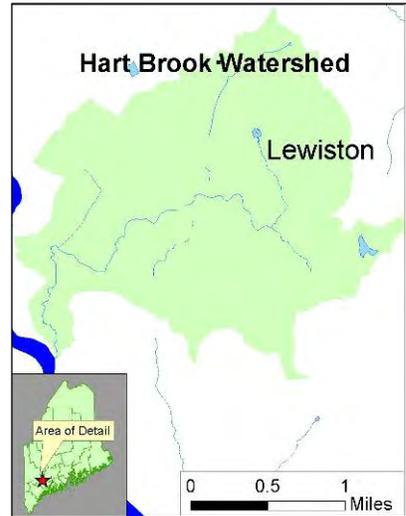
Waterbody Status: Urban Impaired Stream

Project Grantee: City of Lewiston

Project Duration: January 2007 – August 2008

319 Grant Amount: \$73,400

Local Match: \$54,163



**PROBLEM:**

Hart Brook (also known as Dill Brook) is a small Class B urban stream located in Lewiston. The brook is approximately 3.7 miles long with a watershed of 3.4 square miles and flows into the Androscoggin River. The watershed includes residential, commercial, industrial and undeveloped land and is approximately 22% impervious. The watershed also includes the area around the Maine Turnpike Exit 80, which is a prime new commercial development area in Lewiston.

Hart Brook was first tested by Maine DEP in 1998, at which time modeling showed that the stream would not meet its water quality classification for aquatic life. Hart Brook was again tested in 2003 and results showed that aquatic life remained impaired and dissolved oxygen levels exhibited drastic swings. Additional site investigation in 2005 showed continuing impairment issues related to aquatic life, stream bank and channel erosion, and illicit discharges. A draft TMDL was released in August 2007.

**PROJECT DESCRIPTION:**

The purpose of this project was to develop a Watershed Management Plan (WMP) for the Hart Brook Watershed that would allow for continued development in the watershed while also working to improve the water quality of the brook and return it to Class B standards.

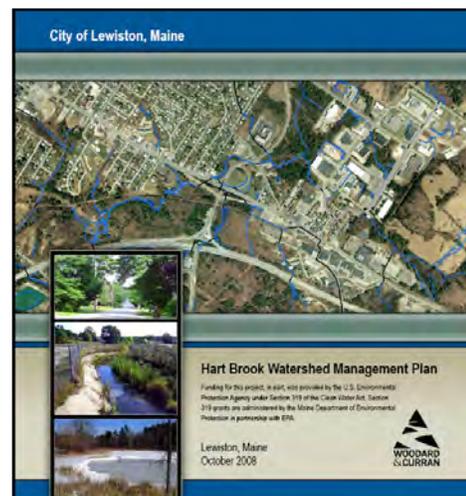
The WMP was developed by the City of Lewiston and a stakeholder group with technical assistance provided by a consultant and Maine DEP. A public meeting was held at the start of the development process, and a mix of 26 residential, commercial, and government entities attended. Approximately 1/3 of those attending continued on as part of the stakeholder group, which met three more times. To develop the plan, project staff assembled and evaluated data; conducted public outreach; monitored stream hydrology and water quality; developed mitigation measures, cost projections and prioritizations; and wrote and reviewed the watershed management plan. The result of this work was a comprehensive watershed management plan document, including an Action Plan which outlines the actions for each of the involved entities.



Field assessment of a possible structural retrofit location.

## PROJECT OUTCOMES:

- Project staff evaluated potential stream impairments; analyzed subwatershed contributions to urban runoff pollutant loads; and identified 659 structural retrofit locations within the priority developed areas of the watershed. These retrofits were then prioritized using a ranking evaluation and used to develop a list of 65 top retrofit sites.
- An action plan with prioritized structural and non-structural stormwater management practices was developed with input by watershed stakeholders at two public meetings.
- Public outreach and education about Hart Brook's water quality included several newspaper articles and a stormdrain stenciling project by local students.
- The *Hart Brook Watershed Management Plan* was completed in October, 2008. The plan includes background stream and watershed information, methods and results of the watershed assessment and stormwater source assessment, structural and non-structural alternatives reviews, maps and an action plan. Available at [www.ci.lewiston.me.us/stormwater/hartbrook/index.htm](http://www.ci.lewiston.me.us/stormwater/hartbrook/index.htm).



## PROJECT PARTNERS:

Woodward & Curran  
 Jacobs Edwards and Kelcey  
 Pike Industries  
 Androscoggin River Alliance  
 Lewiston-Auburn Economic Growth Council  
 Androscoggin Valley Council of Governments  
 GZA for the Maine Turnpike Authority  
 Central Maine Power  
 Geiger Industries  
 Elmet Technologies  
 Wahlco Metroflex  
 Androscoggin Valley Soil and Water Conservation District

## CONTACT INFORMATION:

Kristin Feindel, DEP – (207) 287-5586, [kristin.b.feindel@maine.gov](mailto:kristin.b.feindel@maine.gov)  
 Jan Patterson, City of Lewiston – (207) 513-3009 x3421, [jpatterson@ci.lewiston.me.us](mailto:jpatterson@ci.lewiston.me.us)

## Highland Lake Conservation Project, Phase II

#2004R-03

Waterbody Name:	Highland Lake
Location:	Falmouth, Windham, Westbrook – Cumberland County
Waterbody Status:	Impaired, NPS Priority Watershed, Most at Risk
Project Grantee:	Cumberland County SWCD
Project Duration:	April 2004 – March 2008
319 Grant Amount:	\$225,636
Local Match:	\$180,117



### PROBLEM:

Highland Lake covers 623 acres, has a maximum depth of 67 feet, an average depth of 22 feet, and a flushing rate of 0.7 flushes per year. Its watershed covers 8.4 square miles and is part of the Presumpscot River Watershed. The Maine DEP and Highland Lake Association (HLA) volunteers have monitored Highland Lake's water quality since 1974. The lake was placed on the State's list of impaired waters due to a declining water quality trend. Dissolved oxygen levels in the lake's bottom layer are also at critically low levels, threatening the lake's trout population, which needs cold oxygen-rich water to survive.

Efforts have been underway for several years to address this decline. Cumberland County SWCD and HLA volunteers completed a watershed survey in 1997 and identified 104 erosion sites (42% private roads, 13% state and town roads, and 24% residential). Cumberland County SWCD created the *Highland Lake Watershed Management Plan* in 1999 and carried out a grant project from 1999 - 2002 to install BMPs on both residential and road sites. The Highland Lake Youth Conservation Corps (YCC) formed through this project and installed BMPs on 88 sites in the watershed during 2000 - 2002. The lake's TMDL report was completed in 2003.

### PROJECT DESCRIPTION:

The primary purpose of this project was to significantly reduce erosion and export of sediment and phosphorus into Highland Lake by installing conservation practices at NPS sites throughout the watershed. Project staff worked with road associations and residents to fix 13 priority road sites. Matching grants were provided to 50 landowners to install buffers and other conservation practices, and the Highland Lake YCC provided labor on many of the projects. Technical assistance visits were provided to 145 landowners.

The project also raised awareness through a Cruise the Buffers tour; presentations at two HLA annual meetings and the Towns of Windham and Falmouth; two hands-on workshops; watershed signs and numerous articles in newsletters and local newspapers. The work plan was extended for an additional year due to an \$85,000 project amendment in 2005 and a \$36,000 Stormwater Compensation Fee Fund Project awarded in 2007.



## PROJECT OUTCOMES:

- 13 priority road sites were stabilized and improved through the project. In total, the project resulted in the installation of 1470 feet of ditches, 425 feet of swales, nine new culverts, two settling basins, three plunge pools, nine turnouts, and one French drain. In addition, 4,625 linear feet of pavement was installed; 450 linear feet of road surface was improved with new material, crowning and grading; and five existing culverts were stabilized with riprap.
- Pollutant loading to Highland Lake was reduced by an estimated 143 tons of sediment and 105 pounds of phosphorus per year (EPA Region 5 Method).
- Residential and Plant Matching Grants (\$100) were awarded to 51 landowners and resulted in the installation of numerous conservation practices including 1,000 shrubs, trees and groundcovers.
- Approximately 30 volunteers attended three hands-on workshops during the project. Participants increased their knowledge about lakefront buffers, rain gardens, and using the Frontrunner to properly grade, crown, and maintain gravel roads.
- Funding from this project supported the continuation of the Highland Lake Youth Conservation Corps program that installed over 200 conservation practices on 54 residential properties and 32 private road sites.



Overlook Drive - before



Overlook Drive - after

## PROJECT PARTNERS:

Highland Lake Association  
Highland Lake Youth Conservation Corps  
Maine Department of Transportation  
Towns of Westbrook, Falmouth and Windham

## CONTACT INFORMATION:

Don Kale, DEP – (207) 822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
Betty Williams, Cumberland County SWCD – (207) 892-4700, [betty-williams@cumberlandswcd.org](mailto:betty-williams@cumberlandswcd.org)

## Highland Lake Watershed Improvement Project (Bridgton)

#2005R-10

Waterbody Name:	Highland Lake
Location:	Bridgton, Sweden – Cumberland and Oxford Counties
Waterbody Status:	NPS Priority Watershed, Most at Risk
Project Sponsor:	Cumberland County SWCD
Project Duration:	April 2005 – August 2008
319 Grant Amount:	\$98,008
Local Match:	\$83,236



### PROBLEM:

Highland Lake is a 334-acre lake in Bridgton that drains into Long Lake and then Sebago Lake. The lake's direct watershed covers 10.2 square miles and extends into Sweden and Waterford. The shoreline is moderately developed with 351 camps and year-round homes, including a town beach and several businesses. Lakes Environmental Association (LEA) and Maine DEP have monitored Highland Lake's water quality since 1976. The lake was placed on the State's list of impaired waters due to declining water clarity, and a TMDL Assessment for the lake was completed in 2004.

LEA has conducted outreach and provided technical assistance to Highland Lake residents and municipal officials for several decades. In 1997 they received a 319 grant to carry out the *Highland Lake Watershed Project*. Using their 'hotspots' GIS inventory, they identified and prioritized erosion sites in the watershed, and used grant cost sharing funds to fix six of the nine highest priority sites in the watershed. The project also conducted 42 Clean Lake Check-Ups, which resulted in another nine construction projects. Due in part to LEA's efforts, the lake was removed from the impaired list in 2006 after the water quality data showed an improving trend.

### PROJECT DESCRIPTION:

The purpose of the project was to significantly reduce erosion and export of sediment and phosphorus into Highland Lake. Conservation practices were installed at 46 sites throughout the watershed. This included 16 large-scale abatement sites and 30 residential sites (funded with help from the project's \$300 small matching grant program).



During the project, LEA spent over 280 hours (in-kind match) educating local children through their watershed education program. In addition, presentations about the project were presented at LEA's annual meetings, and project updates were included in LEA's and CCSWCD's newsletters and websites. In October 2007, a watershed tour showcased completed road and residential sites. At the end of the project, LEA conducted an inventory of remaining problem sites and maintenance needs in the watershed and identified seven roads that need additional work. LEA tested Highland Lake's water quality from May – September throughout the grant period, and completed a Water Quality Summary Report about the data and preliminary trends.

### PROJECT OUTCOMES:

- The project successfully fixed 16 high and medium impact NPS sites in the watershed, including 12 road sites, three beach sites and one driveway. The project awarded \$300 matching grants to address another 30 residential sites.
- The road sites involved grading, adding new surface material and installing plunge pools, settling basins and ditches. Other conservation practices installed during the project include:
  - Native buffer plantings (575 plants)
  - Rubber razor diverters (5)
  - Roof dripline trenches (5)
  - Open top culvert diverters (5)
  - Infiltration steps (4)
  - Drywell (1)
- Pollutant loading to Highland Lake was reduced by an estimated 50 tons of sediment and 42 pounds of phosphorus per year (Region 5 Method).
- LEA conducted a preliminary analysis of water quality data collected during the project (2004 – 2007) and found that phosphorus, clarity and chlorophyll levels showed minor improvements since the beginning of the project.



The project addressed three high impact sites on Hardscrabble Road in the Town of Sweden. Work included 850 feet of ditch stabilization, slope stabilization and installation of several turnouts and plunge pools, resulting in a pollutant load reduction of an estimated 20.15 tons of sediment per year.

### PROJECT PARTNERS:

Lakes Environmental Association  
Portland Water District  
Town of Bridgton  
Town of Sweden

### CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, [wendy.garland@maine.gov](mailto:wendy.garland@maine.gov)  
Heather True, CCSWCD – (207) 892-4700, [htrue@cumberlandswcd.org](mailto:htrue@cumberlandswcd.org)

# Libby Brook Conservation Project

## #2005R-11

Waterbody Name: Libby Brook

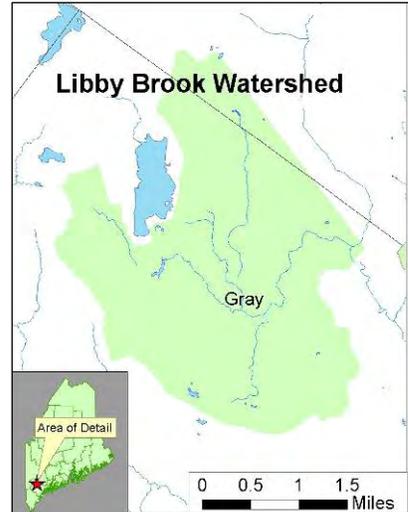
Location: Gray – Cumberland County

Project Grantee: Cumberland County SWCD

Project Duration: April 2005 – March 2008

319 Grant Amount: \$53,252

Local Match: \$47,513



**PROBLEM:**

Libby Brook is a perennial, Class B stream in the Royal River Watershed. The Libby Brook watershed covers 23 square miles, and its tributaries include Mill Brook, Hatchery Brook and Cole Brook. Although Libby Brook is still considered to meet state standards, DEP monitoring in 2000 indicated that at least one site on the stream failed to meet the Class B biological standards.

A 1998 watershed survey conducted by the Friends of the Royal River (now named Royal River Conservation Trust) identified 50 sites having the potential to pollute Libby Brook. Of these, 36 were rated as medium and high impact. In 2003 Cumberland County SWCD staff revisited those 36 sites and found that 33 continued to be impacting the watershed. Over half of the documented issues were associated with state, town and private roads and resulted from lack of drainage and poor road maintenance. Other causes of stream degradation included agricultural livestock having free access to the stream, eroded ATV trails, golf course erosion, and streambank erosion coupled with insufficient riparian buffers.

**PROJECT DESCRIPTION:**

The primary purpose of this project was to significantly reduce erosion and export of sediment and phosphorus into Libby Brook by installing BMPs at 18 sites. The Royal River Youth Conservation Corps provided labor at 13 project sites.

The project raised awareness about watershed issues and promoted long-term watershed stewardship by working closely with the ecology students at the Gray-New Gloucester High School. The Cumberland County SWCD’s Education Coordinator delivered numerous lessons on topics such as watersheds, topography, water quality parameters, testing procedures and non-point source pollutants found in Libby Brook. Project activities were also publicized in local newspapers.



Local high school students study Libby Brook

## PROJECT OUTCOMES:

- The project fixed 18 moderate to high impact sites in the watershed, 13 of which included labor from the Royal River Youth Conservation Corps. This work prevented an estimated 143 tons of sediment from reaching Libby Brook annually (EPA Region 5 Method).
- On May 6, 2006, a Gravel Road Maintenance Workshop was held on Wild Acres Road. Ten participants from the Libby Brook Watershed and surrounding areas were trained to use the Front Runner to properly grade and crown gravel roads.
- Students from the ecology class at Gray-New Gloucester High School conducted water quality monitoring on Libby Brook and its tributaries. They also analyzed test results and documented their findings in several articles submitted to several local newspapers.
- On May 23, 2007 these same high school students demonstrated what they had learned by educating sixth graders during a Middle School Field Day. They prepared materials, presentations, and outdoor stations in order to share their knowledge of watershed issues with their younger counterparts.



Several projects were completed at a farm located adjacent to Libby Brook. Fencing was installed along 1000 feet of the brook to keep cows out of the stream. Several cow trails on the farm were stabilized with gravel and mulch, and shrubs and perennials were planted on eroded streambanks.

## PROJECT PARTNERS:

Royal River Youth Conservation Corps  
Maine Department of Transportation  
Royal River Conservation Trust  
Gray New-Gloucester High School  
Wild Acres Road Association  
Casco Bay Estuary Project  
Natural Resources Conservation Service  
Town of Gray

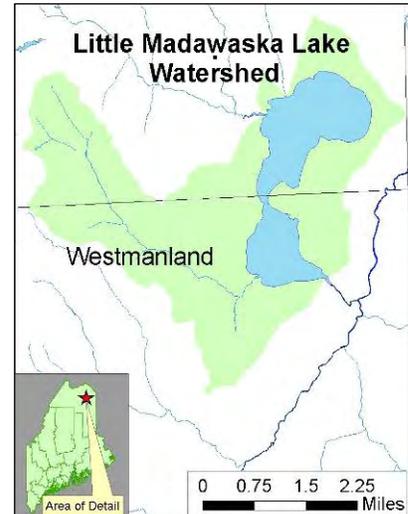
## CONTACT INFORMATION:

Don Kale, DEP – (207) 822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
Heather True, Cumberland County SWCD – (207) 892-4700, [htrue@cumberlandswcd.org](mailto:htrue@cumberlandswcd.org)

## Little Madawaska Lake Conservation Project

### #2003R-35

Waterbody Name:	Little Madawaska Lake
Location:	Westmanland – Aroostook County
Waterbody Status:	Removed from Impaired List
Project Grantee:	Town of Westmanland
Project Duration:	July 2006 – September 2008
319 Grant Amount:	\$79,700
Local Match:	\$82,269



### PROBLEM:

Madawaska Lake is a 1564-acre lake with two distinct basins, known locally as the Big and Little Lake. The Little Lake is located entirely in the Town of Westmanland, while the Big Lake is located entirely in unorganized territory, T16 R4. The lake was listed as impaired in 1988 due to frequent algae blooms and a TMDL was completed in 2000. Water quality improved following changes in timber harvesting practices, septic system replacements and increased oversight and assistance to lakefront properties. The lake was removed from the impaired list in 2006.

The western side of Little Madawaska Lake is bordered by seasonal camps and year round residences. These structures are accessible by a single road, Little Madawaska Lake Road (LMLR). The Town of Westmanland and the residents of LMLR are responsible for the road upkeep and condition. Excessive erosion and sedimentation from the road was identified as a high priority problem in a 2003 watershed survey. The watershed survey also identified numerous high priority residential sites, which included driveways, unstable shorelines and lack of buffers. Together these land uses have contributed a significant load of sediment and nutrients to the lake.

### PROJECT DESCRIPTION:

The goal of the project was to significantly reduce pollutant loading to Little Lake. The Town of Westmanland worked with landowners to correct significant erosion problems on the LMLR and camp lots. An engineering study completed in 2003 on the LMLR helped prioritize work sites on the road. The town hired the engineering firm that had completed the study to design the BMPs and conduct inspections of some of the complex BMPs. The same engineer was hired to help design BMPs on a few of the residential lots where there were significant problems and space was limited.



A local contractor who is certified in erosion control practices was hired to install BMPs, which included establishing and/or reshaping ditches, adding appropriate road surface material, grading, installing plunge pools, replacing culverts and reconstructing a stream crossing on LMLR. Residential BMPs included redirecting water from driveways into stable areas, planting buffers, limited use of rip rap, controlling roof runoff, and using reverse drainage swales.

## PROJECT OUTCOMES:

- The greatest outcome is the stabilization of major sections of the Little Madawaska Lake Road. The road had been a significant source of sediment load to the lake that contributed an estimated 82.3 tons of sediment/year and 82.3 pounds of phosphorous/year to the lake.
- The correct alignment and sizing of the McClusky Brook crossing prevented a significant washout from occurring during May 2008 County flooding event.
- Sediment and nutrient loading to the lake was reduced by an estimated 83.9 tons of sediment and 83.9 pounds of phosphorous/year (EPA Region 5 Method) The TMDL set a target of 227 pounds of phosphorous from entering the lake; this project met 37% of the target.
- The homeowners and town also put tremendous support behind this project with nearly all the match raised in cash.



## PROJECT PARTNERS:

Residents of Little Madawaska Lake Road

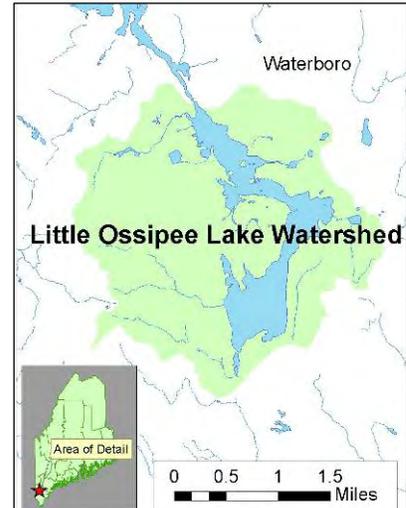
## CONTACT INFORMATION:

Kathy Hoppe, DEP – (207) 760-3134, [Kathy.m.hoppe@maine.gov](mailto:Kathy.m.hoppe@maine.gov)

Erich Margeson, Town of Westmanland – (207) 896-3081

## Little Ossipee Lake Improvement Project Phase I - Implementation #2004R-24A – WIFAP

Waterbody Name: Little Ossipee Lake  
 Location: Waterboro – York County  
 Waterbody Status: NPS Priority Watershed, Most at Risk  
 Project Sponsor: York County SWCD  
 Project Duration: November 2004 – March 2008  
 319 Grant Amount: \$50,830  
 Match: \$50,439 (local), \$17,500 (ME Dept. Ag.)



### PROBLEM:

The Little Ossipee Lake watershed covers 4.7 square miles in the Town of Waterboro. The lake covers 557 acres and is located adjacent to Waterboro Center. The lake’s shoreline is developed with over 450 seasonal and year round homes, a private campground and public boat ramp, swimming area and park.

The DEP and volunteers have monitored Little Ossipee Lake’s water quality since 1977. The water quality is considered excellent, but as with many of Maine’s lakes, Little Ossipee’s water quality is threatened by NPS pollution from uncontrolled soil erosion and stormwater runoff. In 1997, the Little Ossipee Lake Association (LOLA), DEP and York County SWCD conducted a watershed survey and identified 103 erosion sites. LOLA then worked with the Town of Waterboro and Maine Department of Transportation (DOT) to fix several of these sites. In 2004 the same project partners updated the survey with funding from another 319 grant and identified 85 erosion sites.

### PROJECT DESCRIPTION:

The purpose of the project was to significantly reduce watershed pollutant loading to help protect and improve water quality in Little Ossipee Lake. The project installed conservation practices on 13 NPS sites in the watershed. Three workshops were held in conjunction with project construction, where volunteers learned about and helped install a rain garden, native buffers, infiltration steps and bank stabilization. Two additional construction projects were originally called for in the workplan, but work could not be completed within the project timeline. The project also provided technical assistance to 25 landowners, which exceeded the goal of 15 visits.

A workshop, “How to Form a Road Association” was held in July, 2007 and attended by 30 residents from Little Ossipee Lake and other neighboring lakes. The *Little Ossipee Lake Shoreline Stewardship Guide* was printed and distributed in May, 2007. Waterboro Selectmen and town staff attended a boat tour around the lake in August, 2006. Other project updates were publicized through local press releases and postings on the LOLA website.



Students from the Maple Stone School in Acton volunteered at two project sites.

**PROJECT OUTCOMES:**

- The project successfully fixed 13 erosion sites in the watershed, including sites on four private roads, two town roads, five residential properties and three driveways. The project incorporated an extensive number and variety of conservation practices including:
 

Native buffer (107 plants)	Road surface stabilization and shaping (3)
Rubber razor blades (4)	Ditch installation and stabilization (3)
Infiltration trenches (2)	Permanent mulching–Erosion Control Mix (2)
Road turnouts (3)	Sediment basins (3)
Level spreader (1)	New culverts (2)
- Pollutant loading to Little Ossipee Lake was reduced by an estimated 35.3 tons/year of sediment and 30.0 pounds/year of phosphorus (EPA Region 5 Method).
- The *Little Ossipee Lake Shoreland Stewardship Guide* was created in May 2007. LOLA will provide copies of this 20-page color booklet to new lakefront property owners. Available at [http://littleosipeelake.org/Little\\_Ossipee\\_Shoreline\\_Guidebook\\_WebVersion\\_2.pdf](http://littleosipeelake.org/Little_Ossipee_Shoreline_Guidebook_WebVersion_2.pdf).
- The Town of Waterboro contributed nearly \$35,000 in cash match to the project. Almost \$16,000 of this town match was allocated to fixing the severe erosion problems associated with the four sites on Courtney Lane (see photos below).



**Courtney Lane Before** – Severe erosion along the road carried an estimated 20.5 tons of sediment per year across an adjacent property and into the lake.

**Courtney Lane After** – A sediment basin was installed at the top of the road to detain runoff from the adjacent town road. The road was paved, crowned and ditched. The downhill property was stabilized and its buffer was extended.

**PROJECT PARTNERS:**

Little Ossipee Lake Association  
 Town of Waterboro  
 Maine Department of Agriculture

**CONTACT INFORMATION:**

Wendy Garland, DEP – (207) 822-6320, [wendy.garland@maine.gov](mailto:wendy.garland@maine.gov)  
 Forrest Bell, York County SWCD – (207) 324-0888, [info@yorkswcd.org](mailto:info@yorkswcd.org)

## Long Lake Watershed Improvement Project

### #2005R-24 – WIFAP

Waterbody Name: Long Lake

Location: Bridgton, Harrison, Naples – Cumberland County

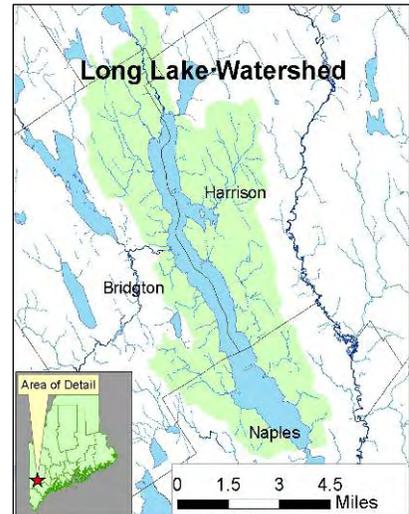
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Cumberland County SWCD

Project Duration: December 2005 – July 2008

319 Grant Amount: \$30,000

Match: \$22,252 (local), \$20,000 (Maine Dept. Ag.)



**PROBLEM:**

Long Lake is a large 5,358-acre waterbody located in the Towns of Bridgton, Harrison and Naples. The lake’s direct watershed covers 36 square miles and extends into Waterford and Sweden. Long Lake has a flushing rate of 0.94 times per year and flows into Brandy Pond and Sebago Lake. The lake is a popular year-round destination and is developed with 935 seasonal and year-round homes, three public boat launches, one commercial boat launch, two commercial marinas, seven commercial campgrounds, two large boys and girls summer camps and numerous businesses along the south and west edge of the lake.

Lakes Environmental Association (LEA) has been collecting water quality data on Long Lake regularly since 1976. The lake was placed on the State’s list of impaired waters due to a declining water quality trend, and a TMDL Assessment for the lake was completed in 2005. With 319 grant funding, LEA completed the *Long Lake Watershed Study* in 1990. The resulting report includes a step by step process to determine allowable phosphorus loading rates, model ordinances and other lake protection strategies. Over the past decade, LEA has also conducted over 100 free property consultations with watershed landowners. The DEP removed Long Lake from the impaired list in 2006 because of improved trophic state and water quality.

**PROJECT DESCRIPTION:**

The primary purpose of this project was to significantly reduce erosion and export of sediment and phosphorus into Long Lake. A secondary goal was to raise awareness about watershed problems and foster long-term watershed stewardship. The project installed BMPs at seven priority erosion sites previously identified by LEA through GIS mapping and field surveys. The project also established the Long Lake Youth Conservation Corps (YCC). The YCC hired local high school students to install BMPs at smaller-scale sites in the summer of 2007 and set the stage for continued YCC work in 2008.



Long Lake YCC Buffer Planting

## PROJECT OUTCOMES:

- Erosion abatement projects were completed at 27 sites throughout the watershed, which will prevent an estimated 112.2 tons of sediment and 95.4 pounds of phosphorous from reaching Long Lake annually (EPA Region 5 Method).
- Conservation practices were installed at seven priority sites throughout the Long Lake watershed. These sites include the Naples Town Beach in Naples, Bridgton Academy Beach in Bridgton, Pine Cove Road in Harrison, Salmon Point Beach in Bridgton, and two sites on Mountain View Road in Naples.
- The Long Lake Youth Conservation Corps was established and worked with watershed residents to implement BMPs, such as footpaths, infiltration trenches and terraces, shoreline buffer planting, runoff diverters, riprap installation on 15 different properties. The program was so successful in 2007 that there was a backlog of 16 sites lined up for the 2008 YCC field season, which continued with funding from a separate 319 grant.



Naples Town Beach - Before



Naples Town Beach - After

## PROJECT PARTNERS:

Maine Department of Agriculture  
Lakes Environmental Association  
Long Lake Youth Conservation Corps  
Maine Department of Transportation  
Town of Naples  
Town of Harrison  
Town of Bridgton  
Bridgton Academy

## CONTACT INFORMATION:

Don Kale, DEP – (207) 822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
Jami Fitch, Cumberland County SWCD – (207) 892-4700, [jami-fitch@cumberlandswcd.org](mailto:jami-fitch@cumberlandswcd.org)

# Maranacook Lake Watershed Management Plan Development

## #2004P-08

Waterbody Name: Maranacook Lake

Location: Readfield, Winthrop – Kennebec County

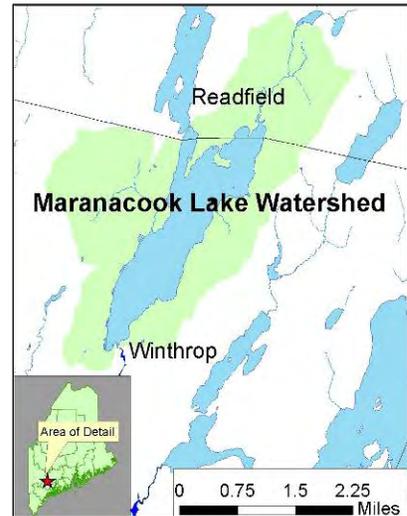
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Cobbossee Watershed District

Project Duration: May 2004 – March 2008

319 Grant Amount: \$24,826

Local Match: \$27,826



### PROBLEM:

Maranacook Lake has a surface area of 1,762 acres and direct watershed area of 21.51 square miles. The lake has two distinct basins. The north basin is in Readfield and the south basin is primarily in Winthrop. Water quality of the two basins has been monitored since the mid-1970s. The south basin has above average water quality and maintains adequate dissolved oxygen concentrations to support a cold-water fishery. The water quality of the north basin is considered to be slightly below average, and dissolved oxygen becomes depleted in the deeper water by mid-summer.

The primary threat to water quality is phosphorus loading from land use activities as well as potential internal recycling of phosphorus in the north basin. Land use in the watershed consists of forested land (70%), agriculture (12%), development (12%) and other (roads, wetlands) (6%). In 2000, the Town of Readfield received 319 funds to conduct a camp road survey in the north basin watershed and a BMP demonstration project. In this study, 108 NPS problems were identified on 24 roads.

### PROJECT DESCRIPTION:

The primary purpose of the project was to develop a watershed management plan. The project began with an extensive outreach and education campaign. A mailing was sent to all watershed residents to inform them about the project and invite participation in reforming the lake association. The Friends of the Cobbossee Watershed staff spent two weeks (in 2004 and 2005) on the lake disseminating outreach materials from the OTTER II, their educational boat. In addition, two public meetings were held with more than 60 people attending each meeting.

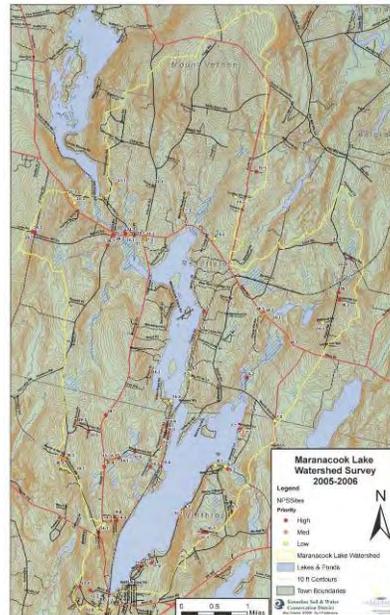
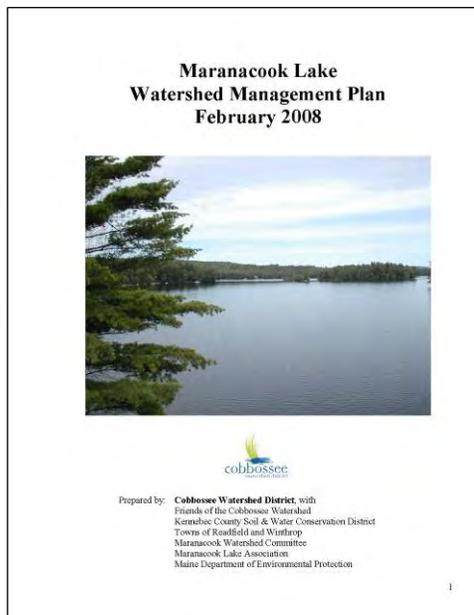
In early 2005, a watershed committee consisting of project partners and ten citizen volunteers was formed to guide development of the plan. The committee met nine times to establish goals, objectives and activities for the plan. A training session was held in May 2005 to train volunteers to conduct an NPS watershed survey. Due to low participation, the majority of the survey was carried out by the Cobbossee Watershed District through the summer (2005) and spring (2006). Finally, a survey questionnaire about the lake was made available to the public. After compilation of NPS survey results,



watershed information and committee input, the draft watershed plan was developed and made available to the public. A final public forum was held in February 2008 to present the plan and solicit final input.

## PROJECT OUTCOMES:

- The *Maranacook Lake Watershed Management Plan* was completed in February 2008. Available at [http://www.state.me.us/spo/landuse/compplans/plans/readfield/MLWM\\_PLAN\\_FINAL\\_0227086.pdf](http://www.state.me.us/spo/landuse/compplans/plans/readfield/MLWM_PLAN_FINAL_0227086.pdf)
- An NPS survey was completed for about three-quarters of the watershed. The survey identified 82 NPS sites, and 34 of the sites were determined to be high priority. The identified sites will be the focus of future implementation efforts.
- The Maranacook Lake Association, which had been dissolved since the mid 1970s, was reformed. By the end of the project, the lake association had close to 150 members.



## PROJECT PARTNERS:

Friends of the Cobbossee Watershed  
Kennebec County Soil and Water Conservation District  
Town of Readfield  
Town of Winthrop  
Maranacook Lake Association

## CONTACT INFORMATION:

Mary Ellen Dennis, DEP - (207) 287-7729, [mary-ellen.c.dennis@maine.gov](mailto:mary-ellen.c.dennis@maine.gov)  
William J. Monagle, CWD - (207) 377-2234, [wmonagle@roadrunner.com](mailto:wmonagle@roadrunner.com)

# Meduxnekeag Lake Shoreline Erosion Project

## #2005R-23 – WIFAP

Waterbody Name: Meduxnekeag (Drews) Lake

Location: Linneus, Oakfield, New Limerick – Aroostook County

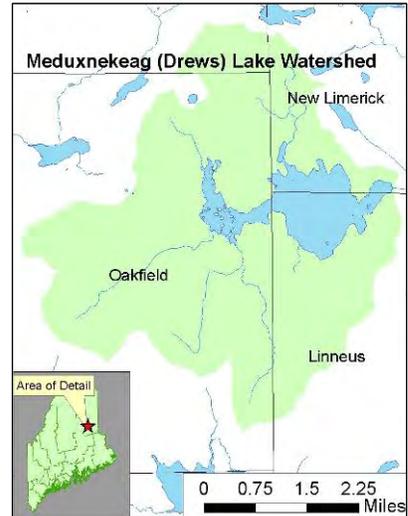
Waterbody Status: NPS Priority Watershed

Project Grantee: Southern Aroostook SWCD

Project Duration: May 2006 – September 2008

319 Grant Amount: \$30,000

Local Match: \$20,420 (local), \$20,000 (ME Dept. Ag.)



**PROBLEM:**

Meduxnekeag Lake, also known as Drews Lake, is 11,798 acres. It is ringed by a mix of seasonal and year round camps. There has been an increase in both seasonal conversions as well as redevelopment of lots (removing old camps and replacing with larger homes). The development pressure can be expected to continue due to the lake’s close proximity to Houlton, a major community in the County, and easy access to I-95. The development pressure is compounded by steep slopes, exceeding 15% in some areas, and shallow soils. In addition, some of the lake’s shoreline was historically filled, which has resulted in shoreline instability and erosion problems.

A watershed survey by volunteers in 1999 and a subsequent re-evaluation by the Southern Aroostook SWCD in 2004 identified numerous NPS sites. Roads were identified as a major source of soil and phosphorous (50%), along with shoreline erosion (30%). The Southern Aroostook SWCD carried out a 319 grant project from 2003 – 2005 and addressed several camp road and driveway sites.

**PROJECT DESCRIPTION:**

The project focused on reducing pollutant loading to the lake by working with residents to install BMPs on residential lots. Due to the complex nature of a few locations, the state soil scientist, NRCS staff and Maine DEP engineers were all consulted. A few innovative BMPs were installed to address driveway and roof runoff.

To encourage shoreline stabilization through the use of buffers, a local horticulturalist was consulted and provided specific native plant lists for each site. The goal was to minimize riprap use and maximize the use of native plants to create a complex root system to hold the shoreline in place. Southern Aroostook SWCD staff held a kick off educational event at the lake and a tour of BMP sites after the project was completed.



**PROJECT OUTCOMES:**

- BMPs were installed on 11 residential lots to reduce soil erosion and phosphorous export to the lake.
- The project reduced pollutant loading to Meduxnekeag Lake by an estimated 249 tons of soil, 249 pounds of phosphorous, and 497 pounds of nitrogen per year (EPA Region 5 Method).
- Many lake residents have been inspired by the progress that has been made to protect the lake. They are now setting their sights on starting a LakeSmart program around the lake.



Before - Unstable/eroding shoreline



After – Shoreline stabilized with riprap

**PROJECT PARTNERS:**

Natural Resource Conservation Service, Houlton Office  
Maine Department of Agriculture

**CONTACT INFORMATION:**

Kathy Hoppe, DEP – (207) 760-3134, [Kathy.m.hoppe@maine.gov](mailto:Kathy.m.hoppe@maine.gov)  
Angela Wotton, Southern Aroostook SWCD, (207) 532-2087 ext 3, [angela.wotton@me.nacdnet.net](mailto:angela.wotton@me.nacdnet.net)

# Narraguagus River Protection Project, Phase 1

## #2006R-20 – WIFAP

Waterbody Name: Narraguagus River

Location: T34MD, T35MD, T28MD, T22MD, Beddington and Devereaux TWP – Hancock & Washington Counties

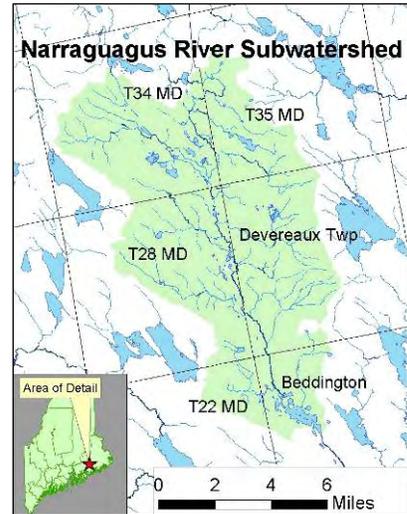
Waterbody Status: NPS Priority Watershed, Salmon River

Project Grantee: Washington County SWCD

Project Duration: March 2007 – December 2008

319 Grant Amount: \$30,000

Match: \$31,513 (local), \$20,000 (ME Dept. Ag.)



**PROBLEM:**

The Narraguagus River is listed among eight rivers in Maine that contain a federally endangered Distinct Population Segment of Atlantic salmon. According to the Atlantic Salmon Recovery Plan, the Narraguagus River is second only to the Machias River in its importance to Atlantic salmon. Commercial timber harvesting and blueberry production are the two most important land uses within the watershed. The watershed is also used extensively for recreational purposes such as fishing, hunting, ATV/snowmobile riding, canoeing and camping. There is some development along the Narraguagus, especially in the Town of Cherryfield.

NPS erosion detrimentally affects riverine habitat for salmonids and contributes to ‘embeddedness’, where soil particles fill in the spaces of coarse gravel making it unsuitable for spawning and juvenile habitat. The Narraguagus River Watershed Council and Project SHARE coordinated the development of the *Narraguagus River Watershed Nonpoint Source Pollution Management Plan* (January, 2003) with help from a 319 grant. Washington County SWCD conducted a NPS survey in the sub-watershed of the Narraguagus River where the majority of high value salmon habitat is located and identified 21 NPS sites, the majority of which were eroding stream crossings.

**PROJECT DESCRIPTION:**

The project focused on the highest priority subwatershed of the river, which contains the greatest amount of critical habitat for spawning and rearing juvenile salmon. This subwatershed extends southward from the outlet of Deer Lake to the outlet of Beddington Lake. Best Management Practices were installed at 11 of the highest priority NPS sites. Treating these sites significantly reduced the amount of sediment washing into the river annually, thereby protecting critical salmon habitat. The project also educated landowners about BMPs and long-term maintenance. All construction projects were completed by a contractor certified in erosion and sediment control practices by the Maine DEP’s contractor certification program. Press releases about the project were printed in local newspapers.



**PROJECT OUTCOMES:**

- The project installed BMP's to fix 11 NPS sites located in the highest priority sub-watershed (in terms of Atlantic salmon habitat) of the Narraguagus River.
- An experimental "squash" culvert was successfully installed. This type of culvert is viewed as a potential cost effective substitute for an arch culvert.
- Three crossings were removed and the channel was stabilized with BMP's, allowing 190 feet of channel to revert to natural streambed.
- The project resulted in an estimated pollutant load reduction of 108 tons of sediment annually (EPA Region 5 Method and WEPP model).
- The project was completed in close cooperation with the landowner, American Forestry Technologies (AFT), which owns and maintains a large amount of timberland in the Downeast Atlantic salmon watersheds. From this project, AFT learned the proper application and maintenance of BMPs, which they will apply to their forest roads in the future.



Stabilized underdrain culvert



"Squash culvert" that has been installed to maintain stream integrity

**PROJECT PARTNERS:**

American Forestry Technologies  
Narraguagus River Watershed Council  
Maine Land Use Regulation Commission  
Maine Department of Agriculture

**CONTACT INFORMATION:**

Greg Beane, DEP – (207) 941-4292, [greg.e.beane@maine.gov](mailto:greg.e.beane@maine.gov)  
Nate Pennell, Washington County SWCD – (207) 255-0936, [nate.pennell@verizon.net](mailto:nate.pennell@verizon.net)

## Panther Pond Conservation Project – Phase I

### #2005R-17

Waterbody Name: Panther Pond

Location: Raymond, Casco – Cumberland County

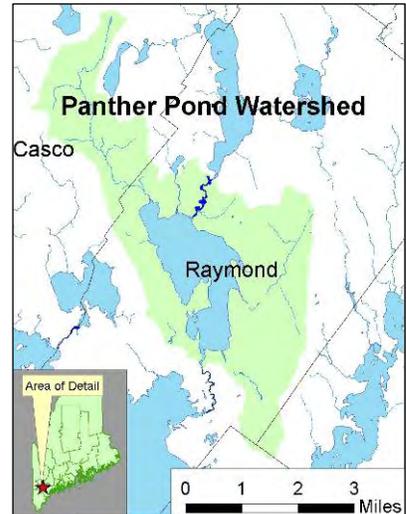
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Sponsor: Town of Raymond

Project Duration: April 2005 – August 2008

319 Grant Amount: \$43,945

Local Match: \$144,699



**PROBLEM:**

Panther Pond is a 1439-acre lake located in the Town of Raymond. Panther Pond’s shoreline is developed with over 300 homes, four youth summer camps and an extensive network of unpaved camp roads. The direct watershed covers 12.3 square miles, and the larger watershed includes Crescent Lake, Raymond Pond and several smaller ponds. Panther Pond contributes about 18% of the flow into Sebago Lake, which serves as a drinking water supply for the Portland region.

The Raymond Waterways Protective Association (RWPA) and Maine DEP have monitored water quality on Panther Pond since 1974. Data indicates that the lake experiences moderate depletion of dissolved oxygen in late summer. In 2002 the Panther Pond Association (PPA) formed to promote conservation efforts in their watershed. In 2003, the PPA, RWPA, Cumberland County SWCD and Maine DEP conducted an independently-funded watershed survey and identified 84 erosion sites contributing an estimated 61 tons of sediment per year to the lake. Prior to the Phase I project, several of these sites were fixed by the Town, residents and the Maine DOT’s Surface Water Quality Protection Program.

**PROJECT DESCRIPTION:**

The purpose of the project was to significantly reduce erosion and export of phosphorus into Panther Pond. The project also aimed to raise awareness about watershed problems and foster long-term watershed stewardship. Conservation practices were installed on a total of 46 sites in the watershed, including 26 large-scale erosion sites and another 20 smaller sites through small matching grants. A shoreline survey was also completed in 2007 to document shoreline conditions. Digital photos were taken of each shoreline property, labeled according to tax map and lot number and provided to the Town Code Enforcement Office for enforcement and permitting purposes.



Volunteers build infiltration steps and spread mulch on an eroded path to the lake.

A project brochure was mailed to all watershed landowners at the start of the project and at the beginning of the second year. Four hands-on workshops were held in conjunction with project construction, and three tours (over 66 participants) were conducted to showcase completed project sites. Project updates were presented at RWPA and PPA’s annual meetings, and project materials were included on the RWPA website (<http://www.raymondmaine.org/committees/waterways/>), RWPA newsletters and PPA mailings.

## PROJECT OUTCOMES:

- The modestly-sized project successfully fixed erosion problems at 26 large-scale erosion sites (four more sites than originally planned). Small matching grants (\$100 each) were awarded for another 20 sites to install conservation practices such as buffers, rubber razor diverters, waterbars and infiltration steps.
- Pollutant loading to Panther Pond was reduced by an estimated 75.1 tons of sediment and 62.2 pounds of phosphorus per year (EPA Region 5 Method). This reduction amounts to 70% of the estimated pollutant load associated with sites identified during the 2003 watershed survey and one high impact site identified after the survey project.
- Local match contributed to the project totaled \$144,699, which far exceeded the original project goal of \$39,825. The Town of Raymond and local residents proved to be extremely involved throughout the project, which accounts for much of the match. Three of the seven sites in the Plummerville complex were also funded, in part, with a \$17,700 grant from the DEP's Stormwater Compensation Fund.
- The project built local momentum for continued work in the watershed. RWPA was awarded a 319 grant to begin the second and final phase of the project in April 2009.



Prior to construction, runoff raced down the paved boat launch and created large gullies in the beach. With project cost sharing, the landowner installed a rubber blade at the base of the pavement to divert water into a new rain garden. A sediment ring catches sediment before it reaches the garden.

## PROJECT PARTNERS:

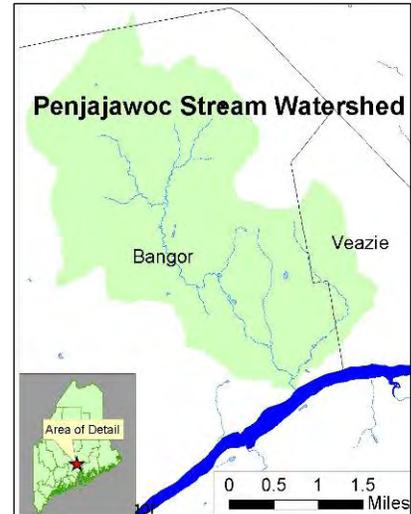
Panther Pond Association  
Portland Water District  
Raymond Waterways Protective Association

## CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, [wendy.garland@maine.gov](mailto:wendy.garland@maine.gov)  
Noralee Raymond, Town of Raymond and RWPA – (207) 671-3329, [lakes@raymondmaine.org](mailto:lakes@raymondmaine.org)

# Penjajawoc Stream Watershed Management Plan Development #2002R-34A

Waterbody Name: Penjajawoc Stream  
 Location: Bangor, Veazie – Penobscot County  
 Waterbody Status: Urban Impaired Stream  
 Project Grantee: City of Bangor  
 Project Duration: July 2004 – October 2008  
 319 Grant Amount: \$29,260  
 Local Match: \$34,895



**PROBLEM:**

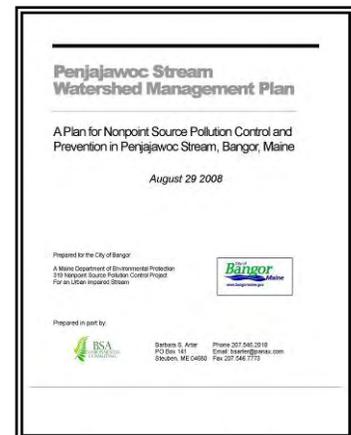
Penjajawoc Stream is a third order stream located primarily in Bangor. It has a watershed area of 8.57 square miles and is 5.2 miles long. Meadow Brook and Mount Hope Cemetery Brook are the major tributaries. The upper watershed includes a large, high value emergent freshwater marsh (known as Penjajawoc Marsh), forestlands, cultivated land and low density residential development. The middle portion of the watershed is highly developed and includes a large retail mall and numerous smaller commercially developed sites. The lower watershed is composed of primarily older low-density residential development and a cemetery.

As a result of urban stormwater runoff, Penjajawoc Stream fails to meet Class B water quality standards for dissolved oxygen, biological criteria and habitat. A total maximum daily load (TMDL) has been developed and will be completed in August 2009 after final public comment has been received.

**PROJECT DESCRIPTION:**

The purpose of this project was to develop a watershed management plan for the Penjajawoc Stream watershed. During the first two years of the project, a geomorphic analysis was conducted by Parish Geomorphic and a Storm Water Management Model (SWMM) was completed by ENSR Corporation. These studies provided further understanding of stream conditions and stormwater/pollutant loading. A low impact development retrofit analysis was also completed by WBRC Architects and Engineers under a separate EPA-funded grant.

After the data collection and analysis work was completed, the City hired a facilitator to help with the stakeholder process and draft the management plan. In the fall of 2007, a public meeting and three stakeholder meetings were held to gather input on the plan and implementation strategies. After the first draft of the plan was released in December 2007, many more stakeholders wanted to be involved due to concerns about the impact of the plan. The project was extended six months to allow for further stakeholder involvement. Over this period, one stakeholder meeting, two public meetings and many individual meetings were held. A final draft plan was completed in August 2008.



## PROJECT OUTCOMES:

- A comprehensive watershed management plan was completed in August 2008.
- Extensive stakeholder involvement resulted in greater understanding and acceptance of the plan by stakeholders. The City implemented a stakeholder charter that will establish an advisory panel for implementation of the plan.
- The project led to stakeholder consensus in support of a stormwater utility; which is a fee-based financial mechanism to support the implementation of stormwater improvements.
- A Penjajawoc volunteer water quality monitoring group was established. The City also hired a consultant to design a comprehensive monitoring plan for the stream that will monitor status of the stream as Best Management Practices are implemented.



Penjajawoc Stream adjacent to Hannaford Plaza

## PROJECT PARTNERS:

Department of Inland Fisheries and Wildlife  
State Planning Office  
Penjajawoc Marsh/Mall Commission  
Bangor Area Citizens Organized for Responsible Development (BACORD)  
Eastern Maine Community College  
Bangor Mall Area Business Owners and Operators  
Bangor Land Trust

## CONTACT INFORMATION:

Mary Ellen Dennis, DEP - (207) 287-7729, [mary-ellen.c.dennis@maine.gov](mailto:mary-ellen.c.dennis@maine.gov)  
Wendy Warren, City of Bangor - (207)-992-4255, [wendy.warren@bangormaine.gov](mailto:wendy.warren@bangormaine.gov)

## Perley Brook Watershed Project: Phase III

### #2006R-18B

Waterbody Name: Perley Brook

Location: Fort Kent – Aroostook County

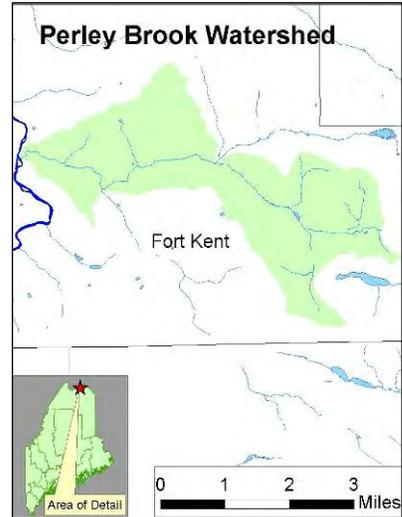
Waterbody Status: NPS Priority Watershed

Project Grantee: St. John Valley SWCD

Project Duration: April 2007 – March 2008

319 Grant Amount: \$28,800

Match: \$14,925 (local), \$20,000 (ME Dept. Ag.)



**PROBLEM:**

Perley Brook’s 19.5 square-mile watershed is a mix of residential (5%), agriculture (45%) and forestry (50%) land uses. There are approximately 66 major landowners, mostly agricultural producers, in the watershed. Application of fertilizers, steep slopes, and lack of winter cover account for many of the NPS problems on agricultural fields. Manure storage, heavy use areas, and water access account for much of the NPS problems associated with livestock. With the help of 319 funding, the St. John Valley SWCD has surveyed the complete Perley Brook watershed and identified numerous site specific problems.

NRCS has been working with the agricultural groups to address as many problems as possible with help from various Natural Resources Conservation Service (NRCS) and Maine Department of Agriculture programs. In addition, the District has secured previous 319 funding to address many of the high priority issues.

**PROJECT DESCRIPTION:**

This Phase III project addressed three previously identified sites on three farms in both the South and North Perley Brook watersheds. Two farms are small diversified working farms with a variety of livestock issues including livestock trampling sensitive areas on steep slopes and inadequate manure storage. The third farm has 300 head cattle and sits at the headwaters of a tributary to South Perley Brook.

St. John Valley SWCD worked with landowners and NRCS to design and install nutrient control BMPs. BMP designs met NRCS’s Conservation Practice Standards and Maine’s Certified Nutrient Management Program guidelines. The following BMPs were installed: heavy use area protection, waste storage facility, diversion, alternative watering facility, and a sediment basin. To spread the word and encourage others to install conservation practices the District included articles in their newsletter and articles were submitted to the local paper.



Water diversion to keep clean water from mixing with animal waste

## PROJECT OUTCOMES:

- The project successfully partnered with small diversified farms, too small for most NRCS programs, to address nutrient management problems. Manure storage facilities were also installed to control manure from a 300 head cattle operation at the headwaters of a tributary to Perley Brook.
- Buffer areas were planted to eliminate livestock trampling of sensitive areas on steep slopes.
- The project prevented an estimated 136 pounds of phosphorous and 548 pounds of nitrogen from entering Perley Brook each year (STEPL and EPA Region 5 Method).



Cattle farm waste storage site before construction



Cattle farm waste storage site after construction

## PROJECT PARTNERS:

Natural Resource Conservation Service, Ft. Kent Office

## CONTACT INFORMATION:

Kathy Hoppe, DEP – (207) 760-3134, [kathy.m.hoppe@maine.gov](mailto:kathy.m.hoppe@maine.gov)

Casey Bowie, St. John Valley SWCD, (207) 834-3311 ext 3, [casey.bowie@me.nacdnet.net](mailto:casey.bowie@me.nacdnet.net)

## Pleasant Lake and Parker Pond Watershed Survey

### #2007PP-11

Waterbody Name: Pleasant Lake and Parker Pond

Location: Casco, Otisfield – Cumberland and Oxford Counties

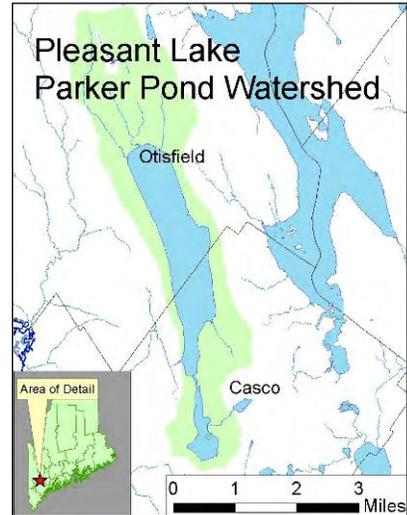
Waterbody Status: NPS Priority Watersheds, Most at Risk (Parker Pond)

Project Grantee: Pleasant Lake / Parker Pond Association

Project Duration: March 2007 – March 2008

319 Grant Amount: \$11,514

Local Match: \$10,343



**PROBLEM:**

Pleasant Lake (1,077 acres) and Parker Pond (166 acres) are located in Casco and Otisfield and have a combined watershed area of 6.7 square miles. The ponds, which are connected by Lilly Brook, drain into Sebago Lake via the Crooked River. The ponds’ shoreline is developed with 150 homes, four summer camps (including the well known Seeds of Peace Camp) and a public boat launch. The ponds are also located adjacent to the village of Casco, which includes numerous businesses and municipal buildings.

The Pleasant Lake/Parker Pond Association (PL/PPA) formed in 1966 and has been monitoring water quality of both ponds since 1977 and 1978, respectively. Water quality of both lakes is considered to be above average; however, Pleasant Lake is beginning to show signs of oxygen depletion in deeper areas. Pleasant Lake’s low flushing rate of 0.2 times per year (statewide average of 1-1.5 times per year) makes the pond more sensitive to increases in phosphorus. In addition to water quality concerns, there is also an infestation of variable-leaf milfoil in Lilly Brook. Since 2001 the PL/PPA has been working to control the milfoil using benthic barriers and screens to prevent the spread into downstream Pleasant Lake.

**PROJECT DESCRIPTION:**

The purpose of the project was to identify, document, and prioritize soil erosion and phosphorous pollution sites in the Pleasant Lake and Parker Pond watersheds and to recommend conservation practices that could mitigate the problems at the documented sites.

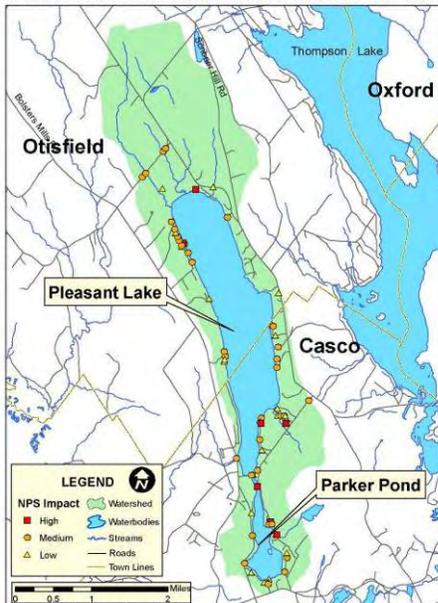
Project staff and planning board members reviewed tax maps and mailed roughly 490 letters notifying watershed landowners about the upcoming survey. On June 9, 2007, 19 volunteers and seven technical leaders attended the survey training and started fieldwork, which was completed by mid-June of that year. A total of 64 erosion sites were identified by volunteers with oversight from technical staff from Cumberland County Soil and Water Conservation District (SWCD) and DEP. Cumberland County SWCD staff estimated pollutant loading for all high and medium impact sites. A survey report and two-page summary of survey findings was completed and distributed to watershed landowners and town officials.



**PROJECT OUTCOMES:**

- Project staff and 19 volunteers surveyed the entire Pleasant Lake and Parker Pond watersheds. In total, 64 erosion sites were identified. 25% of sites were associated with residential activities, 15% were related to private roads, and 17% were driveways.
- The *Pleasant Lake and Parker Pond Watershed Survey Report* (June 2007) summarizes survey findings and lists specific descriptions and recommendations for identified sites.
- Cumberland County SWCD staff estimated pollutant loading associated with the 43 high and medium impact sites as 189 tons of sediment/year and 160 pounds of phosphorous/year (EPA Region 5 Method).
- The project steering committee distributed a two-page summary of the survey findings to all watershed landowners. Landowners whose properties were identified as having some type of erosion problem received a complete copy of the survey report. Additional copies of the complete report were distributed to town officials and Maine DOT.

Pleasant Lake and Parker Pond Watershed Survey



**PROJECT PARTNERS:**

Town of Casco  
 Town of Otisfield  
 Cumberland County SWCD  
 Portland Water District

**CONTACT INFORMATION:**

Don Kale, DEP – (207) 822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
 Betty Williams, Cumberland County SWCD – (207) 892-4700, [betty-williams@cumberlandswcd.org](mailto:betty-williams@cumberlandswcd.org)

## Pleasant Pond NPS Abatement Project

### #2006R-05

Waterbody Name: Pleasant Pond

Location: Litchfield, Richmond – Kennebec County

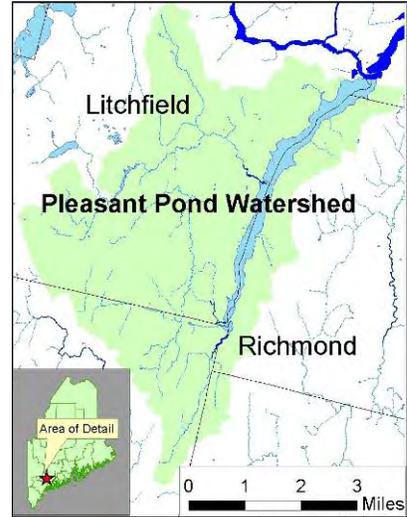
Waterbody Status: Impaired, NPS Priority Watershed, Most at Risk

Project Grantee: Kennebec County SWCD

Project Duration: May 2006 – January 2008

319 Grant Amount: \$70,100

Local Match: \$62,553



**PROBLEM:**

Pleasant Pond is a relatively shallow five-mile-long pond with a 23.4 square mile watershed. While the developed portion of the watershed is relatively small, development is concentrated along the shoreline. The pond does not meet state water quality standards due to high concentrations of phosphorus, re-occurring algal blooms for the past 20 years, and low transparency readings. The lake’s TMDL report (2004) indicated that agriculture accounted for 39% of the phosphorus load. The next largest source was public and private roads (15%). Residential sites and septic systems were estimated to be 7% of the load. The number of active farms has decreased in recent years, and the Natural Resources Conservation Service (NRCS) has been actively addressing agricultural runoff in the watershed.

A shoreline survey was performed by the Cobbossee Watershed District (CWD) in 2000, and a NPS road and ditch survey was conducted by Kennebec County SWCD in 2005. These surveys resulted in a list of over 180 sites where NPS road or residential work was needed.

**PROJECT DESCRIPTION:**

This project was intended to help restore the water quality of Pleasant Pond. The project complemented NRCS work on agricultural areas by treating non-agricultural NPS sources in the watershed. A steering committee was organized by the Four Towns Watershed Association to share information on potential work sites, work with towns on road repair and NPS issues, and develop programs for the public workshops. Project sites were determined through a priority list resulting from past surveys and from individual inquiries in response to project publicity.



Kennebec County SWCD developed and oversaw cost-share agreements and provided technical assistance and overall project guidance. The Friends of the Cobbossee Watershed performed much of the outreach, and organized a summer Youth Conservation Corps to implement BMPs that did not require a road contractor. CWD staff monitored pond water quality during the project and reported the results to the project steering committee. The interest and involvement of the various steering committee entities resulted in a successful project and led to a second phase of work in the watershed, which is currently underway.

### PROJECT OUTCOMES:

- The project treated 18 NPS sites and installed BMPs including road crowning and rebuilding, creating and stabilizing ditches, constructing plunge pools, and installing and armoring culverts.
- The informal boat launch on Thorofare Road was stabilized and protected with support from state, local and private landowners.
- The Friends of the Cobbossee's Youth Conservation Corps installed another nine projects, including vegetated buffers, shoreline rip-rap and waterbars.
- Pollutant loading to Pleasant Pond was reduced by an estimated 33.3 tons of sediment, 33.3 pounds of phosphorus, and 66.5 pounds of nitrogen per year (EPA Region 5 Method and WEPP Model).
- Project staff conducted two educational workshops including one on gravel road maintenance and one "septic social" about the proper care of private septic systems.
- The Cobbossee Watershed District completed two seasons of water quality monitoring and a summary report of the collected data.



**Before** - Severe shoreline erosion



**After** - Shoreline stabilized with geotextile fabric, rip-rap and Erosion Control Mix

### PROJECT PARTNERS:

Friends of the Cobbossee Watershed Youth Conservation Corps  
Cobbossee Watershed District  
Four Towns Watershed Association  
Maine Department of Transportation

### CONTACT INFORMATION:

Kristin Feindel, DEP – (207) 287-5586, [kristin.b.feindel@maine.gov](mailto:kristin.b.feindel@maine.gov)  
John Blais, Kennebec County SWCD – (207) 622-7847 ext 3, [john@kcsxcd.org](mailto:john@kcsxcd.org)

## Pushaw Lake NPS Watershed Project, Phase 1

### #2003R-36

Waterbody Name: Pushaw Lake

Location: Orono, Hudson, Old Town, Glenburn, Bradford – Penobscot County

Waterbody Status: NPS Priority Watershed

Project Grantee: Penobscot County SWCD

Project Duration: April 2006 – September 2008

319 Grant Amount: \$96,090

Local Match: \$87,928



**PROBLEM:**

Pushaw Lake is a 4,680-acre lake located in Orono, Glenburn, Old Town and Hudson. Pushaw Lake’s water quality has been a concern for more than 30 years. A University of Maine Lake Studies Group noted that an algal bloom occurred in 1970, and the Soil Conservation Service noted in 1972 that the lake had a “serious water quality problem”. Currently the potential for nuisance algal blooms in Pushaw Lake is considered low to moderate but increasing algal growth has been observed during the summers of 2001 - 2004. Data obtained in recent years by volunteer lake monitors show a five-year average phosphorous increase of 3 ug/L.

In 2001-2002 twenty local citizens participated in the Watershed Stewards Program offered by the University of Maine Cooperative Extension, and they subsequently recruited additional volunteers to conduct a watershed survey. The resulting survey documented 259 NPS pollution sites in the direct watershed of Pushaw Lake.

**PROJECT DESCRIPTION:**

The goal of this project was to accelerate efforts to protect and improve water quality of Pushaw Lake through funding and technical support to address documented NPS sites. Phase 1 of this project fixed sites in the Towns of Glenburn and Hudson and provided education and outreach to the entire lake watershed. BMP’s were installed on residential lots; town, state, and private roads; town boat launches and private driveways.

Since the lack of buffers is a significant issue on Pushaw, the grantee used a landscape professional to design buffers using native plants that were then installed around the lake. The grantee enlisted the University of Maine Cooperative Extension’s Buffer Brigade (Youth Conservation Corps) to install several buffers during the first year of the project.



Beech Tree Drive stabilization - Hudson

**PROJECT OUTCOMES:**

- The project’s most successful outcome was fixing NPS problems on Beechwood Ave. in Hudson. Project staff worked with the Roger’s Landing Road Association to repair 5,386 feet of the road. The road was crowned, ditches were reestablished, and 16 culverts were installed, replaced or refurbished.
- Nine native buffers were installed along the shoreline of the lake through landowner cost share agreements. Two buffer demonstration sites were constructed - one at Lakeside Landing in Glenburn and the other at Gould’s Landing in Orono. Both projects included native plant buffers, rip-rap shoreline stabilization and rain gardens.
- Project staff provided technical assistance to 28 NPS sites in the Pushaw Lake watershed.
- During the course of the project, the grantee collaborated with the University of Maine Cooperative Extension to improve capacity of the Greater Pushaw Lake Association (GPLA). The GPLA then assisted with updating the Old Town section of the Pushaw Lake Watershed Survey, which collected information on 88 NPS sites.



Gould's Landing buffer demo - Orono



Lakeside Landing buffer demo - Glenburn

**PROJECT PARTNERS:**

Natural Resources Conservation Service  
University of Maine Cooperative Extension  
Town of Glenburn  
Town of Hudson  
Town of Orono  
Town of Old Town  
Greater Pushaw Lake Association

**CONTACT INFORMATION:**

Greg Beane, DEP – (207) 941-4292, [greg.e.beane@maine.gov](mailto:greg.e.beane@maine.gov)  
Chris Brewer, Penobscot County SWCD – (207) 990-3676 X3, [chris.brewer@penobscotswcd.org](mailto:chris.brewer@penobscotswcd.org)

## Unity Pond Watershed Restoration- Phase II

### #2006R-21 – WIFAP

Waterbody Name: Unity Pond (Lake Winnecook)

Location: Burnham, Thorndike, Troy, Unity – Waldo County

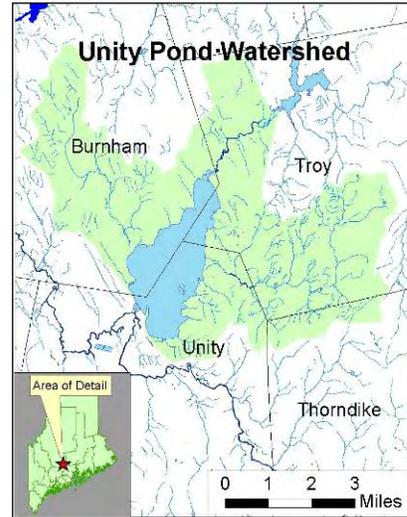
Waterbody Status: Impaired, NPS Priority Watershed, Most at Risk

Project Grantee: Waldo County SWCD

Project Duration: February 2007 – December 2008

319 Grant Amount: \$16,317

Match: \$11,109 (local), \$20,000 (ME Dept. Ag.)



**PROBLEM:**

Unity Pond is a 2,423 acre waterbody valued for fishing, swimming, boating and wildlife. It has direct watershed of 32.7 square miles and a mean depth of 22 feet. The pond is listed as impaired and has a long history of nuisance algae blooms in the late summer and early fall, due to phosphorus from erosion and sediment sources in the watershed and from phosphorus accumulated in the pond bottom sediments. The watershed is mostly forested with about 7% agricultural and 6% developed lands. Residential areas along the lakeshore, agricultural lands, roads, and low density residential are the more significant watershed phosphorus sources.

The Unity Pond Phosphorus Control Action Plan and TMDL Report (2004) and the Unity Pond Watershed Based Plan (2006) provide a thorough assessment of the watershed, water quality of the pond and actions needed to help restore water quality. The Phase I grant project (2004 – 2006) installed BMPs at 20 NPS sites in the watershed.

**PROJECT DESCRIPTION:**

The purpose of the Phase II project was to continue to build local support and action to control erosion and export of sediment and phosphorus loads in order to reduce the magnitude and duration of algal blooms in Unity Pond.

Guided by the TMDL report and Watershed Based Plan, Waldo County SWCD and key partners coordinated water quality improvement efforts to prompt adoption of BMPs at the high priority sources of phosphorus. The project provided technical at 11 sites and financial cost sharing assistance for BMP design and installation at four sites. Considerable time and effort was expended on projects that did not materialize despite extensive outreach efforts. A direct watershed survey of state, town and camp roads was also conducted and a report was filed with DEP and distributed to interested parties and stakeholders.



**PROJECT OUTCOMES:**

- Technical assistance and educational information was provided at 11 sites including two informal camp road associations and nine shoreline properties. Conservation practices that reduce sediment and nutrient loading were installed at two public access sites and two shoreline properties.
- Friends of Unity Wetlands and project staff co-hosted, organized and conducted a Nonpoint Education for Municipal Officials (NEMO) workshop in May 2008 at the Unity Center for Performing Arts. 16 participants attended, with some traveling more than 75 miles.
- Waldo County SWCD, University of Maine Cooperative Extension and other project partners launched the Unity Pond watershed newsletter to promote watershed stewardship. Three editions were produced throughout the project. 500 copies were mailed to shoreline owners, and copies were distributed at several local businesses, town offices and through local organizations.
- Unity College faculty and student volunteers participated in NPS site identification and assessment training in order to conduct Phase I of the Unity Pond Direct Watershed Survey in October 2007. Phase II of the survey was completed by the project coordinator in April 2008. A final report with photo documentation was completed in July 2008. 20 printed copies of the report were distributed to project partners, town offices and local organizations.



Phase I Survey, Mount Rd., Burnham -  
Ditch erosion/exposed soils



Phase II Survey, Oak Lane, Burnham -  
Improperly sized/installed camp road culvert

**PROJECT PARTNERS:**

Unity College  
University of Maine Cooperative Extension  
Friends of Lake Winnecook  
Unity Barn Raisers  
Friends of Unity Wetlands

**CONTACT INFORMATION:**

Norm Marcotte, DEP – (207) 287-7727, [norm.g.marcotte@maine.gov](mailto:norm.g.marcotte@maine.gov)  
Shawn Biello, Waldo County SWCD – (207) 948-3744, [sbiello@unity.edu](mailto:sbiello@unity.edu)

## West Branch Piscataqua River Watershed Survey

### #2005R-04

Waterbody Name: West Branch Piscataqua River

Location: Cumberland, Windham, Falmouth, North Yarmouth – Cumberland County

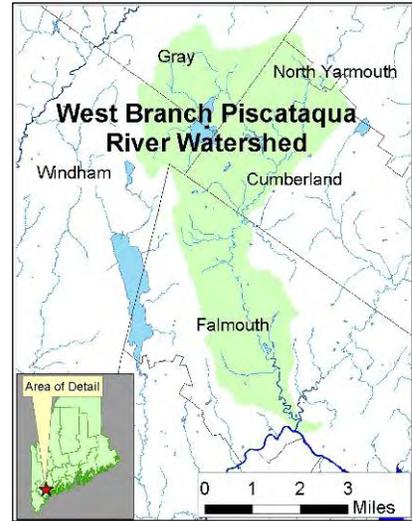
Waterbody Status: NPS Priority Watershed

Project Grantee: Presumpscot River Watch

Project Duration: March 2005 – September 2008

319 Grant Amount: \$13,520

Local Match: \$9,650



**PROBLEM:**

The West Branch of the Piscataqua River has a watershed that covers 18.9 square miles and includes Forest Lake and portions of four towns. The watershed’s population of approximately 5,000 residents has increased by nearly 20% per decade over the last 30 years. The West Branch joins the East Branch in Falmouth and then flows into the Presumpscot River. The Piscataqua River was identified as a high priority tributary in the *Presumpscot River Management Plan* (2003) due to water quality concerns and the 2002 removal of the Smelt Hill Dam, which will allow migratory fish passage into the Piscataqua River and other tributaries.

The Piscataqua River is officially listed as “impaired by bacteria contamination” by the Maine DEP. The DEP’s statewide bacteria TMDL, which includes the Piscataqua River, is currently in draft form. Presumpscot River Watch (PRW) data collected since 1989 indicates that portions of the West Branch experience low dissolved oxygen, high turbidity levels and high bacteria levels. Potential sources of these problems are not known since the sample stations are located at the lower reaches of the river. Watershed survey and stream corridor assessments were completed for the East Branch in 2006, and several projects have been completed in the Forest Lake subwatershed, including a watershed survey (2002), watershed management plan (2003) and two watershed implementation projects (2004 – present).

**PROJECT DESCRIPTION:**

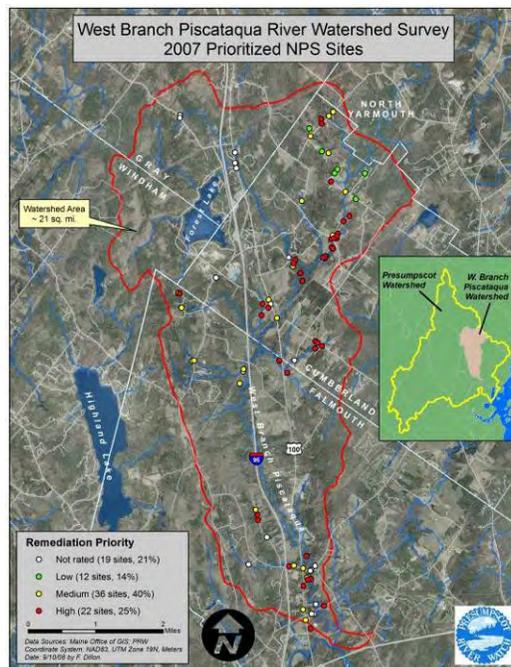
This goal of the project was to conduct a watershed survey to identify and prioritize NPS sources to the West Branch Piscataqua River. The survey was publicized in three local papers, and project fact sheets were mailed to about 500 watershed landowners. Technical staff trained 12 volunteers in May 2007 and 89 sites were identified. A rapid geomorphology assessment was conducted for eight representative reaches on the river and one tributary in August 2006. A summary report was completed in September 2008. The US Fish and Wildlife Service trained helped conduct a culvert and fish passage survey along the Piscataqua River corridor.



Misaligned culvert and lack of buffer

**PROJECT OUTCOMES:**

- 89 nonpoint source pollution sites were documented. Land uses with the most problems included town roads (29%), residential areas (19%), commercial (19%) and private roads (10%).
- Survey findings were summarized in the *West Branch Piscataqua River Watershed Survey Report* (September 2008), which includes a list and maps of all documented NPS sites.
- Project staff created a scoring system to prioritize remediation efforts. 22 sites were rated as high priorities since they have a relatively high impact to water quality and can be fixed with lower cost.
- Findings from the rapid geomorphology survey were summarized in the DEP report, *Piscataqua River Watershed (West Branch) Stream Corridor Survey – Summary Report*.



**PROJECT PARTNERS:**

Towns of Cumberland, Falmouth and Yarmouth  
 Presumpscot River Watershed Coalition  
 Cumberland County SWCD  
 Casco Bay Estuary Project  
 US Fish and Wildlife Service

**CONTACT INFORMATION:**

Don Kale, DEP-(207)822-6319, [Donald.Kale@maine.gov](mailto:Donald.Kale@maine.gov)  
 Forrest Bell, Presumpscot River Watch, (207) 221-6699, [prw@maine.rr.com](mailto:prw@maine.rr.com)

## Wilson, Dexter and Berry Ponds Watershed Survey

### #2005R-02

Waterbody Name: Wilson Pond, Dexter Pond, Berry Pond

Location: Wayne, Monmouth, Winthrop – Kennebec County

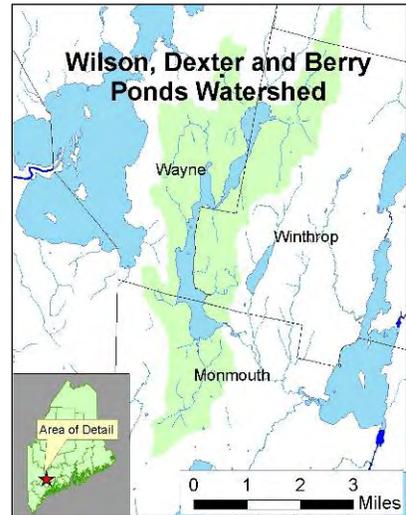
Waterbody Status: Impaired (Wilson Pond), NPS Priority Watersheds

Project Grantee: Cobbossee Watershed District

Project Duration: March 2005 – September 2008

319 Grant Amount: \$7,518

Local Match: \$5,088



**PROBLEM:**

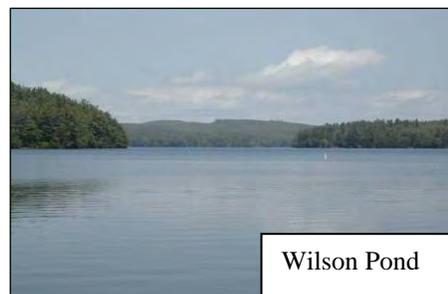
Wilson, Dexter, and Berry Ponds lie on the northwest fringe of the Cobbossee chain of lakes and outlet via Wilson Stream into Annabessacook Lake. Wilson is a moderate-sized scenic lake located primarily in the Town of Wayne, with substantial shore frontage in the Towns of Monmouth and Winthrop. The three ponds drain a total land area of 15 square miles. Predominant land uses in the watershed are forest, agriculture (hayland, orchards, pasture and a currently idle dairy farm and associated row crops), residential, gravel pits and light commercial.

In the early 1990’s Wilson began exhibiting an abrupt reduction in water clarity while the two upstream ponds have exhibited average but consistent water clarity. Wilson Pond was placed on the DEP’s list of impaired waters due to increases in total phosphorus concentration, reduced water clarity and depletion of dissolved oxygen in bottom waters. Wilson Lake’s TMDL report was completed in 2007. NPS sources in the watershed include eroding camp and public roads, shoreline erosion and agricultural runoff.

**PROJECT DESCRIPTION:**

The project was designed to conduct a volunteer survey of the combined watersheds of Wilson, Dexter and Berry Ponds with the purpose of identifying priority NPS problem sites. A Steering Committee comprised of the Cobbossee Watershed District (CWD), Kennebec County SWCD and the Berry Dexter Wilson Watershed Association guided the project.

Low citizen participation required CWD to obtain volunteer assistance from local high school students. Initial field work ended in November 2005 and results were mapped by Kennebec County SWCD in July 2006. After data reliability problems were found, CWD staff resurveyed four of the 13 survey sectors in Fall 2006. Additional shortcomings were identified with data collected earlier (unclear site locations affected the ability to map all sites). During the spring 2007, CWD initiated work on the Wilson Pond TMDL Report, which improved results and made additional field data available for assessing priority sites.



**PROJECT OUTCOMES:**

- All of the Wilson, Dexter and Berry Ponds watersheds were successfully surveyed, and 81 problem sites were identified. Two-thirds of the problem sites were associated with town and private roads.
- Survey results were summarized in the *Wilson, Dexter, Berry Watershed Survey Report (2008)* and incorporated into the *Wilson Lake Phosphorus Control Action Plan and TMDL Report (2007)*.
- Watershed land cover information was determined and mapped using GIS and included in the watershed survey report.
- The survey project laid the foundation for mitigation efforts in the watershed. CWD was awarded a 319 grant for the *Wilson Pond Water Quality Improvement Project (#2009RT06)*, which will begin in April 2009.



NPS Site on Private Driveway



NPS Site on Tappan Farm Road in Winthrop

**PROJECT PARTNERS:**

Berry, Dexter, and Wilson Ponds Association

Kennebec County SWCD

Monmouth Academy High School Students

**CONTACT INFORMATION:**

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Bill Monagle, Cobbossee Watershed District – (207) 377-2234, [cwd@fairpoint.net](mailto:cwd@fairpoint.net)



Students from Maple Stone School help with Little Ossipee Lake grant project



Maine Department of Environmental Protection  
Bureau of Land & Water Quality  
#17 State House Station  
Augusta, Maine 04333

Don Witherill, Director Watershed Management Division  
[Donald.T.Witherill@maine.gov](mailto:Donald.T.Witherill@maine.gov)  
(207) 287-7725

Website: <http://www.maine.gov/dep/blwq/docgrant/319.htm>