



Maine Department of Environmental Protection

Nonpoint Source Management Program 2007 Annual Report



May 2008

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.



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

JOHN ELIAS BALDACCI

GOVERNOR

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COMMISSIONER

May 15, 2008

To the Reader:

On behalf of the Maine Department of Environmental Protection, I am pleased to announce the release of our Nonpoint Source Management Program 2007 Annual Report.

The report summarizes accomplishments of Maine DEP NPS 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, in order to help protect or improve Maine's clean water.

Highlights include:

- 24 NPS projects completed in 2007. Please read our brief "outcome summaries" for more information.
- NPS Watershed Projects completed in 2007 reported estimated reductions of about 310 pounds of phosphorus and 583 tons of sediment per year, equivalent to about 50 (8 yard) dump truck loads of sediment.
- The restoration of Mousam Lake, a three-mile-long lake in York County, was highlighted on the EPA's "Nonpoint Source Program Success Stories" website.

The Report and Executive Summary are posted at DEP's NPS website.
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
Division of Watershed Management, Bureau of Land & Water Quality

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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, industrial sites carry 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 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*, 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 during 2007.

B. 2007 Highlights - Maine DEP NPS Program

In 2007, DEP received \$2,256,543 from EPA under Section 319(h) of the Clean Water Act. DEP used 319 funding 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, such as developers, building contractors, municipal officials, teachers, and the general public. DEP provided technical and financial assistance to more than 50 active NPS watershed projects. About 40% of Fiscal Year 2007 Section 319 funds were passed-through to local organizations for NPS watershed projects to help protect or improve lakes, streams and coastal waters. DEP used Section 319 funds to support assessment work through the Volunteer Lake Monitoring Program and stream sampling

for benthic macro-invertebrates. In addition, funds were used to develop Total Maximum Daily Load (TMDL) assessment reports for waters impaired primarily by NPS pollution, as required by Federal law. DEP completes TMDL reports for NPS impaired lakes or streams as a first step toward restoration of water quality.

2007 Highlights - Maine DEP NPS Program

- The restoration of Mousam Lake, a three-mile-long lake in York County, was highlighted on the EPA's "Nonpoint Source Program Success Stories" website (www.epa.gov/owow/nps/Success319).
- Twenty-four (24) NPS projects funded through the NPS 319 program in previous years were successfully brought to completion. See page 13 for a list of these projects.
 - Restoration or protection work was accomplished in the following nine (9) lake and three (3) stream watersheds:

Lakes – East Pond, Echo Lake, Lake Auburn, Little Sebago Lake, Middle Range Pond, No Name Pond, Salmon- McGrath Lakes, Sebasticook Lake and Webber Pond.

Streams – Sheepscot River West Branch, Tannery Brook and Upper New Meadows River.
 - NPS Watershed Surveys describing nonpoint pollution sources were completed for the following six (6) watersheds: McWain Pond, Megunticook Lake, Nequasset Lake, Square Pond, Moose Brook and Spruce Creek.
 - Watershed management plans were created for the Great Works River, the Ogunquit River and the Sheepscot River.
- NPS Watershed Projects completed in 2007 reported estimated reductions in the amount of sediment and phosphorus loading to lakes or streams. In total, pollutant loading was reduced by about 310 pounds of phosphorus and 583 tons of sediment per year, equivalent to about 50 (8 yard) dump truck loads of sediment.
- Fifteen (15) new NPS Water Pollution Control Projects were funded through both a competitive grant process and the Watershed Improvement Financial Assistance Partnership, which DEP and EPA supported in cooperation with the Maine Department of Agriculture and Maine's 16 Soil and Water Conservation Districts.
- Significant progress was also made on other 319 funded programs. See page 63 for a summary of each program. Some highlights include:
 - Over 1600 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-five (75) new individuals were certified in erosion and sediment control practices in the Volunteer Contractor Certification Program.
 - Maine NEMO provides outreach to municipal officials on how land use decisions are linked to water quality in their towns. NEMO provided 19 presentations to 458 people from 80 towns.

About one year after a NEMO presentation on low impact development (LID), the Town of York passed a general referendum by a huge margin (2047 to 244) modifying stormwater rules to allow the use of LID techniques.

- 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.
- DEP completed work with a market research firm to develop a new tool, an “intercept survey” based on social marketing techniques, to evaluate the effectiveness of NPS outreach efforts. To maintain Maine’s clean waters, DEP is working to improve methods to encourage people to adopt more environmentally friendly behaviors.
- DEP completed and received EPA approval of Phosphorus Control Action Plans (PCAPs) and Total Maximum Daily (Annual Phosphorus) Loading (TMDL) reports for Echo Lake, Arnold Brook Lake and Wilson Pond. 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. (Note, this report does not cover NPS work accomplished 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.

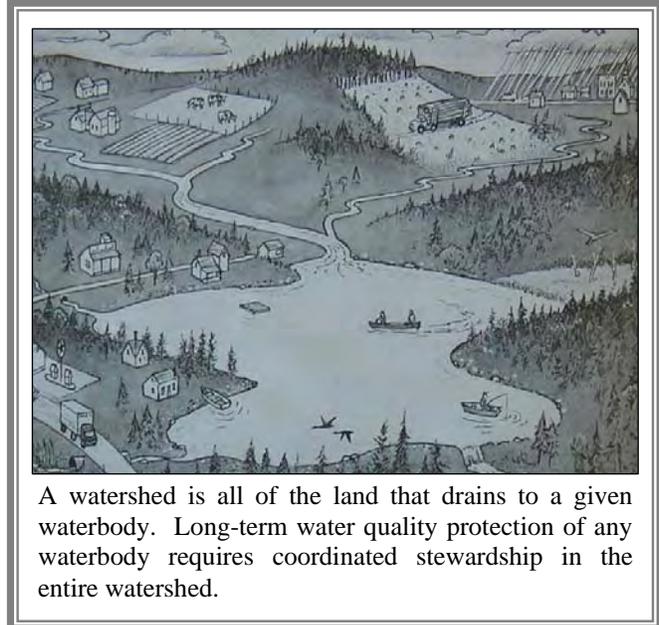
For information about Maine Best Management Practice Guidelines go to:
<http://www.maine.gov/dep/blwq/training/npspubl.htm#bmp>

DEP NPS Management Activities

Watershed planning and management is an approach to protecting water quality and quantity that focuses on whole watersheds. This is a departure from the traditional approach of managing individual wastewater discharges, and is necessary due to the nature of polluted runoff, which in most watersheds is the biggest contributor to water pollution. Polluted runoff is caused by a variety of land use activities, including development, transportation, agriculture and forestry, and may originate anywhere in the watershed. Due to its diffuse nature, polluted runoff has not been effectively managed through regulatory programs alone.

Watershed planning and management involve a number of activities, including: targeting priority problems in a watershed; promoting a high level of involvement by interested and affected parties; developing solutions to problems through the expertise and authority of multiple agencies and organizations; and measuring success through monitoring and other data gathering.

DEP watershed management activities are directed at the state, river basin, or individual watershed level. Education and training programs, many of which are offered through the Nonpoint Source Training & Resource Center, are designed to reach citizens living and working in the individual watersheds.



A watershed is all of the land that drains to a given waterbody. Long-term water quality protection of any waterbody requires coordinated stewardship in the entire watershed.

Technical assistance is also offered by DEP staff to local groups, who are interested in surveying sources of pollution within their watersheds and/or implementing BMPs. The DEP administers grant programs that assist non-profit organizations in carrying out these activities.

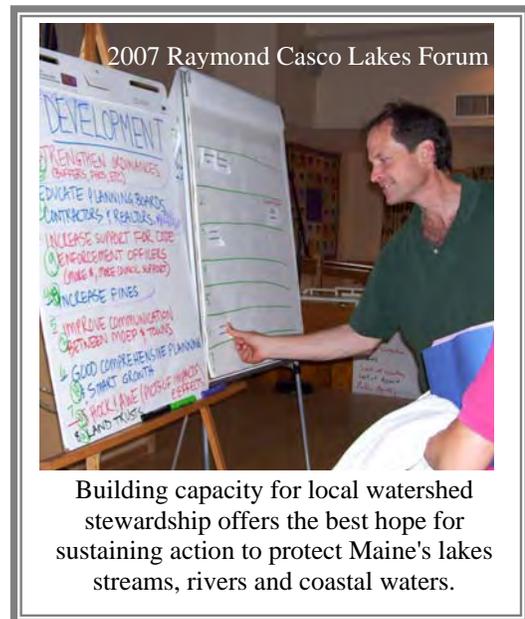
At the basin level, the DEP organizes monitoring and assessment of water quality around the major river basins and bases wastewater license decisions on this information. At the state level, the DEP works with other state and federal agencies, and non-government organizations to establish lists of the highest priority lakes, rivers and streams, and coastal waters. This information is used to direct agency resources to those watersheds. In addition, the DEP administers permit programs to manage potential new pollution sources throughout the organized municipalities in the state, including the Site Location Law, Natural Resources Protection Act and the Stormwater Management Law.

2. Protecting Clean Waters

Maine has significant water quality protection and restoration challenges and relatively limited resources for its 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.

DEP invests considerable staff resources into helping local watershed groups get organized and carry out their goals and objectives. Building local capacity offers the best hope for sustaining action to protect or restore Maine's lakes, streams, rivers and coastal waters over the long term. Maine has many capable and determined watershed stewardship groups and conservation districts working to protect watersheds and clean water. For a list of local, regional and state-wide organizations protecting watersheds, go to www.maine.gov/dep/blwq/group.htm .



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.

Overall restoring impaired waters 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 2007, DEP completed and received EPA approval of Phosphorus Control Action Plans (PCAPs) and Total Maximum Daily (Annual Phosphorus) Loading (TMDL) reports for Echo Lake, Arnold Brook Lake and Wilson Pond. TMDL Assessments are now complete for a total of 42 waterbodies. Of these, 30 lakes and five streams are impaired primarily due to nonpoint sources. Seven rivers and streams are impaired primarily by point sources. For more information about TMDLs and impaired waters, refer <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 to guide future NPS implementation work for 10 NPS impaired watersheds: In 2007 watershed-based plans were completed for Annabessacook Lake, East Pond, Sabattus Pond and Unity Pond. Watershed-based plans for the following waters will be completed in 2008: Penjajawoc Stream, Hart Brook, Togus Pond, China Lake and Pleasant Pond. Long Creek's plan will be completed in 2009. A watershed-based plan is intended to be a strategic plan for actions needed over a 5 to 15 year timeframe 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 two-year work plan for a NPS Watershed Project.

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 2007, Section 319 funds helped sustain or startup NPS Watershed Projects to apply conservation practices (BMPs) in 12 watersheds to help restore impaired waters that have an approved TMDL assessment report.

Impaired Waters / Approved TMDL with NPS Watershed Project in 2007	
Annabessacook Lake	Sebasticook Lake
China Lake	Threecornered Pond
East Pond	Threemile Pond
Highland Lake (Windham)	Togus Lake
Pleasant Pond	Unity Pond
Sabattus Pond	Webber Pond

Restoring Lakes

Conservation practices need to be effectively applied on lands within a watershed to clean-up polluted water runoff. Conservation practices on land in the watershed gradually helps improve water quality in tributary streams and the lake. However, restoring an impaired lake typically requires many years of sustained watershed efforts. Even after watershed improvements are made, lake water quality responds very gradually over many years. Improvements in water quality can be masked by natural variability in climate and lake water quality. For example, a few very rainy summers may decrease water clarity and obscure rebounding water quality in a lake. Despite this lengthy restoration timeline, in recent years several Maine lakes have considerably improved water quality.

In 2007 the restoration of Mousam Lake, a large lake in York County, was highlighted on the EPA’s “Section 319 Nonpoint Source Program Success Stories” (<http://www.epa.gov/owow/nps/Success319/>). EPA’s webpage features NPS-impaired waterbodies around the country that have achieved documented water quality improvements due Section 319 or other funding sources dedicated to solving nonpoint source impairments. In 2006, DEP removed Mousam Lake and 5 other lakes from the impaired waters (TMDL) list.

Turn to the next two pages for the EPA Mousam Lake success story.



Section 319

NONPOINT SOURCE PROGRAM SUCCESS STORY

Maine

Local Groups Key to Mousam Lake Restoration

Waterbody Improved

For decades, Maine's Mousam Lake received increased stormwater runoff from shoreland development, lawns, roads and aging septic systems. Phosphorus in the stormwater led to increased algal growth and subsequent impairments to water quality, including decreased water clarity and dissolved oxygen. Following 10 years of intensive nonpoint source (NPS) pollution control projects, water clarity in Mousam is three feet deeper, and the lake now attains water quality standards. The Maine Department of Environmental Protection (MDEP) removed Mousam Lake from its section 303(d) impaired waters list in 2006.

Problem

Mousam Lake, a three-mile-long lake in southern Maine, attracts boaters, anglers, and vacationers with its sandy shores and excellent cold and warm water fisheries. One of the largest lakes (863 acres) in Maine's southernmost county, Mousam's watershed encompasses 21 square miles, and its shoreline is heavily developed with 700 seasonal and year-round homes. In addition, the lake features a frequently used public boat ramp.

Lake residents and local activists first noticed problems with the lake's water quality in the late 1970s. Changes in the watershed, especially the gradual conversion of forested land into developed land and septic systems, resulted in increased stormwater runoff from residential areas, lawns and roads. Phosphorus in the stormwater led to excessive algal growth, which, in turn, caused increases in chlorophyll *a* levels and decreases in water clarity and dissolved oxygen. From 1980 to 1992, the lake experienced a steady decline in trophic state. In 1998 MDEP designated Mousam Lake as impaired for aquatic life support and added the lake to the state's section 303(d) list.

The Total Maximum Daily Load (TMDL) assessment developed for Mousam Lake in 2003 identified shoreland development as the largest source (51 percent) of phosphorus to the lake. Relatively high-density development in shoreland areas (i.e., numerous houses and gravel roads) increased stormwater runoff and erosion. In addition, aging septic systems in the sandy soils around the lake increased phosphorus in ground water that enters the lake. The TMDL estimated that the annual external phosphorus loading (556 kg/year) would need to be reduced by 27 percent (150 kg/year).

Project Highlights

Since 1997, the York County Soil and Water Conservation District (SWCD), Mousam Lake

Foot of lake gets a facelift



Figure 1. Vegetated buffer planting at the foot of Mousam Lake.

Region Association (MLRA), the towns of Acton and Shapleigh, and MDEP collaborated to identify and mitigate NPS pollution sources and foster long-term watershed stewardship. In 1997 a watershed survey documented key NPS pollution sites including erosion at residential sites, private camp roads and driveways. In 1999 a U.S. Environmental Protection Agency (EPA) section 319 grant was used to install and demonstrate conservation practices at six project sites and to initiate watershed stewardship and education programs (see Figure 1).

From 2001 to 2006, EPA, Maine Department of Agriculture and MDEP funded additional erosion control practices. Cost share agreements with public and private landowners resulted in best management practices being installed at 45 priority NPS sites and an associated reduction in pollutant loading to the lake by more than 150 tons of sediment and 130 pounds of phosphorus per year. Work included stabilizing erosion at developed shoreland properties and improving gravel road surfaces and roadside drainage. In addition, more than 250 other landowners received technical assistance to reduce erosion on their properties. The Mousam Lake Youth Conservation Corps (YCC) program was established

with section 319 funds in 2001 to install practices, raise local awareness and commitment to lake protection, and involve local youth in stewardship. The program was so effective and popular that the towns and MLRA fully funded the YCC from 2002 through 2007, enabling the YCC to complete 115 projects in the watershed.

In addition, more than 200 residents attended workshops known as Septic Socials to learn about septic system function, proper maintenance and water conservation. These socials, modeled after a successful Washington State Sea Grant program, were led by project staff and local septic system professionals, and hosted by local residents in their homes.

The high-profile work around Mousam Lake inspired lake protection efforts on several neighboring lakes. Most notably, the Acton Wakefield Watersheds Alliance (in Maine and New Hampshire) formed in 2004 and started its own YCC program.

Results

Following a decade of local watershed management and restoration efforts, Mousam Lake now meets water quality standards. As seen in Figure 2, water clarity in recent years (2002–2006) was one meter deeper than the lows experienced in the early 1990s (1989–1992). The water quality data trend from 1997 through 2006 indicates that Mousam Lake has a

stable or improving trophic state and meets Maine’s water quality standards for lakes. MDEP removed Mousam Lake from its 303(d) list in 2006 because all trophic parameters indicated a persistent improvement or stabilization of water quality/trophic state.

Partners and Funding

York County SWCD provided sustained leadership, technical services and grants management. Other key partners include Pat Baldwin (a longtime watershed resident and advocate for lake protection programs), the towns of Acton and Shapleigh, MLRA, MDEP, Maine Department of Transportation (MDOT), and EPA.

Since 1997, federal- and state-funded projects helped prompt widespread implementation of erosion control practices. EPA provided \$230,000 in section 319 and 604(b) grants, and the Maine Department of Agriculture provided \$40,000 toward these efforts. In addition, MDOT fixed three major erosion problems associated with state roads. The local match for the restoration work exceeded \$400,000. Each year since 2002, the towns of Acton and Shapleigh have provided approximately \$39,000 per year, for a total of \$234,000, to fund the YCC program. In addition, MRLA provided a \$17,500 cash match, and local residents, road associations and towns provided \$151,000 of in-kind matches.

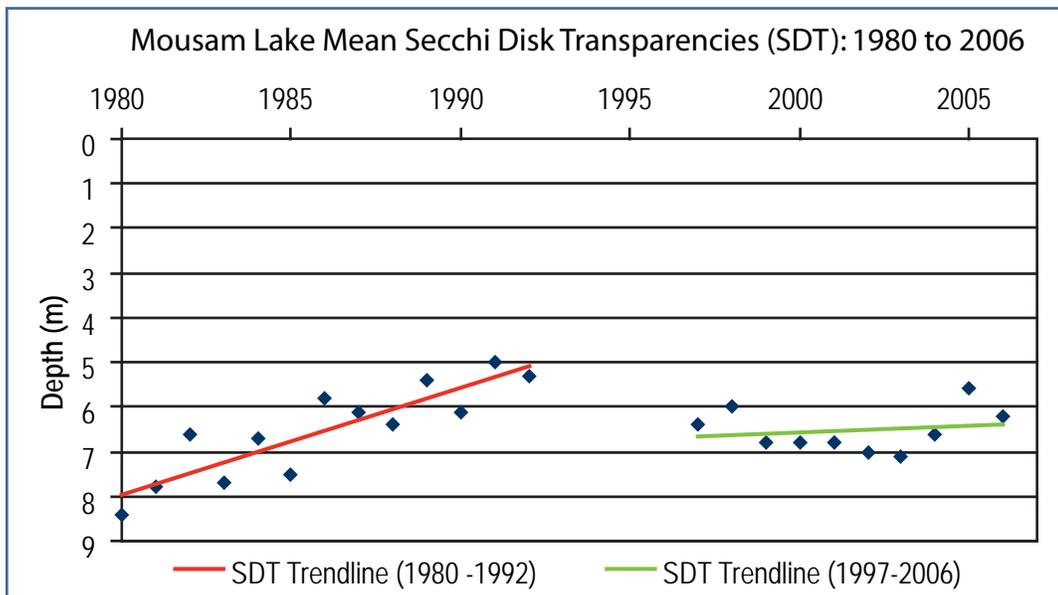


Figure 2. Mousam Lake Mean Secchi Disk Transparencies (SDT) from 1980 to 2006. Annual mean Secchi depth readings from 1980 to 1992 indicate a trend (red line) toward reduced water clarity. Secchi readings from 1997 to 2006 indicate a trend (green line) toward stable and improved water clarity. (Note: no data were collected between 1993 and 1996.)



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D. 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 2007, DEP issued grants to help fund 3 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 Management Plans.** A watershed-based plan is intended to be a strategic plan for actions needed over a 5 to 15 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 2007

In 2007, DEP provided 319 grants to start-up or continue NPS Water Pollution Control Projects. Eleven projects received grants as an outcome of the annual NPS Request for Proposals issued in April 2006.

Project #	Grantee	Project Title	Grant	Match
2007RR01	Hancock County SWCD	Branch Lake Watershed Improvement Project	73,165	51,941
2007RR02	Town of Raymond	Raymond Pond Conservation Project	54,238	41,363
2007RR03	Cumberland County SWCD	Hancock & Sand Ponds Conservation Project – Phase I	75,000	53,761
2007RR04	Kennebec County SWCD	Tacoma Lakes NPS Abatement Project	70,185	50,580
2007RR05	Cumberland County SWCD	Forest Lake Conservation Project – Phase II	75,000	58,228
2007RR06	Kennebec County SWCD	Cobbossee Lake WQ Protection – Phase I	72,640	68,760
2007RR07	Cobbossee Watershed District	Annabessacook Lake Rehabilitation Project	46,400	44,800
2007RR08	Kennebec County SWCD	East Pond Watershed Restoration Project – Phase III	50,545	35,200
2007PP09	York County SWCD	Goodall Brook Survey & Hotspot ID Project	14,635	11,300
2007PP10	Penobscot County SWCD	Lincoln Lakes NPS Watershed Survey Project - Phase I	16,567	11,500
2007RR11	Pleasant Lake & Parker Pond Association	Pleasant Lake / Parker Pond Watershed Survey	11,514	9,406
Totals			\$559,889	\$436,839

3. Results: Request for Proposals – FY 2008 Grants for NPS Pollution Control Projects

DEP issued the Request for Proposals (RFP) in April, 2007 and received 23 proposals requesting about 1.3 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 all the proposals. In July DEP announced the 14 highest ranked projects will be funded with FFY 2008 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 April 2008.

FMI: Contact Norm Marcotte, DEP – (207) 287-7727 or norm.g.marcotte@maine.gov

**Results – Request For Proposals
FFY 2008 Grants for Nonpoint Source Water Pollution Control Projects**

Project Type	RFP Allocation Target	Funds Requested	Funds to be Awarded April 2007
NPS Watershed Project	\$470,000	\$1,223,506 16 proposals	\$655,770 9 projects
Watershed Surveys	\$ 80,000	\$86,702 7 proposals	\$60,576 5 projects
Totals	\$550,000	\$1,310,208 23 proposals	\$716,346 14 projects

NPS Projects to be Awarded NPS Grants in April 2008

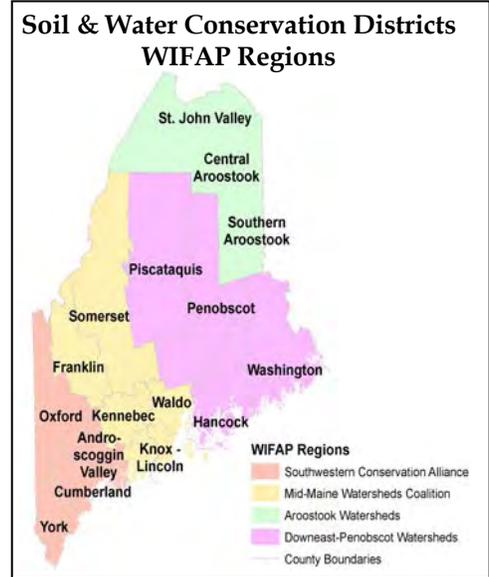
Project	Grantee	Grant	Match
NPS Watershed Projects			
China Lake NPS Reduction - Phase II	China Region Lakes Alliance	102,590	77,620
Cove Brook NPS Pollution Improvement	Cove Brook Watershed Council	91,959	63,438
Dexter Lakes NPS Watershed, Phase 2	Heart of Maine Resource and Conservation Development Area	70,000	47,000
McWain Pond Watershed Improvement Project	McWain Pond Association	42,509	28,831
Nequasset Lake Watershed Improvement Project, Phase I	Androscoggin Valley SWCD	67,225	44,839
Pleasant Pond NPS Abatement, Phase II	Kennebec County SWCD	64,160	43,090
Spruce Creek Watershed Improvement, Phase I	Kittery, Town of	69,670	156,326
Square Pond Watershed Improvement, Phase I	York County SWCD	68,657	72,109
Togus Watershed NPS Reduction Project, Phase 2	Augusta, City of	79,000	64,200
NPS Watershed Surveys			
Brandy Pond Watershed Survey	Cumberland County SWCD	12,870	12,140
Hart Brook Unified Subwatershed Survey	Lewiston, City of	14,190	10,060
McLean Brook Watershed: NPS Survey	St. John Valley SWCD	6,115	4,083
Pleasant River Watershed Survey	Presumpscot River Watch	17,690	14,290
Sabbathday Lake Watershed Survey	Cumberland County SWCD	9,711	8,789
Totals		716,346	646,815

4. WIFAP - Watershed Improvement Financial Assistance Partnership

Background

The Watershed Improvement Financial Assistance Partnership (WIFAP) provides financial assistance to help Maine Soil and Water Conservation Districts (SWCD) conduct watershed-scale NPS projects to help restore or protect lakes, stream or coastal waters that are impaired or considered threatened. SWCDs help forge local partnerships (e.g., towns, watershed organizations, landowners) to reduce pollutant loading to waterbodies by installing BMPs (erosion & sediment controls, improving riparian areas, etc) at significant NPS sites in the watershed.

For WIFAP, Maine's 16 Districts organized into four watershed regions. Maine DEP, the Maine Department of Agriculture, EPA-New England and the Maine Association of Conservation Districts are cooperating partners.



WIFAP Projects Completed in 2007

Four WIFAP-funded NPS projects listed below were completed in 2007. See Section E for a two-page summary of each project.

NPS Project Title	Soil & Water Conservation District
Echo Lake Watershed Improvement Project	Central Aroostook
Little Sebago Lake Conservation BMP Design & Implementation	Cumberland
Middle Range Pond Improvement Project - Phase I Implementation	Androscoggin
Webber Pond Watershed Erosion Control Project	Kennebec

WIFAP Projects Awarded Grants in 2007

Soil and Water Conservation Districts in the four regions developed work plans for NPS projects under WIFAP Program Guidance. DEP and the Maine Department of Agriculture provided a \$50,000 grant award for each region. Program guidance required 50% of WIFAP program funds be directed at implementing approved TMDLs. The Southwestern and Mid-Maine Regions applied WIFAP funds to help restore impaired waterbodies with approved TMDLs. There are 15 impaired lakes with approved TMDLs within the service area of these two Regions. Each Region invested WIFAP funds in a TMDL watershed that already has considerable implementation activity and momentum. NPS Projects developed in 2007 are listed below.

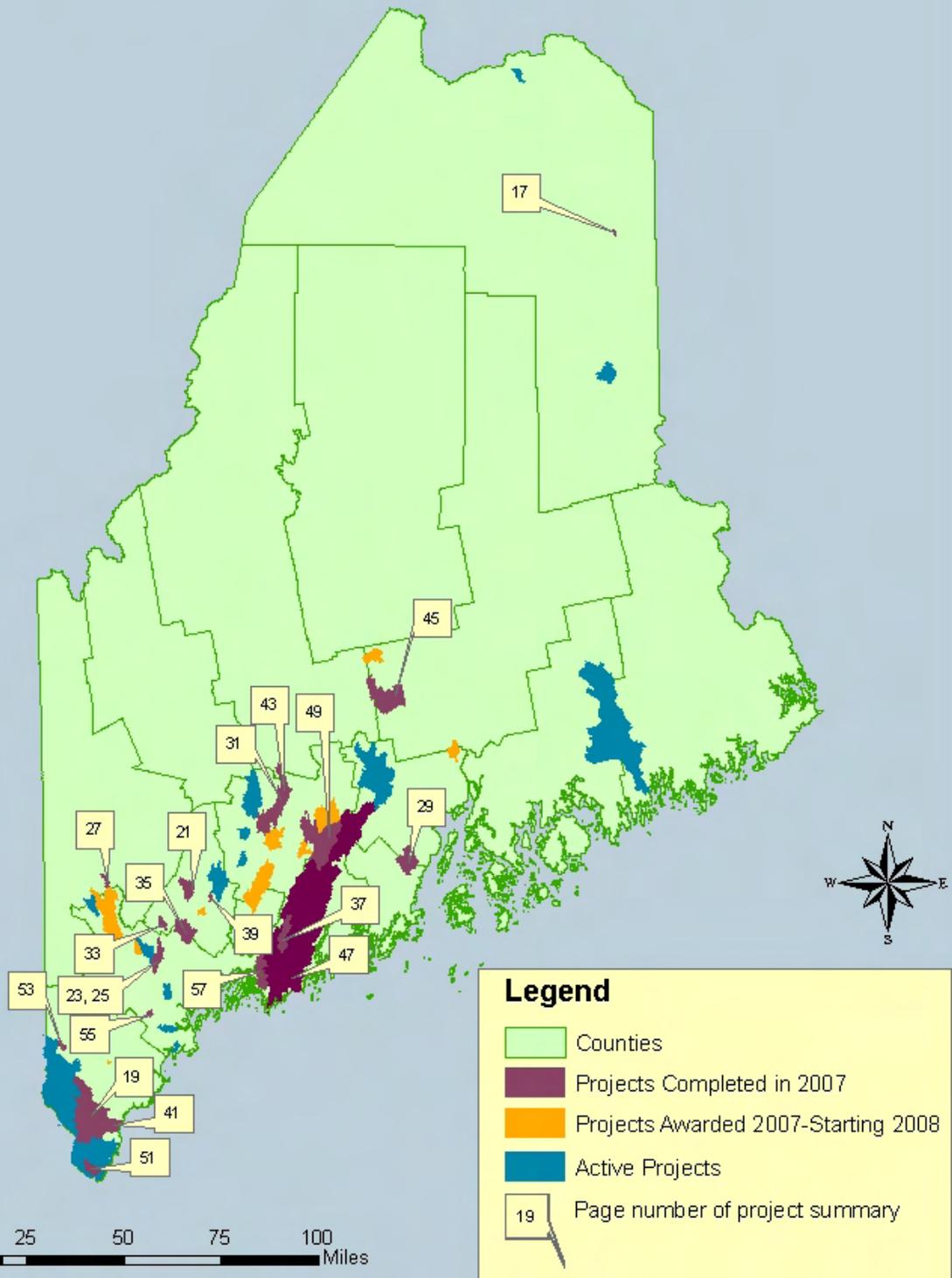
WIFAP Region / Grantee	NPS Project Title	WIFAP Grant	Local Match
Southwestern Conservation Alliance York County SWCD	2007WW22 Mousam Lake Water Quality Improvement Project, Phase III	\$50,000	\$67,370
Mid-Maine Watersheds Coalition Knox-Lincoln SWCD	2007WW24 Duckpuddle Pond Restoration Project: Phase II	\$50,000	\$14,353
Aroostook Watersheds Central Aroostook SWCD	2007WW21 Kennedy Brook/Mantle Lake Watershed Improvement Project	\$50,000	\$18,400
Downeast-Penobscot Watersheds Washington County SWCD	2007WW23 Narraguagus River Protection Project (Segment North of Route 9) Phase 2	\$50,000	\$13,800
Totals		\$200,000	\$113,923

E. Summaries of NPS Water Pollution Control Projects Completed in 2007

Twenty (24) projects funded through the NPS grants program were successfully completed in 2007. Concise two-page summaries of each project are included in the following pages. 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 2007.

NPS Project Title	Page #
East Pond Watershed Restoration Project – Phase II	15
Echo Lake Watershed Improvement Project	17
Great Works River Watershed Management Plan Project	19
Lake Auburn Nonpoint Source Improvement Project	21
Little Sebago Lake Conservation Project - Phase I	23
Little Sebago Lake Conservation Project: BMP Design & Implementation	25
McWain Pond Watershed Survey	27
Megunticook Watershed: NPS Watershed Survey	29
Messalonskee Lake Watershed NPS Remediation Project – Phase I	31
Middle Range Pond Improvement Project - Phase I Implementation	33
Moose Brook Watershed Survey	35
Nequasset Lake Watershed Survey	37
No Name Pond Conservation Project - Phase I	39
Ogunquit River Watershed Management Plan	41
Salmon-McGrath Watershed Load Abatement Project – Phase 3	43
Sebasticook Lake Watershed Project - Phase 3	45
Sheepscot River Watershed Management Plan	47
Sheepscot West Branch NPS Control and Habitat Improvement - Phase III	49
Spruce Creek Watershed Survey	51
Square Pond Watershed Survey	53
Tannery Brook Water Quality Improvement Project - Phase I	55
Upper New Meadows River Watershed Implementation Project - Phase 1	57
Webber Pond Phosphorus Reduction Project	59
Webber Pond Watershed Erosion Control Project	61

Watersheds With 319 Projects Completed or Initiated in 2007



East Pond Watershed Restoration Project – Phase II

#2003R-20

Waterbody Name: East Pond

Location: Oakland and Smithfield –
Kennebec and Somerset Counties

Waterbody Status: Impaired, NPS Priority Watershed

Project Grantee: Belgrade Regional Conservation Alliance

Project Duration: June 2003 – February 2007

319 Grant Amount: \$64,321

Local Match: \$55,173



PROBLEM:

East Pond, which lies at the top of the Belgrade Lakes chain, has a surface area of 1,670 acres and a direct watershed of 4.2 square miles. East Pond has impaired water quality due to algal blooms. The water quality assessment by DEP in 2006 indicated that water quality is stable, but poor. The DEP completed a Total Maximum Daily Load (TMDL) report in October 2001. According to the TMDL report, phosphorus problems in East Pond are due in part to the shallow depth of the pond that allows for recycling of phosphorus from the lake bottom. Phosphorus sources in the watershed include roads, shoreline development and septic systems.

A 2000 watershed survey by the Belgrade Region Conservation Alliance (BRCA) identified a total of 56 NPS sites. The breakdown by land use was: residential and driveway (47%), camp roads (17%), town roads (6%), boat access (6%) and eroding beaches (16%). A Phase I implementation project was completed on East Pond and North Pond from 2001- 2004. Conservation practices were installed on 24 sites, and an additional 20 smaller sites were addressed by the BRCA Conservation Corps.

PROJECT DESCRIPTION:

The Phase II project targeted roads, since roads are one of the primary sources of NPS runoff. Fixing roads also addresses adjacent driveways and parking area problems. By partnering with the East Pond Association, the BRCA was able to address two long driveways and 16 of the 20 camp roads in the watershed. The BRCA Conservation Corps installed seven vegetative buffers at shoreline sites. Technical assistance was provided to property owners and camp road associations, beyond those that participated in cost share projects.



Another goal of the project was to hold a road maintenance workshop with each of the road associations receiving cost share funds. This did not happen, in part due to staff changes at Kennebec County SWCD, the project partner coordinating the workshops. However, road association workshops were held in 2004 and 2005. These workshops covered road maintenance and legal requirements for establishing a road association. A third phase of 319-funded restoration work began in the East Pond watershed in 2007.

PROJECT OUTCOMES:

- The project helped fund the installation of best management practices on a total of 16 camp roads and two driveways (4.3 miles of road). For each road, multiple best management practices were installed including culvert replacements, inlet and outlet protection, sediment basins, ditch stabilization and turnouts, and road surface crowning/resurfacing.
- The BRCA Conservation Corps installed seven buffers (800 square feet) on shoreline residential sites.
- Technical assistance was provided to 35 property owners and three camp road associations.
- Two road association development workshops provided training to 25 camp road owners.
- Pollutant load calculations estimated that 11.4 tons of sediment and 4.6 pounds of phosphorus were reduced due to installation of road BMPs (US EPA Region 5 Method and WEPP Method).



PROJECT PARTNERS:

East Pond Association
Kennebec County SWCD

CONTACT INFORMATION:

Mary Ellen Dennis, DEP - (207) 287-7729, mary-ellen.c.dennis@maine.gov
Peter Kallin, Belgrade Region Conservation Alliance – (207) 495-6039, brcapk@zwi.net

Echo Lake Watershed Improvement Project

#2003R-16A - WIFAP

Waterbody Name: Echo Lake

Location: Presque Isle – Aroostook County

Waterbody Status: NPS Priority Watershed, Impaired

Project Grantee: Central Aroostook SWCD

Project Duration: February 2004 – April 2007

319 Grant Amount: \$54,000

Match: \$52,216 (local), \$18,000 (ME Dept. Ag.)



PROBLEM:

Echo Lake is a shallow (9 feet maximum depth) 90-acre lake located on the east side of Quaggy Joe Mountain on the south end of Presque Isle Township. Land use in the watershed includes seasonal and year-round residential lots, a state park (Aroostook State Park), forest and agricultural lands. The watershed covers approximately 1.4 square miles. With the exception of a small tributary, Echo Lake is the headwaters for the west branch of Presque Isle Stream.

Echo Lake faces a high risk of water quality problems since it is a small shallow lake with a small watershed and concentrated shoreline development. The lake has been monitored by the DEP and volunteers since 1976 and was placed on the State’s list of impaired waters due to declining water quality. In 2001 a watershed survey was completed, and approximately 315 NPS sites were identified. Sixty-six percent (66%) of the identified sites were associated with residential areas, 24% with the state park, and 7% with municipal roads. The DEP’s Phosphorus Control Action Plan (TMDL Assessment) was finalized in 2007.

PROJECT DESCRIPTION:

The purpose of the project was to fix NPS pollution problems in the Echo Lake watershed. The project addressed erosion problems on 19 residential lots and provided technical assistance for another 130-140 NPS sites. The City of Presque Isle addressed five town road sites identified in the 2001 survey. Activities included replacing culverts, reestablishing and stabilizing ditches, and installing plunge pools and sediment basins.



The District partnered with Aroostook State Park to address NPS sites identified in the watershed survey. Upgrades were made to the beach and boat launch parking lots; a steep gravel bank was reshaped and stabilized; and rubber diverters were installed on the Campground Road. The Park independently developed a strategic plan to address erosion and NPS issues within the Park and fixed many of the identified NPS sites on the park’s trail system. Project staff also coordinated 11 information and education meetings during the project and worked with the Echo Lake Association to identify and meet with landowners who were interested in fixing their properties.

PROJECT OUTCOMES:

- The project succeeded in fixing NPS problems on five town roads, 19 residential lots and four state park sites. Technical assistance was provided for another 130-140 sites.
- Annual sediment loading to Echo Lake was reduced by an estimated 30.5 tons per year (WEPP Method and US EPA Region 5 Method).
- Phosphorous loading was reduced by an estimated 30 pounds per year. According to the DEP's 2007 TMDL report, this amounts to 32% of the annual reduction needed to improve lake water quality.
- 60% of the high priority NPS sites from the 2001 survey were addressed.
- Cooperative partnerships were developed with the Echo Lake Improvement Association, City of Presque Isle and Aroostook State Park to address water quality issues.



Project site visit in March 2004.

PROJECT PARTNERS:

Echo Lake Improvement Association

USDA Natural Resources Conservation Service, Presque Isle Office

City of Presque Isle, Public Works and Economic & Community Development Departments

Maine Department of Conservation, Aroostook State Park

CONTACT INFORMATION:

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

Linda Alverson, Central Aroostook SWCD – (207) 764-4153, linda.alverson@me.nacdnet.net.

Great Works River Watershed Management Plan Project

#2004R-06

Waterbody Name: Great Works River

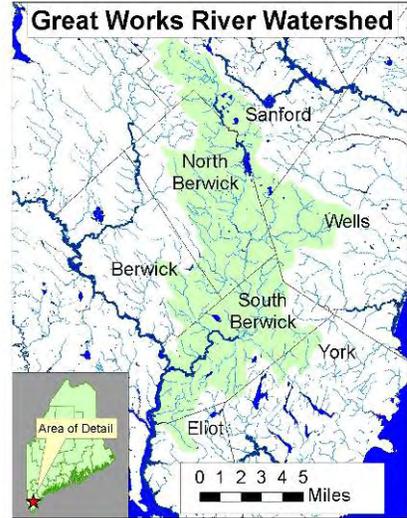
Location: Sanford, North Berwick, Berwick, South Berwick, Eliot, Wells, York – York County

Project Grantee: York County SWCD

Project Duration: April 2004 – December 2007

319 Grant Amount: \$22,584

Local Match: \$17,973



PROBLEM:

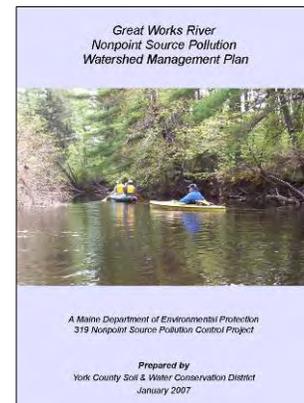
The Great Works River flows 23 miles through six towns and empties into the Salmon Falls River in South Berwick. The river is impounded in four areas, including one dam at the lower end of Bauneg Beg Lake. The 84 square mile watershed includes extensive forested areas and three population centers in Sanford, North Berwick and South Berwick.

According to the Maine DEP’s TMDL report for the Salmon Falls River (May 1999), the Great Works River is the largest contributor of NPS pollution to the Salmon Falls Estuary. The TMDL report calls for implementing BMPs in the Great Works River watershed to reduce phosphorus loads that contribute to impairment and high intensity algal blooms of the Salmon Falls River. High bacteria levels and heavy metals have also been identified as potential sources of pollution to the Great Works River. The Great Works River Watershed Coalition was formed in 2001 and conducts water quality monitoring on 18 sites in the watershed.

In 1999, the Bauneg Beg Lake Association and Maine DEP conducted a survey around the lake and identified 131 erosion sites. In 2001, a watershed survey was conducted in the lower 68 square mile portion of the watershed. Volunteers and technical consultants identified 78 areas with soil erosion and uncontrolled runoff to the river and its tributaries. The majority of these sites were associated with roads, driveways, and residential areas. In 2004, a watershed survey of the remaining 16 square miles of the upper watershed identified 64 additional NPS sites, including many in downtown Sanford.

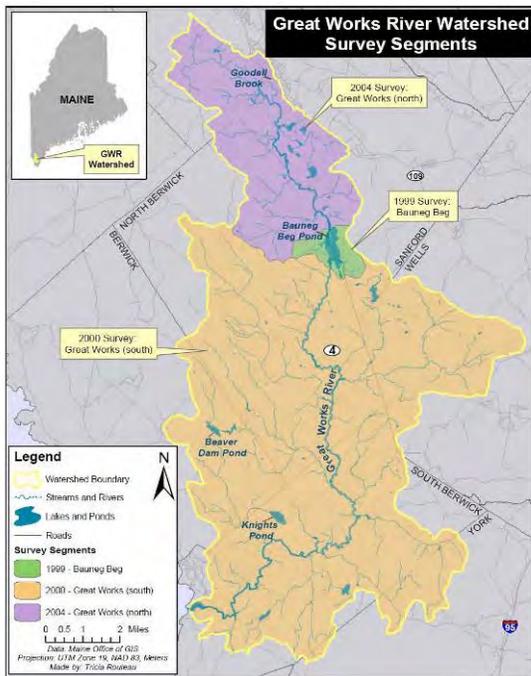
PROJECT DESCRIPTION:

The primary purpose of this project was to create a watershed management plan for the Great Works River. Project staff updated and compiled information from the three past watershed surveys, analyzed water quality data and created GIS maps of watershed resources. On April 30, 2005, about 50 local residents and town officials attended a half-day community forum to discuss watershed issues and brainstorm strategies for protecting the Great Works River and its tributaries. Using watershed data and input from the forum, a draft management plan was developed. Public comments on the draft were incorporated into the plan, and the *Great Works River Watershed Management Plan* was completed in January 2007.



PROJECT OUTCOMES:

- 50 local residents, municipal officials and resource professionals attended a half-day Community Watershed Forum on April 30, 2005. The issues and strategies discussed during the forum served as the framework for the action plan in the Watershed Management Plan.
- Three committees were formed to help carry out the actions listed in the plan. The committees include Funding and Planning; Education, Stewardship and Water Quality Monitoring; and Buffer Campaign and BMP Implementation.
- The *Great Works River Watershed Management Plan* was finalized in January 2007. Copies of the report were distributed to the towns of Sanford, North Berwick, York, Wells, South Berwick, and Berwick and posted on the York County SWCD website (www.yorkswcd.org).



PROJECT PARTNERS:

Wells National Estuarine Research Reserve
 Town of North Berwick
 Town of Berwick
 Town of South Berwick
 Town of Sanford
 Bauneg Beg Lake Association
 USDA Natural Resources Conservation Services
 University of Maine Cooperative Extension

CONTACT INFORMATION:

Donald Kale, Maine DEP – (207) 822-6319, Donald.kale@maine.gov
 Forrest Bell, York County SWCD – (207) 324-7015, info@fbenvironmental.com

Lake Auburn Nonpoint Source Improvement Project

#2005R-16

Waterbody Name: Lake Auburn

Location: Auburn and Turner, Androscoggin County

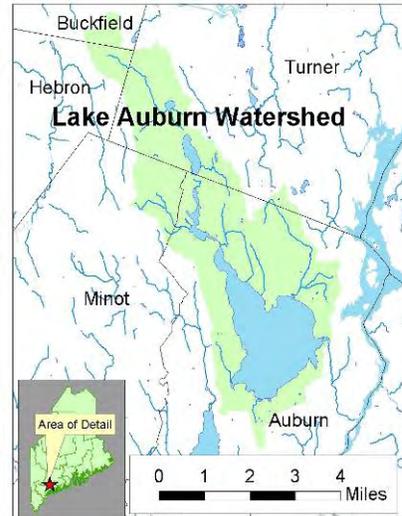
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Lake Auburn Watershed Protection Commission

Project Duration: March 2005 – October 2007

319 Grant Amount: \$53,770

Local Match: \$47,708



PROBLEM:

Lake Auburn is a 2,290 acre lake located in the City of Auburn. Its 15.3 square mile watershed extends into the towns of Turner, Minot, Hebron and Buckfield. Lake Auburn has been the public water supply for the City of Auburn since 1887, and it currently provides water for 45,000 people in Lewiston and Auburn. Lake Auburn’s water quality has been monitored since 1977, and its water quality is considered to be above average. However, rising development pressures and increases in impervious area continue to threaten water quality through the input of stormwater and its associated NPS pollutant load.

Several studies have taken place within the Lake Auburn watershed area over the last decade. These studies have identified many sources of NPS contaminants including shoreline erosion and urban development such as roadways, the community college, contractor facilities and petroleum storage facilities. Studies by the Lake Auburn Watershed Protection Commission (LAWPC) and Drumlin Environmental identified 53 existing or potential NPS sites. In addition, these studies identified the need for the continuation of public education with area residents.

PROJECT DESCRIPTION:

This project installed major structural BMPs at six of the 45 sites identified in the watershed survey. Central Maine Community College (CMCC) installed infiltration dividers, infiltration islands, grassed infiltration strips, and a retention pond between its parking areas and the lake. A section of severely eroded shoreline at the CMCC site was stabilized using rip-rap, geosynthetic fabric and new vegetation. The Holbrook Road boat launch was closed to vehicle traffic and stabilized. A general store and boat rental business adjacent to the lake was purchased and torn down, and the site was replanted to return it to a natural condition. Finally, a stretch of shoreline eroded by unauthorized boat access and roadside parking was blocked off with posts to prevent further erosion and promote the growth of new vegetation.

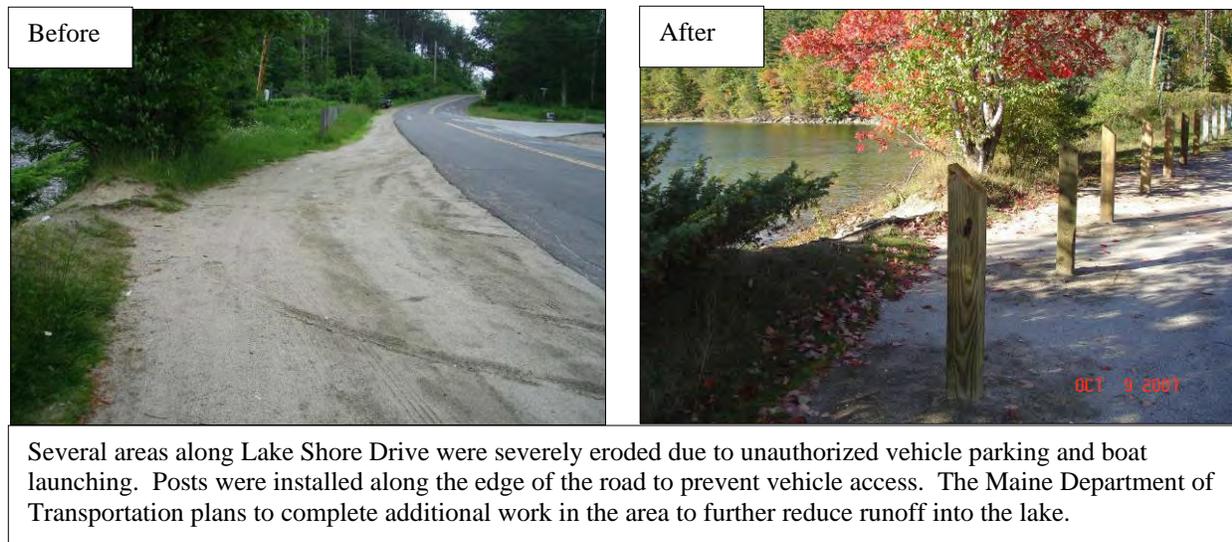


Holbrook boat launch was closed & stabilized

LAWPC staff provided landowners and businesses with technical assistance for another 29 sites. NPS awareness brochures were purchased and mailed to watershed residents, and a 28-page newspaper supplement was created and printed in the 9/30/07 edition of the Lewiston Sunday Paper.

PROJECT OUTCOMES:

- The project helped fund the installation of innovative structural BMPs at the six priority sites. This work reduced pollutant loading to Lake Auburn by an estimated 25.7 tons of sediment and 29.6 pounds of phosphorus each year (RUSLE Method).
- Approximately 100 linear feet of severely eroded shoreline were stabilized using rip-rap, geosynthetic fabric and new vegetation.
- Technical assistance was provided to 29 landowners and businesses.
- Flyers on NPS prevention were mailed to all watershed residents. A 28-page supplement, which highlighted project accomplishments and other work by the LAWPC, was included in the Lewiston Sunday newspaper on 9/30/07.
- 2.85 acres of impervious area were treated by BMPs, which reduced the annual sediment load from these areas by 80 - 89% and the annual phosphorus load by 64 - 92%.



PROJECT PARTNERS:

Auburn Water District
Lewiston Water Division
Central Maine Community College
Comprehensive Environmental Incorporated
Maine Department of Transportation

CONTACT INFORMATION:

David A. Waddell, DEP - (207) 287-7736, david.a.waddell@maine.gov
Mary Jane Dillingham, LAWPC - (207) 784-6469, mjdillingham@awsd.org

Little Sebago Lake Conservation Project, Phase I

#2004R-02

Waterbody Name: Little Sebago Lake

Location: Gray and Windham, Cumberland County

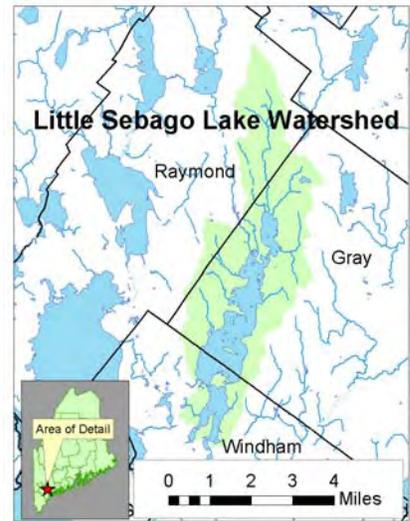
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Sponsor: Cumberland County SWCD

Project Duration: March 2004 – January 2008

319 Grant Amount: \$99,839

Local Match: \$92,215



PROBLEM:

Little Sebago Lake has a surface area of 1,898 acres, numerous perennial tributaries and three distinct basins. Its watershed covers 13.3 square miles and is part of the larger Pleasant River and Presumpscot River Watersheds. The lake’s shoreline is heavily developed with over 1,200 seasonal camps and year-round homes and an extensive network of private roads. The lake also has a state-owned boat ramp, a private 43-site campground and Aimhi Lodge, a commercial operation with 23 rental units.

Lake monitoring data collected since 1975 indicate that the lake has moderate depletion of dissolved oxygen in the hypolimnion in late summer. In 2002 and 2003, the Cumberland County SWCD, Little Sebago Lake Association (LSLA) and Maine DEP completed NPS surveys of the entire watershed and identified 327 erosion sites.

PROJECT DESCRIPTION:

The purpose of the project was to reduce soil erosion and export of sediment and phosphorus into Little Sebago Lake. Conservation practices were installed at a total of 80 sites throughout the watershed. The work included improvements at 14 high priority sites including 10 private roads, one town road, two rights-of-way to the lake and one residential property. Forty-one matching grants were used to install buffers, rain gardens, waterbars and other conservation practices, and 29 landowners received technical assistance. Surplus funds in the project budget were also used to help support the summer Youth Conservation Corps in 2007, which resulted in the completion of an additional 25 sites.

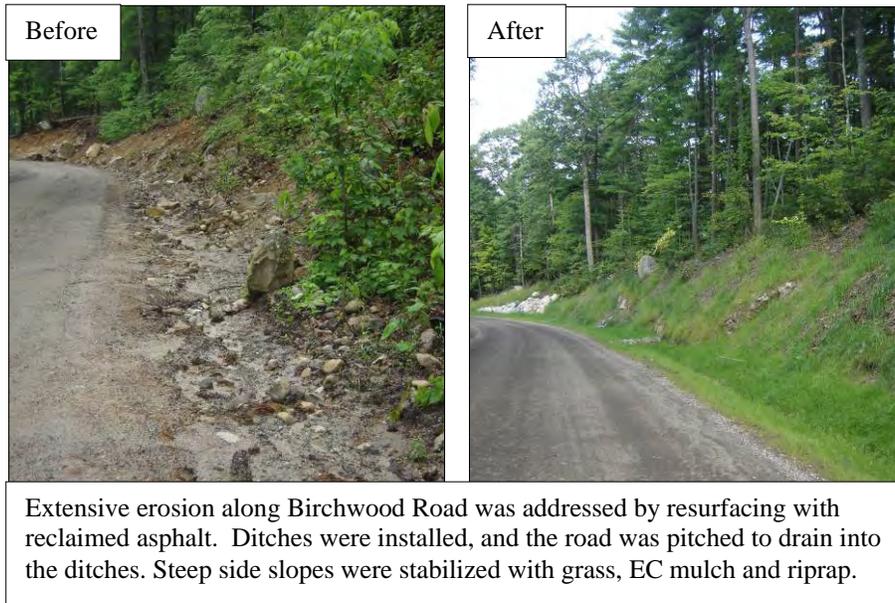


Volunteers build and install waterbars to divert runoff away from lake.

Public outreach included a “Cruise the Buffers” tour, which was held in the summer of 2004. Nineteen people attended a gravel road maintenance workshop in May 2004. Local residents also attended volunteer “work parties” in October 2004 and August 2005 to learn about and install a variety of conservation practices on a right-of-way and a residential property. Project activities were advertised in the four local newspapers and at the lake association’s annual meetings. The project was administered in conjunction with another 319 project (#2004R-24B), which also extended from 2004 – 2008.

PROJECT OUTCOMES:

- The project fixed erosion problems at 14 priority watershed sites. This work prevented an estimated 27 tons of sediment and 24 pounds of phosphorus from reaching the lake each year (US EPA Region 5 Method).
- Twenty-four (24) native plant matching grants were awarded, which resulted in the installation of over 1,000 native plants. Seventeen (17) residential conservation matching grants were also awarded to help landowners install waterbars, rubber razors, infiltration steps and other small residential BMPs.
- Near the end of the project, extra funds remaining in the project budget were reallocated to help support the 2007 summer Youth Conservation Corps season. This summer program, which started in 2006 through the *Phase II* project (#2006R-04), hires local high school students to install erosion control practices and vegetated buffers for watershed landowners. As a result, *Phase I* completed an extra 25 projects and the *Phase II* project will now have extra funds for YCC work in 2008.
- Project staff provided technical assistance to 29 landowners and road associations – far exceeding the goal of 18 in the project workplan.
- BMP designs were completed and landowner outreach was initiated for four priority sites that will be addressed through the *Phase II* project.



PROJECT PARTNERS:

Little Sebago Lake Association
Town of Gray
Town of Windham

CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, wendy.garland@maine.gov
Jami Fitch, Cumberland County SWCD – (207) 892-4700, jami@cumberlandswcd.org

**Little Sebago Lake Conservation Project: BMP Design & Implementation
#2004R-24B - WIFAP**

Waterbody Name: Little Sebago Lake
 Location: Gray and Windham – Cumberland County
 Waterbody Status: NPS Priority Watershed, Most at Risk
 Project Sponsor: Cumberland County SWCD
 Project Duration: October 2004 – November 2007
 319 Grant Amount: \$7,500
 Match: \$17,558 (local), \$2,500 (ME Dept. Ag.)



PROBLEM:

Little Sebago Lake has a surface area of 1,898 acres, numerous perennial tributaries and three distinct basins. Its watershed covers 13.3 square miles and is part of the larger Pleasant River and Presumpscot River Watersheds. The lake’s shoreline is heavily developed with over 1200 seasonal camps and year-round homes and an extensive network of private roads. The lake also has a state-owned boat ramp, a private 43-site campground and Aimhi Lodge, a commercial operation with 23 rental units.

Lake monitoring data, collected since 1975, indicate that the lake has moderate depletion of dissolved oxygen in the hypolimnion in late summer. In 2002 and 2003, the Cumberland County SWCD, Little Sebago Lake Association (LSLA) and Maine DEP completed NPS surveys of the entire watershed and identified 327 erosion sites. The *Little Sebago Lake Conservation Project – Phase I* (#2004R-02) kicked off implementation efforts in 2004 by fixing 55 documented erosion problems.

PROJECT DESCRIPTION:

The purpose of the project was to reduce soil erosion and polluted runoff to Little Sebago Lake. Conservation practices were installed to fix two high priority sites on private roads, and engineering designs were developed for one additional priority private road site. The project was administered in conjunction with another 319 project (#2004R-02), which also extended from 2004 – 2008.

The project had originally intended to fix two high priority sites on Brown Cove Road. Unfortunately, project staff were ultimately unable to help the landowners reach consensus about an acceptable design for the erosion problems on their road. After numerous site walks and facilitated meetings, the project steering committee decided to work on another site where the outlook for cooperation was more promising. It is hoped that the time invested in Brown Cove Road will eventually lead to improvements. Several neighbors have since resumed discussions and started brainstorming solutions.



New culverts on Ramsdell Road

PROJECT OUTCOMES:

- The project fixed two significant erosion problems in the watershed. On Ramsdell Road, an undersized and eroding culvert was replaced with two 4-foot culverts, and the ends were stabilized with riprap. On Mountain View Road, severe erosion along the road shoulder and in the ditch was stabilized by repaving the road and reshaping and armoring the ditch.
- The project reduced pollutant loading to Little Sebago Lake by an estimated 3.4 tons of sediment and 2.9 pounds of phosphorus per year (EPA Region 5 Method).
- Site designs and landowner agreements were completed for one high priority site on Deer Acres Road. This site was then fixed under the *Little Sebago Lake Phase II* (#2006R-04) project with cost sharing funds from the 319 grant, Maine DEP stormwater compensation funds and cash match from the Lyons Point Road Association.
- The partnership forged with the Mountain View Road Association has set the stage for additional joint projects through the *Little Sebago Lake Phase II* project.



The ditch and road shoulder on Mountain View Road were severely eroded. The road shoulder was repaved, and the ditch was reshaped and stabilized with riprap.

PROJECT PARTNERS:

Little Sebago Lake Association
Maine Department of Agriculture
Town of Gray
Town of Windham

CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, wendy.garland@maine.gov
Jami Fitch, Cumberland County SWCD – (207) 892-4700, jami@cumberlandswcd.org

McWain Pond Watershed Survey

#2006P-14

Waterbody Name: McWain Pond

Location: Waterford – Oxford County

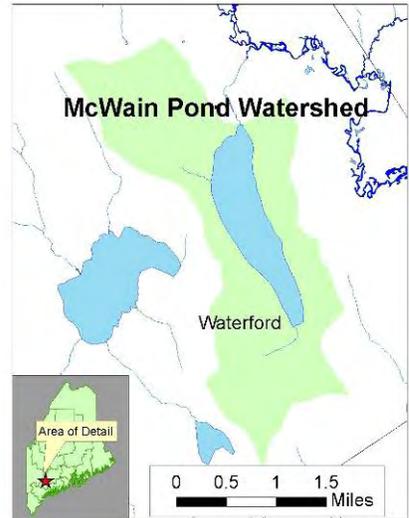
Waterbody Status: NPS Priority Watershed

Project Grantee: Lakes Environmental Association

Project Duration: April 2006 – May 2007

604(b) Grant Amount: \$9,138

Local Match: \$9,185



PROBLEM:

McWain Pond (also known as Long Pond) has a surface area of 445 acres and a watershed area of 3.9 square miles. McWain Pond drains to the Crooked River, which flows into Sebago Lake – a drinking water source for more than 45,000 households in southern Maine. McWain Pond’s shoreline is fringed with 75 seasonal and year-round homes and two summer youth camps, which attract a total of 400 campers each year.

The Maine DEP, Lakes Environmental Association (LEA) and local volunteer monitors have tested McWain Pond’s water quality since 1978. This testing indicates that the bottom waters of the lake experience oxygen depletion to levels that severely limit fish habitat and pose a high risk of phosphorus recycling problems. In addition to its water quality monitoring program on the pond, LEA helps watershed residents address erosion problems through its *Clean Lake Check-Up* program.

PROJECT DESCRIPTION:

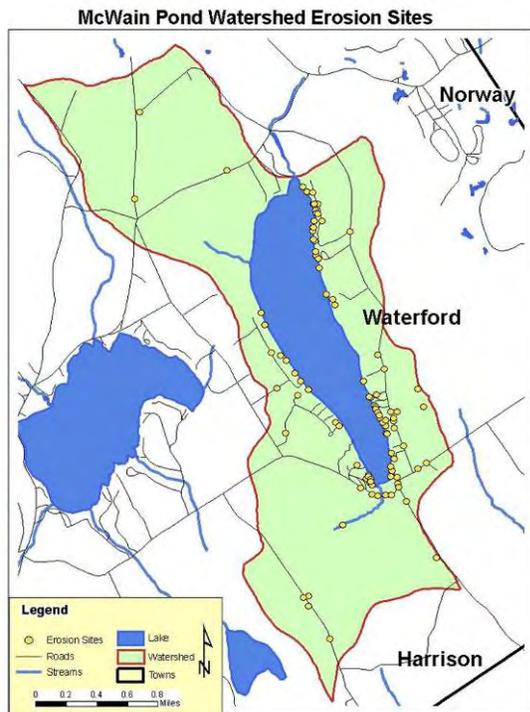
The purpose of the project was to identify, document and prioritize soil erosion sites in the McWain Pond watershed and to recommend conservation practices for each of these sites. Survey methods were based on those outlined in the DEP publication, *Citizen’s Guide to Lake Watershed Surveys*. The day-long volunteer training session was held on April 29, 2006. Eighteen volunteers completed the survey over the following month, and technical staff checked their work throughout the summer and fall months.

The watershed survey identified a total of 95 erosion sites. Survey data was summarized in the *McWain Pond Watershed Survey Report*. Survey reports and two-page summaries of the survey findings were distributed to town officials and watershed residents. Project staff developed detailed BMP designs for four priority erosion sites and delivered one presentation to the McWain Pond Association and two presentations to the Waterford Selectboard. Over the course of the project, 11 articles were printed about the watershed survey in local newspapers and newsletters.

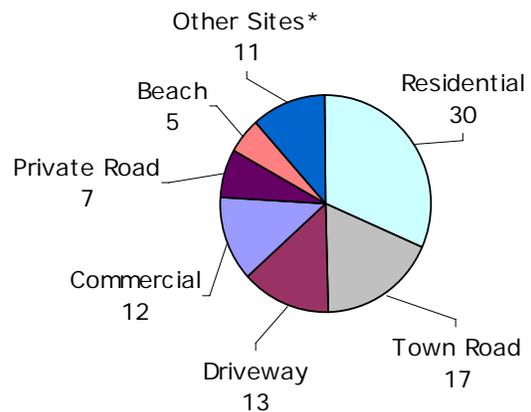


PROJECT OUTCOMES:

- Project staff and 18 local volunteers surveyed the entire McWain Pond watershed and documented 95 erosion sites. The *McWain Pond Watershed Survey Report* (March, 2007) summarizes watershed survey findings and lists specific descriptions and recommendations for identified sites.
- After learning about erosion problems on their properties, several landowners took the initiative to fix sites listed in the watershed survey report. This included three sites at Birch Rock Camp, one beach site in McWain Shores, and two residential sites.
- BMP designs were completed for four priority sites identified in the survey. An engineer was hired to complete two of the designs, and project staff completed the other two site designs.
- The project laid the foundation for mitigation efforts in the watershed. The McWain Pond Association was awarded a 319 grant for the *McWain Pond Watershed Improvement Project*, which will begin in April 2008.



**Watershed Survey Findings
Number of Sites by Land Use**



*Other sites include Construction Site (3), Path (3), Boat Access (3), Logging Road (1) and State Road (1).

PROJECT PARTNERS:

- McWain Pond Association
- Town of Waterford
- Portland Water District
- Birch Rock Camp
- Camp Waziyatah

CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, wendy.garland@maine.gov
 Jeff Stern, Lakes Environmental Association – (207) 647-8580, sternjm@hotmail.com

Megunticook Watershed: NPS Watershed Survey

#2005P-05

Waterbody Name(s): Megunticook Lake and Norton’s Pond

Location: Hope and Camden – Knox County
Lincolnvile – Waldo County

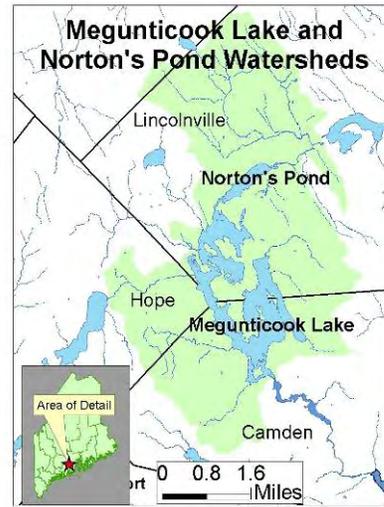
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Sponsor: Megunticook Watershed Association

Project Duration: April 2005 – October 2007

604(b) Grant Amount: \$12,786

Local Match: \$16,408



PROBLEM:

The Megunticook watershed, which includes the watersheds of Megunticook Lake and Norton’s Pond, encompasses 32 square miles and includes residential, commercial and agricultural uses. Norton’s Pond enters the north end of Megunticook Lake and then Megunticook Lake empties into Camden Harbor via the Megunticook River. Water quality has been monitored for Megunticook Lake and Norton’s Pond since 1975, with ratings of “somewhat average” and “average”, respectively. Both waters have moderate potential for nuisance algal blooms, show moderate to high dissolved oxygen depletion in deep areas, and have experienced small areas of filamentous algae over the past five summers. Megunticook Lake is one of the state’s test waters for the expansion of its rainbow trout program.

Both Megunticook Lake and Norton’s Pond have experienced a sharp increase in conversions of seasonal camps to year-round homes in recent years. Major state roads run along the shores of both these lakes, causing concern about the inputs of road sand, salt, and other pollutants into the lakes. The rural towns of Lincolnvile and Hope have seen double-digit growth in recent years, which has resulted in the construction of dirt roads and driveways.

PROJECT DESCRIPTION:

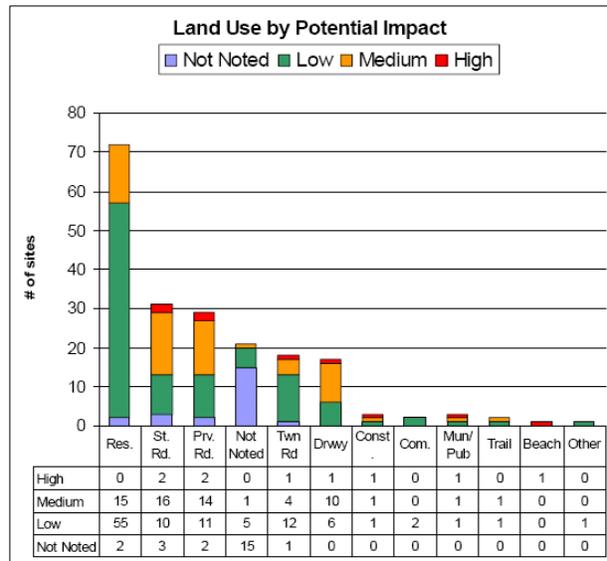
The primary purpose of this project was to identify and document NPS sites in the Megunticook watershed. Due to the size of the watershed, the survey effort was focused around the two major waterbodies – Megunticook Lake and Norton’s Pond. A Steering Committee guided the project, and outreach included mailings to watershed landowners, articles in local newspapers and websites, and public meetings.



The survey took place in the spring of 2005, and 20 volunteers attended the training and completed the field work. 216 erosion sites were identified. Common problems identified were lack of shoreline buffers, shoreline erosion, unstable culverts, and eroding ditches. The data were compiled and the watershed survey report was completed in November 2006.

PROJECT OUTCOMES:

- Project staff and 20 volunteers completed a watershed survey of the area surrounding Megunticook Lake and Norton’s Pond and identified 216 erosion sites.
- The *Megunticook Watershed Survey Report* was completed in November 2006.
- The project produced preliminary BMP designs for four high priority municipal sites.
- A sub-committee formed during the survey - the LakeWise Committee – remains active and continues to conduct outreach and meet with landowners.



PROJECT PARTNERS:

Knox-Lincoln SWCD
 Waldo County SWCD
 Moody Mountain Environmental
 Aqua Maine Inc.
 Town of Camden
 Town of Lincolnville

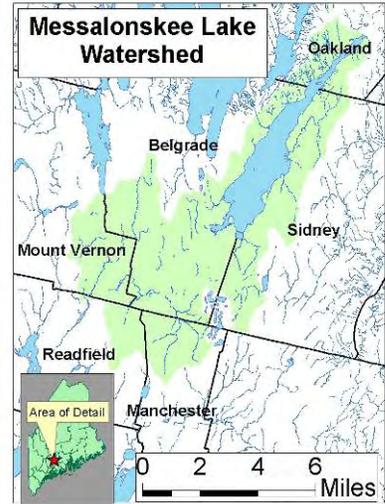
CONTACT INFORMATION:

Kristin Feindel, DEP – (207) 287-5586, kristin.b.feindel@maine.gov
 Ken Bailey, Megunticook Watershed Association – (207) 446-4243, ken@megunticook.org

Messalonskee Lake Watershed NPS Remediation Project, Ph I

#2004R-05

Waterbody Name: Messalonskee Lake
 Location: Oakland, Belgrade, Sidney – Kennebec County
 Waterbody Status: NPS Priority Watershed
 Project Grantee: Belgrade Regional Conservation Alliance
 Project Duration: May 2004 – January 2007
 319 Grant Amount: \$66,846
 Local Match: \$53,331



PROBLEM:

Messalonskee Lake, also known as Snow Pond, is the last lake in the Belgrade Lakes chain. It has a surface area of 3,506 acres and a watershed area of 46 square miles. Although the watershed has historically been mostly agricultural, in the 1990’s there was a significant amount of camp and home building in the watershed.

Water quality data has been collected on the lake since 1970, and water quality is considered to be average. While there is a low potential for nuisance algal blooms, moderate dissolved oxygen depletion in the bottom waters and moderately high phosphorus levels (12-14 ppb) in the surface waters have led to a continued concern over the future water quality of the lake. A watershed survey, published in 2003, identified 426 erosion sites of varying severity in the watershed.

PROJECT DESCRIPTION:

The purpose of this project was to reduce soil erosion and polluted runoff by installing water quality BMPs on medium and high priority NPS sites identified in the 2003 watershed survey. BMPs included extensive road work and buffer plantings and depended on road association and landowner interest. Through the project, approximately two miles of camp roads were rebuilt, including ditching, crowning, and installing turnouts, and 10,700 square feet of vegetated buffer were planted and mulched. The Belgrade Regional Conservation Corps, which is comprised of local high school students, planted buffers, spread erosion control mulch, and installed rip-rap on 14 watershed sites.



The on-the-ground work was combined with one-on-one education of road associations and landowners. Technical assistance was provided to 41 property owners and five camp road associations beyond those involved with cost-share projects. Outreach regarding the impact of erosion on lake water quality was furthered through newsletter and newspaper articles and through the Snow Pond/Messalonskee Lake Association.

PROJECT OUTCOMES:

- BMPs were implemented on seven camp roads and one driveway, totaling approximately two miles of work. Work included culvert inlet/outlet protection, creation and stabilization of ditches and turnouts, use of geotextile mats to stabilize road bases, and road reshaping.
- Eight vegetated buffers, including a town beach buffer, were established through the project.
- Thirteen buffer plantings and riprap installation projects were completed by the Belgrade Regional Conservation Corps.
- The project reduced pollutant loading to the lake by an estimated 3.1 tons of sediment and 2.2 pounds of phosphorus per year (WEPP Method and Colby Method).
- Technical assistance was provided to over 40 property owners and camp road associations. Project staff discussed NPS issues and provided suggestions for specific site remediation.
- Project information and educational articles were printed in the Snow Pond/Messalonskee Lake Association newsletter and the local paper, *Summertime in the Belgrades*.

The Belgrade Regional Conservation Corps plants a buffer.



Before



During



After

PROJECT PARTNERS:

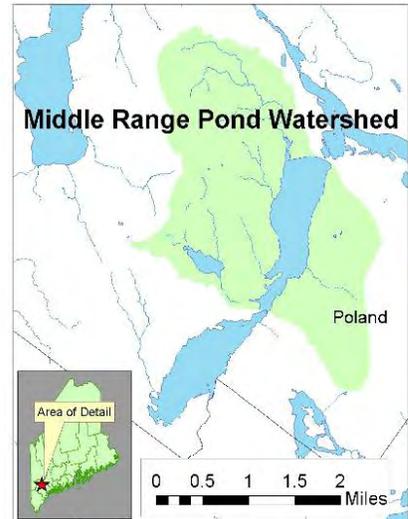
Belgrade Regional Conservation Corps
Snow Pond/Messalonskee Lake Association
Town of Belgrade
Town of Oakland
Town of Sidney

CONTACT INFORMATION:

Kristin Feindel, DEP – (207) 287-5586, kristin.b.feindel@maine.gov
Peter Kallin, Belgrade Regional Conservation Alliance – (207) 495-6039, brcapk@gwi.net

Middle Range Pond Improvement Project, Phase I Implementation #2003R-17A - WIFAP

Waterbody Name: Middle Range Pond
 Location: Poland – Androscoggin County
 Waterbody Status: NPS Priority Watershed, Most at Risk
 Project Sponsor: Androscoggin Valley SWCD
 Project Duration: January 2004 – July 2007
 319 Grant Amount: \$54,000
 Match: \$118,751 (local), \$16,000 (ME Dept. Ag.)



PROBLEM:

Middle Range Pond is part of a chain of three ponds that flow into the Little Androscoggin River. The ponds are known as a top fishing spot with stocked brown, brook and rainbow trout. The public boat launch and State Park on Lower Range Pond also attract recreational use to the ponds. Middle Range Pond has a surface area of 382 acres and a direct watershed area of 5 square miles. A restaurant, summer camp and several informal, popular fishing and swimming spots are also located on the shores of Middle Range Pond. Monitoring data indicates that all three ponds are above average based on clarity, total phosphorus and chlorophyll. There is, however, low to moderate depletion of dissolved oxygen in deep parts of all three ponds during late summer months.

In 1993 the Androscoggin Valley SWCD and Range Pond Environmental Association (RPEA) conducted a cursory survey of the entire Range Ponds Watershed. From 1995-1998, a 319 grant project fixed erosion problems on 15 sites and helped raise awareness and stewardship. A comprehensive watershed survey was conducted in 2003. During this project, 70 erosion sites were identified in the watershed, and preliminary designs were drafted for seven priority sites.

PROJECT DESCRIPTION:

The purpose of this project was to significantly reduce pollutant loading and improve the water quality of Middle Range Pond. Staff and volunteers coordinated and installed conservation practices at 29 priority road and residential sites and provided technical assistance to 34 landowners. 12 buffer projects were also installed with the help of small matching grants for participating landowners.

Project activities were advertised through the RPEA newsletter, press releases, and RPEA annual meetings. All Birch Drive residents were sent mailings about the project, and staff organized two public meetings with residents and town officials to discuss construction plans associated with the eight sites along Birch Drive.



Rubber razors and ditch installed on steep, eroding lake access road.

PROJECT OUTCOMES:

- Conservation practices were installed on 29 priority sites including 21 town roads (primarily on Birch and Schellinger Drive), 3 private roads, 2 residential areas, 2 commercial areas and 1 driveway. The Town of Poland contributed over \$84,000 in cash match and labor towards the numerous town sites.
- The project reduced annual pollutant loading to Middle Range Pond by an estimated 28 tons of sediment and 24 pounds of phosphorus (US EPA Region 5 Method).
- Twelve buffer plantings – along 375 feet of lake and 160 feet of stream – were installed through the project. Local residents, students from a Poland High School environmental class and youth from a local summer camp volunteered to plant four of the buffers.
- Project staff provided technical assistance to 34 landowners during the project period – far exceeding the goal of 20 written into the original workplan. Staff made follow-up visits to half of the sites to further assist landowners with their erosion problems.
- A roads maintenance plan was developed by project staff and formally accepted by the Town of Poland. The plan outlines schedules for street sweeping, catch basin cleanout and other activities for town roads in the watershed. Implementation of this five-year plan will further reduce pollutant loading to Middle Range Pond.



Severe erosion on this steep driveway was remedied by resurfacing with reclaimed asphalt, installing porous pavers on the parking area and planting a buffer next to the lake.

PROJECT PARTNERS:

Range Pond Environmental Association
Town of Poland
Maine Department of Agriculture

CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, wendy.garland@maine.gov
Sue Gammon, Androscoggin Valley SWCD – (207) 753-9400, susan.gammon@me.nacdnet.net

Moose Brook Watershed Survey

#2005P-03

Waterbody Name: Moose Brook

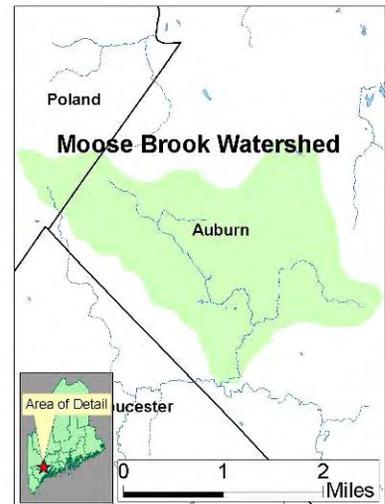
Location: Auburn and Poland – Androscoggin County

Project Grantee: Royal River Conservation Trust

Project Duration: June 2005 – January 2007

604(b) Grant Amount: \$10,215

Local Match: \$7,748



PROBLEM:

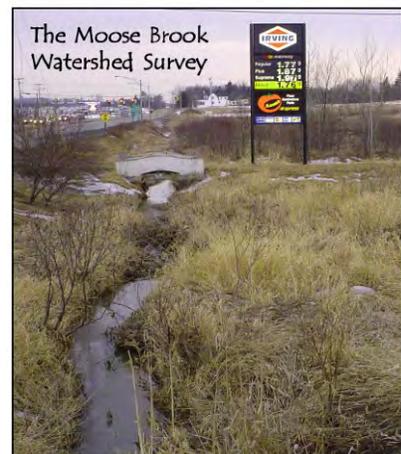
Moose Brook, a small headwater stream of the Royal River, is located almost entirely in a rapidly developing commercial area in the city of Auburn. Based on 1998 aerial photographs, watershed land use is about 67% forested, 8% residential and 16% commercial/industrial. The watershed includes the Auburn industrial park, the Route 202/I-95 interchange area, various commercial developments and mixed residential use.

Water quality data collected on Moose Brook in the mid-1990s indicated that most sites failed to meet dissolved oxygen and *E. coli* standards for Class B streams. Continued development in the I-95 interchange area and residential areas will contribute additional nutrient and bacteria loading to the stream. Heavy metals and increased peak flows from impervious surfaces also pose a threat to this urbanizing stream.

PROJECT DESCRIPTION:

The purpose of the project was to identify and document sources of NPS pollution entering Moose Brook. The watershed survey used the methods outlined in the *Citizen’s Guide to Watershed Surveys* to survey erosion sites and also incorporated an inventory and assessment of impervious surfaces in the watershed.

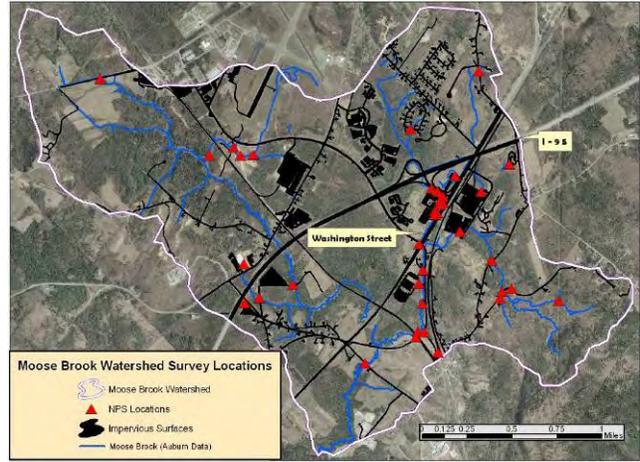
Technical personnel and 12 trained volunteers conducted the surveys over the summer and fall of 2005. Surveyors included local residents and members of the Royal River Youth Conservation Corps (YCC), a summer program that hires local high school students to fix pollution problems and plant buffers in the watershed. The *Moose Brook Watershed Survey Report* (January 2007) includes information and GIS maps of the 38 NPS sites.



The project included outreach to businesses and residents of the Moose Brook watershed. The Royal River Conservation Trust (RRCT) sent letters to landowners in the watershed to inform them of the survey and explain the project goals and methods. The mailing also included an article explaining the importance of individual homeowner actions in relationship to water quality.

PROJECT OUTCOMES:

- Thirty-eight (38) NPS sites were identified and documented in the Moose Brook Watershed.
- The *Moose Brook Watershed Survey Report* was completed in January 2007. The report includes descriptions and recommendations of all survey sites. The following GIS maps were developed and incorporated into the report: NPS site locations, impervious surfaces in the watershed, land-use types within 100 feet of the stream channel and current Auburn zoning overlay.
- The Auburn Municipal Airport used the *Moose Brook Watershed Survey* report to select a mitigation project for their expansion request.
- The *Lewiston Sun-Journal* printed an article on August 9, 2005 about the project, the problems facing the watershed and Royal River YCC's role in the survey.



PROJECT PARTNERS:

- Royal River Youth Conservation Corps
- City of Auburn
- Hillier Associates
- Androscoggin Valley SWCD

CONTACT INFORMATION:

Don Kale, DEP – (207) 822 – 6319, Donald.Kale@maine.gov
 Henry Nichols, Royal River Conservation Trust – (207) 847-9399, royal@maine.rr.com

Nequasset Lake Watershed Survey

#2006P-13

Waterbody Name: Nequasset Lake

Location: Woolwich, Dresden and Wiscasset – Sagadahoc and Lincoln Counties

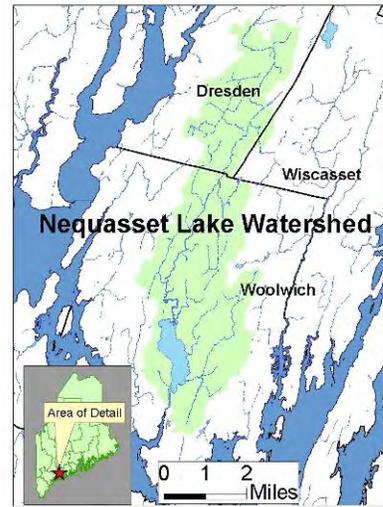
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Androscoggin Valley SWCD

Project Duration: April, 2006 – May, 2007

604(b) Grant Amount: \$14,064

Local Match: \$15,368



PROBLEM:

Nequasset Lake has a surface area of 465 acres, a direct watershed of 20.4 square miles, and serves as the public water supply for over 15,000 people in Bath and the surrounding communities. Comparable high-yield, good quality surface water supplies are rare in coastal Maine. To protect the water supply, the Bath Water District (BWD) limits bodily contact in the lake and has purchased and protected 70% of the shoreline from development. Nevertheless, forested land in the watershed is quickly being developed for residential use.

For over 20 years, the DEP and BWD have monitored the lake’s water quality. According to the DEP, water quality is below average and the lake’s potential for nuisance algal blooms is high. Long term clarity measures about 4 meters, which is below the average for Maine lakes, and occasional algal blooms have reduced clarity to as low as 1.7 meters.

PROJECT DESCRIPTION:

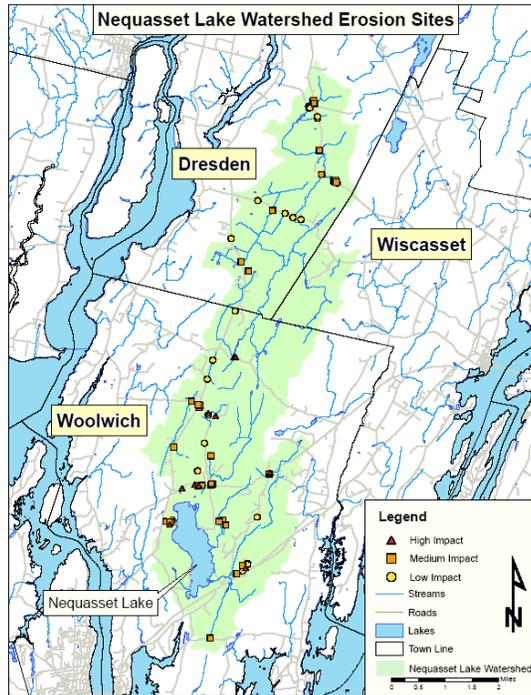
This purpose of the Nequasset Lake Watershed Survey was to identify and prioritize current threats to the lake’s water quality. Specifically, the project documented and prioritized soil erosion and phosphorous pollution sites within the watershed, with a focus on culverts, roads, driveways and trails.

Volunteers were trained to conduct identify erosion sites, rate the relative impact of each site and develop recommendations for fixing these sites. Technical staff conducted follow up visits to sites not assessed during the training, and calculated pollutant loading of all medium and high impact sites. The findings from these surveys were summarized in the *Nequasset Lake Watershed Survey Report*, which was distributed to town officials and interested community members. Public awareness was also raised through community outreach and a public forum.



PROJECT OUTCOMES:

- Volunteers and technical staff identified 66 sites in the Nequasset Lake Watershed that are impacting or have the potential to impact water quality. Fifty-eight sites were associated with town roads, private roads and driveways that tended to have greater impacts and higher cost to fix. The remaining 8 sites were associated with off-road vehicle trails, public access areas, residential land and a commercial road.
- Several private road sites have already been fixed by local residents, at large personal expense.
- The Steering Committee met more often than required and was very active in community outreach, education and volunteer recruitment. The committee continues to meet to work on watershed issues. Overall, the local match exceeded original expectations by more than \$5,000.
- The project laid a solid foundation for continued work in the watershed. Androscoggin Valley SWCD was awarded a 319 grant to begin implementation efforts in April 2008.



PROJECT PARTNERS:

City of Bath
Bath Water District
Town of Dresden
Maine Rural Water Association
Town of Wiscasset

CONTACT INFORMATION:

Donald Kale, DEP- (207) 822- 6319, Donald.Kale@maine.gov
Susan Gammon, Androscoggin Valley SWCD- (207) 753- 9400, susan.gammon@me.nacdnet.net

No Name Pond Conservation Project, Phase I

#2005R-15

Waterbody Name: No-Name Pond

Location: Lewiston and Greene – Androscoggin County

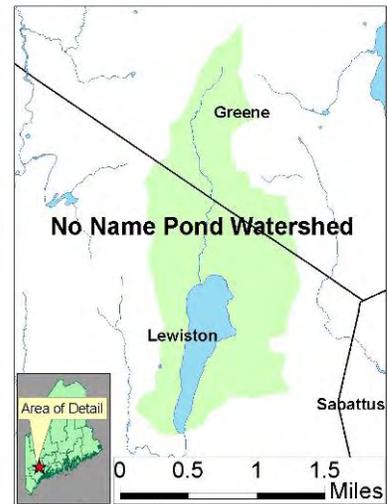
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Grantee: Androscoggin Valley SWCD

Project Duration: March 2005 – December 2007

319 Grant Amount: \$40,300

Local Match: \$51,681



PROBLEM:

No Name Pond has a surface area of 145 acres and a watershed covering 2.11 square miles. No Name Pond is Lewiston’s only great pond and provides all-season recreation for local residents. The pond is managed as a warm-water fishery with occasional stocking of trout and salmon.

No Name Pond’s water quality has been monitored since 1975, and data indicate that the pond is slightly below average. There is a high risk of nuisance algal blooms, moderate to high oxygen depletion and moderate to high risk of internal loading problems. The City of Lewiston developed the *No Name Pond Watershed Management Plan* in 2001. The public outreach component of this project led to the formation of the No Name Pond Watershed Management Association (NNPWMA), which is now actively involved in water quality monitoring and invasive plant patrols. The City of Lewiston and NNPWMA have worked together to accomplish goals laid out in the Watershed Management Plan.

PROJECT DESCRIPTION:

The purpose of this project was to significantly reduce erosion and export of sediment and phosphorus into No Name Pond. Conservation practices were installed at 27 priority NPS sites in the watershed. The availability of technical assistance was offered to all watershed residents, and staff met with and provided assistance to 26 landowners.

Education and outreach activities included the distribution of a brochure at the beginning of the project, printing articles in the association newsletter and local papers, buffer and homeowner workshops and a tour of selected sites at the end of the project.



PROJECT OUTCOMES

- Conservation practices were installed on 27 priority sites, including public roads (using city funds), private roads, driveways and private properties. This work reduced pollutant loading to the pond by an estimated 20.3 tons of sediment and 17 pounds of phosphorus per year (US EPA Region 5 Method and WEPP Method).
- Three buffer workshops and one residential workshop were held during the project. As a result of this outreach, a local resident donated \$500 toward future buffer plantings around the lake. These funds will be used to carry out two large-scale buffer plantings that were designed by project staff but were unable to be completed during the grant project.
- Project staff provided technical assistance to 26 landowners during the project period – far exceeding the goal of 12 written into the original workplan. Staff made follow-up visits to 11 of the sites to further assist landowners with their erosion problems.
- Vegetated buffers were planted at seven locations around the pond – either as stand alone projects or combined with other construction sites. The plantings extended along 115 feet of lake shoreline and 70 feet of streambank.
- Jeanne Raymond, the president of the NNPWMA, received a Community Service award from the City of Lewiston for her commitment to the environment and her work as a steward of the pond.



PROJECT PARTNERS:

No-Name Pond Watershed Management Association
City of Lewiston

CONTACT INFORMATION:

Marianne Hubert, DEP - (207) 287-4140, marianne.e.hubert@maine.gov
Susan Gammon, Androscoggin Valley SWCD - (207) 753-9400, susan.gammon@me.nacdn.net

Ogunquit River Watershed Management Plan

#2003-01

Waterbody Name: Ogunquit River

Location: Ogunquit, Wells, York and South Berwick – York County

Waterbody Status: NPS Priority Watershed

Project Grantee: Wells National Estuarine Research Reserve

Project Duration: May 2003 – March 2007

319 Grant Amount: \$32,800

Local Match: \$14,675



PROBLEM:

The Ogunquit River watershed covers approximately 20 square miles. The river discharges into the Ogunquit estuary behind a 2.5-mile-long beach. Its estuary accommodates many recreational uses, including swimming, recreational fishing, canoeing, kayaking and bird watching. As one of the most productive clam flats in southern Maine, the river is also a valuable economic resource. Annually, clam harvesting licenses provide \$6,200 in revenue to the Town of Ogunquit, and about \$70,000 worth of soft shell clams are harvested each year.

During the 1990’s, Ogunquit’s year-round population increased by 26%, which was twice the rate of York County as a whole. Also within this period, there was an 8% increase in both single family housing units and hotel/ motel rental units. Nearly all of the Town’s runoff flows to the Ogunquit River and estuary, and from 1988 until 1998, the clam flats were closed due to elevated bacterial pollutants. Since the clam flats were re-opened, there have been several emergency closures due to heavy stormwater runoff events.

PROJECT DESCRIPTION:

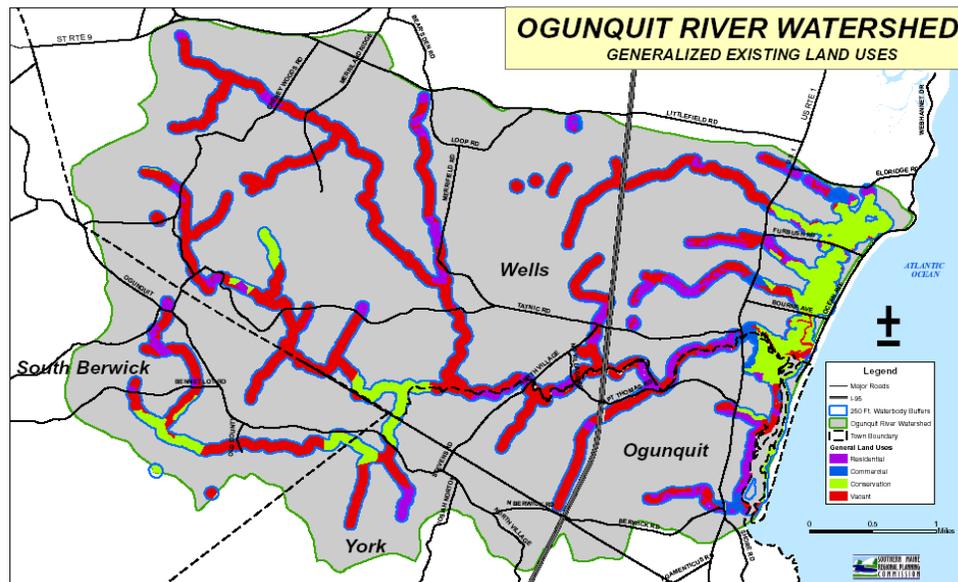
The purpose of this project was to develop a watershed management plan for the Ogunquit River watershed that can be used to guide long-term protection efforts. Watershed problems and needs were assessed in the early phases of the project. In 2003, technical staff and 35 volunteers identified and prioritized 160 NPS sites within the 100 to 250+ foot shoreland zone in the entire watershed. The Southern Maine Regional Planning Commission (SMRPC) used GIS and zoning maps to map vacant land within 250 feet of the river and its main tributaries with the potential for future development.

Survey information and the build-out analysis maps were used to develop a watershed management plan, which recommends BMPs and “smart growth strategies” to significantly reduce NPS pollution and estuary degradation. The project raised awareness and gathered public input in the watershed through six public presentations. 600 property owners within 250 feet of the Ogunquit River were contacted, and several community events were publicized and well attended.



PROJECT OUTCOMES:

- 160 potential NPS sites were identified in the 2003 Ogunquit River shoreland survey. Survey results were summarized in the report, *Ogunquit River Watershed: Shoreland Survey of Non-Point Source Pollution* (March, 2005).
- Staff from SMRPC used GIS and town zoning information to identify and map vacant land within 250 feet of the Ogunquit River and its major tributaries with the potential for future development. The build-out analysis maps are included in the watershed management plan.
- The *Ogunquit River Watershed Management Plan* was completed in 2007. The plan outlines four objectives and 23 action items to protect and restore the watershed.
- The Ogunquit Conservation Commission was formed in 2004, and they have since assumed a leading role in the river protection efforts in Ogunquit and the other watershed towns.



PROJECT PARTNERS:

Towns of Ogunquit, Wells, South Berwick and York
York County SWCD
University of New England
York County Technical College
Ogunquit River Water Sampling Committee
Southern Maine Regional Planning Commission



CONTACT INFORMATION:

Donald Kale, DEP - (207) 822-6319, Donald.Kale@maine.gov
Tin Smith, Wells National Estuarine Research Reserve - (207) 646-1555, tsmith@wellsnerr.org

Salmon-McGrath Watershed Load Abatement Project – Phase 3

#2005R-13

Waterbody Name: Salmon Lake and McGrath Pond

Location: Belgrade and Oakland – Kennebec County

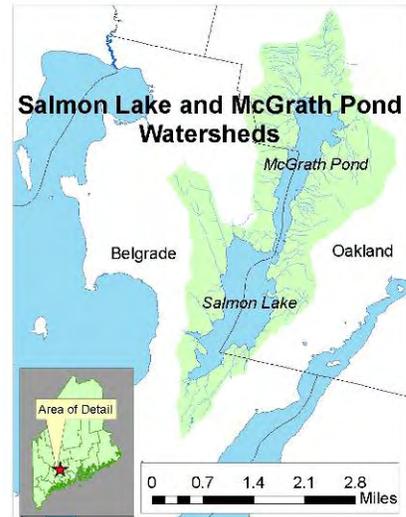
Waterbody Status: NPS Priority Watershed

Project Grantee: Kennebec County SWCD

Project Duration: April 2005 – December 2007

319 Grant Amount: \$46,873

Local Match: \$31,947



PROBLEM:

Salmon Lake and McGrath Pond are located in the towns of Belgrade and Oakland and are part of the Belgrade Lakes watershed. McGrath Pond flows through a short connector to Salmon Lake, which then flows to Great Pond. McGrath Pond has a surface area of 485 acres and a 3.8 square mile watershed, and Salmon Lake has a surface area of 667 acres and a 3.1 square mile watershed.

The water quality of McGrath Pond is slightly above average, and the potential for algal blooms is moderate. Salmon Lake’s water quality, however, is considered to be slightly below average and the potential for algal blooms is moderate. Prior to a restoration project in the mid 1980s, Salmon Lake experienced frequent algal blooms. Since then, it has experienced occasional blooms. The lake continues to have high phosphorus levels and high dissolved oxygen depletion in deep areas of the lake.

A 1999 NPS survey identified 132 NPS sites in the watersheds. An additional 73 sites were identified during the Phase 1 and Phase 2 implementation projects. A total of 70 sites were fixed during these two phases. The majority of sites fixed were high and medium priority sites associated with shoreline development (private roads, driveways and residences), but included some commercial businesses and town or state roads.

PROJECT DESCRIPTION:

The primary purpose of the Phase 3 project was to continue reducing NPS pollutant loading by installing BMPs on 20 high and medium priority sites. Despite challenges in getting BMP sites completed, 19 NPS sites were remediated through cost share agreements. The project proved to be challenging because it was the third phase and there were fewer interested and willing landowners. Also, significant additional staff time was spent seeking contractors and conducting project administration (due to the small scale nature and the large number of landowner agreements).



Pinney Road Project

In addition to remediation on the 19 sites, technical assistance was provided to six landowners with low priority sites. Education and outreach on the project included a camp road workshop and articles in local newspapers and the Kennebec County SWCD newsletter.

PROJECT OUTCOMES:

- Best Management Practices were installed on a total of 19 sites. Project work included the following:
 - Stabilized driveway (1 site) and road surface (4 sites)
 - Installed turnouts (1 site) and ditches (3 sites)
 - Replaced culverts and armored inlets/outlets (2 sites)
 - Spread erosion control mulch (2 sites)
 - Stabilized slope and shoreline (2 sites)
 - Enhanced buffer
- Annual pollutant loading was reduced by an estimated 13.9 tons of sediment and 14.0 pounds of phosphorus due to installation of best management practices (US EPA Region 5 Method and WEPP Method).
- Technical assistance was provided to six landowners.
- 13 landowners attended a road maintenance workshop.



The Phase 3 project addressed several erosion problems on Pinney Road. New surface material was added to the road surface, and the road was crowned. A rock-lined sediment basin was installed to trap runoff (above left), and rubber razor blades were installed to divert runoff into the woods (above right).

PROJECT PARTNERS:

Belgrade Regional Conservation Alliance Conservation Corps
McGrath Pond-Salmon Lake Association

CONTACT INFORMATION:

Mary Ellen Dennis, DEP - (207) 287-7729, mary-ellen.c.dennis@maine.gov
John Blais, Kennebec County SWCD - (207) 622-7847, john@kcsxcd.org

Sebasticook Lake Watershed Project, Phase 3

#2003R-21

Waterbody Name: Sebasticook Lake

Location: Newport – Penobscot County

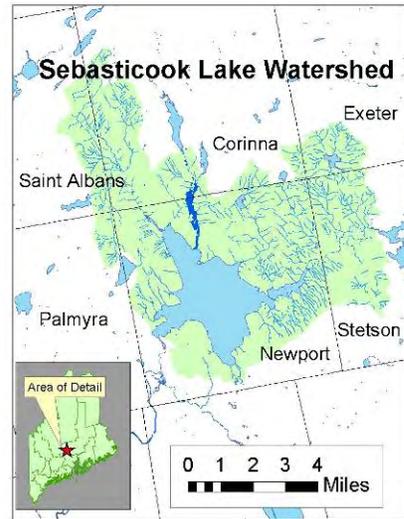
Waterbody Status: NPS Priority Watershed, Impaired

Project Grantee: Penobscot County SWCD

Project Duration: May 2004 – January 2007

319 Grant Amount: \$76,000

Local Match: \$55,794



PROBLEM:

Sebasticook Lake is located in the town of Newport, approximately 26 miles west of the city of Bangor. The lake covers 4,537 acres and holds the distinction of being the largest Maine lake that lies completely within the boundaries of a single town. In addition to Newport, nine other towns are located within Sebasticook Lake’s 85 square mile watershed. Approximately 75% of the watershed is forested. The remaining 25% is developed, of which 64% is in agriculture, 19% is residential and 7% is roads.

Sebasticook Lake was once recognized as one of the most polluted lakes in Maine, and it remains on Maine’s list of impaired waters. However, water quality has improved due to concerted efforts by state and local stakeholders to reduce phosphorus loads. Wastewater treatment has been upgraded in Corinna and Dexter; BMPs have been adopted to address residential and agricultural runoff sources; and the lake’s outlet dam was reconstructed to allow annual fall drawdowns. The DEP’s TMDL Assessment (2001) cited agriculture as the principal source of phosphorus loading to the lake, along with roadways, residential areas, noncultural and atmospheric phosphorus loads and other development.

PROJECT DESCRIPTION:

The purpose of this project was to educate watershed landowners and reduce soil erosion and polluted runoff by installing water quality best management practices (BMPs) on NPS sites. Conservation practices were installed on 21 sites with cost sharing and technical assistance provided by NRCS and DEP.

The project was well publicized through mailings, newspaper articles and public meetings, resulting in a significant number of landowner inquiries. However, the project faced several challenges and was unable to reach the goal of fixing 30 sites. The turnover in personnel (three different project managers) created delays in the project, and it proved difficult to implement the BMP projects within the allotted timeline. The cost estimates in the project workplan were also affected by inflation and the increased costs of fuel. For this reason, the money available for construction was not adequate to complete 30 sites.



The Veazland Farms project was funded by EQIP and 319. The concrete-lined basin traps solids in the farm runoff, and the liquids are filtered through a vegetative buffer.

PROJECT OUTCOMES:

- BMPs were installed at 21 sites. Work included camp road erosion and sediment controls, an agricultural concrete basin, vegetative buffer plantings and lakeshore stabilization.
- Pollution loading to the lake was reduced by an estimated 120 tons of sediment, 127.7 pounds of phosphorus and 333.3 pounds of nitrogen per year (US EPA Region 5 Method).
- Penobscot County SWCD provided technical assistance to 17 individual landowners, one campground, one farm and two towns.
- Through lake association publicity and outdoor workshops, other landowners learned to solve erosion problems.



Project work on Kitchen Hill Road included adding new surface material to the road and enlarging and stabilizing the cross culvert and ditch.

PROJECT PARTNERS:

USDA Natural Resource Conservation Service
Town of Newport
Town of Corinna
Town of Dexter

CONTACT INFORMATION:

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Chris Brewer, Penobscot County SWCD - (207) 990-3676, ext. 3, chris.brewer@me.nacdn.net

Sheepscot River Watershed Management Plan Project

#2004R-09

Waterbody Name: Sheepscot River

Location: 22 Towns – Kennebec, Knox, Lincoln and Waldo Counties

Waterbody Status: NPS Priority Watershed, 2 Impaired Tributaries

Project Grantee: Time & Tide Resource Conservation and Development Area

Project Duration: April 2004 – February 2007

319 Grant Amount: \$62,565

Local Match: \$9,319



PROBLEM:

The Sheepscot River is 58 miles long, extending from Montville to Southport, and its watershed covers approximately 364 square miles. Most of the mainstem is Class AA, and the river and lakes in the watershed are high value recreational resources used for swimming, boating and fishing. The Sheepscot is one of the eight Maine rivers with endangered Atlantic Salmon populations, which brings added special concern for protection and restoration.

Overall, water quality is high, but there are some tributaries either of concern or with impaired water quality. Low dissolved oxygen and sedimentation are considered to be the most significant issues for these tributaries. Land uses of concern include agriculture, forestry, recreation, gravel mining and development. The greatest threat is the conversion of forest to suburban and residential development. Previous work in the watershed includes a road survey of the West Branch and a riparian survey and implementation projects for the Sheepscot and West Branch.

PROJECT DESCRIPTION:

The primary purpose of the project was to develop a watershed management plan for the Sheepscot River. The plan and its recommendations focused on the 12 towns with significant land area (>10 sq. mi.) in the watershed. Time and Tide contracted with Kennebec County SWCD and the Sheepscot River Watershed Council to manage the project.

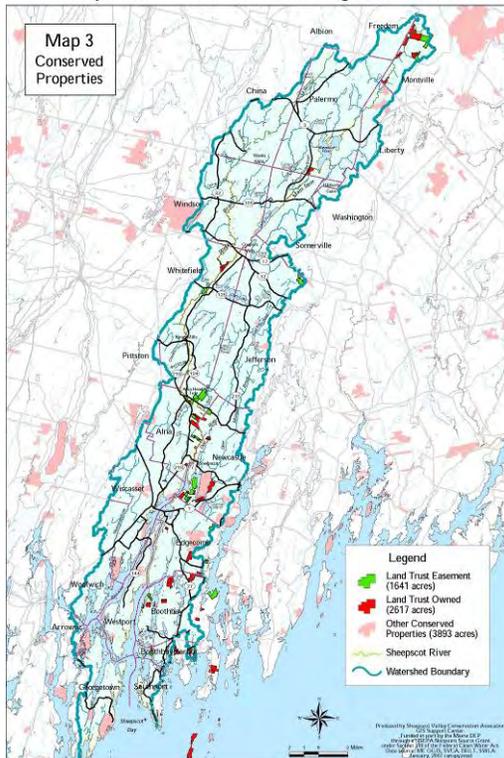


Five project partners completed a survey of road and stream crossings in the twelve towns. The information was compiled in a report and mapped in GIS. Project staff also prepared a water quality assessment report that summarizes and interprets data collected by Sheepscot Valley Conservation Alliance and others. Public input and outreach was generated through four public meetings, meetings with key stakeholders, interviews with 18 landowners and town officials, and presentations at six town meetings. Survey findings, water quality information and public input were used to develop a 90-page watershed management plan, which lays out a clear plan for towns, agencies and water quality organizations.

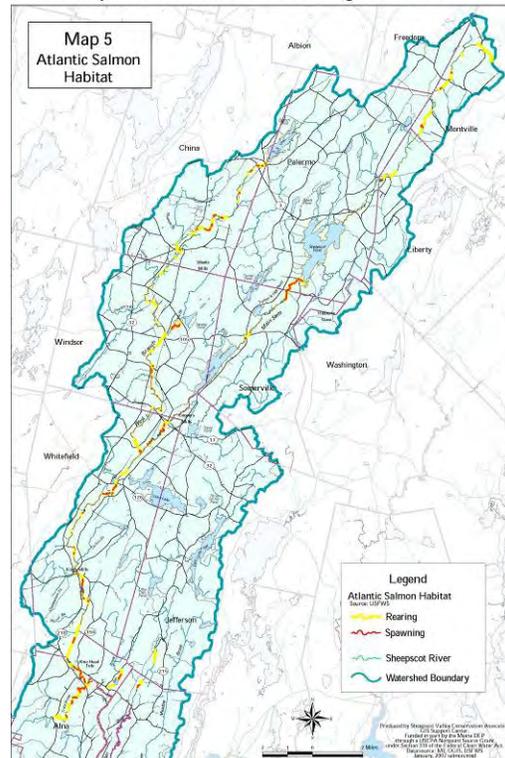
PROJECT OUTCOMES:

- The *Sheepscoot River Watershed Management Plan* (January 2007) was completed. Particular strengths of the plan are the water quality assessment and land use/regulatory analysis sections.
- The plan identifies 20 general recommendation areas and lists specific priority actions and long term actions for each general recommendation.
- A road NPS survey was completed in the watershed. A total of 335 sites were identified, and 105 of the sites were designated as high priority sites.
- Public participation and outreach was generated through four public meetings, meetings with key stakeholders, interviews with 18 landowners and town officials, and five town presentations.

Sheepscoot Watershed Management Plan



Sheepscoot Watershed Management Plan



PROJECT PARTNERS:

- Kennebec County SWCD
- Knox-Lincoln SWCD
- Waldo County SWCD
- Sheepscoot River Watershed Council
- Sheepscoot Valley Conservation Alliance

CONTACT INFORMATION:

Mary Ellen Dennis, DEP - (207) 287-7729, mary-ellen.c.dennis@maine.gov
 Susan Watson, Time & Tide Resource Conservation Area – (207) 622-7847, susan.watson@me.usda.gov

**Sheepscoot West Branch NPS Control and Habitat Improvement, Phase III
#2006R-08**

Waterbody Name: West Branch Sheepscoot River

Location: China, Palermo, Whitefield, and Windsor – Kennebec, Waldo, and Lincoln Counties

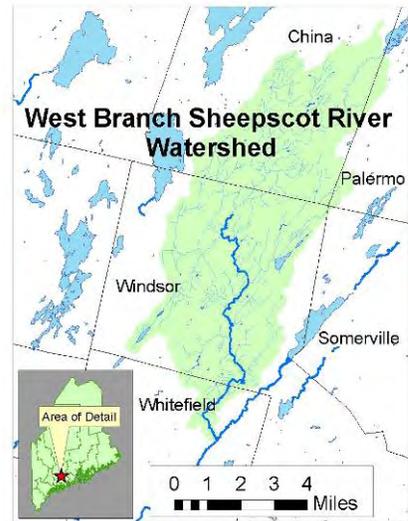
Waterbody Status: NPS Priority Watershed, Impaired

Project Grantee: Kennebec County SWCD

Project Duration: May 2006 – December 2007

319 Grant Amount: \$77,943

Local Match: \$87,451



PROBLEM:

The West Branch of the Sheepscoot River is categorized by the Maine DEP as Class AA - the highest water quality goal. The West Branch does not meet state water quality standards due to persistent low dissolved oxygen, high phosphorus and high turbidity, as well as thermal stress in some locations. The West Branch has historically supported a wild population of Atlantic salmon, but in recent years there has been a decline in spawning salmon.

Nonpoint source pollution – sedimentation and nutrient loading – are seen as the chief impairments to water quality and have a significant impact on the habitat quality for spawning and juvenile salmon and other species. According to a 2005 watershed survey, public and private roads were considered a major source of NPS pollution in the West Branch’s 50 square mile watershed. The first two phases of 319-funded work repaired 65 of the 137 priority road sites identified in the survey. A watershed management plan for the entire Sheepscoot River Watershed, including the West Branch, was completed in 2007.

PROJECT DESCRIPTION:

The objectives of this project were to install BMPs on high and medium priority NPS sites in the watershed, provide specialized training in NPS management to town staff, and continue the water quality monitoring program in the West Branch.

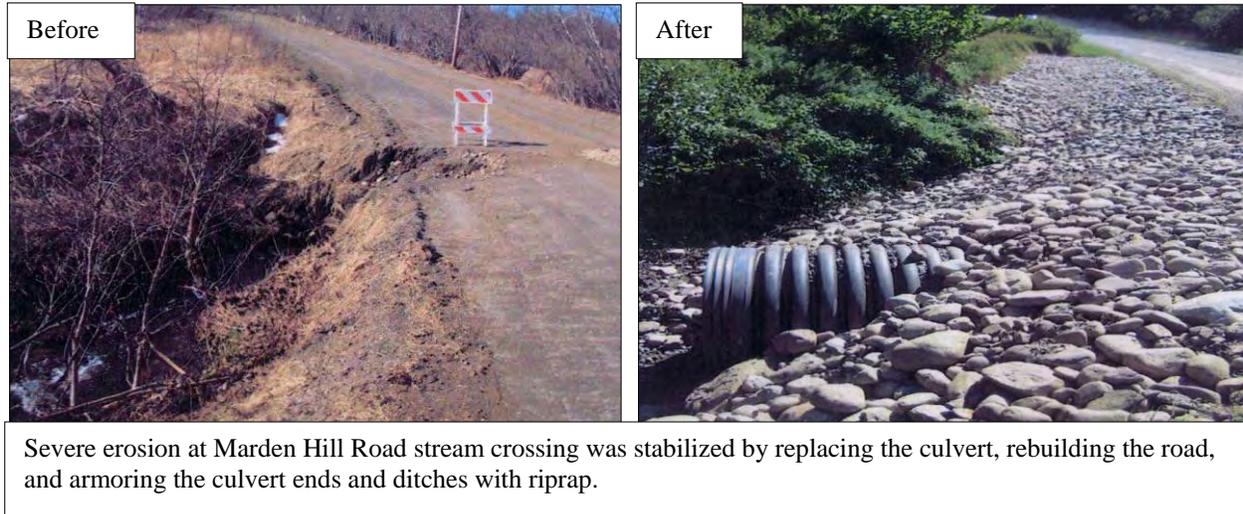
BMPs were implemented at 28 sites in the watershed. Work included road rebuilding and crowning, ditch creation and stabilization, and culvert installation and armoring. Trail and shoreline stabilization work at erosion sites in the Whitefield Salmon Preserve was completed by the Maine Conservation Corps and volunteers. The importance of proper road maintenance and its connection to NPS pollution and the water quality of the river was emphasized through specialized training in road maintenance and technical assistance to town public works employees and road commissioners. Another well-received workshop covered the topic of culvert replacement, culvert impacts and the associated permit process.



Erosion control work by the Maine Conservation Corps

PROJECT OUTCOMES:

- BMPs were implemented on 28 sites in the watershed. Projects included crowning and rebuilding roads, creating and stabilizing ditches, and installing and armoring culverts.
- The Maine Conservation Corps and local volunteers stabilized several trail and shoreline erosion sites in the Whitefield Salmon Preserve.
- The project reduced pollutant loading to the river by an estimated 4.6 tons of sediment, 4.6 pounds of phosphorus, and 9.1 pounds of nitrogen each year (WEPP Method).
- A workshop on permitting and culverts brought together state and federal agencies, towns, contractors and watershed association members.
- The Sheepscot Valley Conservation Association completed two more years of water quality monitoring and reporting, resulting in 14 years of continuous monitoring.



PROJECT PARTNERS:

Town of Palermo
Town of Windsor
Town of China
Sheepscot Valley Conservation Association
Maine Conservation Corps
Maine Department of Transportation Local Roads Center

CONTACT INFORMATION:

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

Spruce Creek Watershed Survey

#2005R-01

Waterbody Name: Spruce Creek

Location: Kittery and Eliot – York County

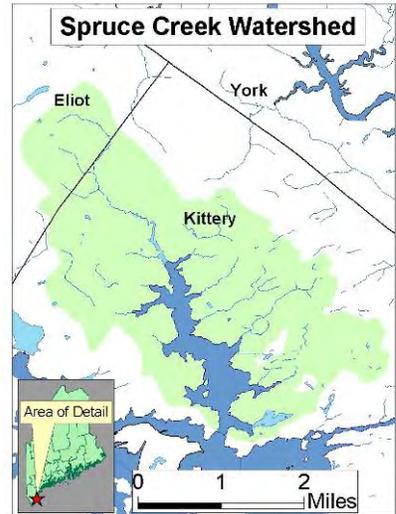
Waterbody Status: NPS Priority Watershed, Impaired

Project Grantee: Wells National Estuarine Research Reserve

Project Duration: May 2005 – January 2007

319 Grant Amount: \$23,725

Local Match: \$19,322



PROBLEM:

The Spruce Creek watershed covers 9.6 square miles in Kittery and Eliot in southernmost Maine. The creek flows into the Piscataqua River about 1.5 miles from where the river meets the Gulf of Maine. The creek is primarily fed by six freshwater streams and includes approximately 3 square miles of tidal area (including high salt marsh, ledge and mud flats). Watershed land use includes sparse residential development and some active farmland and woodlots in the upper reaches in Eliot. Along the Route 1 and Route 95 corridor, there are extensive impervious areas in commercial strip malls, roads and interchanges. The tidal portion is residential with larger homes along the immediate shoreline.

The Maine DEP lists Spruce Creek as Impaired due to bacterial contamination, low dissolved oxygen, toxic contamination and a compromised ability to support aquatic life. Although a portion of Spruce Creek was open to shellfish harvesting in the past, the flats have been closed since 2005 due to poor water quality and high fecal coliform concentrations. The Spruce Creek Association formed in 2002 to promote watershed stewardship and now has over 180 members.

PROJECT DESCRIPTION:

The purpose of this project was to identify, document, and prioritize NPS sites within 250 feet of the estuary and major tributaries of Spruce Creek. On June 4, 2005 over 50 volunteers were trained to document NPS pollution sites, riparian area conditions, and any other impacts on water quality. Over the course of the summer and fall, staff and volunteers surveyed over 56 miles of shoreline and identified 197 NPS sites.



Survey data, maps and recommendations for each site were compiled in the report, *Spruce Creek Watershed: Non-Point Source Pollution Survey* (June, 2006). Copies of the report were shared with town officials and the public, and the report was also posted on the Spruce Creek Association’s website. Public outreach was provided to the general public, planning boards, selectmen, conservation commissions and land trusts through mailings, posters, press releases and the survey training session. Letters about the project were mailed to over 280 riparian landowners. A total of 49 people attended two public presentations about survey findings.

PROJECT OUTCOMES:

- A shoreline survey of Spruce Creek and its major tributaries was completed. The survey documented 197 NPS sites. The most prevalent NPS problems included excess nutrients, lack of vegetated shoreland buffer, trash and debris, impervious surfaces and flow restrictions.
- The *Spruce Creek Watershed: Non-Point Source Pollution Survey* report was completed in June, 2006. The report includes maps and descriptions of the identified NPS sites.
- The survey project established the Spruce Creek Association as a prominent leader in the watershed and helped galvanize local support for ongoing Spruce Creek protection efforts. Since the survey project, a watershed-based plan has been completed, and the Town of Kittery was awarded a 319 grant to begin watershed mitigation efforts in April 2008.
- The value of local match for the project was \$19,322, which far exceeded the planned goal of \$13,325. High volunteer participation in the survey and the Town of Kittery’s \$2,500 contribution to the project helped boost match levels.



50 volunteers participated in the Spruce Creek survey. Due to the high turnout, 75% of the survey was completed on the first day. A local restaurant donated lunch to project volunteers.

PROJECT PARTNERS:

Town of Kittery
Town of Eliot
Kittery and Eliot Conservation Commissions
Kittery Shellfish Commission
Kittery Department of Public Works
Kittery Land Trust
Great Works Regional Land Trust

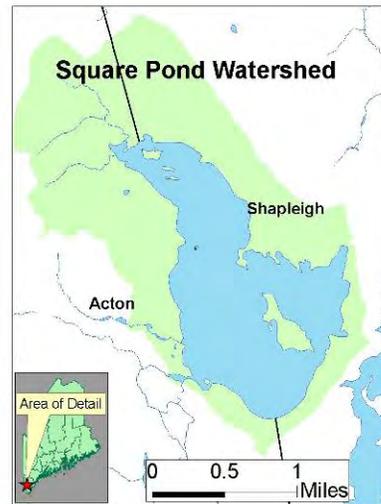
Spruce Creek Association
Spruce Creek Watershed Council
Maine State Planning Office
Maine Department of Marine Resources
Southern Maine Regional Planning Commission
Nonpoint Education for Municipal Officials (NEMO)

CONTACT INFORMATION:

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Tin Smith, Wells National Estuarine Research Reserve, 207.646.1555 x119, tsmith@wellsnerr.org

Square Pond Watershed Survey #2006P-12

Waterbody Name: Square Pond
 Location: Acton and Shapleigh – York County
 Waterbody Status: NPS Priority Watershed
 Project Grantee: York County SWCD
 Project Duration: April 2006 – December 2007
 604(b) Grant Amount: \$12,445
 Local Match: \$17,711



PROBLEM:

Square Pond is a 910-acre lake with a direct watershed of 4.3 square miles. Square Pond flows into Goose Pond and then Mousam Lake, which was recently removed from the state's impaired waters list. The pond is highly developed with over 500 seasonal camps and year-round homes, a state-owned boat launch and a town-owned beach. About 180 seasonal residents live on Treasure Island. The residents operate their own ferry service to the island, which does not have formal roads or automobiles.

The Square Pond Improvement Association (SPIA) and Maine DEP have monitored the pond's water quality since 1977. Data indicates that the lake currently has above average water quality. However, the pond is at risk of future water quality problems due to its high density shoreline development, relatively slow flushing rate of 0.27 times per year, and moderate oxygen depletion in one of the two basins. The SPIA formed a water quality committee in 2003 to focus its energies on this threat. The Mousam Lake Youth Conservation Corps also completed several erosion control projects on lakefront properties.

PROJECT DESCRIPTION:

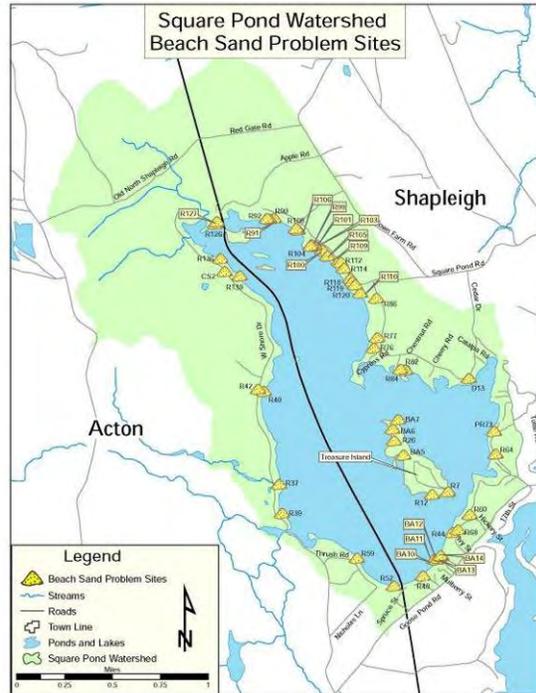
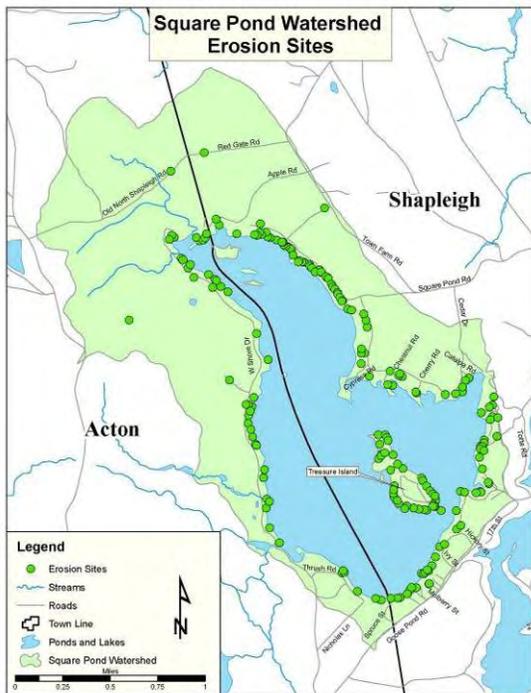
The purpose of the project was to identify, document and prioritize soil erosion sites in the Square Pond Watershed and to recommend conservation practices for each of these sites. Survey methods were based on those outlined in the DEP publication, *Citizen's Guide to Lake Watershed Surveys*. The day-long volunteer training session was held on May 20, 2006. Thirty-two volunteers completed the survey over the following month, and technical staff checked their work in the fall.

The watershed survey identified a total of 207 erosion sites. Survey data was summarized in the *Square Pond Watershed Survey Report*. Survey reports and two-page summaries of the survey findings were distributed to town officials and watershed residents. The SPIA also took the initiative to send tailored notification letters to landowners associated with identified sites. Project staff delivered presentations at the SPIA annual meetings in 2006 and 2007, organized a hands-on workshop to fix erosion problems on a property identified during the survey, and conducted several technical assistance visits in the summer of 2007.



PROJECT OUTCOMES:

- Project staff and 32 volunteers surveyed the entire Square Pond watershed and documented 207 erosion sites. The *Square Pond Watershed Survey Report* was completed in May 2007. The report summarizes watershed survey findings and lists specific descriptions and recommendations for identified sites.
- During the survey, 55 sites were found that had sand added to their beaches. In response to this pervasive problem, project staff developed a two-page flyer outlining the environmental impacts, legal implications and alternatives to adding sand to beaches. 500 copies were printed, and copies were distributed by the SPIA.
- A hands-on workshop was held in July 2007 at a property identified in the watershed survey. During this workshop, volunteers planted 82 plants, spread 14 cubic yards of Erosion Control mulch, installed a roof dripline trench and stabilized a path to the lake.
- The project laid the foundation for mitigation efforts in the watershed. York County SWCD was awarded a 319 grant to start mitigation work in the watershed in April 2008.



PROJECT PARTNERS:

Square Pond Improvement Association
 Town of Acton
 Town of Shapleigh

CONTACT INFORMATION:

Wendy Garland, DEP – (207) 822-6320, wendy.garland@maine.gov
 Joe Anderson, York County SWCD – (207) 324-0888, janderson@yorkswcd.org

Tannery Brook Water Quality Improvement Project, Phase I

#2003R-11

Waterbody Name: Tannery Brook

Location: Gorham – Cumberland County

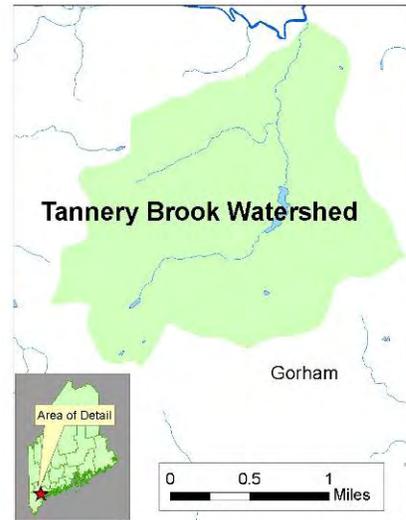
Waterbody Status: Presumpscot River – NPS Priority Watershed

Project Grantee: Cumberland County SWCD

Project Duration: April 2003 – April 2007

319 Grant Amount: \$68,379

Local Match: \$59,291



PROBLEM:

Tannery Brook is a second order, Class B stream that flows into the Little River and then the Presumpscot River. A dam between its middle and lower reaches was breached in 1998, but the structure still blocks the passage of aquatic organisms and restricts water flow. Tannery Brook’s water quality is threatened by NPS pollution from its 2.8 square mile watershed. Numerous stormwater outfalls from the downtown village area and the University of Southern Maine’s Gorham campus contribute excess sediment, increased flows, and warm stormwater to the stream, and an estimated 400 septic systems adjacent to the stream have the potential to impact water quality.

Cumberland County SWCD took the lead role in monitoring Tannery Brook’s water quality for 12 months beginning in November 1999. Monthly water chemistry data from six testing sites indicated that Tannery Brook met its Class B standards for the most part. However, macroinvertebrate sampling indicated that the lower reaches of the stream fail to meet Class B biological criteria. A 2004 watershed survey identified 37 pollution sites in the watershed, and a Stream Habitat and Rapid Geomorphology Survey identified areas of habitat degradation. In October 2004, 35 residents and town officials took part in a day-long community forum, which served as the foundation for the *Tannery Brook Watershed Management Plan* (December, 2005).

PROJECT DESCRIPTION:

The purpose of this project was to reduce NPS pollution in the Tannery Brook watershed. Four stormwater outfalls in the Tannery Brook watershed were improved to remove excess sediment, attenuate peak flows, and lower stream temperature and conductivity. 800 feet of trails were also stabilized in Tannery Brook Park.

Volunteers stenciled approximately 120 storm drains throughout downtown Gorham. The Gorham Public Works staff agreed to continue the stenciling program as part of their catch basin clean-out and maintenance duties. Community updates about project activities were delivered through a Gorham Times newspaper article, a presentation to the Town Council, cable access TV and a mailing to watershed residents.



Volunteers stenciled storm drains with the message, *Dump No Waste, Drains to Stream.*

PROJECT OUTCOMES:

- Stormwater outfalls draining parts of the USM campus and downtown Gorham were improved at four priority watershed sites. Large sediment basins were installed below three outfalls, and new culverts were installed and stabilized at another site. Stormwater BMPs were installed at two additional sites prior to project start up, and the Maine DOT planned to address one more site after the project ended.
- AmeriCorps volunteers stenciled the message, “Dump No Waste, Drains to Stream” on approximately 120 storm drains on 24 streets in the watershed. The Presumpscot River Youth Conservation Corps conducted a clean up of a dump site adjacent to the stream.
- Project staff collaborated with the Gorham Parks and Conservation Commission to stabilize over 800 feet of trails in Tannery Brook Park that had been severely eroded by ATVs.
- Pollutant loading to Tannery Brook and its tributaries was reduced by an estimated 230 tons of sediment per year (US EPA Region 5 Method).



Existing stormwater BMPs at the Rite Aid in downtown Gorham were undersized and unable to handle the runoff. A large rock-lined sediment basin, ditch and checkdams were installed to slow and treat the stormwater.

PROJECT PARTNERS:

Casco Bay Estuary Project
Town of Gorham
Gorham Public Works Department
Gorham Parks and Conservation Commission
Maine Department of Transportation
Nonpoint Education for Municipal Officials Program (NEMO)
Trout Unlimited
University of Southern Maine
Presumpscot River Youth Conservation Corps

CONTACT INFORMATION:

Donald Kale, DEP – (207) 822- 6319, Donald.Kale@maine.gov
Betty Williams, CCSWCD – (207) 892- 4700, betty-williams@cumberlandswcd.org

**Upper New Meadows River Watershed Implementation Project, Phase 1
#2005R-12**

Waterbody Name: New Meadows River

Location: Bath, Brunswick, Harpswell, Phippsburg, West Bath – Cumberland and Sagadahoc Counties

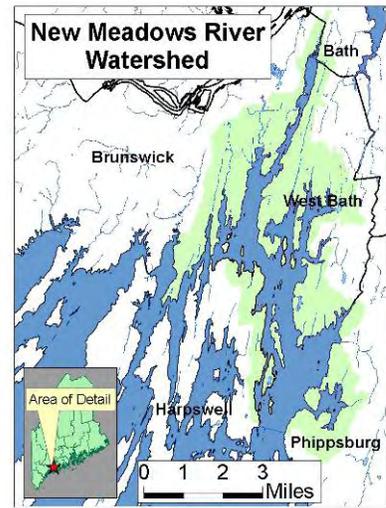
Waterbody Status: NPS Priority Watershed

Project Grantee: Town of Brunswick

Project Duration: May 2005 – December 2007

319 Grant Amount: \$38,500

Local Match: \$105,970



PROBLEM:

The New Meadows River watershed covers 26 square miles in Cumberland and Sagadahoc Counties and empties into the northern end of Casco Bay. The river supports extensive finfish, shellfish and lobster fisheries. The primary water quality problems in the New Meadows River include low dissolved oxygen levels, high fecal coliform counts, and roughly 30 licensed overboard discharge systems. While water quality issues in the lower reaches have been addressed, high nutrient levels and low dissolved oxygen levels persist in the upper portion of the watershed. Problems in the upper watershed have been attributed to the Route 1 causeway, which restricts tidal flow and forms two “lakes”. The lake experiences frequent algal blooms and routinely violates DEP dissolved oxygen standards. While much of these water quality problems are due to the lack of tidal flushing, overland nutrient contributions likely contribute to the problems.

The New Meadows River Watershed Project (NMRWP) was initiated by the watershed towns in 1999 in response to the DEP listing the New Meadows River Estuary as a nonpoint source priority coastal water. This collaborative effort has since conducted a NPS survey of the upper watershed in 2000, completed the *New Meadows River Watershed Management Plan* in 2004 and continues to meet to guide watershed protection efforts.

PROJECT DESCRIPTION:

The purpose of the project was to reduce nutrient loading to the New Meadows “lakes” in the upper watershed. This was accomplished by fixing seven erosion sites identified in the 2000 NPS survey. Project staff provided technical assistance to 25 landowners and municipal officials about additional erosion and runoff issues in the watershed.



Project staff also conducted a survey in the upper watershed to identify areas of probable nutrient loading not identified in the 2000 survey efforts. Completed project sites were highlighted on a “virtual tour” that will be aired on local cable access stations and the New Meadows River Project website. Another presentation on the “importance of Vegetative Buffers” was presented at the Bath City Hall in December, 2007 and aired on Brunswick Cable Access. Press releases were also printed in the Brunswick Times Record.

PROJECT OUTCOMES:

- Seven sites were stabilized in the upper watershed. BMPs included fencing to keep cattle out of a pond leading to the river; installing stone-lined ditches, water diverters and new surface material on roads; and planting native trees and shrubs along a shoreline property.
- Pollutant loading to the New Meadows River was reduced by an estimated 30 tons of sediment per year (US EPA Region 5 Method).
- The steering committee continues to meet regularly and oversees the larger New Meadows River Watershed Project, which addresses NPS pollution, habitat and tidal restoration, and economic resource protection. The committee is updating an Action Plan for the entire New Meadows River Watershed.
- Due to the extensive work completed at a number of the NPS abatement sites, the total local match exceeded the funds originally planned by nearly \$80,000.



PROJECT PARTNERS:

City of Bath
Bowdoin College
Town of Brunswick
Casco Bay Estuary Project
Cumberland County SWCD
Friends of Casco Bay

Maine Department of Marine Resources
Maine Department of Transportation
Maine State Planning Office
New Meadows Lakes Association
Town of West Bath

CONTACT INFORMATION:

Donald Kale, DEP – (207) 822-6319, Donald.Kale@maine.gov
Vanessa Levesque, Town of Brunswick – (207) 725-6639, vlevesque@brunswick.org

Webber Pond Phosphorus Reduction Project

#2005R-09

Waterbody Names: Webber, Threemile and Three-Cornered Ponds

Location: Augusta, China, Vassalboro, Windsor – Kennebec County

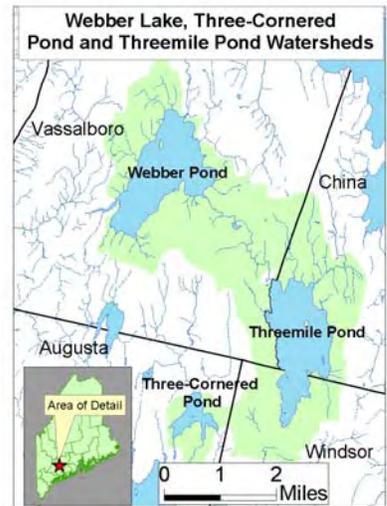
Waterbody Status: Impaired, NPS Priority Watersheds

Project Grantee: Kennebec County SWCD

Project Duration: March 2005 – December 2007

319 Grant Amount: \$77,362

Local Match: \$59,700



PROBLEM:

Three-Cornered Pond drains to Threemile Pond, which then drains into Webber Pond via Seaward Mills Brook. The combined watershed size is approximately 22.5 square miles. Webber and Threemile Ponds have a history of algal blooms during late summer, and there is a general downward trend in water quality in all three ponds. As a result, all three ponds are listed as Impaired by the Maine DEP.

The DEP’s TMDL reports for each pond outline past pollution control efforts, reported sources of phosphorus loading and recommendations for corrective actions. Internal loading from sediment in the ponds is the largest single contributor of phosphorus to the lakes. However, in-lake alum treatments were not recommended because of the expense and continued contribution of land-based pollution sources after treatment, which could again eventually allow phosphorus to exceed the pond's capacity. Past surveys showed that 58% of the 400 residences on the shorelines of the three ponds had moderate to high impacts on water quality. Roads were also significant NPS sources.

PROJECT DESCRIPTION:

This project attempted to reduce phosphorus loading in the three watersheds by implementing actions proposed in TMDL reports and Watershed-Based Plans. Gravel roads and shorelines were the primary pollution sources targeted, and landowners, road associations and towns received intensive outreach and technical assistance along the 45 camp roads and 31 miles of town roads in the tri-watershed.

Cost-sharing was used to implement BMPs on 39 NPS problem sites. Project staff also provided 60 watershed landowners with technical assistance and specific recommendations for their roads and properties. Watershed education and outreach included press releases, road maintenance workshops, presentations and distribution of educational materials. This project was administered in conjunction with a ‘twin’ project (#2005R-26) using the same Steering Committee, in an attempt to create a more cost-effective, efficient and better-managed effort.



Casey Road – stabilized road surface and ditch

PROJECT OUTCOMES:

- 39 NPS problem sites were treated with BMPs in the watersheds. This includes 24 sites on Three-Mile Pond, nine sites on Webber Pond and five sites on Threecornered Pond.
- Pollutant loading to the ponds was reduced by an estimated 11.9 tons of sediment, 10.0 pounds of phosphorus and 20.2 pounds of nitrogen (US EPA Region 5 Method and WEPP Method).
- Approximately 60 parties received on-site technical assistance.
- 21 individuals participated in road maintenance workshops, which were held in conjunction with project #2005R-26, *The Webber Pond Watershed Erosion Control Project*.
- Three lake associations and several private road associations participated in the project and received useful information regarding NPS pollution control.



PROJECT PARTNERS:

China Region Lakes Alliance
Town of China
Town of Vassalboro
Town of Windsor
City of Augusta
Maine Department of Agriculture

CONTACT INFORMATION:

Tony St. Peter, DEP – (207) 287-2116, tony.stpeter@maine.gov
John Blais, Kennebec County SWCD – (207) 622-7847, john@kcsxcd.org

Webber Pond Watershed Erosion Control Project

#2005R-26 – WIFAP

Waterbody Names: Webber, Threemile and Three-Cornered Ponds

Location: Augusta, China, Vassalboro, Windsor – Kennebec County

Waterbody Status: Impaired, NPS Priority Watersheds

Project Grantee: Kennebec County SWCD

Project Duration: December 2005 – December 2007

319 Grant Amount: \$30,000

Match: \$13,984 (local), \$20,000 (Maine Dept. Ag.)



PROBLEM:

Three-Cornered Pond drains to Threemile Pond, which then drains into Webber Pond via Seaward Mills Brook. The three watersheds cover approximately 22.5 square miles. Webber and Threemile Ponds have a history of algal blooms during late summer, and there is a general downward trend in water quality. The TMDL reports for each pond outline past pollution control efforts, sources of phosphorus loading and corrective actions. Although pond sediment is the largest single phosphorus contributor, in-lake alum treatments were not recommended because of the expense and large number of existing land-based phosphorus sources. Area surveys showed that 58% of the 400 shoreline residences of the three ponds had moderate to high impacts on water quality, and roads were also significant NPS sources.

PROJECT DESCRIPTION:

This project attempted to reduce phosphorus loading in the three watersheds by implementing actions proposed in the TMDL and Watershed-Based Plan reports. Nineteen problem NPS sites were fixed through the project, and technical assistance was provided to 20 landowners.

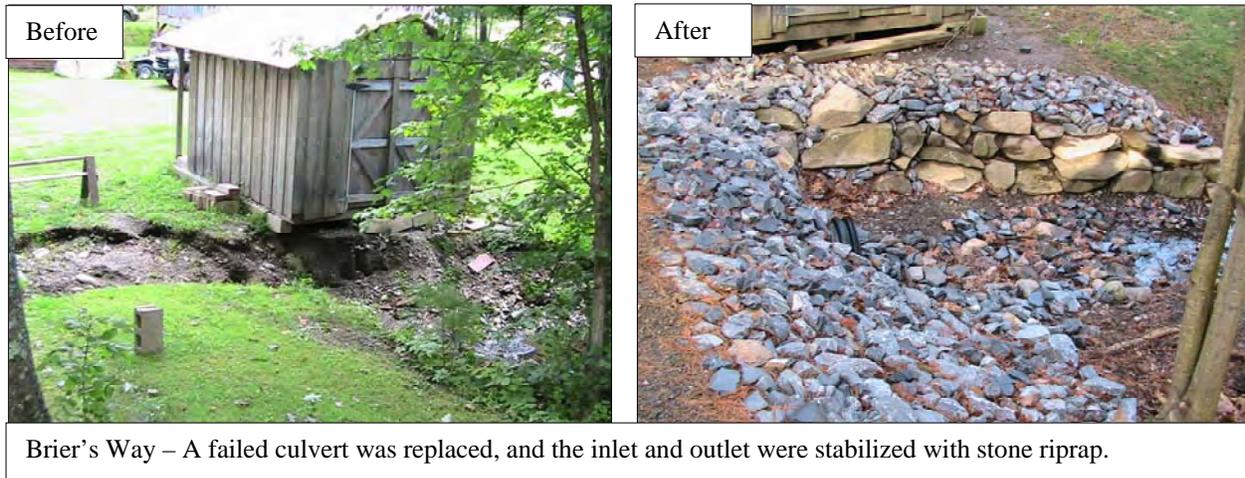
Project outreach included workshops on camp road maintenance. This project was administered in conjunction with a 'twin' grant project (#2005R-05) using the same Steering Committee for both projects, in an attempt to create a more cost-effective, efficient and better-managed effort.



Casey Road – The causeway, which was frequently flooded and eroded, was raised and stabilized.

PROJECT OUTCOMES:

- 19 NPS sites were fixed through the project. This included six sites on Three-Mile Pond, 11 sites on Webber Pond and two sites on Threecornered Pond.
- Pollutant loads to the ponds were reduced by an estimated 23.2 tons of sediment, 19.8 pounds of phosphorus and 39.6 pounds of nitrogen per year (US EPA Region 5 Method and WEPP Method).
- Approximately 20 parties received on-site technical assistance.
- 21 individuals participated in road maintenance workshops that were held in conjunction with the twin 319 project (#2005R-09, *the Webber Pond Phosphorous Reduction Project*).
- Three lake associations and several private road associations participated and received useful information regarding NPS pollution control.



PROJECT PARTNERS:

China Region Lakes Alliance
Town of China
Town of Vassalboro
Town of Windsor
City of Augusta
Maine Department of Agriculture

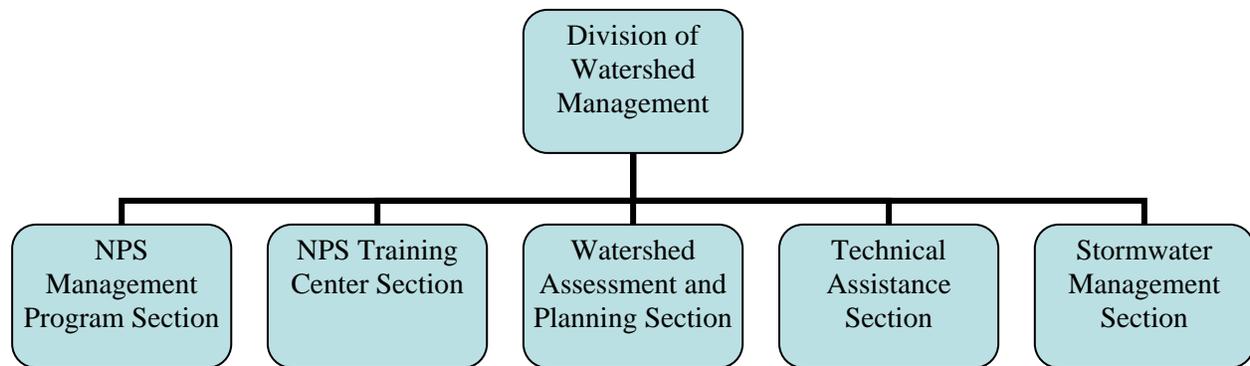
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Tony St. Peter, Maine DEP – (207) 287-2116, tony.stpeter@maine.gov

F. DEP NPS Program & Project Activities in 2007

1. Overview

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. Summaries

In addition to the competitive grants program, DEP directly funds several 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 2007.

DEP NPS Program and Project Activities

Maine Lakes Biomanipulation
Maine Lakes TMDL Assessments
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
Stream Algae (Periphyton) Assessment Tool

Maine Lakes Biomanipulation

The project aims to improve water quality on East Pond, an impaired lakes in the Belgrade Lakes chain, by removing perch and crappie fish populations. 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 was initiated in East Pond following ice-out in the early spring of 2007. Targeted fish removal and disposal will continue in the spring of 2008.

Accomplishments in 2007:

- Removed a total of 10 tons of targeted fish species (98% perch and crappie) via trap netting. The removed fish included 90% adult white perch (34,959), 5% yellow perch (2,678), and 5% black crappie (2,175). An additional 57,436 juvenile white perch (1,400 pounds) were captured via open water seining and removed from East Pond.
- Completed bi-weekly water quality sampling (May to October) for total phosphorus, chlorophyll-*a*, water transparency, dissolved oxygen-temperature profiles, and phyto-plankton and zooplankton assemblage measures with help from University of Maine, Orono.
- 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. Developed standard methods to compare annual changes in fish species composition and relative abundance.
- Held a second informational public meeting in the spring of 2007 prior to fish removal and disposal.
- University of Maine graduate student, Tara Trinko, successfully defended her Master’s thesis: *“Bottom-up and top-down controls of algal bloom frequency in two shallow mesotrophic lakes”*.



East Pond fish removal

For More Information:

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<http://www.state.me.us/dep/blwq/doclake/biomanipulation/index.htm>

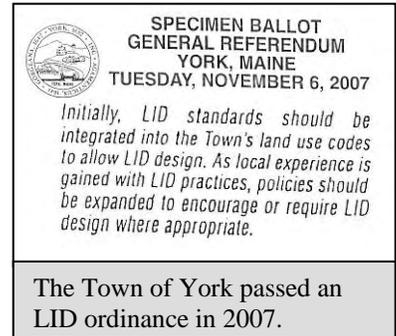
Maine Nonpoint Education for Municipal Officials (NEMO) Program

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.

Accomplishments in 2007:

- Conducted 19 NEMO presentations to 458 people from 80 towns.
- Survey results from the two latest Low Impact Development (LID) presentations indicate a 81% increase in knowledge of how land use affects water quality and a 90% increase in knowledge of how individual actions impact water quality. 80% of participants listed specific actions they would take after seeing the NEMO presentation (including creating a rain garden, joining the conservation commission, and promoting LID).

- As a result of NEMO presentations and training, municipalities have undertaken a variety of actions including LID ordinances, open space planning and acquisition, and evaluation of current ordinances and compatibility with new state stormwater regulations.
- Approximately one year after a NEMO LID presentation, the Town of York passed a general referendum by a huge margin (2047 to 244) modifying stormwater rules in town to allow the use of LID techniques.



For More Information:

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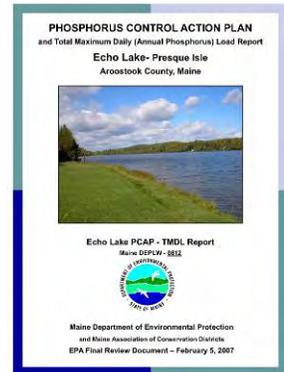
Maine Lakes TMDL Assessment

This is an ongoing project initiated in 1999 to assess current and historical water quality conditions in Maine’s impaired 303(d)-listed lakes and develop watershed plans for and reducing nonpoint sources of pollution and improving lake water quality. To date, 31 lakes and three associated streams have been assessed – a total of 34 water-bodies. Remaining waters include Christina Reservoir-Prestile Stream system (Fort Fairfield) and Long Pond (Rome and Belgrade), which will be completed during 2008.

Accomplishments in 2007:

Completed and received New England Region I US-EPA approval of three Phosphorus Control Action Plans (PCAP’s) and Total Maximum Daily (Annual Phosphorus) Loading (TMDL) reports for the following waterbodies:

- Echo Lake and Arnold Brook Lake (Presque Isle), with the assistance of the Maine Association of Conservation Districts (MACD) in cooperation with the Central Aroostook NRCS/SWCD.
- Wilson Pond (Wayne-Winthrop), under direct contract between FB Environmental Associates and the New England Region I US-EPA.



For More Information:

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<http://www.maine.gov/dep/blwq/docmonitoring/tmdl2.htm>

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 2007:

- Provided training in erosion control practices for contractors and municipal road crews: **529** participants.
- Provided exam review training to **27** candidates for the Certified Professional in Erosion and Sediment Control (CPESC) program resulting in **12** new CPESC in Maine.

- Participated in the coordination of the Maine Beaches and Stream Conferences: **280** participants.
- Coordinated training on inspection and installation of septic systems, and plumbing inspection: **463** participants.
- Sponsored workshops on maintenance of unpaved roads: **90** participants.
- Assisted in the presentation of workshops on developing pollution prevention plans: **246** participants.
- Certified **75** new individuals in the Volunteer Contractor Certification Program and issued **54** LakeSmart awards.
- Distributed over **197** copies of publications and **12** videotapes.



For More Information:

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<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 2007:

- Distributed three issues of MSTP newsletter in both hardcopy and electronic form (see website).
- Helped coordinate and run three rapid stream habitat/geomorphology survey trainings.
- Continued to work with municipalities, local SWCDs, and other partners with the development of watershed management and restoration strategies in the following streams and rivers: Penjajawoc Stream (Bangor), Hart Brook (Lewiston), Long Creek (South Portland), Trout Brook (South Portland) and Sunday River (Newry).
- Assisted groups with volunteer water quality monitoring efforts primarily in the Bangor, Ellsworth, Downeast, Augusta, and Portland Maine regions. Continued development of a statewide volunteer water quality monitoring program. Assisted with the production of a statewide “needs assessment report” related to a Maine Volunteer River Monitoring Program (VRMP).
- Continued work on the development of an official stream survey guidance document for activities such as stream watershed surveys and rapid stream habitat/geomorphology assessments.
- Assisted with organization of the DEP Stream Conference and Maine Stream Summit in 2007.



For More Information:

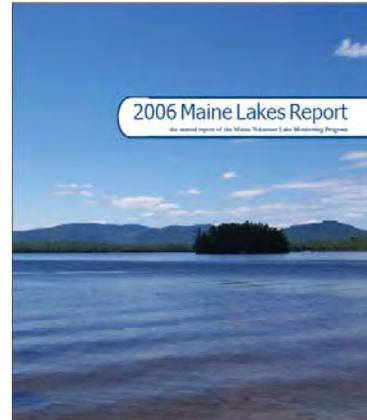
Jeff Varricchione, DEP – (207) 822-6317, jeffrey.t.varricchione@maine.gov
<http://www.maine.gov/dep/blwq/docstream/team/streamteam.htm>

Maine Volunteer Lake Monitoring Program

Grants awarded under the 319 program primarily support 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 associated with the program is in excess of twice the 319 funding level.

Accomplishments in 2007:

- Produced the *2006 Maine VLMP Annual Report*, which reported that during 2006 volunteers obtained 3,628 Secchi transparency readings, 14,777 dissolved oxygen readings, 1,103 total phosphorus samples, and 476 chlorophyll-a samples. These data were collected from 390 lake stations representing 350,878 lake acres which amounts to 36% of Maine's lake surface area.
- Produced three newsletters and convened the 2007 Annual Meeting, which was attended by more than 100 people.
- Trained more than 73 new volunteers for transparency and 16 for dissolved oxygen. Recertified more than 100 volunteers for transparency and more than 100 for dissolved oxygen.
- Encouraged collection of transparency readings on days that the Landsat satellite passed Maine.
- Reached a level of 529 certified volunteer water quality monitors in the program monitoring 483 lake basins in Maine at the end of 2007.
- Launched a Virtual Secchi re-certification process on the website which includes taking virtual Secchi disk readings under a variety of lake trophic conditions and an online test.



For More Information:

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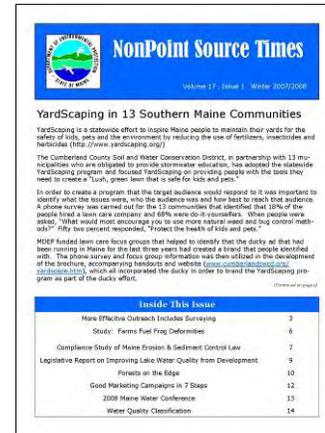
Statewide NPS Outreach

Much of NPS pollution is the result of individual actions/behaviors. To reduce NPS pollution, there is a need to encourage new more environmentally friendly behaviors. To do this, the program has been tapping into and using social marketing techniques for planning and implementation. The program has partnered with stormwater communities that have a shared target audience to create the ThinkBlueMaine Partnership. These communities are helping to bring the statewide message down to the local level. In addition, DEP is using the NPS Times Newsletter to share information with partners throughout the state.

Accomplishments in 2007:

- Worked with market research firm to develop an evaluation tool (intercept survey) for 319 and stormwater community outreach projects. Training was provided to our partners by consultant.

- Supported the Southern Children's Water Festival, which was attended by approximately 700 students and teachers.
- Statewide TV ads on stormwater pollution issues were run through a partnership between stormwater communities and DEP.
- Market research firm held four focus groups on lawn care issues (2 in Portland, 2 in Bangor). Results are being used by DEP, stormwater communities and Cooperative Extension to craft outreach efforts to change lawn care practices that can cause water pollution.
- Worked with New England-wide Cooperative Extension effort funded by CSREES to develop regional lawn care pilot program.
- Distributed four issues of the NPS Times both electronically and in hard copy (see website below).



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Stream Algae (Periphyton) Assessment Tool

The Biological Monitoring Program collected algal samples for the purpose of developing a tool to evaluate the health of Maine’s rivers and streams. Each year, sampling is focused on one of five geographic areas. In 2007, the Biological Monitoring Program focused sampling on streams and rivers in the Kennebec River Basin and Mid-Coast Maine.

Accomplishments in 2007:

- Collected samples from 25 streams in the Kennebec River Basin and five streams in the Mid-Coast region.
- Calculated preferred environmental conditions (aka “optima”) for algal species. The optima predict the levels of environmental variables at which a species has its highest relative abundance. *Brachysira microcephala*, which is an intolerant species, has low optima for total phosphorus (11 µg/L), specific conductance (38 µS/cm), and percent developed watershed (7%). In contrast, *Navicula gregaria*, which is a tolerant species, has higher optima for total phosphorus (31µg/L), specific conductance (270 µS/cm), and percent developed watershed (50%). The species optima will be used to document shifts in community composition from sensitive and intermediate species to tolerant species.
- Started building a statistical model that will predict the likelihood of a sample attaining class A, B, or C biological criteria. This model will tell us if a stream is attaining its assigned goal. Future activities include building statistical models that will infer levels of environmental variables in a stream based on the amount and types of algae growing in the stream. If a stream is not attaining its assigned goal, then the inference models will indicate which stressors are probably damaging the stream and what types of best management practices are needed to restore the stream.



Dead River, West Forks PLT

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