

Nonpoint Source Management Program 2021 Annual Report

July 2022

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Meduxnekeag River, New Limerick



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Table of Contents

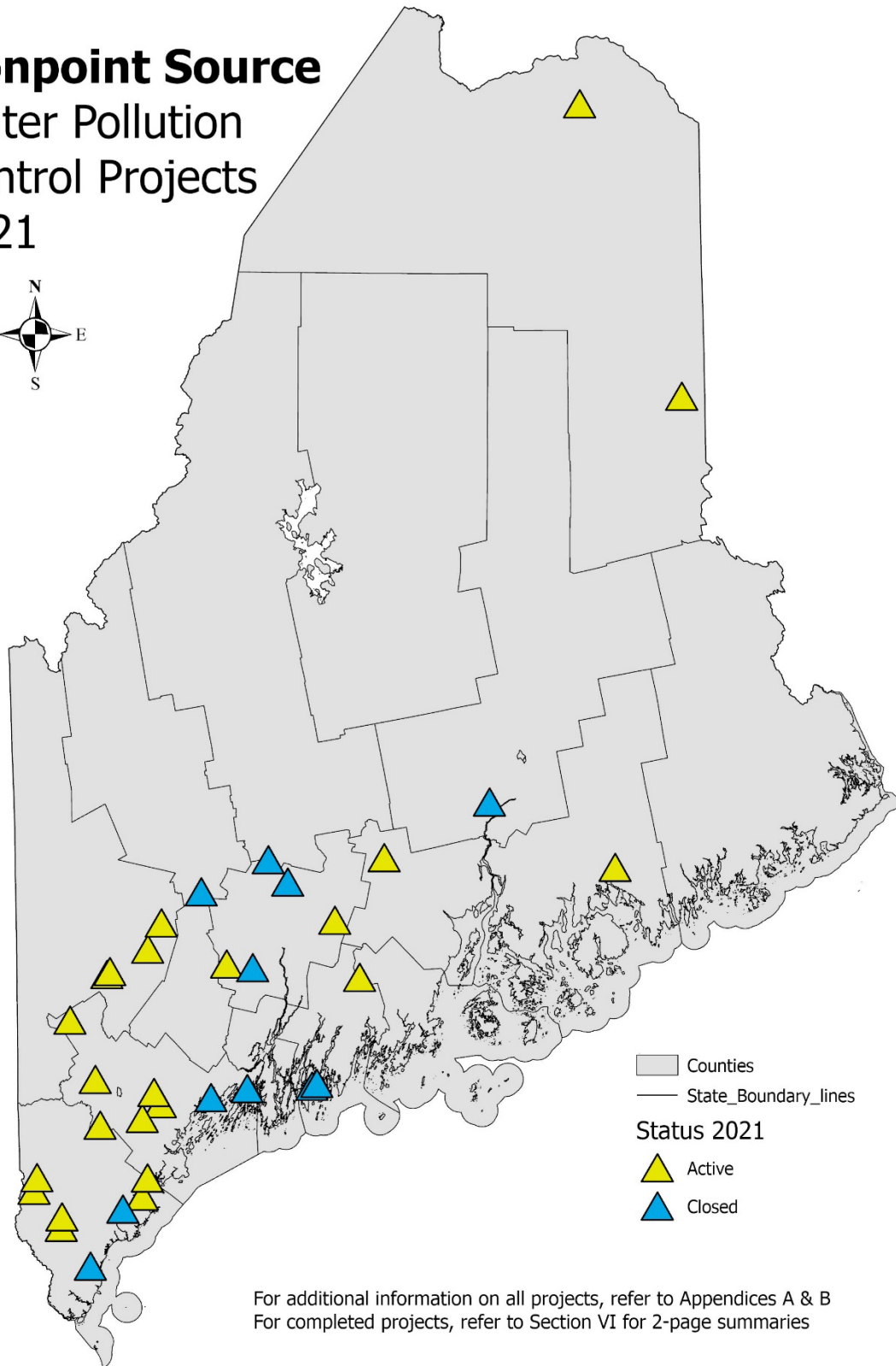
Map of NPS Water Pollution Control Projects Active in 2021	1
I. Introduction	2
II. 2021 Highlights – Maine NPS Management Program	2
III. Maine NPS Management Program	4
A. Overview	4
B. Protecting Clean Waters	5
C. Restoring Impaired Waters	6
D. NPS Pollutant Load Reductions	12
E. Section 319 Grant Administration	12
IV. Maine NPS Program Activities in 2021	13
A. DEP Services for Watershed Groups and Municipalities	13
B. Maine Nonpoint Source Training and Resource Center	15
C. Maine Volunteer River Monitoring Program	16
D. Clean Water State Revolving Fund	17
E. Municipal Stream Crossing Grants Program – Maine Transportation Bond	18
F. Other NPS Program News	19
V. NPS Grants Program	20
A. Overview	20
B. Grant Awards Issued and Started in 2021	21
C. Grants Selected under 2021 Request for Applications (RFA)	22
VI. Summaries of NPS Projects Completed in 2021	23
<u>Appendices</u>	
Appendix A – NPS Grant Projects Closed in 2021	48
Appendix B – Active NPS Grant Projects	49
Appendix C – Maine NPS Program Five-Year Objectives, Milestones and 2021 Accomplishments or Outputs	51

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Document available for download at: <http://www.maine.gov/dep/water/grants/319-documents/reports/>.

NPS Water Pollution Control Projects Active in 2021

Nonpoint Source Water Pollution Control Projects 2021



For additional information on all projects, refer to Appendices A & B
For completed projects, refer to Section VI for 2-page summaries

I. Introduction

Nonpoint source pollution impacts many of Maine's lakes, rivers, streams, and coastal waters. When it rains or snow melts, water running off our driveways, parking lots, yards, farm fields, forestry operations, and industrial sites picks up and carries hitchhiking pollutants into our waters. Pollutants include sediment from erosion; nutrients from fertilizers or animal waste; bacteria from animal waste and failing septic systems; and toxics such as road salt or spilled petroleum products.

Maine DEP coordinates the State of Maine Nonpoint Source Pollution Program (38 MSRA 410) to achieve widespread use of state-agency "best management practice guidelines" to prevent NPS pollution. Since 1990, EPA has awarded funds under CWA Section 319(h) to help states and tribes address the most pressing NPS pollution problems. Section 319 funds that are provided by EPA to the State help support a significant portion of Maine's NPS Program. NPS Program services are guided by the [Maine Nonpoint Source Management Program Plan 2020-2024](#).

DEP coordinates with other State agencies on statewide programs to reduce NPS pollution. CWA Sections 604(b) and 319 funds are used to provide grants for watershed projects to help local communities identify water pollution sources in watersheds and act to restore or protect lakes, streams, or coastal waters.

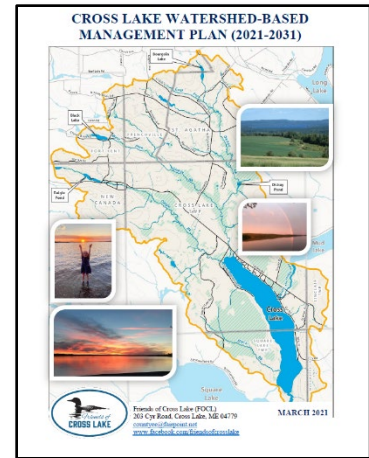
This report summarizes the Nonpoint Source Program's activities and accomplishments in 2021. Each year, DEP prepares this report to inform the public and the EPA about Maine's progress controlling NPS water pollution and fulfill annual reporting requirements of Section 319(h) of the Federal CWA.

II. 2021 Highlights - Maine NPS Management Program

- A. Maine's NPS Program During a Worldwide Pandemic** – Maine's NPS Program, along with the rest of the world, settled into a new sense of normal in 2021. Remote office work and limited personal interactions affected completion of planned activities. Despite this, Maine was able to document Type 2 Success Stories for Annabessacook Lake and Sebasticook Lake. Additionally, the Nonpoint Source Training Center continued to deliver training both live online as well as online on-demand.
- B. Grant Awards** - EPA awarded \$1,984,939 FFY 2021 Section 319 Clean Water Act funds to the DEP. Funds were used to fund programs designed to prevent and reduce NPS pollution problems. Twelve new grants totaling \$979,132 were awarded to municipalities, Soil and Water Conservation Districts, and watershed groups for watershed implementation projects.
- C. Projects Closed Out** - Twelve NPS watershed projects funded through the NPS grants program in previous years were successfully completed. DEP provided technical assistance and granted \$950,834 of Federal CWA Section 319 and 604(b) funds for these projects. Grantees, partners, and landowners contributed matching funds or services valued at \$1,329,016.
- BMPs were installed to reduce polluted runoff in the following ten watersheds, thereby reducing pollutant loading to these waters by an estimated 794 pounds of phosphorus, 404 pounds of nitrogen, and 453 tons of sediment per year¹:

¹ Pollutant load reduction estimates are based on approved methods and assume proper installation and maintenance of Best Management Practices. (See Section III.D.)

- Adams Pond & Knickerbocker Lake (Boothbay)
 - Capehart Brook (Bangor)
 - Cobbossee Lake (Winthrop)
 - Concord Gully Brook (Freeport)
 - McGrath Pond and Salmon Lake (Oakland)
 - Mousam Lake (Acton)
 - North Pond (Smithfield)
 - Ogunquit River (Ogunquit)
 - Parker Pond (Chesterville)
 - Thatcher Brook (Biddeford)
- Watershed-based plans were completed for Mare Brook (Brunswick) and Cross Lake (Cross Lake TWP, Square Lake TWP). A plan provides assessment and management information and describes actions needed to restore NPS-impaired water bodies or to protect water bodies threatened by NPS pollution.



- D. Lake Watershed-based Protection Plans** – DEP and EPA reviewed and accepted two lake watershed-based protection plans in 2021: Trickey Pond in Naples, and Damariscotta Lake in Jefferson, Nobleboro, and Newcastle. The Trickey Pond Environmental Protection Association and the Midcoast Conservancy developed these plans and carried out the supporting watershed surveys with local resources and funding. Trickey Pond applied for and received CWA Section 319 funding in 2021 to help implement its plans.
- E. Maine DEP’s Clean Water State Revolving Fund (CWSRF)** – The CWSRF program helped fund \$4.46 million in NPS projects in 2021 via the linked-deposit forestry program, which makes below-market-rate financing available for forestry BMPs and environmentally friendly logging equipment.
- F. Nonpoint Source Training Center (NPSTC)** – The NPSTC presented or approved 49 in-person and online classes and trained over 900 individuals.
- G. YCC Permit Exemption Pilot Program** – The Maine DEP piloted a program that exempts YCCs from permitting requirements for certain low impact NPS mitigation activities. The permit fees were viewed as a barrier for property owners, and this exemption program is designed remove that impediment. Because of the timing of the pilot program announcement and coronavirus pandemic, participation in the program during 2021, only 5 projects were completed under the exemption. The pilot program will continue into 2022 as more YCCs incorporate the program into their planning process.

III. Maine NPS Management Program

A. Overview

The *Maine Nonpoint Source Management Program Plan 2020-2024* establishes program goals and strategies that Maine uses to make progress controlling NPS pollution. The NPS program uses both statewide programs and targeted watershed-based approaches to promote the use of state-agency defined best management practices (BMPs) to prevent water pollution.

DEP administers the NPS Program in coordination with EPA and other federal, state, and local governmental agencies, and non-governmental organizations. Five Maine agencies share responsibility for implementing NPS programs: Departments of Environmental Protection; Agriculture, Conservation, and Forestry; Transportation; Health and Human Services, Division of Environmental Health; and Marine Resources. State agencies conduct programs that promote voluntary use of BMPs and implement State laws or rules that require meeting performance standards to protect water quality.



The NPS plan describes actions State agencies will take over five years to make progress controlling NPS pollution, including 63 five-year objectives with actions and milestones. Outputs or accomplishments in 2021 are summarized in Appendix C.

The NPS plan is available at: <http://www.maine.gov/dep/land/watershed/nps-program-plan.html>.

B. Protecting Clean Waters

Maine has significant water quality protection and restoration challenges and limited resources for NPS programs. DEP prioritizes and balances the use of available NPS funds to make progress in both protecting and restoring lakes, streams, and coastal waters. Although considerable resources are focused on restoring impaired waters, DEP also invests in NPS control efforts to protect clean waters that are considered threatened by NPS pollution. Preventing NPS water pollution of waters is far more cost effective than restoring a polluted waterbody.

Protecting Maine's clean waters can be accomplished by local communities with technical and financial assistance from DEP and other partners. Local stewardship is needed for any project, plan, or outreach effort to effectively take hold because residents can increase local involvement in watershed management activities. Fortunately, Maine has many capable and determined municipalities, watershed stewardship groups, and Soil and Water Conservation Districts working to protect watersheds and clean waters.

Developing Plans to Protect Lakes

In 2021, two new lake protection plans (indicated with an * below) were developed by local entities using guidance developed by DEP and EPA, bringing the total number of active lake watershed-based protection plans to 35 through 2021.²

Lake Watershed-based Protection Plans Accepted by DEP

Abrams Pond (Eastbrook)	North Pond (Buckfield)
Adams & Knickerbocker Lake (Boothbay)	North Pond (Norway)
Alamoosook Lake (Orland)	North Pond (Smithfield)
Bauneg Beg Lake (Sanford)	Panther Pond (Raymond)
Cobbossee Lake (Manchester)	Parker Pond (Chesterville)
Cold Stream Pond (Enfield)	Pennesseewassee Lake (Norway)
Crescent Lake (Raymond)	Phillips Lake (Dedham)
Damariscotta Lake (Jefferson)*	Sebago Lake & Crooked River (Naples)
Ellis Pond (Roxbury)	Square Pond (Acton)
Forest Lake (Windham)	Toddy Pond (Orland)
Georges Pond (Franklin)	Torse Pond (Readfield)
Great Pond (Franklin)	Trickey Pond (Naples)*
Hogan & Whitney Ponds (Oxford)	Varnum Pond (Wilton)
Lake Anasagunticook (Canton)	Watchic Lake (Standish)
Lake Auburn (Auburn)	Whetstone Pond (Abbott)
Long Pond (Parsonsfield)	Wilson Lake (Wilton)
McGrath Pond & Salmon Lake (Oakland)	Woods Pond (Bridgton)
Mousam Lake (Acton)	

² DEP and EPA have accepted 41 plans since 2013 (this number includes expired plans).

Implementation Projects to Protect Lakes

DEP allocates Section 319 funds provided by EPA to protect clean waters that are threatened by NPS pollution. In 2021, Section 319 funds helped sustain or start NPS watershed implementation projects in the following 20 lake watersheds:

Abrams Pond (Eastbrook)	Lake Penneesseewassee (Norway)
Adams Pond & Knickerbocker Lake (Boothbay)	McGrath Pond & Salmon Lake (Oakland)
Bauneg Beg Lake (Sanford)	Meduxnekeag River (Houlton)
Cobbossee Lake (Manchester)	Mousam Lake (Acton)
Forest Lake (Windham)	North Pond (Smithfield)
Georges Pond (Franklin)	Parker Pond (Chesterville)
Goodall Brook (Sanford)	Sebago Lake (Naples)
Goosefare Brook (Saco)	Square Pond (Acton)
Highland Lake (Windham)	Thatcher Brook (Biddeford)
Lake Anasagunticook (Canton)	Watchic Lake (Standish)

C. Restoring Impaired Waters

State and federal water quality laws require that waters attain their assigned water quality classification. 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 if the waters support healthy habitats for fish and wildlife. DEP places waters found to be degraded (i.e., not attaining water quality standards needed to support designated uses) on the impaired waters lists in the *Integrated Water Quality Monitoring and Assessment Report* or "Integrated Report" (IR) reported to EPA. Restoring impaired waters involves three steps:

- **Water Quality Assessment, including TMDLs & Alternative Approaches.** In addition to DEP's water quality monitoring and assessment programs, DEP establishes a pollution allocation, also called a total maximum daily load (TMDL), for impaired waterbodies to comply with Section 303(d) of the Clean Water Act. A TMDL assessment estimates the necessary reduction in pollution from point and nonpoint sources for the waterbody to meet the state water quality classification.
- **Watershed-based Planning.** A watershed-based plan (WBP) describes overall actions needed in a watershed to help restore water quality. EPA requires a watershed-based plan addressing nine minimum elements prior to use of 319 funds to help restore an impaired waterbody. For EPA guidance on watershed planning, refer to https://www.epa.gov/sites/production/files/2015-12/documents/watershed_mgmnt_quick_guide.pdf.
- **Implementing Pollution Reduction Measures.** Communities, agencies, and individuals install conservation practices or BMPs to eliminate or control sources of NPS pollution. Typically, work needs to be focused within a watershed for 10 years or more to restore an impaired waterbody. DEP provides technical and financial assistance to help communities improve watersheds and restore waters.

Developing Plans to Restore NPS Impaired Waters

DEP provided services and Sections 604(b) and 319 grant funds to help communities develop WBPs, which will then be used to guide restoration of NPS impaired waters.

- In 2021, DEP accepted three nine-element WBPs: Cross Lake (Cross Lake TWP), Mare Brook (Brunswick), and Togus Pond (Augusta).
- Work continues to develop nine-element WBPs for Black Brook (Windham), China Lake (China), Wilson Pond (Monmouth) and Unity Pond (Unity).

- At the end of 2021, there were 31 active nine-element WBPs for NPS impaired waters. Four plans, Capisic Brook (Portland), Pleasant River (Gray), Red Brook (Scarborough), and Whitten Brook (Skowhegan), expired in 2021. In total, 18 plans need to be updated.

Watersheds with Nine-Element Watershed Plans Accepted by Maine DEP

Annabessacook Lake	Kennebunk River (Kennebunk)
Arctic Brook (Bangor)	Kennedy Brook (Presque Isle)
Cape Neddick River (York)	Mare Brook (Brunswick)
Capehart Brook (Bangor)	Medomak River (Waldoboro)
Cochnewagon Pond (Monmouth)	Meduxnekeag River (Houlton)
Concord Gully Brook (Freeport)	Ogunquit River (Ogunquit)
Cross Lake (Cross Lake TWP)	Pearce Brook (Houlton)
East Pond (Smithfield)	Phillips Brook (Scarborough)
Georges Pond (Franklin)	Spruce Creek (Kittery)
Goodall Brook (Sanford)	Thatcher Brook (Biddeford)
Goosefare Brook (Saco)	Togus Pond (Augusta)
Great Pond (Belgrade)	Topsham Fair Mall Stream (Topsham)
Hart Brook (Lewiston)	Trout Brook (South Portland)
Highland Lake (Windham)	

NPS Watershed Implementation Projects

DEP allocates Section 319 funds to help communities implement their watershed-based plans to restore NPS-impaired waters. In 2021, Section 319 funds helped continue or start projects in the following 12 NPS-impaired watersheds:

Capehart Brook (Bangor)	Long Pond (Parsonsfield)
Concord Gully Brook (Freeport)	Meduxnekeag River (Houlton)
Cross Lake (Cross Lake TWP)	Ogunquit River (Ogunquit)
Georges Pond (Franklin)	Phillips Brook (Scarborough)
Goosefare Brook (Saco)	Pleasant River (Windham)
Hart Brook (Lewiston)	Thatcher Brook (Biddeford)

Success Stories

DEP published two NPS Success Stories (<https://ordspub.epa.gov/ords/grts/f?p=109:191:::NO:::map>) highlighting improved water quality in Annabessacook Lake and Sebasticook Lake. Since 1977, funding from local, state, and federal partners, including CWA section 319 grants, supported widespread installation of phosphorus reducing best management practices in Annabessacook Lake watershed. Water quality has significantly improved. In the Sebasticook Lake watershed, extensive agricultural best management practices and erosion controls have helped to improve lake water quality as well.

See Success Stories (pages 8-11) for more details.



NONPOINT SOURCE SUCCESS STORY

Maine

Annabessacook Lake Shows Improvement After Four Decades of Work

Waterbody Improved

For decades, Annabessacook Lake was viewed as one of the most polluted lakes in Maine. A combination of point and nonpoint source (NPS) pollution turned the lake green as early as 1939. All municipal and industrial point sources were removed by 1976, and water quality gradually improved. However, NPS pollution from agriculture, roads and shoreline development still contributed to high in-lake phosphorus concentrations and annual summer algae blooms. Since 1977, funding from local, state and federal partners, including Clean Water Act (CWA) section 319 grants, supported widespread installation of phosphorus-reducing best management practices (BMPs) in the watershed (e.g., manure storage facilities, alum treatment, street sweeping, gravel road and shoreline stabilization). Water quality monitoring shows that Annabessacook Lake's water clarity has now significantly improved, and nuisance algal blooms are much less frequent (only two times in the last eight years).

Problem

Annabessacook Lake lies within the Cobbossee chain of lakes in the towns of Winthrop and Monmouth in south-central Maine. The 13,543-acre lake is developed with 200 shorefront residences, a large network of private gravel roads, a 100-site campground and the urban center of Winthrop. Commercial village areas in Monmouth are located adjacent to lake tributaries in the 21-square-mile watershed (Figure 1).

The lake began experiencing algae blooms as early as 1939, largely due to municipal and industrial discharges. In the mid-1960s the lake was treated with copper sulfate, but to less-than-desired success. In 1967, it was determined that each year over 13,600 kilograms (kg) (30,000 pounds) of phosphorus entered Annabessacook Lake, 93% of which was from municipal and industrial discharges from the village areas of Winthrop, North Monmouth and Monmouth Center. By 1972, a new sewer line conveyed these discharges to the Augusta Sanitary District in Augusta, and by 1976, all point source discharges to the lake had been eliminated. Although there was some improvement, the high phosphorus concentrations and annual nuisance algae blooms continued.

In 1975, U.S. Environmental Protection Agency (USEPA) CWA section 208 funding supported a lake diagnostic study and water quality management plan that identified the major phosphorus sources to Annabessacook Lake as lake sediments (36%), agriculture (24%),



Figure 1. Annabessacook Lake is in south-central Maine.

upstream watersheds (24%) and development (11%). The lake's 2004 total maximum daily load (TMDL) had similar findings about the NPS pollution sources.

Story Highlights

The Cobbossee Watershed District (CWD), which oversees lake restoration efforts in the larger Cobbossee Lake watershed, has worked with many partners to reduce phosphorus loading to Annabessacook Lake. In the 1970s, CWD received CWA section 314 funds to provide cost-sharing for farmers to construct manure storage facilities and to conduct an alum treatment of Annabessacook Lake sediments to stop the internal release of phosphorus. In 2003 and 2020, the CWD



Figure 2. Adding BMPs reduced pollutant loading from gravel camp roads.

used funds from Maine’s stormwater law compensation fee program to purchase a regenerative-air street sweeper that the towns of Winthrop and Monmouth jointly operate to reduce phosphorus loading from priority streets in the downtown and village centers.

From 2007 to 2013, CWD carried out two CWA section 319 projects that installed gravel camp road BMPs on 34 NPS sites and installed 12 catch basin inserts on town roads, reducing annual pollutant loading to the lake by an estimated 8 tons of sediment and 14 pounds of phosphorus (Figure 2). The Friends of the Cobbossee Watershed’s (FOCW) Youth Conservation Corps stabilized shorelines and planted riparian buffers along nearly three-quarters of a mile of eroding shoreline on 32 shorefront properties. CWD and FOCW conducted public outreach to educate homeowners and school children on measures to reduce NPS. CWD also worked with town planning boards and code enforcement officers to review development proposals and strengthen local ordinances.

Results

Annabessacook Lake’s water clarity has been improving since the late 1990s (Figure 3). The lake only experienced eight algae blooms from 1998 to 2019 and only two blooms during the last eight years. The Annabessacook Lake TMDL (2004) determined that the average annual epilimnetic total phosphorus concentration would need to decline from 17 parts per billion (ppb) to 15 ppb to attain bloom-free conditions. Recent monitoring indicates that the TMDL goal has been achieved and that the internal phosphorus load to Annabessacook Lake has been declining. The 2020 Annabessacook Lake Watershed-Based Plan (WBP) anticipates that internal loading will drop by another

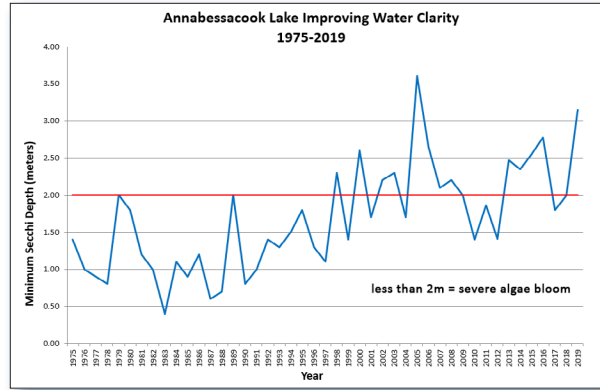


Figure 3. Minimum Secchi depth readings (1975–2019) have improved since 1975.

50 kg per year by 2029, which would equate to a 33% reduction from the TMDL’s reported load. Although the lake water quality has improved and is now generally stable, it continues to exhibit stress (e.g., depleted oxygen, reduced clarity during late summer/early fall). It has not yet reached the point at which it meets Maine’s water quality standards for removal from the Maine’s list of impaired waters, but it is heading in that direction.

Partners Funding

Numerous federal, state and local partners collaborated in the effort to improve the lake’s water quality. CWD served as the local project coordinator and led water quality monitoring, watershed assessment and technical oversight of projects. Key partners included Annabessacook Lake Improvement Association, FOCW, Kennebec County Soil and Water Conservation District, Kennebec Valley Planning Commission, Maine Department of Environmental Protection, U.S. Department of Agriculture Natural Resources Conservation Service (NRCS), USEPA, and the towns of Winthrop and Monmouth.

From 1975 to 1985, USEPA provided over \$1 million in CWA sections 205(j), 208 and 314 grants for diagnostic studies and restoration activities (e.g., alum treatments, BMPs) in the Cobbossee watershed. USEPA provided \$114,850 in CWA section 319 funds for two watershed implementation projects and another \$13,075 in CWA section 604(b) funds to update the lake’s WBP. CWD, towns, landowners and other partners contributed \$294,757 through these three grant and Stormwater Compensation Fund Program projects. NRCS provided farmers with technical assistance and funding through Farm Bill programs.



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NONPOINT SOURCE SUCCESS STORY

Maine

Agricultural Best Management Practices and Erosion Controls Improve Sebasticook Lake

Waterbody Improved

Beginning in the 1950s, point source and nonpoint source (NPS) pollution in the Sebasticook Lake watershed contributed to excess nutrients, which resulted in algae blooms, oxygen depletion and decreased water clarity. Water quality improved after most of the municipal and industrial point sources were removed in the 1980s; however, the lake still experienced prolonged annual algae blooms driven by phosphorus sources (i.e., internal phosphorus loading from lake sediments, agriculture and developed areas). From 1981 to 2014, state, federal and local partners provided funding, including Clean Water Act (CWA) section 319 grants, to install best management practices (BMPs) throughout the watershed. Late summer drawdowns of the lake also flushed phosphorus downstream. Water quality monitoring shows significant improvements in the lake's water clarity, phosphorus levels, extent and duration of algae blooms, and phosphorus loading from lake sediments.

Problem

Sebasticook Lake, a 4,288-acre waterbody in south-central Maine, once supported a valuable fishery and was stocked with trout, landlocked salmon and rainbow smelt (Figure 1). The lake has historic and cultural significance as well—a complex of pre-historic fish weirs lay at the mouth of the Sebasticook River, on the north shore of the lake. This complex is one of the oldest known in North America. In the 1950s, the lake's water quality and coldwater fishery deteriorated precipitously because of point source and NPS pollution in the watershed. The severe water quality problems were largely attributed to municipal wastewater discharges from Newport, Dexter and Corinna, as well as three industrial discharges (including Corrina Woolen Mill, which was later designated as a U.S. Environmental Protection Agency [EPA] Superfund site). Most of these point sources were removed in the 1980s, and the last point source was eliminated in 2005. Water quality improved gradually, but watershed and internal phosphorus sources continued to fuel annual algal blooms. The 2001 Sebasticook Lake Total Maximum Daily Load report identified the most important remaining watershed phosphorus sources as agriculture (45%), roads (19%), residential (15%) and other development (8%). Internal phosphorus loading from lake sediments was also a significant source of phosphorus to the lake.



Figure 1. Sebasticook Lake is in south-central Maine.

Story Highlights

In 1982, seasonal drawdowns on Sebasticook Lake were initiated to release phosphorus-rich water in the fall (Figure 2). In 1988, the dam outlet was reconstructed to increase the annual lake drawdown and export of phosphorus released from lake sediments. The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) spearheaded over three decades of work to reduce the phosphorus export from farming activities in the watershed. From 1981 to 1992, NRCS (formerly the Soil Conservation



Figure 2. Seasonal lake drawdown (1982) flushed out excess phosphorus.

Service) provided funding through the Watershed Protection and Flood Prevention Act (PL-566) to install 22 manure storage systems and treat 5,500 acres with conservation tillage, cover crops and other practices. In 1997 and 2001, NRCS carried out targeted Environmental Quality Incentives Program work in the watershed and funded animal waste, nutrient management and cropland erosion projects. From 2004 to 2014, NRCS applied 1,471 practices on dairy farms and cropland including seven waste storage facilities and 18,000 acres of cropland and nutrient management BMPs. From 2012 to 2014, the National Water Quality Initiative (NWQI) implemented cover crop, crop rotation and forage/biomass plantings on 1,500 acres on farms in the Alder Brook subwatershed.

From 2002 to 2007, Penobscot County Soil and Water Conservation District (SWCD) carried out three CWA section 319 grant projects to tackle nutrient and erosion problems on farms, town and private roads, and shorefront properties. The projects installed BMPs including vegetated buffers/filter strips and sediment basins to control runoff from livestock areas on 49 NPS sites; these reduced annual pollutant loading to the lake by an estimated 189 tons of sediment and 186 pounds of phosphorus. Project partners also raised local awareness through workshops, landowner technical assistance visits, and education about the importance of shoreline vegetated buffers.

Results

Sebasticook Lake's water quality significantly improved in terms of water clarity, total phosphorus (TP), and chlorophyll *a*. From the time water quality monitoring began in the early 1970s, Sebasticook Lake did not experience a year without nuisance algal blooms (defined as a Secchi disk reading < 2 meters) until 1997

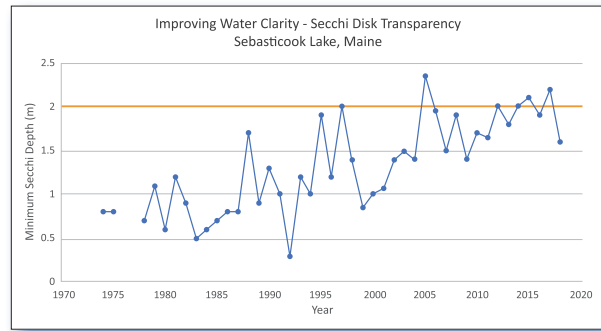


Figure 3. Minimum Secchi disk readings (1972–2018) show improving clarity over time.

and has since had 6 years with minimum clarity at or over 2 meters (Figure 3). Average epilimnetic phosphorus in the 1980s was 78 parts per billion (ppb), while from 2009 to 2018 the average was 25 ppb. Recent chlorophyll *a* measurements show an average value of 14 ppb (2009–2018) versus an average of 34 ppb in the 1980s. The pool of sediment phosphorus available for internal recycling, the major driving force for summer blooms in the lake, declined by an order of magnitude, from approximately 900 ppb to approximately 90 ppb, as a result of the annual lake drawdown. The lake still has occasional algal blooms in the summer; however, the blooms start later in the summer, have a shorter duration and are much less intense.

Partners and Funding

Many federal, state and local partners collaborated in the effort to improve the lake's water quality. Partners included NRCS, EPA, Maine Department of Environmental Protection, Sebasticook Lake Improvement Association, Penobscot County SWCD, USDA Farm Service Agency, U.S. Fish and Wildlife Service, Heart of Maine Resource Conservation and Development, University of Maine Cooperative Extension, Sebasticook Lake Association, nine municipalities, Penobscot Valley Council of Governments, Maine Department of Marine Resources, and many landowners.

From 1975 to 1985, NRCS provided \$500,000 in NWQI funding and \$1.4 million from PL-566. EPA's Clean Lakes program and local contributions funded the \$0.43 million dam outlet reconstruction project. EPA also provided \$157,310 in CWA section 319 funds for three watershed implementation projects. Towns, the Maine Department of Agriculture, landowners, and other partners contributed \$112,711 in match for these three grant projects.



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D. NPS Pollutant Load Reductions

EPA's Section 319 program guidelines require load reduction estimates for projects that will result in load reductions of sediment or nutrients (nitrogen and phosphorous). EPA recognizes that due to runoff variability, load reductions associated with BMP projects cannot be directly measured. Load reduction estimates for Maine Section 319 projects are developed using simple models. DEP and grantees use methods described in the [EPA Region 5 Model](#) and/or the USDA Forest Service [Water Erosion Prediction Project-Road](#) computer model to estimate NPS load reductions.

NPS load reductions for Section 319-funded implementation projects are reported in the EPA Grants Reporting and Tracking System (GRTS) database. The following table shows load reductions reported for 16 active implementation projects in 2021.

2021 NPS Pollutant Load Reductions		
Sediment 256 tons/year	Phosphorus 217 pounds/year	Nitrogen 162 pounds/year

E. Section 319 Grant Administration

EPA awarded \$1,984,939 of FFY 2021 Section 319 funds to DEP. Of FFY 2021 Section 319 funds, 52.7% (\$1,046,549) was allocated for implementation of nine-element WBPs for restoration projects or alternative plans for protection projects. This includes funds (\$67,417) for DEP staff services to help implement WBPs and grant funds (\$979,132) for 12 projects to implement WBPs. Five of the funded projects (\$513,271) will implement nine-element plans for impaired waters, and seven projects (\$465,861) will implement alternative WBPs to protect NPS priority watersheds threatened by NPS pollution.

Section 319 funds also supported eight DEP NPS program staff positions. DEP administered the Section 319 grants awarded to DEP under federal fiscal years 2018- 2021, including monitoring sub-recipient performance on 28 NPS grant projects and providing other DEP NPS program services.

Summary of FFY21 319 Grant and Match Allocations

Activity	Program Funds Subtotal	Project Funds Subtotal	Section 319 Total	Nonfederal Match
NPS Grants for Watershed Implementation		\$979,132	\$979,132	\$1,059,113
NPS Grants for Watershed Planning	\$42,274 ³		\$42,274	
Small Community Grants Program				\$605,840
DEP Staff, Fringe, Travel, Other & Indirect (State Fiscal Year 2021 21.54%) ⁴	\$896,116	\$67,417	\$963,533	\$349,832
Totals	\$939,390	\$1,046,549	\$1,984,939	\$2,014,785

³ 2021 funds were used to support NPS Project, Lower Aroostook River Tributaries Assessment and Watershed-based Plan for Amsden, Gray, Hacker, and McHugh Brooks (#20210011). Funding was awarded in 2022, with an anticipated start in 2022.

⁴ Section 319 funded 8 FTEs and one AmeriCorps volunteer

IV. NPS Program Activities in 2021

A. DEP Services for Watershed Groups and Municipalities

DEP provides considerable technical assistance to help watershed groups and towns reduce NPS water pollution. Some of the activities and projects that DEP supported in 2021 included:

- **Municipal Comprehensive Plan Reviews** - DEP staff provided maps and data to 45 municipalities starting the comprehensive planning process. After plans are submitted to the state, DEP staff review the water resources sections of municipal comprehensive plans for consistency with agency goals, programs, and policies. In 2021, assistance was provided to the following ten towns:
 - Belfast
 - Clinton
 - China
 - Fayette
 - Georgetown
 - Gorham
 - Island Falls
 - New Gloucester
 - Poland
 - Scarborough
- **Lake Watershed Surveys** - Volunteer watershed surveys find, describe, and prioritize NPS pollution sources and recommend BMPs needed at specific NPS sites to reduce polluted runoff to lakes. DEP grant funds are typically not available to help support watershed surveys. However, DEP provides technical assistance and project oversight to local groups that conduct locally funded volunteer watershed surveys. After completing surveys, many of these groups use the survey findings to develop lake watershed-based protection plans that will guide local stewardship efforts and open the door to possible 319 grant funding. In 2021, DEP assisted with the following five watershed surveys:
 - Branch Lake (Ellsworth)
 - Clearwater Lake (Industry/Farmington)
 - Great East Lake (Acton)
 - Messalonskee Lake (Belgrade/Sidney/Oakland)
 - Unity Pond (Unity)

Staff also provided assistance to lake associations to help plan 2022 surveys for Beech Hill Pond (Otis), Clemons Pond (Hiram), Wilson Lake (Acton) and Wilson Pond (Leeds). DEP helped Lake Stewards of Maine (LSM) review applications to their small grants program, which provides mini-grants to help fund watershed surveys.

- **Youth Conservation Corps (YCC)** - The DEP provides some technical assistance to Maine's eight YCC programs. These YCC programs hire high school students to install buffers, erosion control measures, and other conservation practices in lake watersheds. Most of these programs originally started as part of 319 grant projects and continued with local funding support. DEP staff hosted a YCC Roundtable in March 2021 to promote information sharing and collaboration.

The DEP piloted a program that exempts YCCs from permitting requirements for certain low impact NPS mitigation activities. The permit fees were viewed as a barrier for property owners, and this exemption program is designed remove that impediment. Because of the timing of the pilot program announcement and coronavirus pandemic, participation in the program during 2021, only five projects were completed under the exemption. The pilot program will continue into 2022 as more YCCs incorporate the program into their planning process.

- **Watershed Group Support** - DEP supports the work of watershed associations and communities through presentations at annual association meetings and technical assistance outside of 319 grant-funded projects. In 2021, DEP provided watershed maps upon request and assistance to many organizations and groups focused on the following watersheds:
- **Watershed Roundtable** – Approximately 40 watershed professionals from state agencies, municipalities, watershed organizations, and SWCDs attended the DEP’s 19th annual Watershed Managers Roundtable in November. Given Covid-19 restrictions, the 2021 gathering was again hosted via Zoom with a full-group roundtable and lightning round presentations.
- **Lake Phosphorus Compensation Fee Projects** - Under the Maine Stormwater Law, developers in certain lake watersheds have the option to pay a compensation fee in lieu of constructing additional BMPs to comply with a portion of a parcel’s phosphorus budget. DEP staff works annually with seven partner organizations to identify and implement phosphorus mitigation projects in these watersheds. In 2021, York County Soil and Water Conservation District used compensation funds to purchase a new high-efficiency street sweeper for the Town of Sanford. Lakes Environmental Association and Cumberland County Soil and Water Conservation District both did planning for projects to be constructed in 2022.

B. Maine Nonpoint Source Training Center

The Maine NPS Training Center's primary focus is to provide training to various groups throughout the state to help them prevent NPS pollution. In addition, the Center maintains an inventory of NPS publications and acts as a clearinghouse for information on NPS pollution and best management practices.

Accomplishments in 2021:

- Presented 18 eight-hour 'Basic & Advanced Erosion Control Practices' (BAESC) courses in-person statewide (216 participants). Another 154 people were trained online through the new modular course.
- Hosted 15 four-hour continuing education classes (131 participants). An additional 16 classes presented by other organizations were approved for continuing education credits with topics ranging from septic system installation, bio-engineering practices, and living shorelines.
- On-line continuing education training was utilized by 158 people who completed individual modules online for recertification credit.
- Developed new four-hour 'Winter Best Management Practices for Erosion Control' and 'BMPs for Landscape Professionals' courses.
- Conducted two 'Maintenance and Repair of Gravel Roads' trainings (27 participants).
- Offered free online ESC instruction for Certified Underground Tank Installers and code enforcement officers (CEO) for CEO Training and DEP Certification Credit.
- Revised award of training credit hours from calendar year to rolling basis so each assigned credit hour will now be worth one year of recertification credit.
- Implemented contractor certification reinstatement procedures resulting in increased retention of expiring contractors and use of continuing education.
- Partnered with staff in several Maine DEP, Maine DOT, Maine DACF, Maine Audubon, and US ACOE, Maine Project office to develop new training materials.
- Developed four video resources for use by DEP staff.



For More Information:

John Maclaine, DEP, (207) 615-3279, john.maclaine@maine.gov
NPS Training Center Website, <http://www.maine.gov/dep/land/training/index.html>

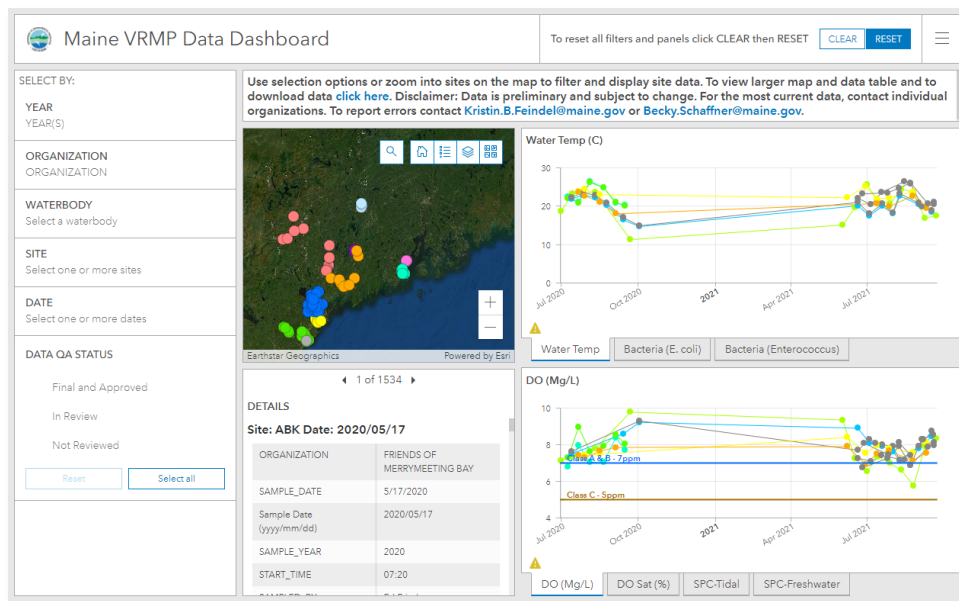
C. Maine Volunteer River Monitoring Program

The purpose of the Volunteer River Monitoring Program (VRMP) is to provide a standardized approach to river and stream monitoring. Volunteer groups participating in the program collect data under the VRMP Quality Assurance Program Plan (QAPP) and develop Sampling and Analysis Plans (SAPs) specific to their needs. The volunteer organizations are also responsible for recruiting and organizing the volunteers, attending an annual training/certification, and entering the data electronically.

The VRMP provides technical support and resources to the volunteer groups. This support includes assistance with SAP development/updates, annual training, and equipment maintenance and loan. VRMP staff also review the data entered by the volunteer groups, upload acceptable data to DEP's database, and produce an annual report.

Accomplishments in 2021:

- VRMP staff and partners trained and certified/re-certified volunteers from nine volunteer organizations to monitor 54 rivers and streams and one harbor statewide. This was two more than the previous year and these new groups expanded monitoring in central Maine.
- Despite the continuing pandemic, water quality data were collected by approximately 65 volunteers at 145 sites during 870 sampling events.
- Data collected included temperature, dissolved oxygen, conductivity, bacteria, chlorophyll, and nutrients.
- Expanded use of volunteer electronic data collection via Survey123 and made data readily available via online Dashboard.



For More Information:

Kristin Feindel – (207) 215-3461, kristin.b.feindel@maine.gov

VRMP Website – www.maine.gov/dep/water/monitoring/rivers_and_streams/vrmp/index.html

Dashboard - <https://maine.maps.arcgis.com/apps/dashboards/0ca4fbd9c7584fbd9c2c56ef5413a915>

D. Clean Water State Revolving Fund

In Maine, the Clean Water State Revolving Fund (CWSRF) finances NPS projects through several different direct loans, pass-through loans, and linked-deposit loans. These programs funded \$4.46 million in the following types of NPS projects in 2021.

Accomplishments in 2021:

The CWSRF linked-deposit forestry program makes below market-rate financing available for forestry BMPs and the purchase of environmentally friendly logging equipment. Loan recipients must comply with forest industry harvesting standards and environmental inspections. In 2021, \$4.46 million in loans were made.



For More Information:

Brandy Piers, CWSRF Program Manager – (207) 287-7808, brandy.m.piers@maine.gov
Clean Water SRF Website – <http://www.maine.gov/dep/water/grants/srfparag.html>

E. Municipal Stream Crossing Grants Program – Maine Transportation Bond

In 2014, Maine voters approved the first referendum for a “Clean Water for Maine” bond, resulting in \$5.4 Million invested in Maine stream crossing upgrades over 3 initial rounds grants. Since then, DEP has received funding for the upgrade and replacement of municipal culvert stream crossings through Transportation Bonds approved by voters and the Maine Legislature in 2017, 2018 and 2020.

DEP has developed a grant program to disseminate these funds for stream crossing culvert upgrades. NPSTC has provided additional workshops and training on the design of Stream Smart Road Crossings aimed at municipal officials, public works staff, engineers, and consultants. Program funds are intended to improve public safety by reducing the risk of culvert failures and flooding; improve fish habitat by removing barriers to fish passage; sizing crossings to meet 1.2 times the streams bankfull width with a natural stream bottom or open-bottomed structure; improves water quality; and represent a cost-efficient and effective investment. In addition to the program goals listed above, projects also provide NPS, stream habitat connectivity, and woody debris-passage benefits.

Accomplishments in 2021:

- In November 2017, voters approved \$5 million in bond funding for upgrading culverts at stream crossings to improve fish and wildlife habitats and increase public safety. Two RFPs under this funding (\$5 million total) was released in 2019.

The program received a total of 89 proposals for the upgrade of stream crossings resulting in the award of 55 projects receiving grant funds. By the end of 2021, 35 of these projects were completed, 9 had withdrawn applications due to various reasons, primarily surrounding cost and contractor availability, and 11 planned for 2022 construction. The funds associated with withdrawn projects have been re-awarded to subsequent projects or are in the process of being re-awarded.

- In November 2018, voters approved another \$5 million in bond funding for upgrading culverts at stream crossings to improve fish and wildlife habitat and increase safety. One RFP under this funding (\$5 million total) was released in fall 2020. Maximum award amounts were increased, and DEP awarded approximately 41 projects in early 2021. Eight projects from this round were completed in 2021.
- The grants program received an additional \$4 million for stream crossing grants for its 2021 RFP. Grants will be awarded in 2022.
- With assistance from Maine Audubon’s Stream Smart program, Army Corps of Engineers Maine Project Office, and Maine DOT Bridge Maintenance Engineer, NPSTC coordinated and produced a four-hour [online training video](#), which was integrated into the application materials for additional guidance. This video and trainings for prospective applicants have resulted in a noticeable increase in the quality of proposals and designs.

For More Information:

John Maclaine, DEP, (207) 615-3279, john.maclaine@maine.gov

Culvert Bond Website – <https://www.maine.gov/dep/land/grants/stream-crossing-upgrade.html>

F. Other NPS Program News

NPS Work on Protection Priority Watersheds

In 2021, DEP worked to identify and target assistance to lake watersheds with the highest protection priority. This included targeted work on “Watch List” lakes and development of criteria for a “Most Vulnerable Lakes” list.

DEP’s Lakes Unit keeps an internal ‘Watch List’ for non-impaired lakes at risk of being listed as impaired due to declining water quality. Of these lakes, 25 are affected by NPS and included on the NPS Priority Watersheds list. In 2021, DEP was involved with planning or implementation in eight watch-listed watersheds:

- Abrams Pond, Eastbrook (319 grant project)
- Androscoggin Lake, Leeds (planning assistance)
- Cobbosseecontee Lake, Winthrop (319 grant project)
- Georges Pond, Franklin (319 grant project)
- Highland Lake, Windham (319 grant project)
- Messalonskee Lake, Sidney/Belgrade (watershed survey)
- Mousam Lake, Shapleigh (319 grant projects)
- Salmon Lake, Belgrade (319 grant project)

Additionally, DEP took steps in 2021 to develop a Most Vulnerable Lakes List consisting of lakes that currently have acceptable water quality but are losing deep water habitat for coldwater fish over time due to decreasing levels of deep-water dissolved oxygen and a rise in the prevalence of anoxia (<2 ppm dissolved oxygen). These conditions also increase the risk of internal phosphorus recycling and declining water quality. DEP expects to complete this assessment in 2022 and add the designation “Most Vulnerable” to applicable NPS Priority List watersheds.

Climate Change and Environmental Justice

The Maine Legislature passed LD 1682, “An Act to Require Consideration of Climate Impacts by the Public Utilities Commission and To Incorporate Equity Considerations in Decision Making by State Agencies”, which was signed into law by Governor Mills on June 17, 2021. This law directs the Public Utilities Commission to use the state’s greenhouse gas emission in executing its duties, powers, and regulatory functions. The law also directs the Governor’s Office of Policy Innovation and the Future to define terms associated with environmental justice and develop methods of incorporating equity considerations in decision making at the Department of Environmental Protection and the Public Utilities Commission. A report to the Joint Standing Committees on Environment and Natural Resources and Energy, Utilities, and Technology is to be submitted by Feb 15, 2022.

Healthy Soils Program

The Maine Legislature passed LD 437, “An Act to Establish the Maine Healthy Soils Program”, which was signed into law by Governor Mills on June 10, 2021. The law creates the Healthy Soils Program in DACF with the purpose of improving soil health, protecting biological and microbial diversity, increase greenhouse gas drawdown, promote healthy soil agricultural processes, and promote and expand the use of healthy soils best management practices among farmers and farmland owners in the State.

DEP plays a lead role and coordinates with other State agencies including DACF to carry out the State of Maine Nonpoint Source (NPS) Pollution Program (38 M.R.S. §410). Statewide efforts are guided by Maine’s NPS Management Program Plan (2020-2024). A key objective in the current five-year plan is to “increase field crop agriculture’s use of soil health practices to reduce soil erosion, improve water quality and offset carbon emissions.” DEP and DACF are collaborating on this objective.

V. NPS Grants Program

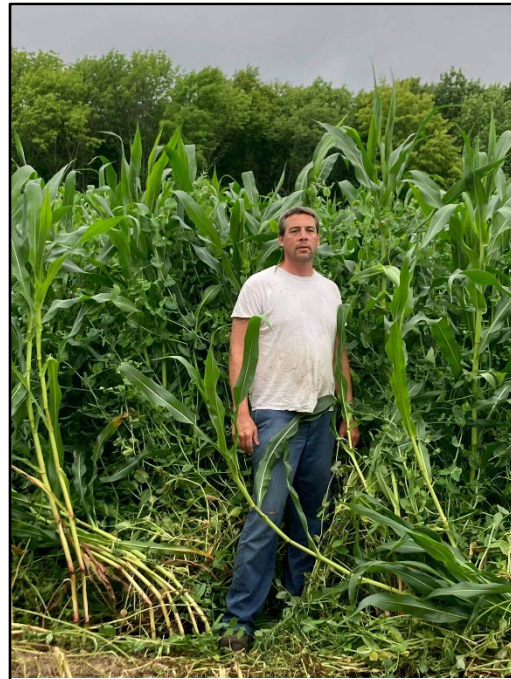
A. Overview

DEP uses a watershed-based approach as the coordinating framework to organize public and private sector efforts to identify, prioritize, and then implement activities to restore or protect waters. Through its pass-through grants program, DEP administers awards and monitors sub-grants of Federal CWA Section 319 and 604(b) funds from the EPA for watershed projects to help restore or protect lakes, streams, rivers, or coastal waters affected by NPS pollution. DEP issues grants to local project sponsors to help fund two types of watershed-based projects:

- **Watershed-based Plan Development.** DEP offers grants to help communities develop watershed-based management plans that include EPA's nine key elements. A plan provides assessment and management information and describes actions needed over a 10-year period to restore NPS-impaired waters or to protect unimpaired waters considered threatened by NPS pollution. A thorough assessment of NPS problems (e.g., watershed survey) is needed to prepare an informed watershed plan.
- **Watershed-based Plan Implementation.** DEP offers grants to help communities implement their watershed-based plans and carry out actions called for in the plan to make progress restoring or protecting a waterbody.



Watershed survey follow up conducted for the China Lake watershed-based management plan.



Mixed cover crop of peas and corn planted with no-till seeder as part of the Cross Lake Restoration Plan, Phase 1.

B. Grant Awards Issued and Started in 2021

DEP issued nine new grants (\$599,892) in 2021 using CWA Section 319 funds to help communities implement actions called for in their watershed management plans to restore impaired waters or protect waters threatened by NPS pollution. CWA Section 604b funding (\$49,600) was awarded to Kennebec County Soil & Water Conservation District to develop a Watershed-based Management Plan for North Pond.

NPS Grants Issued in 2021

Project Title	Grantee	Project ID#	Grant	Match
Abrams Pond Protection Project Phase II	Town of Eastbrook	20210006	\$68,349	\$45,625
Damariscotta Lake Watershed Protection Project, Phase II	Midcoast Conservancy	20210009	\$31,535	\$25,330
Lake Anasagunticook Watershed Protection Project, Phase II	Oxford County SWCD	20210001	\$51,655	\$34,444
Long Pond Watershed Protection Project, Phase 1	York County SWCD	20210008	\$70,610	\$47,128
Mousam Lake Watershed Protection Project - Phase II	York County SWCD	20210003	\$65,994	\$47,533
North Pond Watershed-based Management Plan Project	Kennebec SWCD	20210010	\$49,600	\$84,508
Pleasant River Restoration Project Phase II	Cumberland County SWCD	20210005	\$63,421	\$60,321
Sebago Lake Watershed Protection Project - Phase IV	Portland Water District	20210004	\$79,043	\$94,407
Square Pond Protection Project Phase III	York County SWCD	20210002	\$93,661	\$62,539
Watchic Lake Protection Project Phase I	Watchic Lake Association	20210007	\$75,632	\$49,802
Totals			\$649,492	\$551,637

C. Grants Selected under 2021 Request for Applications (RFA)

In March 2021, DEP issued an RFA for projects to help communities implement their watershed-based plans and make progress restoring or protecting a waterbody. DEP received 13 applications and issued conditional grant awards for 11 projects. Three projects started in fall 2021, and the other nine projects will begin in 2022

Conditional Grant Awards under Section 319 RFA

Project Title	Grantee	Project #	Grant	Match
Cobbossee Lake Watershed Protection Project, Phase III	Cobbossee Watershed District	20220005	\$93,847	\$63,800
Cross Lake Watershed Restoration Project, Phase I	County of Aroostook	20210012	\$149,775	\$135,609
Georges Pond Watershed Protection Project, Phase II	Georges Pond Association	20220004	\$84,265	\$56,622
Great Pond Watershed Restoration Project, Phase I	7 Lakes Alliance	20220001	\$109,430	\$140,250
Kennebunk River Watershed Restoration Project, Phase I	York County SWCD	20220007	\$88,248	\$59,192
McGrath Pond-Salmon Lake Watershed Protection Project, Phase V	7 Lakes Alliance	20220003	\$94,270	\$86,955
North Pond Watershed Protection Project, Phase III	7 Lakes Alliance	20210013	\$104,950	\$110,125
Ogunquit River Watershed Restoration Project, Phase IV	Town of Ogunquit	20210014	\$61,990	\$43,496
Topsham Fair Mall Stream Watershed Restoration Project, Phase III	Town of Topsham	20220008	\$153,479	\$102,629
Trickey Pond Watershed Protection Project, Phase 1	Cumberland County SWCD	20220006	\$75,811	\$52,599
Trout Brook Watershed Restoration Project, Phase IV	Cumberland County SWCD	20220002	\$45,801	\$31,081
Totals			\$1,061,867	\$882,358

VI. Summaries of NPS Projects Completed in 2021

Twelve watershed projects funded through the NPS grants program in previous years were successfully completed. DEP provided technical assistance and granted \$930,834 of Federal Clean Water Act funds for these projects. Grantees, partners, and landowners contributed matching funds or services valued at \$1,329,016.

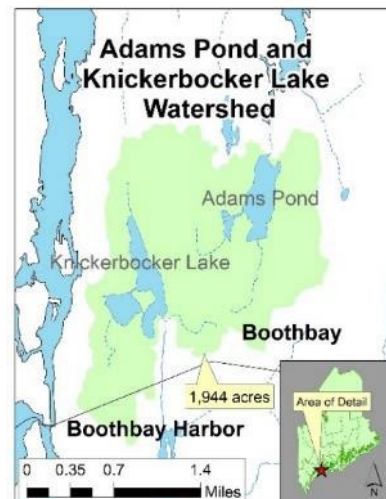
- BMPs were installed to reduce polluted runoff in ten watersheds, including seven lake and three coastal or stream watersheds. Over the course of these projects, NPS work reduced annual pollutant loading to these waters by 794 tons of sediment, 404 pounds of phosphorus, and 453 pounds of nitrogen per year.
- Watershed-based plans were completed for Cross Lake (Cross Lake TWP) and Mare Brook (Brunswick). Watershed-based plans provide assessment and management information and describe actions needed to restore NPS-impaired water bodies or to protect water bodies threatened by NPS pollution.

Two-page summaries of each project are included in the following pages. These summaries will be uploaded to the Gulf of Maine's Knowledgebase database located at: <http://www.gulfofmaine.org/kb/2.0/search.html>.

Project Title	Page Number
Adams-Knickerbocker Lake Protection Project, Phase III	24
Capehart Brook Watershed Restoration Project, Phase III	26
Cobbosee Lake Watershed Protection Project, Phase II	28
Concord Gully Brook Watershed Restoration Project, Phase II	30
Cross Lake Watershed-based Management Plan	32
Mare Brook Watershed-based Plan Development Project	34
McGrath Pond-Salmon Lake Watershed Protection Plan, Phase IV	36
Mousam Lake Watershed Protection Project, Phase I	38
North Pond Watershed Protection Plan, Phase II	40
Ogunquit River Watershed Restoration Project, Phase III	42
Parker Pond NPS Watershed Protection Project, Phase II	44
Thatcher Brook Watershed Restoration Project, Phase II	46

Adams Pond & Knickerbocker Lake Watershed Protection Project, Phase III #20200007

Waterbody Names:	Adams Pond and Knickerbocker Lake
Location:	Boothbay, Boothbay Harbor - Lincoln County
Waterbody Status:	NPS Priority Watershed, Most at Risk
Project Sponsor:	Boothbay Region Water District Project
Duration:	January 2021- December 2021
319 Grant Amount:	\$42,940
Local Match:	\$79,213



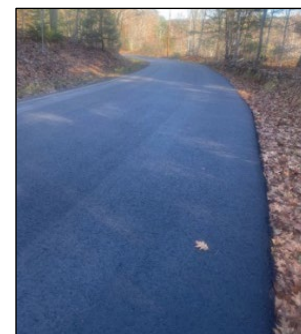
PROBLEM:

Adams Pond (80 acres) and Knickerbocker Lake (110 acres) are the public water supply for the towns of Boothbay, Boothbay Harbor, and Southport. Although significant parts of both watersheds remain undeveloped, erosion and runoff associated with existing development contribute soil and phosphorus to the lakes and watershed streams and adversely affect water quality. Based on measures of Secchi disk transparency, total phosphorus, and chlorophyll-a, the water quality of both lakes is considered below average. Dissolved oxygen (DO) levels in Adams Pond and Knickerbocker Lake in recent years show DO depletion in deep areas of the lake. There is a high potential for phosphorus to leave the bottom sediments and become available in the water column in both lakes.

A 2014 watershed survey identified 48 NPS sites in the Adams Pond and Knickerbocker Lake watersheds. Post-survey fieldwork identified four more high priority sites. Census data show Boothbay's population is growing at a rate higher than the state average, and two large developments within the watersheds are expected to increase population growth and stimulate more development. Because the Adams Pond and Knickerbocker Lake watersheds are centrally located, easily accessible by major roadways, and largely undeveloped, they are particularly attractive for development. From 2017-2019, a Phase I project installed BMPs at 24 sites and reduced annual pollutant loading to the ponds by 77 tons of sediment and 65 pounds of phosphorus, and from 2019-2020 a Phase II project installed BMPs at 11 sites and reduced pollutant loads by 22.4 tons of soil and 19 pounds of phosphorus from reaching Adams Pond annually and 8.4 tons of sediment and 7.1 pounds of phosphorus from reaching Knickerbocker Lake annually

PROJECT DESCRIPTION:

The overall goal of this Phase III project was to improve the water quality of Adams Pond and Knickerbocker Lake by reducing or eliminating nonpoint source pollution discharges to the lakes. The project work plan called for the installation of sediment and erosion control BMPs at one high priority NPS site within the watershed. Public outreach for the project included direct landowner contact, one presentation at the Knickerbocker Lake Association annual meeting and two press releases in the local newspaper



Gaecklin Rd after proper base was added, and the road was paved and crowned. New ditches were installed.

PROJECT OUTCOMES:

- One NPS abatement project in the Knickerbocker Lake watershed was complete. The Town of Boothbay installed BMPs along approximately 2,250 feet of a severely eroding town road. The project included regarding, resurfacing, and paving the road, adding ditches with check dams, and installing culverts and ditch turn outs to move runoff into the adjacent forested buffer.
- The completed project prevented 13.42 tons of soil and 11.4 pounds of phosphorus from reaching Knickerbocker Lake annually (Region 5 Method).
- Project staff met with Gaecklin Rd residents on site throughout the project, discussed the project at the Knickerbocker Lake Association meeting and provided the community with project updates via two press releases in the local newspaper.
- The project resulted in \$79,213 in local match (exceeding the original work plan match by \$44,511).



Gaecklin Road Before – The town road lacked stormwater BMPs causing severe erosion and polluted runoff.



Gaecklin Road After – Various road BMPs were installed, which included paving, crowning, and ditching.

PROJECT PARTNERS:

Town of Boothbay
Boothbay Region Water District
Gaecklin Road Residents
Dirigo Engineering
Knickerbocker Lake Association

CONTACT INFORMATION:

Addie Halligan, DEP – (207) 441-9057, addie.halligan@maine.gov
Sue Mello, BRWD – (207) 633-4723 x111, suem@bbrwd.org

Capehart Brook Watershed Restoration Project Phase III #20180010

Waterbody Name:	Capehart Brook
Location:	City of Bangor – Penobscot County
Waterbody Status:	Impaired, NPS Priority Watershed
Project Grantee:	City of Bangor
Project Duration:	April 2019 – December 2021
319 Grant Amount:	\$125,000
Local Match:	\$85,450



PROBLEM:

Capehart Brook is a small stream (0.46 miles) in the City of Bangor that drains to Kenduskeag Stream, a tributary of the Penobscot River. Water quality analyses of Capehart Brook indicate low dissolved oxygen (DO) concentrations and large DO diurnal swings suggestive of nutrient enrichment. Capehart Brook's 685-acre watershed contains 15% impervious cover and runoff from roads, roofs and parking lots carry soil, oils, metals, and other pollutants into the brook. Impervious cover also results in abnormally high volumes of flow during storm events due to the loss of absorption normally associated with undisturbed watersheds. According to DEP's *Maine Impervious Cover TMDL* (2012), to support Class B aquatic life uses the Capehart Brook watershed should have the characteristics of a watershed with 8% impervious cover. Both the TMDL and a previously conducted Stream Corridor Survey recommend effectively disconnecting impervious cover to reduce contaminants and volume to levels approximating a watershed with 8% impervious cover.

The *Capehart Brook Watershed Management Plan* (2011) was developed to guide stream restoration. Previously, the City of Bangor's Phase I 319 grant project (#2011RT16) installed two subsurface bio-retention cells, 21 rain barrels and three rain gardens in the watershed. The City's Phase II 319 grant project (#2015RT01) revitalized the Sunny Hollow Detention Pond and installed 19 bio-retention cells.

PROJECT DESCRIPTION:

The Phase III project was managed by the City of Bangor's Engineering Department and consisted of installing an underdrained soil filter (USF) and 550 linear feet of in stream restoration. These BMPs are designed for pollutant removal and improving instream habitat for aquatic organisms.

Project outreach included signage, website updates and a press release. Informational signs were developed and posted at the two project sites. A sign at the school describes the purpose of the underdrained soil filter, and a second sign describes the stream restoration work and overall stream restoration project.



Underdrained soil filter installed to treat stormwater runoff at Penobscot Christian School.

PROJECT OUTCOMES:

- Installed an underdrained soil filter to treat 0.8 acres of impervious area, including most of the school parking lot and some of the school's roof. The project is estimated to reduce 320 pounds of sediment, 4.58 pounds of nitrogen and .86 pounds of phosphorus from entering the brook annually.
- Restored 550 linear feet of stream by adding gravel bars, rootwads and streambank plantings.
- The City of Bangor contributed \$65,229 over the agreement match requirement.
- The City of Bangor completed a post-construction maintenance plan for the USF and will have legal access to the site through an easement for annual inspections. Maintenance will be scheduled as needed following inspections.



Instream restoration work included adding gravel bars, root wads and plantings along 550 feet of stream.

PROJECT PARTNERS:

Penobscot Christian School

CONTACT INFORMATION:

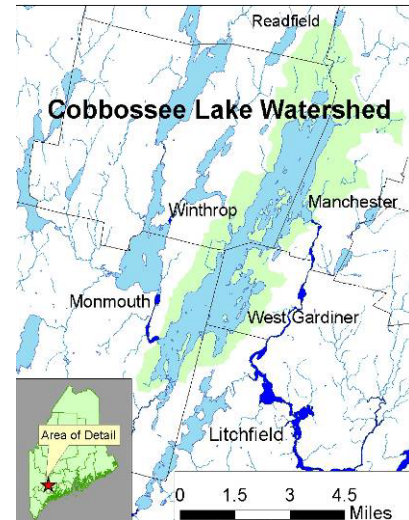
Rich May, City of Bangor – (207) 949-3819, richard.may@bangormaine.gov, www.bangormaine.gov

Greg Beane, Maine DEP - (207) 299-4703, greg.e.beane@maine.gov

Cobbossee Lake Watershed Protection Project, Phase II

#20180011

Waterbody Name:	Cobbossee Lake
Location:	Winthrop, Manchester, West Gardiner, Readfield, Litchfield, Monmouth - Kennebec County
Waterbody Status:	NPS Priority Watershed, Threatened
Project Grantee:	Cobbossee Watershed District
Project Duration:	January 2019 – December 2021
319 Grant Amount:	\$90,410
Local Match:	\$106,369



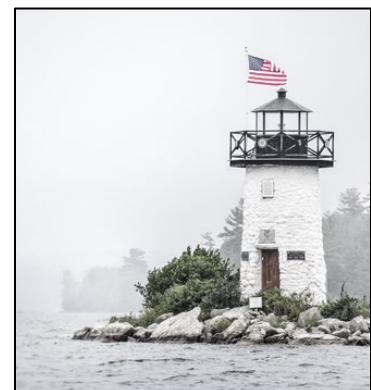
PROBLEM:

Cobbossee (Cobbosseecontee) Lake is a large lake with a surface area of approximately 5,238 acres and a direct watershed of 27 square miles. The lake supports a large recreational fishery and recreational boating and is a backup drinking water supply for the City of Augusta. The lake has been continuously monitored by the Cobbossee Watershed District (CWD) for over 40 years and the CWD has implemented several water quality improvement projects over the years. From 1996 to 2002, Cobbossee Lake experienced a gradual increase in water clarity and the minimum Secchi disk reading did not fall below two meters. Due to this sustained improvement, Cobbossee Lake was removed from the impaired list in 2006. However, the lake had a severe bloom in 2009 and 2013 and therefore continued efforts are needed to maintain its de-listed status.

The Kennebec County SWCD, with assistance from the CWD, completed the 2007–2008 Cobbossee Lake Water Quality Protection, Phase I project (#2007RR06). In 2015, the CWD completed the Cobbossee Lake Watershed Survey (#2013RR17) and prepared the Cobbossee Lake Watershed-Based Protection Plan (April 2015). The Cobbossee Lake Protection Project Phase I (#2106RR02) installed BMPs at 21 NPS sites and provided technical assistance to 18 camp roads and 20 property owners.

PROJECT DESCRIPTION:

The goal of the Phase II project was to reduce sediment and phosphorus loading to Cobbossee Lake by installing BMPs on 15-20 NPS sites, primarily on eroding and poorly draining camp roads. In addition, the Friends of the Cobbossee Watershed's (FOCW) summer Youth Conservation Corps (YCC) planned to provide technical assistance and labor to address another 15 NPS sites on shorefront properties. Project outreach included FOCW classroom visits and TadPole Patrol programs, project articles in partner newsletters and local newspapers.



PROJECT OUTCOMES:

- Six camp road upgrades involving the installation of BMPs intended to reduce erosion and improve treatment of stormwater runoff were installed at 19 NPS sites, accounting for a reduction in annual loading to the lake of 5.7 tons of sediment and 5.7 pounds of total phosphorus (WEPP Model).
- The Youth Conservation Corps provided technical assistance to 26 landowners and stabilized over 1,500 linear feet of eroding shoreline at 17 properties using a combination of riprap, geo-textile fabric, and vegetation.
- More than 500 students benefited from the Friends of the Cobbossee Watershed's (FOCW) watershed education program, and many children and adults were provided lake and watershed education via the FOCW's 32 Tadpole Patrol sessions held during the project.

**PROJECT PARTNERS:**

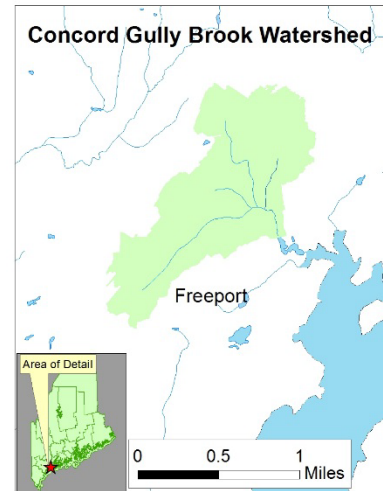
Friends of the Cobbossee Watershed

CONTACT INFORMATION:

William Monagle, Cobbossee Watershed District - (207) 377-2234, wmonagle@roadrunner.com
Greg Beane, Maine DEP - (207) 299-4703, greg.e.beane@maine.gov

Concord Gully Brook Watershed Restoration Project, Phase II #20180004

Waterbody Name:	Concord Gully Brook
Location:	Freeport - Cumberland County
Waterbody Status:	Urban Impaired Stream
Project Grantee:	Town of Freeport
Project Duration:	July 2018 – June 2021
319 Grant Amount:	\$90,677
Local Match:	\$249,555



PROBLEM:

Concord Gully Brook is an urban impaired stream located in Freeport. The main stem is approximately 1.5 miles long. There is one major tributary, Porter's Landing Brook, and several other minor tributaries. The watershed encompasses 561.8 acres (0.88 square miles) and has a mix of land uses that includes residential, commercial, public, and forested land. DEP calculated the total impervious area to be 22%.

This Class B stream has been on Maine's 303(d) list since 2004 because it does not meet standards for aquatic life, habitat, or bacteria. The threats to water quality identified during the plan development include stream bank erosion, stream channel changes, degraded stream habitat, elevated chloride, and elevated nutrients and bacteria during stormflow conditions. The Concord Gully Brook Watershed Management Plan (April 2015) was developed by Cumberland County SWCD and the Town of Freeport (#2012RT18). The plan identified ten instream restoration projects to improve habitat and floodplain connectivity and nine stormwater retrofit projects. The Concord Gully Brook Restoration Phase I project (#2016RT09) implemented instream restoration projects at two priority locations.

PROJECT DESCRIPTION:

The purpose of this project was to continue restoration efforts of the stream's water quality and aquatic habitat through installation of stormwater BMPs, reducing and stabilizing eroding stream banks, and reducing chloride loading.

Successful collaboration between the Town of Freeport, L.L. Bean and contractors allowed for agreement on strategies to address chloride management. Snow from L.L. Bean's campus will be moved to outside of the watershed and snow from municipal areas of the Village area will be trucked to a location where it discharges into a lined stormwater pond.



Before - The West St crossing. Stream was extremely constricted, disconnected and causing erosion downstream.

PROJECT OUTCOMES:

- Installation of a stream-smart crossing structure at the West Street Crossing. The impact of the West Street crossing of the Porter's Landing Tributary was greatly reduced through installation of a stream-smart crossing that removed the stream restriction and encouraged formation of a more natural stream channel. Work at this site included installation of step-pools on the downstream side of the crossing, dissipating the energy and stabilizing the heavily eroding stream channel.
- Construction of a bioretention swale at the Train Station Parking Lot.
- Design of five stormwater BMPs in the watershed.
- Improved snow management plans for the Town and LL Bean, reducing the input of chloride into the brook's groundwater.
- Reduction of an estimated 27 tons/year of sediment, 17 pounds/year of phosphorus, and 45 pounds/year of nitrogen to Concord Gully (Region 5 Method).
- The extensive efforts of the Town added to the overall project generating over 73% in total project match and exceeding the project's match goal by \$142,800.



After – Upstream side of the crossing. Enlarged culvert removes constriction to the stream and allows channel to reform.



After – Downstream side of the crossing. More natural stream bottom under road, leading into created step-pools allowing for connectivity and for the energy to dissipate as it moves down the slope.

PROJECT PARTNERS:

Atlantic Resource Consultants
Field Geology Services
L.L. Bean

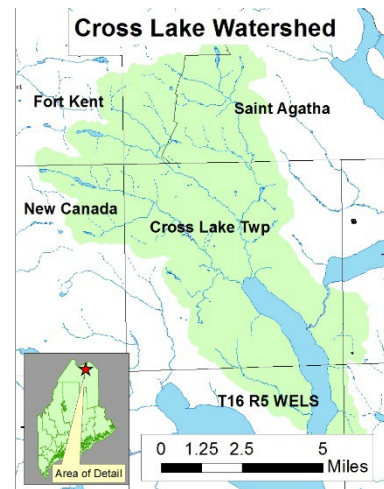
CONTACT INFORMATION

Adam Bliss, Town of Freeport - (207) 865-4743 x106, abliss@freeportmaine.com
Kristin Feindel, Maine DEP - (207) 215-3461, kristin.b.feindel@maine.gov

Cross Lake Watershed-based Management Plan

#20190011

Waterbody Name:	Cross Lake
Location, County:	Cross & Square Lake Twps, Aroostook
Waterbody Status:	Impaired, NPS Priority Watershed
Project Grantee:	County of Aroostook
Project Duration:	October 2019 –June 2021
604(b) Grant Amount:	\$17,419
Local Match:	\$29,576



PROBLEM:

Cross Lake is a fairly large lake at 2,479 acres with a 58 square mile watershed. There are two impaired major tributaries that flow into the northwest end of Cross Lake - Daigle and Dickey Brooks. Forestland and wetlands comprise 45% and 29% of the watershed land use respectively, agriculture is 23% and development only 3%. While row-crop agriculture (potatoes) is not the dominant land use, it is the most intense, leaving thousands of acres of bare soil exposed to erosion each year. A 2020 update to the 2019 watershed survey of nonagricultural lands identified 126 NPS sites, with 21% (26) rated high impact, 47% (59) rated medium, and 32% (41) low impact. Based on Secchi disk transparency (0.9-5.0 m), Total Phosphorus (historical average 16 ppb, recent average 17 ppb). Chl-a measurements (2 - 53 µg/L), and reoccurring algal blooms, the water quality of Cross Lake is listed as impaired.

PROJECT DESCRIPTION:

The purpose of the project was to develop a watershed-based management plan to guide lake restoration efforts. Aroostook County government subcontracted this project to the newly formed Friends of Cross Lake (FOCL), who managed this project and wrote the nine-element watershed-based management plan. The project partnered with a variety of agencies including US EPA Region 1 for a bathymetry survey that allowed for accurate calculations of internal phosphorus loading, NRCS's National Water Quality Initiative and local and state office for agriculturally related information and mapping, and Lake Stewards of Maine, University of Maine at Fort Kent (UMFK), and MEDEP Lake's Unit for in-lake water quality monitoring.

Phosphorus load calculations and modeling, water quality analysis and review, as well as internal loading calculations were contracted to a local Maine firm. Due to the pandemic the Technical Advisory and Steering committees, as well as other public involvement opportunities were held virtually.



Cross Lake algal bloom in June 2019

PROJECT OUTCOMES:

- Creation of an accurate bathymetry map, a valuable tool for current and future projects.
- The Cross Lake Watershed-Based Management Plan (2021-2031) was completed and approved, providing direction for water quality restoration efforts for Cross Lake and two impaired major tributaries (Dickey and Daigle Brooks).
- Formation of important partnerships with NRCS, St. John SWCD, UMFK, Maine Forest Service, and Irving Woodlands (major landowner) that will be needed to restore the lake.
- Intense in-lake water quality monitoring leading to a better understanding of Cross Lake's water quality and lake dynamics.
- Shorefront property residents increased awareness and knowledge of their impact on their lake's water quality. This has resulted in the introduction of the LakeSmart program.



Wood harvest in Daigle Brook watershed



Row crop agriculture in Dickey Brook watershed

PROJECT PARTNERS:

Friends of Cross Lake (FOCL)
 Maine DACF's Forest Service
 University of Maine, Fort Kent
 USDA Natural Resources Conservation Service
 US Environmental Protection Agency, Region 1
 Irving Woodlands

CONTACT INFORMATION:

Kathy Hoppe, DEP – (207) 540-3134, kathy.m.hoppe@maine.gov
 Cheryl St. Peter, FOCL – (207) 768-6617, countyee@fairpoint.net
 Ryan Pelletier, County of Aroostook - (207) 493-3318, ryan@aroostook.me.us

Mare Brook Watershed-Based Plan Development Project #20190012

Waterbody Name: Mare Brook

Location: Brunswick – Cumberland County

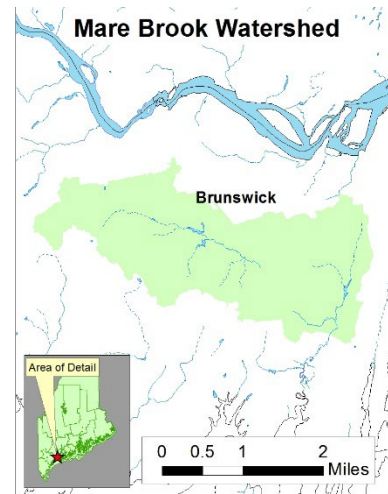
Waterbody Status: Impaired, NPS Priority Watershed

Project Grantee: Town of Brunswick

Project Duration: October 2019 – December 2021

604(b) Grant Amount: \$32,181

Local Match: \$75,888



PROBLEM:

Mare Brook (also referred to as Mere Brook) is a 5.7-mile stream that flows through the heart of Brunswick’s residential districts, under roads, through Coffin Ice Pond, through a ¾ mile long culvert underneath the airport runway and is joined by Merriconeag Stream (which flows through Picnic Pond) prior to reaching Harpswell Cove. Mare Brook’s 5 sq. mile watershed includes residences, institutional and office buildings, roads, athletic fields, Brunswick Landing (former Naval Air Station) and public conservation lands. While Mare Brook has large areas of highly buffered shoreline and the watershed contains 39% forest and wetland complexes, the watershed is approximately 21% impervious.

Mare Brook is a Class B stream impaired due to benthic macroinvertebrate bioassessments and habitat assessment. To address the brook’s impairment, the Town of Brunswick and a large group of invested stakeholders have sought to explore the causes of the brook’s impairment and solutions to restore its water quality via several town-funded and grant-funded studies.

PROJECT DESCRIPTION:

The project purpose was to develop a locally sponsored, watershed-based management plan (WMP) for Mare Brook with specific action items to address the multiple water quality problems previously identified within the watershed and with the waterbody.

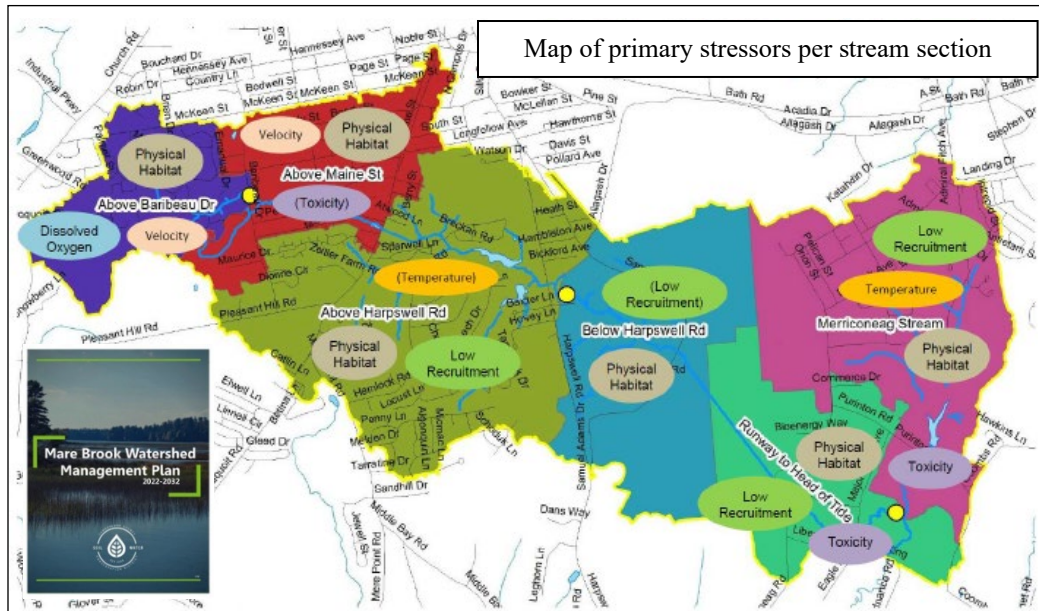
The Town of Brunswick, with support from Cumberland County SWCD and an engaged Steering Committee, reviewed previous studies and the results of additional surveys and monitoring. The information was used to conduct a stream stressor analysis by stream section and determine the primary stressors, causes and solutions. This process and the resulting plan action items were presented to the public to obtain input and provide information through a series of three broadcasted events in the fall of 2021. The 10-year WMP is intended to help direct limited resources and funds from a variety of involved stakeholders and different priority interests toward restoration activities that are likely to have the biggest impact. The WMP will be implemented by the town with oversight of a leadership team.



Steering committee member assisting with sampling Mare Brook.

PROJECT OUTCOMES:

- The *Mare Brook Watershed-based Management Plan* was created and accepted by Maine DEP. The community-developed management plan's goal is to restore Mare Brook to its designated Class B standards.
- Methods from Maine DEP's 2019 "Guide to Identifying Stream Stressors" were used which allowed restoration actions to be identified and prioritized based on the brook stressors in six different sections of the watershed.
- Field surveys and water quality monitoring were conducted. Survey work included a geomorphic assessment, culvert and outfall inventory and stormwater retrofit reconnaissance. Monitoring included sampling of macroinvertebrates and water quality parameters at several locations.
- Generation of over \$75,000 of match, \$48,000 over the required match amount, demonstrating community and Town support for this project.

**PROJECT PARTNERS:**

Bowdoin College
 Brunswick Area Citizens for a Safe Environment
 Brunswick Conservation Commission
 Brunswick Sewer District
 Brunswick Town Council
 Brunswick-Topsham Land Trust
 C.A. White & Associates
 Cumberland County SWCD

Casco Bay Estuary Partnership
 Field Geology Services
 Friends of Mare Brook and Coffin Pond
 Maine Department of Marine Resources
 Midcoast Regional Redevelopment Authority
 US Navy Base Realignment and Closure Committee

CONTACT INFORMATION:

Matt Panfil, Town of Brunswick - (207) 725-6660, mpanfil@brunswick.org
 Heather Huntt, Cumberland County SWCD - (207) 892-4700, hhuntt@cumberlandswcd.org
 Kristin Feindel, Maine DEP - (207) 215-3461, Kristin.B.Feindel@maine.gov

McGrath Pond - Salmon Lake Watershed Protection Plan - Phase IV #20190001

Waterbody Name:	McGrath Pond & Salmon Lake
Location:	Belgrade & Oakland, Kennebec County
Waterbody Status:	NPS Priority Watershed
Project Grantee:	7 Lakes Alliance
Project Duration:	January 2019 – December 2021
319 Grant Amount:	\$64,095
Local Match:	\$74,008



PROBLEM:

McGrath Pond and Salmon Lake are contiguous bodies of water located in the towns of Belgrade and Oakland and are part of the Belgrade Lakes Watershed. McGrath Pond flows through a short thoroughfare to Salmon Lake, which then flows to Great Pond. The surface area of McGrath Pond is 485 acres with a 3.78 square mile watershed and Salmon Lake has a surface area of 667 acres and a 3.14 square mile watershed.

The water quality of McGrath Pond is slightly above average and the potential for algal blooms is moderate. Salmon Lake water quality is slightly below average and the potential for algal blooms is moderate. Prior to a restoration project in the mid-1980s, Salmon Lake experienced algal blooms and since then experiences an occasional bloom. Three phases of 319 implementation projects from 2000-2007 addressed 89 NPS sites in the combined watershed. Despite these efforts, Salmon Lake continues to have high phosphorus levels and dissolved oxygen depletion in deep areas of the lake. The locally-funded 2017 watershed survey identified 105 sites, including 12 high impact and 47 medium impact NPS sites in the watershed. A watershed-based protection plan (WBPP) was developed in 2018.

PROJECT DESCRIPTION:

The primary purpose of the project was to implement BMPs at high priority NPS sites identified in the 2018 WBPP. In addition to pollutant reductions, the project aimed to raise community awareness through residential BMP workshops, gravel road workshops, LakeSmart evaluations and a stewardship project at Pleasant Point Park. Project outreach also included newsletter articles and press releases and aimed to build momentum to address NPS sites through Phase IV and beyond.



Project sign installed at Pleasant Point Park in Oakland

PROJECT OUTCOMES:

- BMPs were installed at a total of 41 NPS sites, including 10 high priority sites located on private roads, residential sites, Camp Tracy and Pleasant Point Park.
- Pollutant load calculations estimated that 77.1 tons of sediment, 65.6 pounds of phosphorus and 130.9 pounds of nitrogen were reduced per year due to installation of best management practices (Region 5 Method).
- Two road maintenance workshops (65 participants) were held in 2019 and 2021.
- McGrath Pond Salmon Lake Association (MPSLA) volunteers conducted 17 LakeSmart evaluations.
- 7 Lakes YCC installed 21 BMPs at 14 residential properties.



Before and After Photos - Camp Tracy road project

PROJECT PARTNERS:

Camp Tracy
Kennebec County SWCD
McGrath Pond-Salmon Lake Association
Town of Belgrade
Town of Oakland

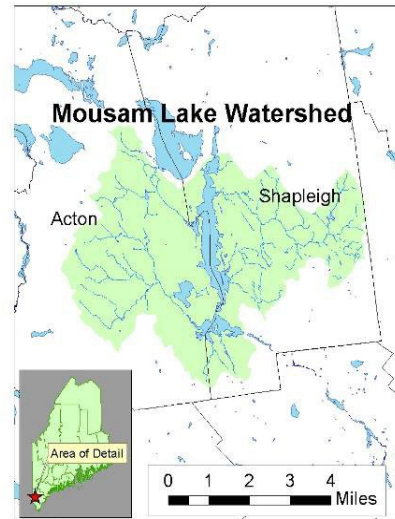
CONTACT INFORMATION:

Greg Beane, Maine DEP – (207) 299-4703, greg.e.beane@maine.gov
Charlie Baeder, 7 Lakes Alliance – (207) 458-1334 charlie.baeder@7lakesalliance.org

Mousam Lake Watershed Protection Project, Phase I

#20190010

Waterbody Name:	Mousam Lake
Location:	Acton and Shapleigh – York County
Waterbody Status:	NPS Priority Watershed
Project Sponsor:	York County SWCD
Project Duration:	January 2019 – December 2021
319 Grant Amount:	\$84,846
Local Match:	\$57,993



PROBLEM:

Mousam Lake is a dual-basin, 979-acre waterbody located in the towns of Acton and Shapleigh, in York County, Maine. The 25 square mile watershed also includes the watersheds of Goose and Loon Ponds. The lake shoreline is heavily developed with over 950 year-round and seasonal residences. There are nearly 1,650 parcels in the Mousam Lake watershed. Other land uses in the watershed include commercial boat marinas, gas stations, stores, restaurants, and the Acton Fairgrounds property located near the western shore of Mousam Lake.

Mousam Lake was listed as an impaired lake by Maine DEP until 2006, when, after a decade of nonpoint source mitigation work (partially funded through USEPA Section 319 grants) in the watershed, water quality stabilized and it was delisted. In 2017, a locally-funded watershed survey was completed identifying 189 nonpoint source (NPS) erosion sites. 60% of all sites were related to erosion on residential properties nearest to the Lake. 28% of identified sites were associated with roads (town roads, private roads, and driveways). Road sites tend to be larger erosion problems with a greater impact to the lake.

PROJECT DESCRIPTION:

The purpose of this project was to protect Mousam Lake from pollution and improve or maintain current water quality. The project significantly reduced erosion and export of sediment and phosphorus from the watershed by installing Best Management Practices (BMPs) at high priority town road, private road, and residential sites.

Additionally, the project increased public awareness about watershed issues and aimed to foster long-term watershed stewardship



PROJECT OUTCOMES:

- Installed BMPs at six sites throughout the watershed, including 3 road sites and 3 residential sites.
- The Acton-Shapleigh Youth Conservation Corps completed 15 smaller projects on residential properties in the watershed.
- Reduced pollutant loading to Mousam Lake by an estimated 6.5 tons of sediment and 5.5 pounds of phosphorus (Region 5 Method).
- Mousam Lake Region Association produced an educational video about the threat stormwater poses to lakes and how it can be mitigated through the use of BMPs. The video has been viewed over 600 times.



Pond Road – A steep, eroding path leading directly to the lake was blocked off with a fence and vegetated. An erosion control mulch berm was installed to direct stormwater from the road into an existing catch basin and check dams were added to the existing ditch.

PROJECT PARTNERS:

Acton-Shapleigh Youth Conservation Corps
 Cumberland County Soil and Water Conservation District
 Mousam Lake Region Association
 Three Rivers Land Trust
 Shapleigh Conservation Commission
 Tattle Street Road Association
 Town of Acton
 Town of Shapleigh

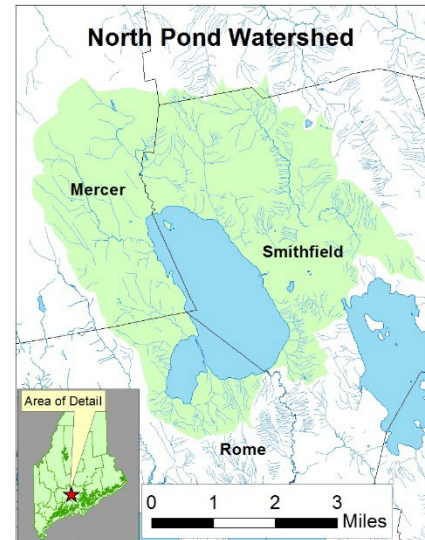
CONTACT INFORMATION:

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 Mindee Goodrum, York County SWCD – (207) 324-0888 x208, mgoodrum@yorkswcd.org

North Pond Watershed Protection Plan, Phase II

#20200003

Waterbody Name:	North Pond
Location:	Smithfield, Rome and Mercer – Kennebec and Somerset Counties
Waterbody Status:	NPS Priority Watershed
Project Grantee:	7 Lakes Alliance
Project Duration:	January 2020 –December 2021
319 Grant Amount:	\$118,758
Local Match:	\$144,011



PROBLEM:

North Pond is the second lake in the seven-lake Belgrade Chain of lakes, receiving inflow from East Pond via Serpentine Stream in Smithfield Village. The North Pond watershed covers 22 square miles (15.7 North Pond and 6.3 Serpentine Stream) in the towns of Mercer, Smithfield and Rome. The surface area of North Pond covers approximately 2,531 acres, has a perimeter of 9.5 miles, and a maximum depth of 20 feet. North Pond is used extensively for swimming, fishing, and boating, and is accessible via a public boat launch on the north end of the lake. The shallow water provides excellent habitat for warm-water fish and supports 14 fish species including small and largemouth bass, white perch and chain pickerel. The Serpentine watershed includes a large area of freshwater wetlands of statewide significance between East and North Ponds. The lake is also home to 45 adult loons.

Water quality data has been collected in North Pond since 1970. Based on these historic data, the potential for nuisance algal blooms and internal loading is moderate. However, total phosphorus has been increasing slightly over the past 10 years, and the lake experienced cyanobacteria blooms in 2018-2020. Agricultural land use was historically a significant contributor to nutrient loading. Currently, land uses associated with residential, roads and commercial development are the greater threat to the pond. Locally funded watershed surveys in 2014 and 2016 identified 158 NPS sites in the watershed. The Phase I 319 grant project (#20180003) installed BMPs at five high priority road sites and Pine Tree Camp. Additional BMPs were installed by the Youth Conservation Corps (YCC) on another 28 sites.

PROJECT DESCRIPTION:

The project purpose was to significantly reduce the pollutant load to North Pond by addressing soil erosion and stormwater runoff to the lake. This was accomplished through targeted implementation of BMPs at high priority NPS sites identified in the 2016 watershed survey. In addition to pollutant reductions, the project increased awareness about the need for lake protection by utilizing targeted outreach strategies such as direct landowner contact, annual buffer workshops, meetings with watershed partners, newsletter articles and press releases.



Bacon Road (Mercer) after
crowning and ditch stabilization

PROJECT OUTCOMES:

- BMPs were installed at six high priority sites located on town and private roads as well as Pine Tree Camp. The Youth Conservation Corps installed BMPs on another 14 residential properties. Total BMP installations exceeded project targets with 52 BMPs installed (30 BMPs planned).
- Pollutant loading to North Pond was reduced by an estimated 234 tons of sediment, 199 pounds of phosphorus and 398 pounds of nitrogen per year (Region 5 Method).
- One road maintenance workshop, two “Buff Enough” workshops, two annual meeting presentations and two algae bloom meetings were conducted through the project.
- Local match for the project totaled \$144,011, far exceeding the project goal of \$112,505.



Pine Tree Camp before and after – Bluestone gravel was applied to 1,500 feet of chronically eroding road; 400 feet of ditch was stabilized; and two culverts were replaced and reset.

PROJECT PARTNERS:

Kennebec County SWCD
North Pond Association
Pine Tree Camp
Town of Mercer
Town of Rome
Town of Smithfield

CONTACT INFORMATION:

Greg Beane, Maine DEP – (207) 299-4703, greg.e.beane@maine.gov
Charlie Baeder, 7 Lakes Alliance – (207) 458-1334, charlie.baeder@7lakesalliance.org

Ogunquit River Watershed Restoration Project, Phase III

#20180012

Waterbody Name: Ogunquit River

Location: Ogunquit and Wells - York County

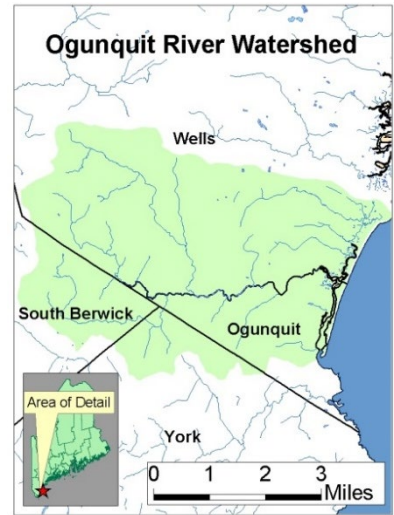
Waterbody Status: NPS Priority Watersheds, Tidal Portion Impaired, Most at Risk

Project Grantee: Town of Ogunquit

Project Duration: April 2019-December 2021

319 Grant Amount: \$59,990

Local Match: \$61,283.42



PROBLEM:

The Ogunquit River watershed is an approximately 21 square mile coastal southern Maine watershed located in Ogunquit, South Berwick, York, and Wells, Maine. The river is tidally influenced downstream of the Route 1 crossing and flows through salt marshes before emptying into the Gulf of Maine behind Ogunquit’s 3.5 mile barrier beach. The Ogunquit River is a high value area of heavy contact recreation (swimming, boating, and fishing) enjoyed by over a million residents and visitors each year.

The river is impacted by stormwater runoff and malfunctioning septic systems associated with residential, municipal, and commercial properties. The Ogunquit River estuary is impaired due to elevated bacteria (fecal pollutants) and is included in the *Maine Statewide Bacteria Total Maximum Daily Load* (August 2009). Advisories have been issued at the beach at the outlet of the Ogunquit River. Dry and wet weather sampling at multiple sites since 2012 show Enterococci ranges up to 2,481 cfu/100mL, with particularly high counts or “hotspots” (>4,884 cfu/100mL) along Leavitt Stream, a tributary to the Ogunquit River, and in runoff and seeps from the Main Beach parking lot. The *Ogunquit River Watershed Based Plan (July 2013)* focuses on ways to address sources of bacteria and nutrients in the watershed. The Ogunquit River Watershed Restoration Project, Phase I (#2014BB09) and Phase II (#2016RT06) implemented BMPs for stormwater mitigation, evaluated areas of illicit sewage discharge and administered a public outreach campaign.

PROJECT DESCRIPTION:

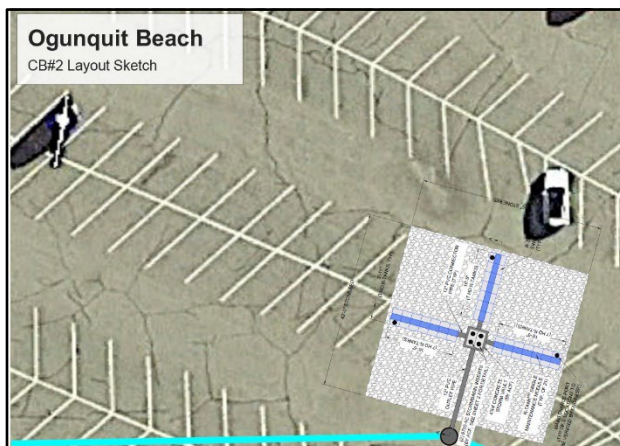
The project purpose was to help reduce bacteria levels in the Ogunquit River and minimize the number of beach advisories near the outlet. The project addressed several key problems, including polluted stormwater runoff, septic system issues, and improper pet waste disposal. A structural BMP was installed at the Main Beach parking lot to help reduce bacteria and other pollutant loading to the river and Riverside Beach. The project built on the public outreach program developed under Phase I and II with a targeted focus on raising awareness about proper septic system maintenance, particularly in residential neighborhoods around Leavitt Stream, and proper pet waste disposal throughout the watershed.

SOURCES OF FECAL MATTER ENTERING WATERWAYS	FECAL MATTER THREATENS PUBLIC SAFETY AND AQUATIC LIFE	CITIZEN QUICK TIPS
<p>ANIMAL WASTE</p> <p>1. Pets</p> <p>UNIMPROVED SEWAGE DISPOSAL</p> <p>2. Unsewered home septic systems</p> <p>3. Improperly installed, vented, or clogged septic systems</p> <p>INDUSTRIAL RUNOFF</p> <p>4. Runoff from parking lots, streets, and other paved areas</p> <p>5. Runoff from construction sites</p> <p>6. Runoff from agricultural operations</p>	<p>Fecal matter is an indicator of fecal pathogens that cause disease and illness in humans. These pathogens can be ingested directly by water and wildlife or indirectly by pet animals.</p> <p>High concentrations can cause fish to become ill and can harm or destroy other organisms in contaminated waterways. For these reasons, pet waste is never to be dumped in any effort to trap and contain. Pets should be trained to defecate in designated areas and to be cleaned up immediately.</p>	<p>MAINTAIN SEPTIC SYSTEMS</p> <p>1. Regularly inspect septic tanks (every 2-3 years)</p> <p>2. Inspect systems if you observe any signs of trouble (slow drainage or gurgling, odors, or sewage in yard)</p> <p>3. Use less water to reduce the volume of effluent</p> <p>PREVENT OVERFLOW RUNOFF</p> <p>1. Don't overuse water</p> <p>2. Don't flush anything but toilet paper, human waste, and sanitary napkins down the toilet</p> <p>3. Don't pour paint, oil, or other hazardous materials down the drain</p> <p>MINIMIZE HOUSEHOLD POLLUTION</p> <p>1. Use less water</p> <p>2. Use less detergent</p> <p>3. Don't use bleach</p> <p>4. Don't use antibacterial cleaners</p> <p>5. Don't use pesticides</p> <p>6. Don't use herbicides</p> <p>7. Don't use fertilizers</p> <p>8. Don't use lawn mowers</p> <p>9. Don't use trimmers</p> <p>10. Don't use blowers</p> <p>11. Don't use leaf blowers</p> <p>12. Don't use weed whackers</p> <p>13. Don't use string trimmers</p> <p>14. Don't use chainsaws</p> <p>15. Don't use generators</p> <p>16. Don't use power tools</p> <p>17. Don't use power washers</p> <p>18. Don't use pressure washers</p> <p>19. Don't use steamers</p> <p>20. Don't use dryers</p> <p>21. Don't use washers</p> <p>22. Don't use dryers</p> <p>23. Don't use washers</p> <p>24. Don't use dryers</p> <p>25. Don't use washers</p> <p>26. Don't use dryers</p> <p>27. Don't use washers</p> <p>28. Don't use dryers</p> <p>29. Don't use washers</p> <p>30. Don't use dryers</p>

Pet waste & septic education brochures were distributed in neighborhoods where bacteria detection levels were high.

PROJECT OUTCOMES:

- Installation of an enhanced drywell with bacteria filter insert at one catch basin in the Main Beach parking lot.
- Brochures were distributed to over 100 residences with key outreach messages about proper pet waste disposal, proper septic system maintenance, and general information on nonpoint source pollution and fecal indicator bacteria in neighborhoods near where water quality monitoring efforts showed high bacteria counts.
- Three public presentations (one to the Ogunquit Select Board, two to the Ogunquit Conservation Commission) were given to raise awareness of water quality issues in the Ogunquit River and ongoing efforts of restoration.
- Three years of water quality monitoring and reporting.
- Pollutant load reduction to the Ogunquit River from BMPs installed is an estimated 0.4 tons of sediment, 2.4 pounds of phosphorus, and 14.6 pounds of nitrogen per year (*STEPL*) annually, along with reduction of fecal contamination from humans, dogs and birds to the river.
- This project generated \$61,283.42 in local match (covering 50% of the total project costs).



Design plans of enhanced drywell and catch basin inserts to treat the runoff from the Main Beach Parking Lot.



One of twelve sampling sites (shown at low tide) monitored to determine BMP effectiveness and assess the bacteria impairment.

PROJECT PARTNERS:

Town of Ogunquit
 FB Environmental Associates
 Maine Healthy Beaches
 Ogunquit Conservation Commission

CONTACT INFORMATION:

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Parker Pond NPS Watershed Protection Project, Phase II

#20190006

Waterbody Name:	Parker Pond
Location:	Chesterville, Fayette, Mt. Vernon, Vienna - Franklin & Kennebec Counties
Waterbody Status:	NPS Priority Watershed
Project Grantee:	30 Mile River Watershed Association
Project Duration:	January 2019 – December 2021
319 Grant Amount:	\$178,132
Match:	\$332,338



PROBLEM:

Parker Pond is in the northern branch of the “30 Mile River,” a connected chain of lakes in Central Maine. Parker Pond has a surface area of 1,524 acres, a direct watershed of 6.3 square miles, and an average depth of 31 feet. The pond is a valuable resource for the public, with an excellent bass fishery, salmon and brook trout fisheries, state-owned islands, and public boat and hiking access. Shoreland development and the resulting nonpoint source pollution are among the biggest threats to the pond. Most of the development on the pond occurred before current shoreland zoning laws were in place. There are many private camp roads throughout the watershed, most located near the pond. Development in neighboring lake watersheds has led to increased phosphorus loads and severe algae blooms in those lakes. Parker faces the same prospect unless concerted action is taken to prevent it.

In 2011, 30MRWA and its partners conducted a watershed survey of Parker, David, and Tilton Ponds, identifying 46 erosion sites in Parker’s watershed. Of these sites, 27 were designated as high or medium impact due to site size, slope, amount of soil eroded, and proximity to the water. Half of those sites were in residential areas (14 residential, 9 driveway). Seventeen sites were on roads (13 private, 4 town). All but one of these road sites had larger erosion problems, rated at high or medium impact. The Phase I project (#2012RR23) installed BMPs at six high priority sites on private roads, and the Youth Conservation Corps (YCC) installed BMPs at another 12 residential sites.

PROJECT DESCRIPTION:

The purpose of this project was to reduce erosion and polluted runoff sources to Parker Pond. This was accomplished by addressing identified priority sites, with an emphasis on gravel roads. The goal was achieved through working with local stakeholders to implement BMPs at high priority sites and provide road management plans and technical assistance to several gravel roads in the watershed. The YCC installed BMPs at residential sites. Project outreach included LakeSmart outreach and property evaluations, a Zoom workshop, presentations at town and lake association meetings and articles in newsletters and local papers.



Due to Covid-19, the YCC only operated in 2019.

PROJECT OUTCOMES:

- Coordinated the design and implementation of a large culvert replacement on Sandy River Road in Chesterville and extensive road work on the steep hills approaching the crossing. The Sandy River Road sites (culvert replacement and associated road work) generated a total of \$308,652 of match funds for this project.
- The project reduced annual pollutant loading to Parker Pond by an estimated 172.9 tons of sediment and 146.9 pounds of phosphorus (Region 5 Method and WEPP Model). The Sandy River Road project accounted for 160 tons and 140 pounds of phosphorus of the total.
- Developed five road management plans and gave technical assistance regarding improvement & maintenance on an additional six gravel roads that border the pond.
- Installation of conservation practices at 24 sites with the Youth Conservation Corps.
- Published six PPA newsletter articles, two 30 Mile newsletters and two news articles. Presented at three PPA annual meetings (2019, 2020, 2021) and two public town meetings. Also created the Parker Pond Lake Smart team in 2019 (17 evaluations, and 10 awards to-date) and sponsored one informational workshop for Parker Pond landowners in fall of 2021.



Sandy River Road – This steep road has had severe and chronic erosion problems for many years, and the crossing itself was undersized and collapsing. With funding from a State of Maine DEP Culvert Grant, Town of Chesterville and 319 grants, the site was able to finally be addressed with installation of numerous check dams, stabilized ditches, paved road surface, and a new aluminum, open-bottom arch culvert (22' span).

PROJECT PARTNERS:

30 Mile River Watershed Association
 Parker Pond Association
 Town of Chesterville
 Town of Fayette
 Town of Mount Vernon

Town of Vienna
 Kennebec County SWCD
 Parker Lake Shores Recreation Association
 State of Maine DEP Culvert Grant

CONTACT INFORMATION:

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Thatcher Brook Watershed Restoration Project, Phase II

#20190004

Waterbody Name: Thatcher Brook

Location: Biddeford and Arundel – York County

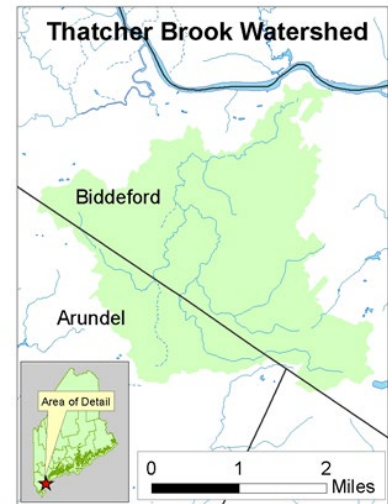
Waterbody Status: Impaired Stream, NPS Priority

Project Grantee: City of Biddeford

Project Duration: February 2019 – December 2021

319 Grant: \$75,619.16

Local Match: \$33,332.11



PROBLEM:

Thatcher Brook is a Class B urban impaired stream located in Biddeford and Arundel that flows into the Saco River. The stream is 7.7 miles long and has a 7.12 square mile watershed that includes large tracts of forested land, wetland, and pasture lands. The watershed also includes several major state roads and a designated growth area with existing retail and commercial development, industrial parks, and residential housing.

Thatcher Brook is listed as impaired because it does not meet aquatic life or bacteria standards. MDEP macroinvertebrate samples collected indicated the stream did not meet Class B standards in 2004, 2012 and 2013 for aquatic life use. Thatcher Brook was included on the DEP's Bacteria TMDL (2009) and Impervious Cover TMDL (2012). The primary stressors to the brook include stream channel alteration, elevated phosphorus, depressed dissolved oxygen, and habitat alteration. Elevated chloride is a potential secondary stressor in the watershed. The City of Biddeford developed the Thatcher Brook Watershed Management Plan in 2014. The Phase I implementation project (#2017RT11) installed two 'chop and drop' habitat restoration projects and culvert removal project; installed watershed signage, provide seven technical assistance visits to commercial landowners and implemented stream protection ordinances in Arundel and Biddeford.

PROJECT DESCRIPTION:

The City of Biddeford worked with York County Soil and Water Conservation District (YCSWCD) to implement action items recommended in the 2015 Thatcher Brook Watershed Based Management Plan. The primary purpose of this project was to reduce inputs of nutrients and untreated stormwater runoff into Thatcher Brook so it can meet Class B water quality standards. The project included the installation of two stormwater treatment systems in the City's Industrial Park, an educational site walk of the systems, the creation of an interactive website and several additional education and outreach efforts.

Impervious Surface Density:

This analysis shows the density of impervious surface in the watershed. This is similar to the previous analysis on road density however, this takes into account all impervious surfaces excluding roads (e.g. parking lots, buildings, sidewalks, etc.). These impervious surfaces contribute to the pollutants that enter the watershed through runoff and decrease the water quality. The buttons below show the various visualizations of the watershed. One specifically shows the total impervious cover by overlaying this map with the road density analysis (in red). These analyses allow us to see how complex and interconnected the Thatcher Brook ecosystem is. These analyses show that

StoryMap created by UNE intern, teaches public about the watershed, demonstrates the accomplishments from multiple phases and shares ongoing efforts to restore Thatcher Brook.

PROJECT OUTCOMES:

- The City of Biddeford successfully designed and installed two underdrain soil filters along Morin Street in the Industrial Park to provide stormwater filtration in an area of high impervious cover.
- UNE Intern, Dean Hernandez, created an online interactive [StoryMap](#) that showcases the Thatcher Brook watershed resources, problems within the watershed and ongoing restoration efforts. This will continue to be updated to share ongoing restoration efforts.
- A site walk of the Morin Street soil filters was hosted by the City of Biddeford, YCSWCD and the Saco Watershed Collaborative that gave the public an opportunity to learn about soil filters and their function in treating stormwater.
- Pollutant load reductions totaled 0.21 tons of sediment, 0.88 pounds of phosphorus and 3.7 pounds of nitrogen annually.
- City Engineering staff and YCSWCD presented project highlights to the Biddeford City Council to wrap up the project.



Before: Morin St before BMP installation



After: Underdrain soil filters installed on Morin Street

PROJECT PARTNERS:

City of Biddeford
York County SWCD
Town of Arundel
Biddeford Conservation Commission

Maine Department of Transportation
Wells National Estuarine Research Reserve
University of New England
Saco Watershed Collaborative

CONTACT INFORMATION:

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Appendix A. NPS Grant Projects Closed in 2021

Project Title	Project ID#	Grantee	Grant Amount	Non-federal Match	Completion Date
Adams Pond & Knickerbocker Lake Watershed Protection Project, Phase III	20200007	Boothbay Region Water District	\$42,940.00	\$34,376.00	12/31/2021
Capehart Brook Restoration Project, Phase III	20180010	Bangor, City of	\$125,000.00	\$85,450.00	12/31/2021
Cobbossee Lake Watershed Protection Project, Phase II	20180011	Cobbossee Watershed District	\$90,410.00	\$60,634.00	12/31/2021
Concord Gully Brook Watershed Restoration Project, Phase II	20180004	Town of Freeport	\$90,677.00	\$106,739.00	8/6/2021
Cross Lake Watershed Based Management Plan Development Project	20190011	County of Aroostook	\$17,419.00	\$30,482.00	7/19/2021
Mare Brook Watershed-based Management Plan Development Project	20190012	Town of Brunswick	\$32,181.00	\$27,761.54	12/31/2021
McGrath Pond and Salmon Lake Watershed Protection Project, Phase IV	20190001	Belgrade Regional Conservation Alliance (DBA 7 Lakes Alliance)	\$64,095.00	\$47,452.00	12/31/2021
Mousam Lake Watershed Protection Project, Phase I	20190010	York County SWCD	\$94,981.00	\$76,597.00	12/31/2021
North Pond Protection Project, Phase II	20200003	7 Lakes Alliance	\$118,758.00	\$112,505.00	12/31/2021
Ogunquit River Restoration Project, Phase III	20180012	Ogunquit, Town of	\$59,990.00	\$40,619.00	12/31/2021
Parker Pond Watershed Protection Project, Phase II	20190006	30 Mile River Watershed Association	\$178,132.00	\$294,109.00	12/31/2021
Thatcher Brook Restoration Project, Phase II	20190004	Biddeford, City of	\$127,200.00	\$84,800.00	12/31/2021

Appendix B. Active NPS Grant Projects

Project Title	Project ID#	Grantee	Grant Amount	Non-federal Match	Planned Completion Date
Phillips Brook Restoration Project, Phase I	20190007	Town of Scarborough Maine	\$115,623.37	\$106,896.56	12/31/2022
Goosefare Brook Watershed Restoration Project, Phase II	20190008	Town of Old Orchard Beach	\$111,145.00	\$83,419.00	12/31/2022
Unity Pond Watershed-based Plan Update Project	20200006	Waldo County SWCD	\$45,508.00	\$19,625.00	12/31/2022
China Lake Watershed based Plan Development	201900013	Kennebec County SWCD	\$27,590.00	\$38,575.00	3/11/2022
Meduxnekeag River Watershed Restoration, Phase II	20200001	Southern Aroostook SWCD	\$33,591.00	\$23,537.00	10/31/2022
Georges Pond Watershed Protection Project, Phase I	20190015	Georges Pond Association	\$45,960.00	\$33,106.00	3/31/2022
Forest Lake Protection Project, Phase III	20200002	Cumberland County SWCD	\$86,381.05	\$78,947.15	12/31/2022
Goodall Brook Restoration Project, Phase II	20200004	Sanford, City of	\$79,174.00	\$91,017.00	3/31/2022
Bauneg Beg Lake Protection Project, Phase I	20200005	York County SWCD	\$52,601.00	\$41,013.00	12/31/2022
Wilson Pond Watershed-based Plan Update Project	20190016	Cobbosee Watershed District	\$22,692.00	\$8,289.00	12/31/2022
Black Brook Watershed Management Plan Project	20190017	Cumberland County SWCD	\$13,770.00	\$21,604.00	12/31/2022
Lake Penneesseewassee Watershed Protection Project, Phase I	20200009	Oxford County SWCD	\$77,282.00	\$57,678.00	12/31/2022
Goosefare Brook Restoration Project, Phase III	20200008	Saco, City of	\$69,028.00	\$49,258.00	12/31/2022
Lake Anasagunticook Watershed Protection Project, Phase II	20210001	Oxford County SWCD	\$51,655.00	\$34,444.00	12/1/2022
Highland Lake Protection Project, Phase IV	20200010	Cumberland County SWCD	\$102,318.00	\$71,117.00	12/31/2022
Pleasant River Restoration Project, Phase II	20210005	Cumberland County SWCD	\$63,421.00	\$60,321.00	12/31/2022
Abrams Pond Protection Project, Phase II	20210006	Town of Eastbrook	\$68,349.00	\$45,625.00	12/31/2022
Square Pond Protection Project, Phase III	20210002	York County SWCD	\$93,661.00	\$62,539.00	12/31/2022
Sebago Lake Watershed Protection Project, Phase IV	20210004	Portland Water District	\$79,043.32	\$94,407.00	12/1/2022

Project Title	Project ID#	Grantee	Grant Amount	Non-federal Match	Planned Completion Date
Mousam Lake Watershed Protection Project, Phase II	20210003	York County Soil and Water Conservation District	\$65,994.00	\$47,533.00	12/31/2022
Damariscotta Lake Watershed Protection Project, Phase II	20210009	Midcoast Conservancy	\$31,535.00	\$25,330.00	12/31/2022
North Pond Watershed Based Management Plan	20210010	Kennebec County SWCD	\$49,600.00	\$34,908.00	12/31/2023
Cross Lake Watershed Restoration Project, Phase I	20210012	County of Aroostook	\$149,775.00	\$135,609.00	12/31/2023
North Pond Watershed Protection Project, Phase III	20210013	7 Lakes Alliance	\$104,950.00	\$110,125.00	12/31/2023
Ogunquit River Watershed Restoration Project, Phase IV	20210014	Town of Ogunquit	\$61,990.00	\$43,496.00	12/31/2023
Watchic Lake Protection Project, Phase I	20210007	Watchic Lake Association	\$74,632.00	\$49,802.00	12/31/2022

Appendix C: NPS Program Five-year Objectives, Actions, and Annual Milestones

This section provides the five-year objectives, actions, and milestones for Maine’s NPS program for the years 2020 through 2024. Tables 10 and 17 focuses on DEP’s NPS Program administration and its watershed approach to improve and protect water quality. Tables 11 to 16 list objectives for Maine’s statewide approach to address six major NPS pollution categories: developed areas, agriculture, transportation, forestry, subsurface wastewater disposal, and hydrologic and habitat modification.

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)		2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024			
1. <u>Prioritization List</u> : Identify NPS Priority Watersheds and evaluate NPS priority lists biennially or more frequently as new information becomes available.	<ul style="list-style-type: none"> Evaluate NPS priority watersheds lists and criteria biennially or more frequently as needed. Announce public opportunity to submit requests and support for waterbodies to be added to the priority lists. Update priority lists and decision tree as needed- add or remove individual waterbodies as new information becomes available. Notify towns, planning commissions, shellfish committees, and other stakeholders about new or removed NPS priority watersheds. Develop map and post on DEP webpage. Share with partners, including DEP Land Bureau. 	Amanda Pratt, DEP	1. Updated NPS priority watershed list and map.	X ✓		X		X	Preparing for 2022 update process.		
2. <u>Prioritization Criteria</u> : Identify additional prioritization criteria & waters for addition to the NPS Priority Watersheds list and/or for targeted outreach.	<ul style="list-style-type: none"> Develop Most Vulnerable Lakes list and associated criteria (considering factors including climate change, sediment chemistry, lake morphometry, anoxia potential, and land use). Develop and document methods to evaluate waters particularly impacted or threatened by agriculture, forestry and other NPS sources. 	Amanda Pratt, DEP	2. Most Vulnerable Lakes list developed.		X				DEP Lakes Unit is developing models to be considered for Most Vulnerable Lakes List, which will be completed in 2022 (see page 19 FMI).		

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)				
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs				
3. <u>Assessment:</u> Conduct water quality monitoring to support future NPS watershed planning and project development.	<ul style="list-style-type: none"> Evaluate data collected by DEP, LSM, and other partners. Coordinate with local partners to conduct supplemental water quality monitoring, biological monitoring, and bracket sampling. Consult with partners and use Stream Stressor Guidance document to evaluate and identify primary stressors. 	Jeff Dennis, DEP	3. Supplemental monitoring conducted in at least three watersheds/yr.	3 6	3 3	3	3	3	Conducted monitoring in Biddeford Pool, Black Brook, and Card Brook.				
4. <u>Assessment:</u> Develop State agency and partner capacity to use Microbial Source Tracking to identify and track bacteria sources in streams and marine waters.	<ul style="list-style-type: none"> Reach out to Maine and regional labs and compile list of ones with MST analysis capabilities. Consult with regional experts to create protocol needed to store and transport samples for future MST analysis. Assess existing DEP lab equipment and explore procurement of equipment needed to filter and freeze samples. Use above protocol to store/transport DEP and partner water samples. Use resulting MST data to investigate and address bacteria sources. 	Meagan Sims, DEP <i>Partners: DMR</i>	4. MST storage and transport SOP developed in 2020 and used by DEP starting in 2021.	X	X				In 2020, DEP used EPA multipurpose grant funds to purchase ultralow temperature freezer suitable for storing MST samples and reviewed DMR protocols for MST storage. SOP to be developed in 2022 in coordination with other DEP programs.				
5. <u>Assessment:</u> Streamline and facilitate watershed survey data collection, sharing and analysis through expanded use of mobile apps.	<ul style="list-style-type: none"> Explore, promote, and transition to using Survey123 or other mobile data collection tools during watershed surveys. 	Amanda Pratt, DEP	5. At least one survey in 2020, two surveys in 2021 and 50% of watershed surveys use mobile data collection tools by 2022.	1 6	2 5	X	X	X	DEP assisted with five watershed surveys in 2021: Branch Lake (Ellsworth), Clearwater Lake (Industry/Farmington), Great East Lake (Acton), Messalonskee Lake Belgrade/Sidney/Oakland), Unity Pond (Unity). All five used Survey123 to collect survey data.				

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)				
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs				
6. <u>Planning</u> : Incorporate climate change and resilience planning into watershed-based planning.	<ul style="list-style-type: none"> Review existing information (e.g., Hazard Mitigation Plans), assess stream culverts during watershed assessments and incorporate in WBPs. Use available planning tools and resources to identify other potential climate impacts to consider during WBP projects (e.g., sea level rise, vulnerable septic systems, marsh migration, coldwater refugia) and incorporate into WBPs. Incorporate information on climate change impacts into watershed survey training. 	Greg Beane, DEP	6. Review tools and incorporate into pilot WBP planning project by 2021. All new WBPs include section on climate change by 2022.		X	X	X	X	Starting in 2021, WBP Planning Request for Applications included requirement to consider climate change impacts in funded projects. Stream culvert assessment to be piloted in 2022. Mare Brook WBMP, Cross Lake WBMP, and Togus Pond WBMP included sections on climate change.				
7. <u>Restoration Planning</u> : Approve nine-element watershed-based plans (new or updates) that guide local actions to restore impaired waters.	<ul style="list-style-type: none"> Provide decision makers with information needed to develop sound WBPs including data necessary to determine the dominant stressors contributing to the impairment, and sufficient watershed and stream corridor information to identify and prioritize specific implementation activities needed to restore the waterbody. 	Alex Wong, DEP	7. Ten nine-element WBPs approved.	2 3	2 3	2	2	2	Nine-element plans approved for Cross Lake, Togus Pond, and Mare Brook.				
8. <u>Protection Planning</u> : Approve alternative WBPs (new or updates) that guide protection of unimpaired waters.	<ul style="list-style-type: none"> Working with partners, provide technical assistance for the development of lake watershed-based protection plans. Coordinate to secure EPA approval of alternative WBPs. 	Amanda Pratt, DEP	8. 15 alternative WBPs approved.	3 7	3 2	3	3	3	Two alternative plans accepted: Trickey Pond and Damariscotta Lake.				

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs					
9. <u>Planning</u> : Promote and support watershed assessment and planning for threatened streams.	<ul style="list-style-type: none"> Assess water quality data and watershed conditions to identify stressors for Falmouth’s threatened streams. Develop protection strategy for each stream that identify BMPs and actions for addressing existing and future likely stressors. Promote/pursue development of similar protection strategies with other communities with threatened streams. 	Kristin Feindel, DEP	9. Stream Protection Strategy developed for Falmouth streams by 2020.	X ✓						Milestone completed in 2020. DEP continues to support Falmouth’s stream protection efforts in helping prioritize streams and protection efforts, such as pesticide and fertilizer ordinances.				
10. <u>Planning</u> : Promote collaboration and planning for projects that maintain open shellfish harvesting areas or restore closed shellfish harvesting areas, reduce coastal beach advisories, and mitigate other NPS impacts to coastal waters.	<ul style="list-style-type: none"> Convene coastal work group and conduct annual meetings to share information and identify and collaborate on shared priorities. DEP, DMR, Maine Coastal Program, and MPAP will collaborate to support shared priorities through the NOAA-funded Coastal Community Grants program. DEP and DMR will review proposals and provide technical support to selected projects. 	Addie Halligan, DEP <i>Partners: MCP, DMR, DACF - MPAP</i>	10. CCG grant program funds at least one planning project per year in DEP NPS Priority Watersheds	1 1	1 1	1	1	1	CCG awarded funding to the Town of Topsham for nature-based climate solutions for the Topsham Fair Mall Stream Watershed. DEP convened coastal work group meeting in fall of 2021.					
11. <u>Protection</u> : Focus NPS program on watershed protection priorities and highlight the	<ul style="list-style-type: none"> Work proactively with partners to protect lakes on DEP’s Watch List and Most Vulnerable Lakes list (see #2 above) with the goal of keeping off the impaired list. 	Amanda Pratt, DEP	11. Summary of work on protection priorities incorporated		X ✓	X	X	X	Summary of lake protection work on DEP’s Watch List incorporated into Annual Report (see page 14). Most Vulnerable Lakes criteria refined in 2021 and list to be finalized in 2022.					

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024						
value of these protection efforts.	<ul style="list-style-type: none"> Report to EPA annually on Maine’s protection efforts including work on Most Vulnerable Lakes. 		into NPS Annual Report.											
12. <u>Restoration</u> : Fully or partially restore four NPS impaired waterbodies and submit to EPA as NPS Success Stories.	<ul style="list-style-type: none"> Provide technical support and funding through Section 319 grant program to support implementation of WBPs for waters with high potential to be restored. Collect targeted water quality and biological information to determine if water classification standards have been met. Prepare NPS Success Stories that document the restorations. 	Alex Wong, DEP	12. Four NPS success stories approved for partially or fully restored waterbodies.		1		2	1	No activity in 2021. 2018/2020/2022 Integrated Report did not de-list any lakes.					
13. <u>Substantial Improvement</u> : Demonstrate substantial improvement in water quality and/or ecological condition in two NPS impaired waterbodies.	<ul style="list-style-type: none"> Provide technical support and funding through NPS Section 319 grant program to support implementation of WBPs for impaired waters. Collect targeted water quality and biological information to determine the effectiveness of implementation efforts and guide WBP modifications. Evaluate data to determine if water classification standards have been met or if there has been substantial incremental improvement. Prepare NPS Success Stories that document the substantial improvement in water quality and/or ecological condition. 	Alex Wong, DEP	13. Two NPS success stories approved that show progress toward achieving water quality goals (Type 2) or ecological restoration (Type 3).		1 2		1		Finalized Anbessacook Lake and Seabasticook Lake Type 2 Success Stories in 2021.					
14. <u>Restoration/Protection</u> : Promote local efforts to maintain	<ul style="list-style-type: none"> DMR meets with coastal towns, local shellfish committees, and other partners to encourage local action (Fisherman’s Forum, shellfish committees, or town meetings). 	Addie Halligan, DEP	14. Medomak River case study and bacteria		X				No activity in 2021; to be completed in 2022.					

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)				
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs				
open shellfish harvesting areas or restore closed shellfish harvesting areas.	<ul style="list-style-type: none"> DEP creates Medomak River case study and guidance for investigating and addressing bacteria sources. Materials incorporated into electronic version of Maine Shellfish Handbook. 		investigation/mitigation guidance created.										

Table 11. Developed Areas				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs					
1. Require and promote the use of effective erosion and sediment control BMPs during soil disturbance activities.	<ul style="list-style-type: none"> Update Chapter 305 of the Natural Resource Protection Act to improve erosion and sediment control standards for soil disturbance, instream work and other sections, as needed. Update ESC BMP Manual to reflect current approaches. Create in a format that can be easily accessed in the field. 	Mark Stebbins, DEP	1. NRPA rule-making completed in 2021 and ESC BMP Manual updated in 2022.		X	X								Given COVID-19 related disruptions, staffing shortages, and new Maine’s Climate Action Plan, DEP’s Land Bureau will be reevaluating program and rulemaking priorities and timeline.
2. Implementation and update of Chapter 1000 Shoreland Zoning to strengthen water quality protection at the local level.	<ul style="list-style-type: none"> Work with municipalities with older shoreland zoning ordinances to implement most recent standards. Review and update Chapter 1000 for areas of possible clarification and improvement, including ESC, buffer standards, contractor certification requirements. 	Colin Clark, DEP	2. Shoreland Zoning rule-making completed	X										Anticipate requesting adjustments to objectives and milestones in 2021 to align with Climate Action Plan strategies and priorities.

Table 11. Developed Areas Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
3. Update Chapter 500 Stormwater Rules to reduce water quality impacts from new or redevelopment projects.	<ul style="list-style-type: none"> Initiate stakeholder process to review Chapter 500 for areas for possible clarification and improvement, including natural hydrology and LID/green infrastructure, recertification, and chloride. Develop draft rules and release for public comment with adoption by 2022. 	Mark Stebbins, DEP	3. Stakeholder process completed in 2021 and Revised rules adopted in 2022.		X	X			Internal discussions have started regarding the stakeholder process.	
4. Regularly update the Maine Stormwater BMP manual to reflect the current best management practices.	<ul style="list-style-type: none"> Evaluate proposals for new or modified BMPs for approval under Chapter 500 Stormwater Rules. Conduct annual review and regularly update the Maine Stormwater BMP manual to reflect current science and guidance. 	Dave Waddell, DEP	4. List of new approved BMPs.	X ✓	X ✓	X	X	X	Kraken cartridge filter review continued into 2021, with eventual approval as a proprietary BMP to meet Chapter 500 Standards.	
5. Evaluate stormwater and ESC BMPs and develop guidance about climate change resiliency and adaptation planning.	<ul style="list-style-type: none"> Review stormwater and ESC BMPs for climate resiliency and adaption considerations, including storm sizing and modifications needed for areas with rising groundwater and sea level. Create appendix for Stormwater Manual that includes design considerations and available tools. 	Mark Stebbins, DEP	5. Appendix created for Stormwater Manual.		X				See #1 above.	
6. Provide guidance to State and local regulators, developers, and other partners about BMP selection to target	<ul style="list-style-type: none"> Review stormwater BMPs for nitrogen removal efficiencies and identify additional BMPs to consider adding to the manual. Develop a crosswalk to highlight BMPs most appropriate and inappropriate for different waterbodies and stressors (e.g., no infiltration for small streams with high commercial 	Jeff Dennis, DEP	6. Crosswalk table completed in 2020. Training provided to DEP Land Bureau on using crosswalk	X	X				No progress to report in 2021; to be carried out in 2022.	

Table 11. Developed Areas Lead Agency: Maine DEP				Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	
specific localized resource concerns.	development, nitrogen removal BMPs for coastal watersheds). <ul style="list-style-type: none"> Incorporate crosswalk into BMP manual and share with partners for use in WBPs and project reviews. 		for project reviews in 2021.						
7. Provide training and certification to encourage proper use of ESC BMPs by contractors and other installers.	<ul style="list-style-type: none"> Conduct Basic and Advanced Sediment Control training workshops. Administer the ESC Certification Program and maintain or increase the number of people certified to 2,500 (2,374 in 2019). 	John Maclaine, DEP	7. At least 500 people trained and at least 2,500 people with program certification/yr.	500 trained/yr 2,500 certified/yr 348 2,540	401 2,676				Trained 401 and with 2,676 individuals certified in the program for 2021. See Section IV.B. for more details.
8. Develop additional trainings and supplemental training materials to enhance contractor and installer understanding and ability to properly install BMPs.	<ul style="list-style-type: none"> Develop additional online trainings and approve/add third-party trainings to facilitate recertification process. Create and post short instructional, demonstration videos about BMPs and NPS-related issues (e.g., silt fence installation). 	John Maclaine, DEP	8. One additional course added per year and three videos created in 2020 and 2023.	1 10 3 0	1 1 4	1 3	1	1	Developed Winter BMP course for Landscape professionals, 4 training videos to complement Stream Crossing Grant criteria and 4 training videos for use by regulatory and Departmental field staff.
9. Provide municipalities with NPS training, technical support, and resources to prompt and improve water resource protection.	<ul style="list-style-type: none"> Develop training and certification program for municipal officials and inspectors. Certify municipal officials and inspectors to review BMPs for proper use and installation. 	John Maclaine, DEP	9. Certification program developed in 2020. At least 20 municipal officials certified/year beginning in 2021.	X ✓	20 32	20	20	20	Partnered with Maine CEO Training Program to offer free online Erosion and Sedimentation Control instruction to 32 CEOs.

Table 11. Developed Areas Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
10. Encourage municipalities to consider water resources in local planning decisions.	<ul style="list-style-type: none"> • Provide information to municipalities starting to develop or update Comprehensive Plans. • Review draft Comp Plans for consistency and completeness and provide feedback about ways to strengthen local efforts to protect and restore water quality. 	Alex Wong, DEP	10. DEP feedback provided on at least four comp plans/year.	4 9	4 10	4	4	4	Completed reviews of 10 plans: Belfast, China, Clinton, Fayette, Georgetown, Gorham, Island Falls, New Gloucester, Poland, and Scarborough.	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. Monitor agricultural operations to ensure compliance with the requirement to implement approved nutrient management plans (NMP).	<ul style="list-style-type: none"> Evaluate agricultural operations (AOs) to determine if they need to develop and implement an approved NMP. Track existing AOs with an approved NMP to ensure that their NMP is up-to-date. Provide guidance for initial development of an NMP or for facilitating updates as needed. Continue to identify AOs that need an NMP and help AOs comply with the obligation to operate according to an NMP. Publicize updates to the Nutrient Management Rules, including stream exclusion requirement. Coordinate with NRCS and DEP Shoreland Zoning to align programs regarding stream exclusion. 	Mark Hedrich, DACF	1. 90% of NMPs that are due for renewal are updated within six months of expiration.	90 56	90 50	90	90	90	314 active NMPs and 23 needed renewal. 50% were updated or received variances. 16 new farm NMPs developed covering 1350 acres and 724 animal units -13 were CNMPs. 42 NMP updates completed covering 12,215 acres and 9874 animal units – 25 were CNMPs. 4 Compost Management Plans updates to be approved shortly, 2 new CMPs pending development.	
2. Coordinate training and certification program for Nutrient Management Planning Specialists.	<ul style="list-style-type: none"> Provide certification and recertification training opportunities for certified planners. Update test and training manual to reflect updated nutrient management rules. 	Mark Hedrich, DACF	2. NMP test updated in 2021 and NMP training manual updated by 2024.	✓	X			X	On-line credits available for certification and recertifications. COVID-19 inhibited other trainings. Seven training sessions recorded for future use.	
3. Monitor livestock agricultural operations to ensure compliance with requirement to operate according to a Livestock	<ul style="list-style-type: none"> Evaluate new or expanded agricultural operations (AOs) to determine their requirement for obtaining a LOP. Continue to identify AOs that need a LOP and help AOs comply with the obligation to operate according to a LOP. 	Mark Hedrich, DACF	3. 75% of farms needing LOPs are developed within nine months.	75 63	75 40	75	75	75	19 active LOPs. 2 LOP updates. 3 LOP updates in progress. 3 farms need follow-up as potential CAFOs. One CAFO inspection done. Most CAFO inspections not held due to	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
Operations Permit (LOP).	<ul style="list-style-type: none"> Evaluate farms to determine if they are considered a Concentrated Animal Feeding Operation (CAFO) as defined by state or federal regulations. Initiate steps for appropriate permitting of these entities as needed. Conduct annual inspections of CAFOs to determine compliance with terms of the LOP. 								COVID-19 and PFAS priorities, staff time not available.	
4. Provide agricultural operations with up to date information on BMPs.	<ul style="list-style-type: none"> Update the Manual for Best Management Practices for Maine Agriculture. 	Mark Hedrich, DACF	4. Completed update of BMP manual.				X		Two sections of BMP Manual updated. Planned for completion by 2023.	
5. Implement the Agricultural Compliance Program to resolve water quality-related complaints (30 visits conducted in 2018).	<ul style="list-style-type: none"> Investigate complaints concerning farm operations that involve threats to human or animal health and safety, and to the environment. Prescribe new or modified site-specific BMPs where needed to resolve the issue, particularly water-quality-related matters. Complete site visit reports to document complaints received and resolutions. Provide reports to DEP semiannually. DEP prepares annual summary of water quality complaints received, investigated and resolved and shares with DMR, DEP, NRCS, NMRB. 	Matt Randall, DACF	5. 25% of sites with water quality issues are resolved within 30 days, 50% resolved within 90 days and 75% resolved within 180 days.	X ✓	X ✓	X	X	X	There were 0 complaints related to water quality issues in 2021. DACF provided 10 proactive technical assistance visits in 2021.	
6. Promote the use of BMPs with horse farms and other small hobby farms.	<ul style="list-style-type: none"> Convene at least one meeting with DACF, Cooperative Extension, SWCDs, NRCS, DEP and other stakeholders to develop an outreach strategy for hobby farms. 	Alex Wong, DEP	6. Stakeholder meeting held in 2020. At least one	X ✓		X				

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
	<ul style="list-style-type: none"> Implement at least one identified strategy. 		stakeholder-recommended outreach strategy pursued by 2022.							
7. Collaborate with NRCS and EPA in the NWQI program to make progress restoring impaired waters with agricultural NPS sources.	<ul style="list-style-type: none"> Evaluate water quality information for Oliver Brook and Meduxnekeag River NWQI. Provide information to NRCS for project close-out of the Unity Pond, Halfmoon Stream & Sandy Stream subwatersheds, and Nickerson Lake - Meduxnekeag River subwatershed projects. Support development of NRCS Watershed Assessments for Readiness Phase of Sheepscot River and Cross Lake NWQI projects. Conduct monitoring before NWQI implementation in new NWQI watersheds. 	Wendy Garland, DEP	7. Oliver Brook water quality summary prepared (post implementation) in 2020. Monitoring plan developed for one Readiness Phase watershed in 2020 and water quality monitoring conducted in 2021.	X ✓	X ✓				<p>Midcoast Conservancy conducted bacteria and DO monitoring in Sheepscot NWQI watershed.</p> <p>Cross Lake and Sheepscot River NWQI implementation continued in 2021.</p> <p>Oliver Brook to be monitored again in 2024 per DEP basin rotation schedule (water quality summary was completed in 2020, as planned).</p>	
8. Coordinate and communicate with DACF, SWCDs, NRCS, and industry groups (e.g., Maine Potato Board) on water quality priorities.	<ul style="list-style-type: none"> Attend NRCS State Technical Committee meetings. Participate in SWCD local working group meetings and Natural Resource Assessments to share DEP priorities and opportunities for NRCS program support. Reach out to the various industry boards and councils to raise awareness of water quality 	Jeff Dennis, DEP	8. Attend at least five local working group meetings/year in a variety of regions in the state and meet with at	X ✓	X ✓	X	X	X	DEP participated in State Technical Committee meeting and attended six local working group meetings in 2021: Cumberland/York, Franklin, Oxford, Penobscot, Kennebec/Lincoln and Southern Aroostook.	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
	issues related to their industry including nonattainment watersheds.		least one industry group/year.							
9. Increase field crop agriculture’s use of soil health practices to reduce soil erosion, improve water quality, and offset carbon emissions.	<ul style="list-style-type: none"> Reach out to various stakeholders at the state and local level and explore ways to address agriculturally derived water quality impairment issues. 	Tom Gordon, DACF	9. Meeting held between DEP, DACF and NRCS to discuss agriculture and water quality impacts.	X	✓				<p>Met with CWSRF and DACF to discuss funding opportunities for soil health in November, 2021.</p> <p>Enabling legislation for the Maine Healthy Soils Program signed into law on June 10, 2021. See Section IV.F, above.</p>	

Table 13. Statewide Approach - Transportation Lead Agency: Maine DOT					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. Continue using Erosion and Sedimentation Control BMPs on applicable Maine DOT projects.	<ul style="list-style-type: none"> Continue to implement and enforce Maine DOT Standard Specification 656. Continue ongoing ESC training for Maine DOT staff and contractors. Annual Stormwater MOA report submitted to MDEP summarizing Maine DOT activities as required by the Stormwater MOA between DEP and Maine DOT. 	Peter Newkirk, Maine DOT	1. At least 25 contractors trained/year and 100 DOT employees trained/year	25 contractors & 100 employees trained/yr 62 employees trained					<p>Maine DOT continues to implement “Standard Specification 656: Erosion and Sedimentation Control” for all projects contracted out or performed by the agency.</p> <p>Maine DOT’s in-person ESC training plan was disrupted by the COVID-19 pandemic.</p> <p>Maine DOT provided an online ESC training on 3/4/21 (40 employees) and on 10/7/21 (24 employees). On 2/3/22, Maine DOT submitted the annual stormwater MOA report to Maine DEP Land Division</p>	
2. Provide training and technical assistance to promote use of BMPs on town and county roads.	<ul style="list-style-type: none"> MLRC will provide training to towns through Maine Local Roads Center (MLRC). NPSTC will promote DEP Erosion and Sediment Control certification for Public Works staff. 	John Maclaine, DEP Peter Coughlin, MDOT	2. DEP will certify at least five DPW employees through the NPSTC per year.	5 6	5 35	5	5	5	35 municipal employees were certified in 2021.	
3. Promote chloride salt reduction BMPs to protect water quality while maintaining safe	<ul style="list-style-type: none"> Continue MLRC training and BMP Task Force to promote snow and ice control BMPs to municipal Public Works. 	Peter Coughlin, Maine DOT	3. At least 30 workshops held/year, covering 4 different	30 10	30 21	30	30	30	MLRC training efforts were curtailed by the COVID-19 pandemic. The program delivered 21, 3-hr for 55 towns for a total of 284 participants.	

Table 13. Statewide Approach - Transportation Lead Agency: Maine DOT				Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	
roads for travelling public.	<ul style="list-style-type: none"> Maine DOT will continue to investigate new products, technologies, or efficiencies to reduce the use of chlorides. 		subjects for 150 different towns.						(No traditional full-day in-person training workshops were held.)
4. Identify chloride impacted or threatened streams and consider/promote salt reduction strategies in these areas.	<ul style="list-style-type: none"> DEP will identify high priority watersheds for salt reduction efforts and share with Maine DOT & towns. Provide chloride fact sheet to towns & provide technical assistance and/or training. Identify DEP priority area to implement alternative practices (e.g., catch basin to deliver chloride to stream instead of infiltration). 	Jeff Dennis, DEP	4. Chloride-impacted and threatened streams list developed.	X ✓					Completed
5. Explore stakeholder interest, possible program funding options, and feasibility of Green Snow Pro type program.	<ul style="list-style-type: none"> Meet with MS4 communities, Maine DOT, SWCDs, Long Creek Watershed Management District and other stakeholders to discuss Green Snow Pro program level of interest and any next steps. If support and funding exists, propose legislation to limit liability for certified snow removal contractors. 	Alex Wong, DEP	5. Limited liability legislation drafted (if supported).	X					Portland Area MS4 communities incorporated Green Snow Pro and liability promotion legislation into their new five-year permit, which starts in 2022. Plan to coordinate with MS4s in the upcoming legislative session.
6. Promote reduction in the number of outdoor sand/salt piles.	<ul style="list-style-type: none"> Maine DOT will eliminate its remaining 13 outdoor sand/salt piles by 2024. MLRC will provide technical assistance to towns regarding town salt storage facilities. 	Peter Newkirk, Maine DOT	6. Maine DOT removes two sand/salt piles per year.	2 0	2 2	2	2	2	Two outdoor sand/salt piles were eliminated in 2021. Eight additional piles are scheduled for 2022.
7. Address NPS problems identified by DEP on State roads through Maine DOT maintenance	<ul style="list-style-type: none"> Annually, DEP will provide Maine DOT and Maine Turnpike Authority (MTA) with a GIS layer of priority watersheds and list of State road watershed survey sites. MDOT, MTA and DEP will meet annually to review DEP needs (above) and Maine DOT's six- 	Peter Newkirk, Maine DOT	7. Maine DOT completes at least one NPS project/year.	1 2	1 0	1	1	1	DEP provided Maine DOT a list of 37 potential NPS sites. Maine DOT regional staff reviewed and prioritized sites to be addressed during the future

Table 13. Statewide Approach - Transportation Lead Agency: Maine DOT					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
program and construction projects.	year plan to identify shared priorities and possible NPS projects that can be completed through Maine DOT and MTA maintenance or construction projects.								work plans. No NPS project were completed in 2021	
8. Provide technical assistance and training to prevent & mitigate NPS impacts from camp roads.	<ul style="list-style-type: none"> NPSTRC and partners will host workshops and online resources to promote gravel road BMPs. Promote the development of informal or formal road associations to coordinate road maintenance and improvement. 	John Maclaine, DEP	8. At least two NPSTC-approved workshops held per year.	2 1	2 2	2	2	2	Conducted 21 workshop in 2021, with 27 total participants	
9. Promote bluestone gravel for use on camp roads and driveways where available.	<ul style="list-style-type: none"> Compile a list of providers and post on NPSTC website and in Gravel Road Maintenance Manual. 	John Maclaine, DEP	9. List of bluestone suppliers compiled and posted online.	X	✓				Bluestone is regional in nature, and unavailable to many areas of the state without significant delivery fees. The topic is now incorporated into NPSTC training.	

Table 14. Statewide Approach – Forestry Lead Agency: Maine Forest Service					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. Increase overall effective BMP application on harvests from 76% to 85% or greater. Effective BMPs include all	<ul style="list-style-type: none"> Offer BMP training programs, with partners including the Maine Sustainable Forestry Initiative, Certified Logging Professional, Qualified Logging professional program, and Northeast Master logger. Deliver existing or develop new and topic specific trainings as needed to address problem 	Tom Gilbert, MFS	1. Maine Forestry BMPs Use and Effectiveness report documents effective BMP	85 78		85		85	The biennial Maine Forestry BMP Use and Effectiveness report for the 2020-21 BMP monitoring seasons includes data from 175 sites and will be released in the spring of 2022. It is reported that 68% of sites	

Table 14. Statewide Approach – Forestry				Lead Agency: Maine Forest Service					Schedule Planned (X #) Actual (✓ #)				
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2021 Accomplishments and Outputs				
appropriately applied BMP practices, effective planning, and avoiding waterbody crossings.	<p>areas when identified by monitoring, compliance inspections and industry consultation.</p> <ul style="list-style-type: none"> Work with DEP and Maine Municipal Bond Bank and EPA to maintain CWSRF funding and promote the Maine Forestry Direct Link Loan Program financing to reduce NPS risk at timber harvest sites. <p>Apply northeast regional forestry BMP monitoring protocol on a biennial basis to assess use & effectiveness of forestry BMPs.</p>		application on 85% of sites inspected						monitored had effective BMP application.				
2. Maintain the Forest Ranger-approved water quality inspections of timber harvest sites at over 90%.	<ul style="list-style-type: none"> Forest rangers will continue routine inspections of timber harvests for environmental compliance. MFS field foresters will continue to provide technical assistance to prevent problems from occurring and quickly fix problems encountered during inspections. 	Tom Gilbert, MFS	2. Over 90% of sites exhibit environmental compliance during timber harvest inspections.	90 97	90	90	90	90	MFS Rangers conducted 3,051 water quality related inspections. Of those, 93 required on site mitigation measures or other regulatory intervention.				
3. Ensure agencies and staff responsible for protecting Maine’s water resources from potential degradation have a clear understanding of each’s roles and responsibilities including	<ul style="list-style-type: none"> MFS will work with Land Use Planning Commission (LUPC) and DEP to clarify each agencies’ responsibility for permitting and enforcement of NRPA stream crossing and Chop and Drop activities. MFS will work with LUPC and MDEP to develop and deliver timber harvest NRPA (stream crossing) training to agency staff, municipalities and the industry. MFS will incorporate NRPA (stream crossing) education in their Certified Logger Program 	John Maclaine, NPSTC	3. Interagency meeting held in 2020 and joint timber harvest NRPA (stream crossing) training event held in 2021.	X	X ✓				MFS developed 2 new guidance documents detailing the NRPA permitting process as it relates to stream crossings and reviewed these documents with audiences at 3 events in 2021. NPS Training Center developed four online training videos about stream crossings and created 4 video resources for use by regulatory and department field staff.				

Table 14. Statewide Approach – Forestry				Lead Agency: Maine Forest Service					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024						
enforcement procedures.	(CLP), Master Logger Program (MLP), and BMP monitoring program.													
4. By 2024, improve consistency for the regulated community by increasing the number of critical mass municipalities that have adopted statewide standards for timber harvesting in shoreland areas to 252 (adoption by 224 towns in 2019).	<ul style="list-style-type: none"> • DEP will support adoption of SWS by inviting MFS to participate in Shoreland Zoning trainings. • DEP will support adoption of SWS by providing draft municipal Shoreland Zoning ordinances to MFS before issuing approvals and incorporating information about SWS adoption process in Shoreland Zoning training. MFS will proactively approach towns, provide technical assistance with ordinance updates, and review draft ordinances to help align with SWS. 	Tom Gilbert, MFS	4. By December 2024, 27 new municipalities adopt statewide timber harvesting standards or DEP adopts ordinances for them.	6 9	6 10	5	5	5						Ten new towns adopted statewide standards for timber harvesting in 2021.

Table 15. Statewide Approach – Subsurface Wastewater Disposal Lead Agency: Maine DHHS, Environmental Health					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. Ensure municipalities properly implement Subsurface Wastewater Disposal (SSWD) rules to protect public health and water quality.	<ul style="list-style-type: none"> Provide technical assistance and training to towns on the appropriate implementation of the subsurface rules. Assist in the training and licensing of Local Plumbing Inspectors. Develop resource for CEOs showing photos with a range of site conditions. 	Brent Lawson, DHHS	1. 200 visits to towns per year. Photo guide developed for CEOs in 2021.	38	20				Training was provided at 4 scheduled town training sessions, and 20 site visits. The number is lower due to COVID related staffing restrictions. DHHS is exploring new approaches to providing technical assistance and training.	
2. Consider adjacent water resources when reviewing variance requests for Onsite Sewage Disposal System (OSDS).	<ul style="list-style-type: none"> Review advanced treatment systems and identify treatment efficiencies for phosphorus and nitrogen. Review variance requests for OSDS in shoreland zones and require that systems next to lakes install systems that remove phosphorus, and systems next to coastal waters remove nitrogen. 	Brent Lawson, DHHS	2. List of advanced systems with phosphorus and nitrogen removal efficiency.				X		Milestone planned for 2023.	
3. Improve the State’s Voluntary OSDS Inspection Program and oversee expansion to all shoreland zones.	<ul style="list-style-type: none"> Update inspection program rules with requirements for inspectors to receive national certification, take a standard test, submit inspection forms, etc. Evaluate the current inspection program and needs before expanding statewide. Develop Legislative report as directed by LD543. Adjust inspection program in preparation for transition to OSDS Inspection Program expansion to all shoreland zones. 	Alex Pugh, DHHS	3. Report submitted to Legislature and revised rules adopted in 2020.	X					Due to staffing shortages, no action was taken in 2021. Draft rules are awaiting public comment period.	

Table 15. Statewide Approach – Subsurface Wastewater Disposal Lead Agency: Maine DHHS, Environmental Health					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
4. Conduct public outreach about new requirements in shoreland zone.	<ul style="list-style-type: none"> Conduct training for real estate professionals and incorporate information about new legislation re: property transfer inspections. 	John Maclaine, DEP	4. One realtor workshop conducted per year.	1 0	1 0	1	1	1	No realtor workshops held in 2021.	
5. Develop criteria for inspecting OSDS that are at risk for short-circuiting and impacting water resources.	<ul style="list-style-type: none"> DEP and DACF will develop guidance on identifying OSDS at high-risk of short-circuiting due to age, soils, and proximity to water. Dave Rocque (DACF) will develop optional advanced inspection standards/methodology. DEP and DACF will evaluate/refine through pilot program that uses methods on several types of systems. 	Amanda Pratt, DEP <i>Partners: Dave Rocque, DACF</i>	5. Guidance document developed in 2020. Draft advanced inspection standards developed by 2020 and tested by 2022.	X	✓	X			Following field inspections in 2021, approach continuing to be assessed.	
6. Review OSDS threats to water quality as part of watershed-based planning process.	<ul style="list-style-type: none"> DEP will promote guidance with partners and incorporate into watershed planning projects. 	Alex Wong, DEP	6. Septic system threat evaluated in all watershed-based management plans starting in 2021.	✓	✓	X	X	X	All WBMPs, except those in fully sewered watersheds, addressed septic system threats.	

Table 16. Statewide Approach – Hydrologic and Habitat Modification Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. Adopt new standards for stream crossings (new, repair, and replacement) to improve aquatic organism passage and improve hydraulic capacity and resiliency to larger storms.	<ul style="list-style-type: none"> Adopt draft standards for stream crossings under Section 305 to better align with Stream Smart principles. 	Mark Stebbins, DEP	1. Revised standards adopted by Legislature.	X					<p>Due to staffing shortages, DEP’s Land Bureau will be reevaluating program and rulemaking priorities and timeline.</p> <p>Anticipate requesting adjustments to objectives and milestones in 2022 to align with Climate Action Plan strategies and priorities.</p>	
2. Provide training to minimize impacts during culvert installation/ replacement and ensure long term stability and proper function.	<ul style="list-style-type: none"> Develop curriculum and provide trainings on culvert installation/replacement. 	John Maclaine, DEP <i>Partners:</i> Maine DOT DIFW ACOE	2. Curriculum developed in 2020 and one multi-agency workshop held/year starting in 2021.	X ✓	1 1	1	1	1	<p>Created 4 training videos for use in both live and on-demand training.</p> <p>Participated in Maine Audubon’s Stream Smart Phase 1 Virtual training with over 100 attendees.</p> <p>Audubon’s Stream Smart virtual training incorporates the 4 aforementioned videos. The Stream Smart training is also available on-demand.</p>	

Table 16. Statewide Approach – Hydrologic and Habitat Modification Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
3. Administer DEP stream culvert grant program (culvert bond program) that funds upgrades of municipal culverts.	<ul style="list-style-type: none"> Projects selected and contracts implemented for two 2019 RFPs totaling \$5 million. Two RFPs released in 2020 and projects selected and contracts implemented for another \$5 million. Support partner efforts to secure additional program funding. Visit past culvert bond projects, document conditions, and compare to proposed designs. 	John Maclaine, DEP	3. 100 culverts upgraded through 2019 and 2020 RFPs.	25 32	25 43	25	25		See additional program highlights in Section IV.E.	
4. Promote use of living shorelines and similar approaches to address NPS problems, restore impacted habitat and maintain existing habitat values.	<ul style="list-style-type: none"> Explore and develop policy to limit use of riprap on streambanks and lakeshores in NPS watershed projects. Evaluate living shorelines pilot projects. If appropriate, pursue revisions to Chapter 305 to accommodate living shoreline approaches in coastal and other shoreline areas. 	Alex Wong, DEP	4. Shoreline riprap policy for NPS watershed projects developed in 2021.		X				Policy drafted and distributed to partners, expect policy to be approved in 2022. Approved project for Cross Lake Protection Plan Phase 1, which will include 12 living shoreline stabilization projects.	

Table 17. Statewide Approach – NPS Program Coordination Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
1. <u>Program Administration:</u> Continue to manage and implement the NPS Program to meet program goals and work towards addressing the State’s water quality problems as effectively and expeditiously as possible.	<ul style="list-style-type: none"> DEP employs appropriate programmatic and financial systems that ensure section 319 funds are used efficiently and consistent with fiscal and legal obligations (Section 319 program guidelines, EPA-DEP Performance Partnership Agreement). In keeping with CWA Section 319(h)(8) and (11), provide EPA with sufficient information, annual reports, GRTS data and other information about Maine’s 319 program to determine whether the State’s previous year progress was satisfactory. Conduct sub-recipient monitoring according to program standard operation procedures using DEP’s NPS Grant Administration Guidelines (2016). Complete and close out all active grant projects within the contract period. 	Alex Wong, DEP	1. Maine’s NPS Program submits annual report to EPA and continues to achieve Satisfactory Progress Determination from EPA.	X ✓	X ✓	X	X	X	Completed satisfactory progress interview/review with EPA for FFY 2020. EPA issued a favorable determination May 19, 2021. The determination for FFY21 reporting period to be issued by summer 2022.	
2. <u>Program Administration:</u> Update the ME NPS Management Plan by 2024.	<ul style="list-style-type: none"> Consult with lead agencies and gather partner input to update the Maine NPS Management Program Plan for the next five-year cycle including milestones for 2025-2029. 	Alex Wong, DEP	2. Maine NPS Management Program Plan approved by EPA 10/1/24.					X	No progress to report; planned for 2024.	
3. <u>Education & Outreach:</u> Promote more effective awareness and behavior change methods and tools for DEP programs and NPS projects and partners.	<ul style="list-style-type: none"> Provide technical assistance and training opportunities in <u>social marketing</u> by hosting or participating in Maine workshops, seminars and conferences. Provide technical assistance and training opportunities in how to effectively use <u>social media</u> and other electronic platforms. 	Kathy Hoppe, DEP	3. Host or help coordinate at least two social marketing and two social media workshops.	1 0	1 0	1	1		Not carried out in 2021 due to COVID-19. Workshop series planned for fall 2022.	

Table 17. Statewide Approach – NPS Program Coordination Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
4. <u>Partnerships</u> : Build and strengthen coordination and communication between Maine’s NPS Program’s lead agencies.	<ul style="list-style-type: none"> Convene meeting of NPS lead agencies and partners to review NPS Plan activities and determine need and frequency of future work group meetings. Conduct regular outreach to lead agencies, request semiannual updates on NPS Plan action items and milestones, and provide annual updates to lead agencies. Continue to work with other government agencies to address and improve areas of environmental concern and seize opportunities for further collaboration. 	Alex Wong, DEP	5. Meeting of NPS Plan lead agencies and partners held in 2020. NPS Plan status update sent to lead agencies annually.	X ✓	X ✓	X	X	X	DEP met individually with each lead agency in 2021. Maintained regular contact and prompted semi-annual program updates to plan milestones.	
5. <u>Partnerships</u> : Build and strengthen partnerships to promote collaboration and effective implementation of the Maine NPS Management Plan.	<ul style="list-style-type: none"> Conduct the annual Watershed Roundtable to bring together watershed professionals to share information, network and foster collaboration. Improve upon and continue to coordinate the watershed managers’ listserv to efficiently promote sharing between partners. 	Alex Wong, DEP	6. Host annual Watershed Roundtable and explore options and migrate listserv to improved platform in 2020.	X ✓	X ✓	X	X	X	Hosted virtual Watershed Roundtable with 40 participants from municipalities, NGOs, SWCDs and other state agencies. 149 people in contained in direct email database, 209 people are subscribed to watershed listserv. Waiting for upcoming State listserv upgrade before migrating to new platform.	
6. <u>Funding</u> : Explore funding options to address NPS sources and program needs.	<ul style="list-style-type: none"> Explore funding options for addressing malfunctioning onsite disposal systems where there are likely water quality impacts (e.g., CWSRF, SCG, Section 319 to replace OSDS, connect to public sewer, or extend sewer lines). 	Alex Wong, DEP	7. List of funding options developed.			X			No progress to report; to be pursued by 2022.	

Table 17. Statewide Approach – NPS Program Coordination Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2021 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
	<ul style="list-style-type: none"> • Explore and pursue additional funding to support development of WBPs and watershed implementation projects. • Explore, promote, and pursue FEMA hazard mitigation grants for installation of green infrastructure, stream/floodplain restoration, and culvert replacements. • Share information with partners about funding opportunities through listserv and WBP planning and implementation projects. 									
7. <u>Funding:</u> Promote CWSRF programs, track funding for NPS projects and explore new program opportunities.	<ul style="list-style-type: none"> • Track CWSRF projects and funding awarded to NPS projects and summarize in the NPS Annual Report. • Explore and promote ways for CWSRF to meet Maine’s NPS needs (e.g., salt reduction equipment, uncovered sand/salt piles. WBP development, brownfields, alum treatments, land protection). Review other State programs, meet with partners to explore needs and determine options and feasibility. • Publicize CWSRF opportunities through the watershed listserv and roundtable. 	Brandy Piers, DEP	8. Summary of CWSRF-funded NPS projects included in the annual NPS Program Report. One new NPS program area developed using CWSRF by 2023.	X ✓	X ✓	X	X	X	CWSRF funding for NPS projects in 2020 totaled \$4.46 million. Projects described in Section IV.D.	



Messalonskee Lake Watershed Survey



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Document available for download at:
<http://www.maine.gov/dep/water/grants/319-documents/reports>

