

Nonpoint Source Management Program 2022 Annual Report

July 2023

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Highland Lake (Windham, Westbrook, Falmouth)



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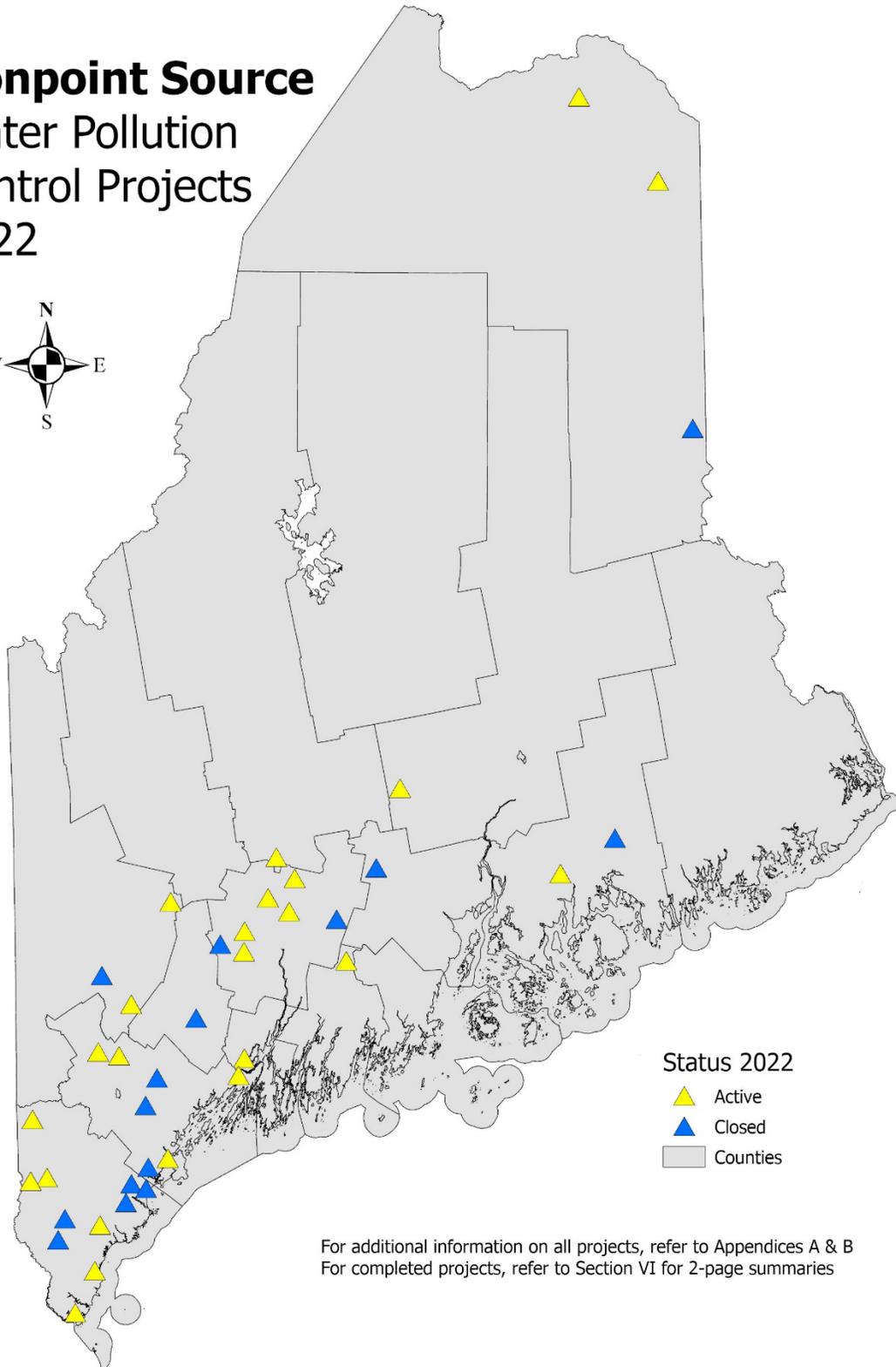
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Document available for download at: <http://www.maine.gov/dep/water/grants/319-documents/reports/>.

NPS Water Pollution Control Projects Active in 2022

**Nonpoint Source
Water Pollution
Control Projects
2022**



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 restore or protect lakes, streams, or coastal waters.

This report summarizes the Nonpoint Source Program's activities and accomplishments in 2022. 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. 2022 Highlights - Maine NPS Management Program

- A. Grant Awards** - EPA awarded \$1,983,939 FFY 2022 Section 319 Clean Water Act funds and \$236,000 FFY 2022 Section 604b Clean Water Act funds to the DEP. Funds were used to fund programs designed to prevent and reduce NPS pollution problems. Ten new watershed implementation grants totaling \$954,761 and three new watershed planning grants totaling \$134,194 were awarded to municipalities, Soil and Water Conservation Districts, and watershed groups.
- B. Projects Closed Out** - Eighteen NPS watershed projects funded through the NPS grants program in previous years were successfully completed. DEP provided technical assistance and granted \$1,214,283 of Federal CWA Section 319 and 604(b) funds for these projects. Grantees, partners, and landowners contributed matching funds or services valued at \$1,131,675.
- BMPs were installed to reduce polluted runoff in the following thirteen watersheds, thereby reducing pollutant loading to these waters by an estimated 252 pounds of phosphorus, 418 pounds of nitrogen, and 350 tons of sediment per year¹:

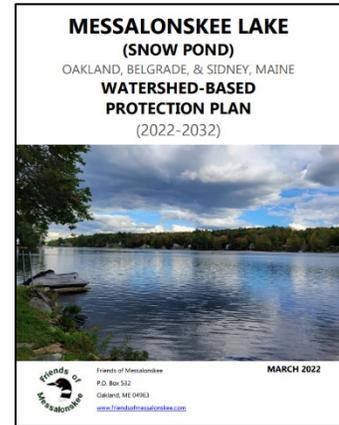
<ul style="list-style-type: none"> ○ Abrams Pond ○ Bauneg Beg Lake ○ Forest Lake ○ George's Pond ○ Goodall Brook ○ Goosefare Brook (Phases II & III) 	<ul style="list-style-type: none"> ○ Hart Brook ○ Highland Lake ○ Meduxnekeag River ○ Lake Pennessewassee ○ Phillips Brook ○ Thatcher Brook ○ Watchic Lake
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¹ Pollutant load reduction estimates are based on approved methods and assume proper installation and maintenance of Best Management Practices. (See Section III.D.)

- Watershed-based plans were completed for China Lake, Long Pond (Belgrade), Mare Brook, Unity Pond, and Wilson Pond. 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.

C. Lake Watershed-based Protection Plans - DEP and EPA reviewed and accepted three lake watershed-based protection plans in 2022: Branch Lake (Ellsworth), Great East Lake (Acton), and Messalonskee Lake (Oakland). The Branch Lake Association, Acton Wakefield Watershed Alliance, and the Friends of Messalonskee Lake developed these plans and carried out the supporting watershed surveys with local resources and funding.

D. Maine DEP's Clean Water State Revolving Fund (CWSRF) - The CWSRF program helped fund \$1.8 million in NPS projects in 2022 via the linked-deposit forestry program, which makes below-market-rate financing available for forestry BMPs and environmentally friendly logging equipment.



E. Nonpoint Source Training Center (NPSTC) - The NPSTC presented or approved 55 in-person and online classes and trained 987 individuals.

F. 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 five projects were completed under the exemption. The pilot program continued in 2022 during which 41 projects were completed. The pilot program will continue into 2023, after which program success will be determined.

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 2022 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 2022, three 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 38 through 2022.²

Lake Watershed-based Protection Plans Accepted by DEP

Abrams Pond (Eastbrook)	Mousam Lake (Acton)
Adams & Knickerbocker Lake (Boothbay)	Messalonskee Lake (Oakland)*
Alamoosook Lake (Orland)	North Pond (Buckfield)
Bauneg Beg Lake (Sanford)	North Pond (Norway)
Branch Lake (Ellsworth)*	North Pond (Smithfield)
Cobbossee Lake (Manchester)	Panther Pond (Raymond)
Cold Stream Pond (Enfield)	Parker Pond (Chesterville)
Crescent Lake (Raymond)	Pennesseewassee Lake (Norway)
Damariscotta Lake (Jefferson)	Phillips Lake (Dedham)
Ellis Pond (Roxbury)	Sebago Lake & Crooked River (Naples)
Forest Lake (Windham)	Square Pond (Acton)
Georges Pond (Franklin)	Toddy Pond (Orland)
Great East Lake (Acton)*	Torsey 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)

² DEP and EPA have accepted 42 plans since 2013. (This number includes expired plans, which are more than ten years old and need to be updated.)

Implementation Projects to Protect Lakes

DEP allocates Section 319 funds provided by EPA to protect clean waters that are threatened by NPS pollution. In 2022, 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)	Long Pond (Parsonsfield)
Bauneg Beg Lake (Sanford)	McGrath Pond & Salmon Lake (Oakland)
Cobbossee Lake (Manchester)	Mousam Lake (Acton)
Damariscotta Lake (Jefferson)	North Pond (Smithfield)
Forest Lake (Windham)	Sebago Lake (Naples)
Great Pond (Belgrade)	Square Pond (Acton)
Highland Lake (Windham)	Trickey Pond (Naples)
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 2022, DEP accepted five nine-element WBPs: China Lake (China), Long Pond (Belgrade), Long Pond (Parsonsfield), Mare Brook (Brunswick), and Unity Pond (Unity).

- Work continues to develop nine-element WBPs for North Pond (Smithfield), Tributaries to the Aroostook River (Presque Isle, Caribou, Ft. Fairfield), Biddeford Pool (Biddeford), Sebasticook Lake (Newport), and Spruce Creek (Kittery).
- At the end of 2022, there were 30 active nine-element WBPs for NPS-impaired waters. Two plans, Pearce Brook (Houlton) and Trout Brook (South Portland) expired in 2022. In total, 17 plans are more than ten years old and need to be updated.

Watersheds with Nine-Element Watershed Plans Accepted by Maine DEP

Annabessacook Lake (Winthrop)	Kennebunk River (Kennebunk)
Arctic Brook (Bangor)	Kennedy Brook (Presque Isle)
Cape Neddick River (York)	Long Pond (Belgrade)
Capehart Brook (Bangor)	Long Pond (Parsonsfield)
China Lake (China)	Mare Brook (Brunswick)
Cochnewagon Pond (Monmouth)	Medomak River (Waldoboro)
Concord Gulley Brook (Freeport)	Meduxnekeag River (Houlton)
Cross Lake (Cross Lake TWP)	Ogunquit River (Ogunquit)
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)	Unity Pond (Unity)
Highland Lake (Windham)	Wilson Pond (Monmouth)

NPS Watershed Implementation Projects

DEP allocates Section 319 funds to help communities implement their watershed-based plans to restore NPS-impaired waters. In 2022, Section 319 funds helped continue or start projects in the following 12 NPS-impaired watersheds:

Cross Lake (Cross Lake TWP)	Ogunquit River (Ogunquit)
Goodall Brook (Sanford)	Phillips Brook (Scarborough)
Goosefare Brook (Saco)	Pleasant River (Windham)
Hart Brook (Lewiston)	Topsham Fair Mall Stream (Topsham)
Kennebunk River (Kennebunk)	Thatcher Brook (Biddeford)
Meduxnekeag River (Houlton)	Trout Brook (South Portland)

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, the [Pollution Load Estimation Tool \(PLET\)](#) 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 18 active implementation projects in 2022.

2022 NPS Pollutant Load Reductions		
Sediment 481 tons/year	Phosphorus 409 pounds/year	Nitrogen 767 pounds/year

E. Section 319 Grant Administration

EPA awarded \$1,983,939 of FFY 2022 Section 319 funds to DEP. Of FFY 2022 Section 319 funds, 52% (\$1,032,216) was allocated for implementation of nine-element WBPs for restoration projects or alternative plans for protection projects. This includes funds (\$77,454) for DEP staff services to help implement WBPs and grant funds (\$954,762) for 10 projects to implement WBPs. Six of the funded projects (\$606,569) will implement nine-element plans for impaired waters, and four projects (\$348,193) 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 2021-2022, including monitoring sub-recipient performance on 32 NPS grant projects and providing other DEP NPS program services.

Summary of FFY22 319 Grant and Match Allocations

Activity	Program Funds Subtotal	Project Funds Subtotal	Section 319 Total	Nonfederal Match
NPS Grants for Watershed Implementation		\$954,762	\$954,762	\$1,169,531
NPS Grants for Watershed Planning	\$29,193		\$29,193	
Nonpoint Source Training Center	\$9,000		\$9,000	
Small Community Grants Program				\$613,046
DEP Staff, Fringe, Travel, Other & Indirect (State Fiscal Year 2022 21.54%) ³	\$913,530	\$77,454	\$990,984	\$383,549
Totals	\$951,723	\$1,032,216	\$1,983,939	\$2,166,126

³ Section 319 funded 8 FTEs, one AmeriCorps volunteer, and 1 part-time contractor to assist in project oversight in Aroostook County during staff transition.

IV. NPS Program Activities in 2022

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 2022 included:

- **Municipal Comprehensive Plan Reviews** - DEP staff provided maps and data to 50 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 2022, assistance was provided to the following nine towns:
 - Auburn
 - Brooksville
 - Kennebunk
 - Newcastle
 - Nobleboro
 - Orland
 - Presque Isle
 - Swans Island
 - York
- **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 2022, DEP assisted with the following four watershed surveys:
 - Androscoggin Lake (Wayne)
 - Beech Hill Pond (Otis)
 - Clemons Pond (Hiram)
 - Wilson Lake (Acton)

Staff also provided assistance to lake associations to help plan 2023 surveys for Monson Pond (Ft. Fairfield), Sebasticook Lake (Newport), Springy Pond (Clifton), Taylor Pond (Auburn), and Thompson Lake (Otisfield).

- **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 April 2022 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 continued in 2022 during which 41 projects were completed. The pilot program will continue into 2023, after which program success will be determined.

- **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 2022, DEP provided watershed maps upon request and assistance to many organizations and groups focused on the following watersheds:

- Alder Brook (Lisbon Falls)
 - Biddeford Pool (Biddeford)
 - Brandy Pond (Naples)
 - Clearwater Lake (Farmington)
 - Embden Pond (Embden)
 - Highland Lake (Windham)
 - Kennebunk River (Arundel)
 - Long Creek (South Portland)
 - Monson Pond (Ft. Fairfield)
 - Red Brook (Scarborough)
 - Saddleback Lake (Dallas Pt)
 - Spruce Creek (Kittery)
 - Sucker Brook (Hampden)
 - Vaughn Brook (Hallowell)
 - Weskeag River (S. Thomaston)
- **Watershed Roundtable** - Approximately 77 watershed professionals from state agencies, municipalities, watershed organizations, and SWCDs attended the DEP's 20th annual Watershed Managers Roundtable in October. The 2022 gathering was a hybrid meeting, with some attendees participating via Zoom, and some participating in a face-to-face meeting. The format remained the same 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 2022, Lakes Environmental Association used compensation funds to engineer and replace a filter berm that failed catastrophically with gabion baskets and outlets berms and swales in the Brandy Pond watershed.



2022 Watershed Roundtable

B. Maine Nonpoint Source Training Center

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

Accomplishments in 2022:

- Presented 26 8-hour 'Basic & Advanced Erosion Control Practices' (BAESC) courses (486 in-person and 158 online participants).
- Certified 283 new individuals/contractors in Erosion Control Practices, presented 20 in-person continuing education classes to 299 individuals, and provided 401 on-line continuing education credit hours to individuals Certified in Erosion Control Practices.
- Provided two training programs and one workshop in the Maintenance and Repair of Gravel Roads with 44 participants attending.
- Presented three 4-hour continuing education courses on Winter BMPs for Erosion Control.
- Created a new 4-hour training on inland shoreline stabilization practices.
- Approved four training courses for opportunities through third party organizations of courses qualifying for re-certification in Erosion Control Practices including courses in septic system installation, bio-engineering practices, living shorelines, and septic installers courses.
- Partnered with staff in several Maine DEP offices and bureaus, as well as staff from Maine DOT, Maine DACF, Maine Land Use Planning Commission, Maine Audubon, and Army Corps of Engineers Maine Project Office, Maine CEO Training Program, and Maine Board of Underground Storage Tank Installers (BUSTI) to develop and deliver training.
- Maintained the Maine DEP's Certification in Inspection and Maintenance of Stormwater Best Management Practices. There are currently 125 individuals certified through this program.



Gravel Road Training

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 2022:

- VRMP staff and partners trained and certified/re-certified volunteers from ten volunteer organizations to monitor 42 rivers and streams and one harbor statewide. This included one new organization, the Royal River Alliance.
- Water quality data were collected by approximately 95 volunteers at 123 sites during 980 sampling events.
- Data collected included temperature, dissolved oxygen, conductivity, bacteria, chlorophyll, and nutrients.
- Continued use of volunteer electronic data collection via Survey123, which allows for data to be readily available via online Maine VRMP Data Dashboard.



Little Androscoggin VRMP sampling site by volunteer Carol Rice.

For More Information:

Kristin Feindel, DEP - (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 \$1.8 million in the following types of NPS projects in 2022.

Accomplishments in 2022:

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 2022, \$1.8 million in loans were made.



Cut to length harvester



Pipe arch used for stream crossing

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. The 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 2022:

- In November 2020, voters approved \$4 million in bond funding for upgrading culverts at stream crossings in order to improve fish and wildlife habitats and increase public safety. One RFP under this funding (\$5 million total) was released in 2021 with awards made in 2022. Thirty-four projects were funded during this round for grants up to \$125,000.
- With assistance from Maine Audubon’s Stream Smart program, Army Corps of Engineers Maine Project Office, and Maine DOT Bridge Maintenance Engineer, NPSTC was able to coordinate and produce a 4 hour separate pre-recorded online training videos in lieu of in-person workshops, which were integrated into the application materials for additional guidance. These workshops and trainings have resulted a noticeable increase in quality of proposals and designs since they began prior to the second round in 2019.
- The grants program received an additional \$3 million for stream crossing grants for 2022 RFP. Funding from this program is from Maine’s Jobs & Recovery Act. Staff are currently reviewing these applications. The maximum award for projects submitted during this round has increased to \$150,000.
- Following feedback from various user groups and to help streamline reviews, the 2022 application moved away from open-ended questions to outcome-based commitments. Also, the 2022 round removed the optional plan requirement at the time of review and selection. This change was to assure these standards were met in the final design and to provide additional equity in project selection (e.g., ability to hire an engineer prior to award may be prohibitive to smaller communities).

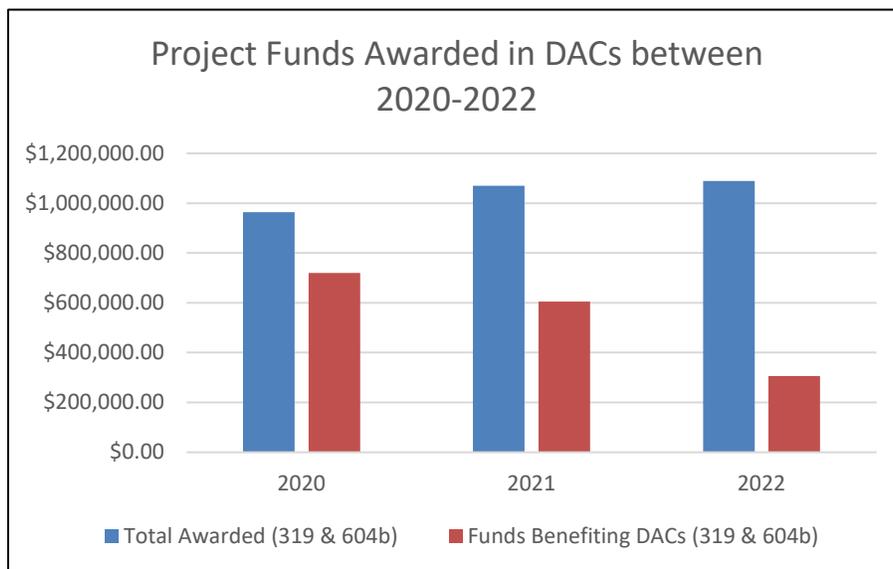
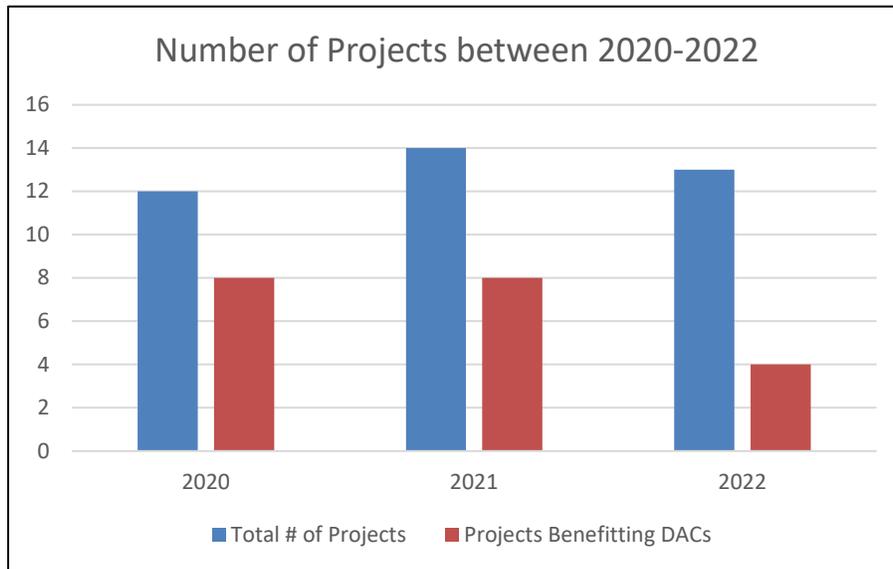
For More Information:

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. Equity and Environmental Justice

Executive Order 14008 establishes the Justice40 Initiative, in which the Federal Government has made it a goal that 40% of certain Federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. Maine’s NPS Program is committed to equitable funding throughout the state. Between FFY2020 and FFY2022, CWA 319 and 604b funds were awarded to 39 projects, 20 of which benefited Disadvantaged Communities (DACs). Total project funds awarded during this time period was \$3,122,652, with \$1,630,665 (52%) benefitting DACs.



To ensure equity in project selection and funding into the future, in 2022 the Maine NPS Program expanded its NPS Priority Watersheds list to include DACs within critical Atlantic Salmon Habitat and revised the scoring criteria used to evaluate the FFY23-24 round of Watershed-based Management Planning Grants and Watershed-based Implementation Grants. The revised criteria utilizes data from the Climate & Economic Justice

Screening Tool (CEJST, <https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5>) to provide a maximum of 5 points out of 100 possible points based on the percentage of the watershed that is designated a Disadvantaged Community.

Using CWA Section 604(b) funding for FY2022, the program procured contractor assistance to develop screening criteria more specific to Maine. Development of the tool will start in 2023, with results to be incorporated in the FFY24-25 grant Request for Applications.

The NPS Program is also participating in the “J40 Staff Work Group” convened by the Governor’s Office on Policy, Innovation, and the Future (GOPIF), where diversity, equity, inclusion, and justice efforts across State Agencies are shared and coordinated.

G. Climate Change Adaptation and Resilience Measures

The Maine 5-year NPS Management Program Plan for 2020-2024 includes a multi-faceted approach to supporting climate change adaptation and resiliency. Program achievements for 2022 for climate related objectives are summarized below:

- *Identify additional prioritization criteria and waters for addition to the NPS Priority Watersheds list and/or for targeted outreach. (Table 10, #2)*

The list of NPS Priority Watersheds was expanded to include critical Atlantic Salmon Habitat effected by channel alteration. Many of the headwater streams once frequented by the endangered Atlantic Salmon (*Salmo salar*) in Washington County, Maine, have been artificially widened and flattened by historic log drives. Alterations such as these leave streams susceptible to greater temperature fluctuations as channel widening exposes more water to sunlight and shallower depths heat more readily. Restoring these streams to “Stage 0” natural baseline will increase habitat resilience in a warming climate.

- *Incorporate climate change and resilience planning into watershed-based planning Review existing information (e.g., Hazard Mitigation Plans), assess stream culverts during watershed assessments and incorporate in WBPs. (Table 10, #6).*

To achieve this objective, program staff and partners utilize available planning tools and resource to identify potential climate impacts to consider in watershed-based planning projects (e.g., sea level rise, vulnerable septic systems, marsh migration, coldwater refugia) and incorporate into watershed-based plans. Starting in 2021, Requests for Applications for watershed-based plans included a requirement to consider climate change impacts in funded projects.

Program staff developed a culvert assessment procedure intended to document stream crossings that might be failing due to climate related issues. This assessment was piloted in 2021, refined in 2022, and deployed in watershed surveys during the 2023 field season.

Furthermore, the DEP incorporated a discussion of climate change impacts into watershed survey training materials.

- *Evaluate stormwater and ESC BMPs and develop guidance about climate change resiliency and adaptation planning (Table 11, #5).*

The DEP committed to reviewing stormwater and erosion & sedimentation control BMPs for climate resiliency and adaptation considerations, including storm sizing and modifications needed for areas with rising groundwater and sea level, with the objective of creating an Appendix for the Stormwater BMP

Manual to guide design considerations. This effort has been hampered by staffing shortages, but is being incorporated into the Stormwater Rule, Chapter 500 revisions, underway in 2023.

- *Increase field crop agriculture's use of soil health practices to reduce soil erosion, improve water quality, and offset carbon emissions (Table 12, #9).*

The Healthy Soils Program at DACF started in 2022 after its enabling legislation passed in 2021. The DEP plays a lead role and coordinates with other State agencies, including DACF to carry out the State of Maine NPS Pollution Program (38 M.R.S. §410). DEP and DACF are collaborating on outreach opportunities in Aroostook County.

- *Administer DEP stream culvert grant program (culvert bond program) that funds upgrades of municipal culverts (Table 16, #3).*

The Nonpoint Source Training Center (NPSTC) manages the culvert grant program (See Section E, above). Culvert replacements must meet "Stream Smart" standards. These standards increase climate resiliency by requiring crossing widths to incorporate floodplain and sediment transport. These standards also serve to ensure aquatic organism passage which aids the accessibility of temperature and dissolved oxygen refugia in a warming climate.

The NPS Management Program also participates in the US Climate Alliance Working Lands group,

Finally, using CWA Section 604(b) funding for FY2022, the DEP procured contractor assistance to develop climate resiliency screening criteria in conjunction with the Equity and Environmental Justice screening tool (see Section F, above). Development of the tool will start in 2023, with results to be incorporated in FFY24-25 grant Request for Applications.

H. Other NPS Program News

NPS Work on Protection Priority Watersheds

In 2022, DEP worked to identify and target assistance to lake watersheds with the highest protection priority. This included targeted work on “Watch List” lakes and continued development of 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 2022, DEP was involved with planning or implementation in eight watch-listed watersheds:

- Abrams Pond, Eastbrook (319 grant project, 604b planning project)
- 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 continued 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. Unexpected model results were identified and work to refine the model continued in 2022.

Long Pond (Parsonsfield) Watershed Project

Long Pond experienced its first cyanobacteria bloom in 2017. Blooms of varying intensities continued annually, reducing average water clarity by over 3 meters. In 2019, the Long Pond Association (LPA) and DEP conducted a watershed survey to identify NPS sites contributing to chronic cyanobacterial blooms. Additional water quality monitoring confirmed the role of internal recycling in fueling the blooms. The LPA developed the Long Pond Watershed-based Management Plan (2020), which recommended installation of watershed BMPs to address the external loading and a locally-funded alum treatment to address the internal loading.

In 2021, York County SWCD received a CWA Section 319 grant for the Phase I project that will address six private road sites and four summer camp sites, as well as provide residential matching grants of \$500 for up



Alum application, June 2022



Long Pond Survey Volunteers (2019)

to ten properties. The road sites consist of curbing, shifting the road, creating formalized parking and stormwater treatment via buffer plantings.

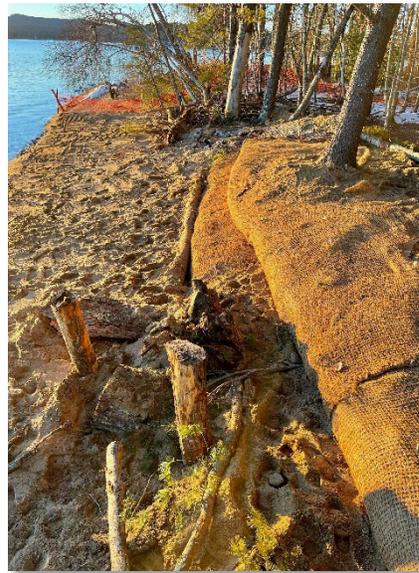
Separate from the CWA Section 319 Phase I project, the LPA raised local funds and treated 118 of the pond’s 263 acres with alum designed to stop cyanobacteria blooms. In June 2022, an alum treatment was carried out to help curtail the pond’s chronic cyanobacteria blooms. The LPA plans to address remaining NPS sites in the next few years in order to provide long-lasting water quality benefits.

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. 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 projects:

- **Watershed-based Plan Development.** DEP offers grants funded through CWA Sections 604(b) and 319 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. Most watershed surveys and protection plans are locally funded.
- **Watershed-based Plan Implementation.** DEP offers grants funded through CWA Section 319 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.



Sebago Lake Protection Project, Phase IV, construction of living shoreline. Left photo shows installation of engineered log jams with rootwads facing the shore. Right photo shows soil encapsulated lifts, which will be planted with native vegetation.

B. Grant Awards Issued and Started in 2022

DEP issued 11 new grants (\$1,124,391) in 2022 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. In addition, CWA Sections 604b and 319 funding was awarded to the York County SWCD (\$49,962), the Town of Newport (\$49,908), and the Town of Kittery (\$34,324) to develop Watershed-based Management Plans for Biddeford Pool, Sebasticook Lake, and Spruce Creek, respectively.

NPS Grants Issued in 2022

Project Title	Grantee	Project ID#	Grant	Match
Cobbossee Lake Watershed Protection Project, Phase III	Cobbossee Watershed District	20220005	\$93,847	\$63,800
Cross Lake Watershed Protection Project, Phase I	County of Aroostook	20210012	\$212,300	\$135,609
George's Pond Watershed Protection Project, Phase II	George's 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 Co. 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 Restoration Project, Phase IV	Town of Ogunquit	20210014	\$61,990	\$43,496
Trickey Pond Watershed Protection Project	Cumberland Co. SWCD	20220006	\$75,811	\$52,599
Trout Brook Watershed Restoration Project, Phase IV	Cumberland Co. SWCD	20220002	\$45,801	\$31,081
Topsham Fair Mall Stream Restoration Project, Phase III	Town of Topsham	20220008	\$153,479	\$102,629
Totals			\$1,124,391	\$882,358

C. Grants Selected under 2022 Request for Applications (RFA)

In March 2022, DEP issued an RFA for projects to help communities implement their watershed-based plans and make progress restoring or protecting a waterbody. DEP received eight applications and issued conditional grant awards for all eight projects, which all started in 2023.

Conditional Grant Awards under Section 319 RFA

Project Title	Grantee	Project #	Grant	Match
Goosefare Brook Watershed Restoration Project, Phase IV	City of Saco	20220012	\$147,740	\$180,946
Goodall Brook Watershed Restoration Project, Phase III	City of Sanford	20220013	\$61,870	\$81,761
Long Pond (Belgrade) Watershed	7 Lakes Alliance	20230001	\$112,550	\$126,498
Messalonskee Lake Watershed Protection Project, Phase II	7 Lakes Alliance	20230002	\$111,884	\$123,795
Mare Brook Watershed Restoration Project, Phase I	Town of Brunswick	20230003	\$149,850	\$137,489
Torsey Pond Watershed Protection Project, Phase I	Cobbossee Watershed District	20230004	\$80,391	\$53,721
Branch Lake Watershed Protection Project, Phase III	Hancock Co. SWCD	20230005	\$112,483	\$100,709
Hogan-Whitney Ponds Watershed Protection Project, Phase II	Oxford Co. SWCD	20230006	\$77,910	\$55,500
Totals			\$854,678	\$860,419

VI. Summaries of NPS Projects Completed in 2022

Eighteen watershed projects funded through the NPS grants program in previous years were successfully completed. DEP provided technical assistance and granted \$1,214,283 of Federal Clean Water Act funds for these projects. Grantees, partners, and landowners contributed matching funds or services valued at \$1,131,675.

- BMPs were installed to reduce polluted runoff in 14fourteen watersheds, including seven lake and seven stream or river watersheds. Over the course of these projects, NPS work reduced annual pollutant loading to these waters by 350 tons of sediment, 252 pounds of phosphorus, and 418 pounds of nitrogen per year.
- Watershed-based plans or updates to watershed-based plans were completed or updated for Black Brook (Windham), China Lake (China), Unity Pond (Unity), and Wilson Pond (Monmouth). 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> and [Maine NPS Grants History ArcGIS Project Map](#).

Project Title	Page Number
Abrams Pond Watershed Protection Project, Phase II	23
Bauneg Beg Lake Watershed Protection Project, Phase I	25
Black Brook Watershed-based Plan Development Project	27
China Lake Watershed-based Plan Development Project	29
Forest Lake Protection Project, Phase III	31
George's Pond Watershed Protection Project, Phase I	33
Goodall Brook Watershed Restoration Project, Phase II	35
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Highland Lake Watershed Protection Project, Phase IV	43
Meduxnekeag River Watershed Restoration Project, Phase II	45
Lake Pennesseewassee Watershed Protection Project, Phase I	47
Phillips Brook Restoration Project, Phase I	49
Thatcher Brook Watershed Restoration Project, Phase III	51
Unity Pond Watershed-based Management Plan Update	53
Watchic Lake Protection Project, Phase I	55
Wilson Pond Watershed-based Plan Update	57

Abrams Pond Watershed Protection Project, Phase II

#20210006

Waterbody Name: Abrams Pond

Location: Eastbrook and Franklin – Hancock County

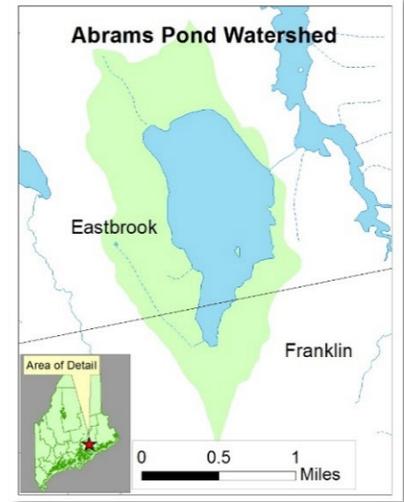
Waterbody Status: NPS Priority Watershed

Project Grantee: Town of Eastbrook

Project Duration: January 2021 – December 2022

319 Grant Amount: \$68,349

Local Match: \$65,305



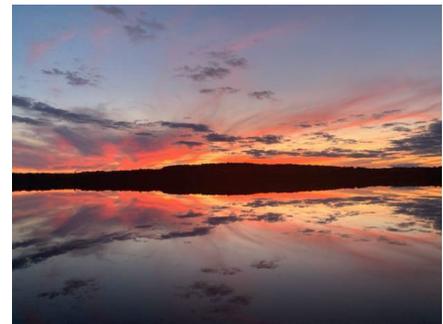
PROBLEM:

Abrams Pond is a 435-acre pond with a maximum depth of 27 feet, a mean depth of 18 feet and a flushing rate of 0.41 times per year. The 1.7 square mile watershed is 73% forested, 20 % agricultural (blueberries and hay) and 7% residential development. Abrams Pond is the headwater that feeds into Scammon Pond, Webb Pond, Webb Book, Graham Lake and the Union River. The Union River is part of the Designated Critical Habitat for the Atlantic Salmon, Gulf of Maine Distinct Population Segment under the Endangered Species Act.

The Maine DEP and Lake Stewards of Maine have collected data on the water quality of Abrams Pond since 1980. According to these data, Abrams Pond water quality is considered to be below average based on measurements of clarity, total phosphorus, and Chlorophyll-a. The potential for algal blooms on Abrams Pond is considered high, and blooms occurred in 1999, 2002, and 2012. Abrams Pond is currently listed on Maine DEP’s NPS Priority Watersheds list as “Watch List”, which indicates that the lake is near the impairment threshold. In 2014, a watershed survey was conducted by volunteers of Abrams Pond Association (APA), with assistance of Maine DEP and Hancock County SWCD and 34 NPS sites were identified. A Phase I 319 grant project (#20190003) installed BMPs at nine priority sites from the survey, provided technical assistance to 24 sites and developed an outreach and education plan.

PROJECT DESCRIPTION:

The purpose of this project was to reduce phosphorus inputs from the Abrams Pond watershed by addressing five camp road sites, four driveway sites and five residential sites. Outreach increased awareness of NPS pollution, gravel road maintenance and sediment and erosion control BMPs. Technical assistance visits encouraged BMP installation and promoted behavior change. Outreach strategies included residential buffer workshop, distribution of an educational brochure through the Town’s tax-bill mailing, workshop for blueberry farmers, press releases, and newsletter articles in the APA annual newsletter.



Sunset at Abrams Pond

PROJECT OUTCOMES:

- Project staff visited 25 sites and provided technical recommendations for the reduction of erosion-related runoff of sediment and nutrients, which resulted in the development of 10 NPS site plans.
- Grant funds helped facilitate installation of erosion and sediment control BMPs at 15 sites to protect pond water quality. Of these sites, 6 were on residential sites, 4 were on private roads and 5 were on driveways.
- Pollutant loading to Abrams Pond was reduced by an estimated 85 tons of sediment, 17 pounds of phosphorus, and 144 pounds of nitrogen per year (Region 5 Method).



Sallie Road before BMPs



Sallie Road after BMPs

PROJECT PARTNERS:

Abrams Pond Association

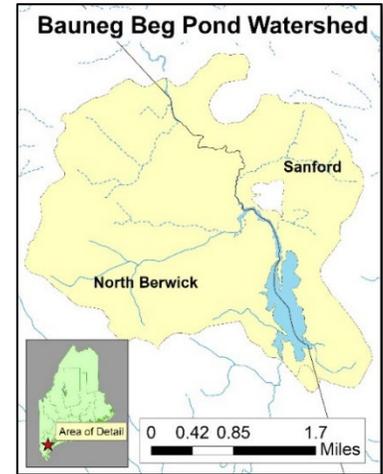
CONTACT INFORMATION:

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

Jeffrey Norment, Hancock County SWCD – (207) 667-8663 jnorment@hancockcountyswcd.org

Bauneg Beg Lake Watershed Protection Project Phase I #20200005

Waterbody Name:	Bauneg Beg Lake
Location:	North Berwick and Sanford, York County
Waterbody Status:	Most at Risk from Development
Project Grantee:	York County SWCD
Project Duration:	February 2020 – December 2022
319 Grant Amount:	\$52,601
Local Match:	\$54,264



PROBLEM:

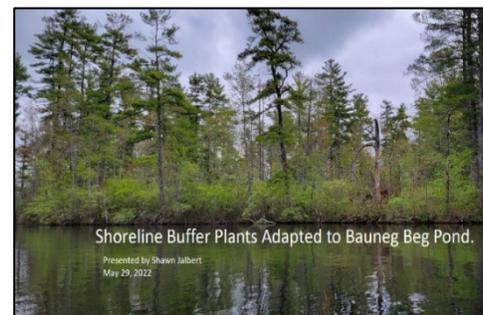
Bauneg Beg Lake lies within the greater Great Works River watershed and flows into the Salmon Falls River. It is a 200-acre lake with a 16.4 square mile watershed and a flushing rate of 8.8 times per year. Its watershed includes Goodall Brook in downtown Sanford, forested areas, wetlands, residential and commercial development, small farms, and gravel pits. The shoreline is mostly developed with around 200 seasonal and year-round homes.

Bauneg Beg Lake is a highly colored lake with long-term averages of 2.9 m for SDT, 18 ppb for TP, and 7 ppb for Chl *a*. Since the 1980s, DO profiles reveal high depletion below 4 meters beginning in mid-summer with the potential for TP to leave the bottom sediments and become available to algae in the water column (internal loading). Past lake protection efforts included a 1999 watershed survey, a 319-funded demonstration project (#2001-06) that addressed 10 NPS sites, and work through the Great Works River watershed survey, plan development and Phase I implementation projects (2003-2008). In 2018, a locally-funded watershed survey documented 74 problem sites, including 56 high and medium impact sites. 41% of all sites were located on private residential property and driveways and 30% were state, town, and private roads. The Bauneg Beg Lake Watershed-Based Protection Plan was approved in 2018.

PROJECT DESCRIPTION:

The purpose of this project was to reduce phosphorous and sediment loading to Bauneg Beg Lake through installation of BMPs and education and outreach within the local community.

The impacts of the COVID-19 pandemic gave the project a slow start, reduced the ability to host large volunteer events, and resulted in difficulties identifying and completing BMPs. Twenty residential technical assistance visits were completed, of which nine landowners followed through with matching grant projects. Recommended BMPs were installed at two locations. The Bauneg Beg Lake Association hosted a successful native plant workshop in May 2022 and created watershed and educational signs that were placed throughout the watershed. The lake association also provided Welcome Wagon packets to 12 residents and assembled 200 additional packets to be handed out in spring 2023.



Native plant workshop presentation

PROJECT OUTCOMES:

- Construction of BMPs at two high priority locations – the Oakdale Cemetery and Javica Lane. Work included installation of infiltration trenches, native buffer plantings and a rain garden.
- Technical assistance and design of BMPs to reduce the impact of the priority Sand Pond Road site, for installation outside of the grant project.
- A total of 9 residential matching grants awarded to landowners toward the purchase of native plants and/or materials for conservation practices such as runoff diverters, infiltration steps, trenches, dry wells, and buffers.
- Technical assistance provided to 11 additional residential landowners, allowing for future conservation practice installations.
- Reduction of an estimated 0.87 tons/year of sediment, 0.67 pounds/year of phosphorus, and 4.71 pounds/year of nitrogen to Bauneg Beg Lake (Region 5 Method).
- Exceedance of total project match by \$13,250.



Installation of vegetated swale and rain garden on Javica Ln.

PROJECT PARTNERS:

Bauneg Beg Lake Association
 City of Sanford
 Oakdale Cemetery
 Town of North Berwick

CONTACT INFORMATION:

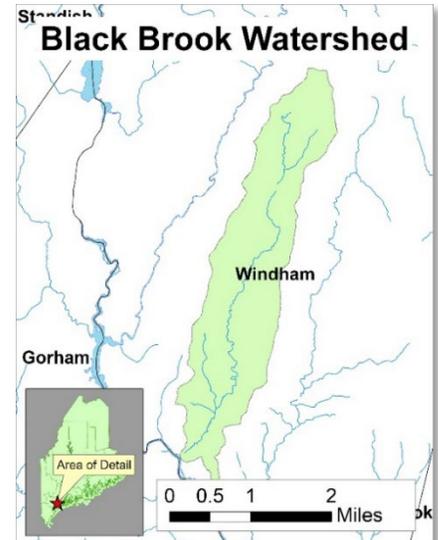
Shri Verrill, York County SWCD – (207) 324-0888, sverrill@yorkswed.org
 Kristin Feindel, DEP – (207) 215-3461, kristin.b.feindel@maine.gov



Educational signs placed in 4 separate locations in the watershed.

Black Brook Watershed-Based Plan Development Project #20190017

Waterbody Name:	Black Brook
Location:	Windham – Cumberland County
Waterbody Status:	Impaired, NPS Priority Watershed
Project Grantee:	Cumberland County SWCD
Project Duration:	October 2019 – December 2022
604(b) Grant Amount:	\$4,092
319 Grant Amount:	\$13,770
Local Match:	\$20,605



PROBLEM:

Black Brook is a 6.07-mile stream with a 3.91 square mile watershed area located entirely within the Town of Windham. Its headwaters originate just north of Route 302, a highly trafficked state road, and it outlets into the Presumpscot River just south of Route 202/Main Street. The watershed is roughly 10% developed with impervious surfaces making up roughly 6-7% of the watershed. The watershed is comprised mostly of forested land, yet nearly 27% is agricultural with most of this area located in the center of the watershed. Nearly half of the watershed is comprised of Scantic and Lamoine silt loam, which are poor draining glaciomarine deposits. Two small, unnamed tributaries flow into Black Brook prior to its crossing with River Road.

Since 2009 the Presumpscot Regional Land Trust (PRLT) and volunteers have monitored the brook with support from DEP's Volunteer River Monitoring Program. Current data shows Black Brook as not consistently meeting its State Class B water quality designation for either bacteria (*E. Coli*) or dissolved oxygen. This is the case for samples both at the headwaters and the outlet of Black Brook.

PROJECT DESCRIPTION:

The primary purpose of this project was to develop a locally sponsored, watershed-based management plan (WBP) for Black Brook with specific action items to address the multiple water quality problems previously identified within the watershed and with the waterbody. The Cumberland County SWCD and the Town of Windham with support from PRLT reviewed all known information and existing water quality data to inform further assessment and monitoring needs. The gathered information was used to conduct a stream stressor analysis by stream segment and determine the primary stressors, causes and solutions. This process

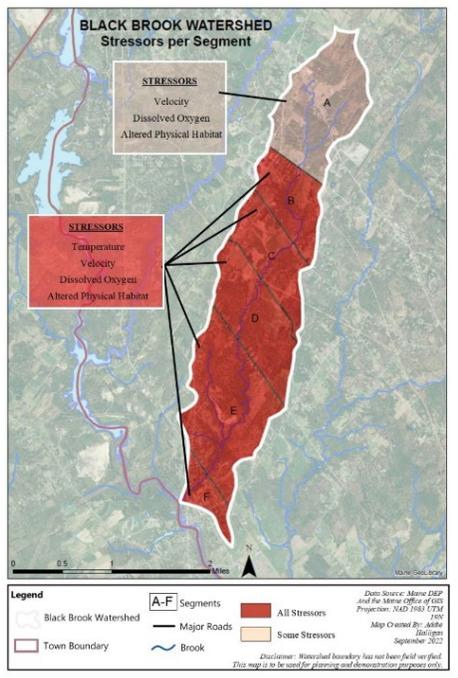


Black Brook

and the resulting plan action items were presented to the during the Town of Windham's Natural Resource Advisory Committee (NRAC) meeting in August of 2022, which included Town Councilors and the public for feedback. The 10-year WBP 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 WBP will be implemented by the town with oversight of a leadership team.

PROJECT OUTCOMES:

- The *Black Brook Watershed-based Management Plan* was created and accepted by Maine DEP. The community-developed management plan’s goal is for partial restoration of Black Brook by reducing levels of *E.coli* bacteria to meet Class B standards and improved dissolved oxygen levels to meet a minimum of Class C standards for dissolved oxygen.
- 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 segments of the watershed. Proximate stressors identified include elevated stream temperatures, decreased base flow velocity and diversity, low dissolved oxygen, diurnal dissolved oxygen swings, decreased habitat during base flow, and increased unnatural deposition of sediment altering physical habitat.
- Assessment and survey work included a desktop analysis, an abbreviated watershed survey, a stream corridor survey, and a habitat assessment. Monitoring included increasing PRLT monitoring from two historical sample sites to four sampling sites for a suite of parameters, deploying continuous data loggers at three locations in 2021 and 2022, and microbial source tracking at four sites during two sampling events.
- Generation of over \$20,605 of match which demonstrates community and Town support for this project.



Stressor map



Middle Left Photo: Beaver dam lodge creating impoundment at road crossing.

Upper Right: Metaphyton, a filamentous form of algae observed in Black Brook, an indication of excess nitrogen

Lower Right: Hayfields span across the middle watershed

PROJECT PARTNERS:

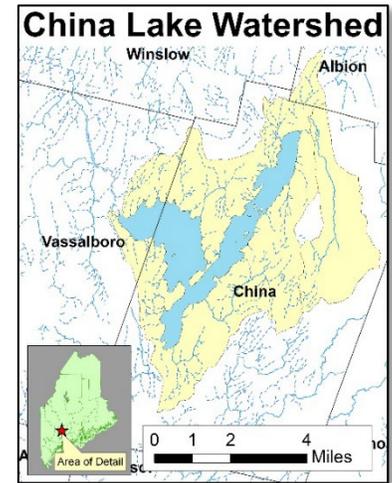
- Presumpscot Regional Land Trust
- Town of Windham
- Town of Windham’s Natural Resources Advisory Committee

CONTACT INFORMATION:

- Heather Hunt, Cumberland County SWCD – (207) 892-4700, hhunt@cumberlandswcd.org
- Gretchen Anderson, Town of Windham – (207) 894-5900, gaanderson@windhammaine.us
- Amanda Lessard, Town of Windham – (207) 894-5900, allessard@windhammaine.us
- Addie Halligan, Maine DEP – (207) 441-9057, Addie.Halligan@maine.gov

China Lake Watershed-based Plan Development Project #20190013

Waterbody Name:	China Lake
Location:	China, Vassalboro, and Albion - Kennebec County
Waterbody Status:	Impaired
Project Grantee:	Kennebec County SWCD
Project Duration:	November 2019 – March 2022
319 Grant Amount:	\$27,590
Local Match:	\$53,329



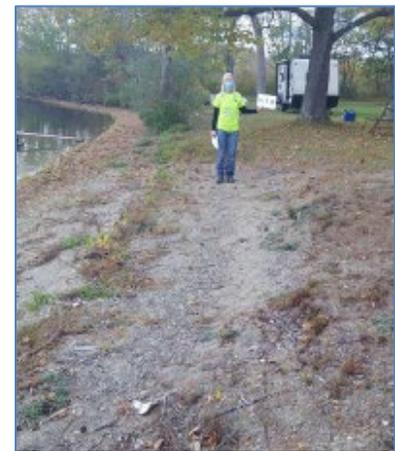
PROBLEM:

China Lake covers 3,848 acres and has a 32 square mile watershed. The lake was once well known for its coldwater fishery of salmon and trout. However, China Lake has experienced annual algal blooms since 1983 and was subsequently placed on the State's list of impaired waters due to nonattainment of water quality standards. The lake is the community and economic focal point for the Town of China and the public drinking water supply for the greater Waterville area. The lake has three public boat launches and is heavily used for recreation, boating, fishing and swimming.

China Lake has received CWA Section 319 implementation funds for the China Lake NPS Reduction Project, Phase I in 2006 (#2003R-37), which resulted in the design and installation of 23 BMPs, 91 property owner consultations, and an estimated 61 tons of sediment prevented from reaching China Lake. Phase II (#2007RT28) reduced pollutant loading by 53 tons of sediment with BMPs installed on priority agricultural lands and 13 additional high impact NPS sites. The China Lake Total Maximum Daily Load (TMDL) was completed in 2001, and a watershed-based plan was completed in 2008.

PROJECT DESCRIPTION:

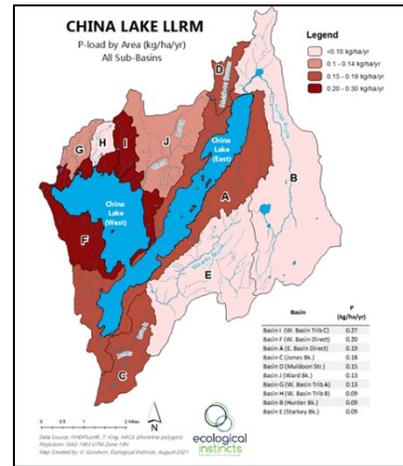
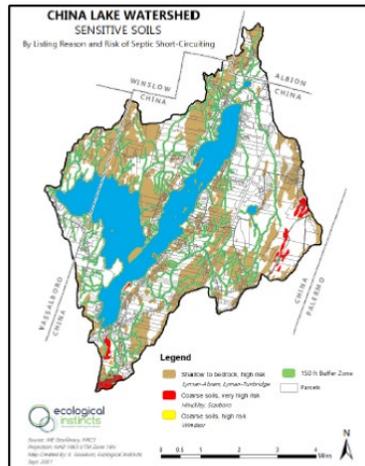
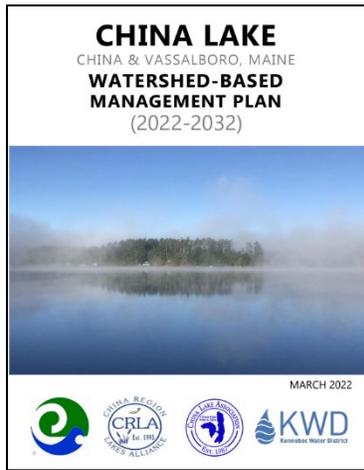
The purpose of the China Lake Watershed-Based Management Plan Project was to create a comprehensive WBP for China Lake with well-developed implementation strategies to effectively improve the water quality over the next 10 years. In addition, the plan established new, scientifically-sound water quality thresholds for designing an alternative water quality restoration strategy (in-lake treatment) and for addressing current sources of NPS pollution in the watershed. Project activities included a water quality analysis and diagnostic feasibility analysis for addressing anoxia; phosphorus loading estimates for high impact/priority NPS sites; a future monitoring plan; an updated watershed and pollutant load analysis and updated land-cover data layer; three technical review committee meetings, three stakeholder review committee meetings, and two public meetings.



Challenges of performing a watershed survey during the pandemic

PROJECT OUTCOMES:

- A land-cover update was completed in 2021 resulting in an accurate accounting of land cover in the watershed. The update included a review of active forestry by the Maine Forest Service and review of agricultural land-use types by the Kennebec SWCD and USDA/NRCS.
- A watershed survey was conducted in 2020 that documented a total of 161 NPS sites across 11 different land uses in the watershed.
- An agricultural survey was completed by Kennebec SWCD in coordination with USDA/NRCS. This included a desktop review of agricultural activities and conservation practices in the China Lake watershed over the last 10-year period. This survey identified 860 NRCS conservation practices installed between 2007 and 2020 representing \$1,750,000 in funding.
- A water quality analysis was conducted for all three basins of China Lake to examine both long- and short-term trends along with watershed modeling and an analysis of internal phosphorus loading to develop updated water quality goals for China Lake.
- Sediment samples were collected at ten different locations through the lake to gain a better understanding the sediment chemistry, potential for P release, mass of P in the sediment, and estimated dose and cost for conducting an aluminum treatment.
- A septic vulnerability analysis was completed to identify parcels in the watershed located on “at-risk” soils.
- The China Lake WBMP was completed and when implemented will reduce the phosphorus load in the east basin by 712 kg/yr and by 270 kg/yr in the west basin.



Pages from the Watershed-based Management Plan

PROJECT PARTNERS:

- China Region Lakes Alliance
- China Lake Association
- Colby College
- Kennebec Water District
- Town of China
- Town of Vassalboro
- Maine Forest Service
- USDA Natural Resources Conservation Service

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Forest Lake Protection Project, Phase III

#20200002

Waterbody Name: Forest Lake

Location: Cumberland, Gray and Windham – Cumberland County

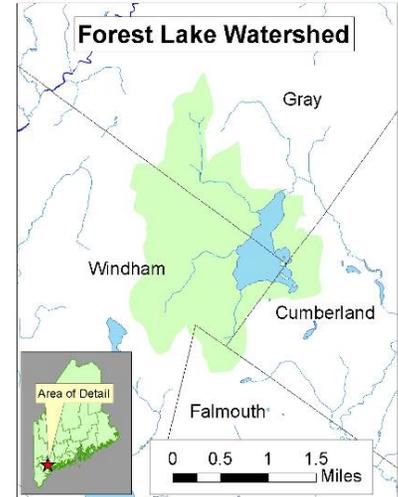
Waterbody Status: NPS Priority Watershed, Most at Risk

Project Sponsor: Cumberland County SWCD

Project Duration: January, 2020 – December 2022

319 Grant Amount: \$78,289

Match: \$78,447



PROBLEM:

Forest Lake is a 210-acre lake that is developed with about 380 shoreline homes in the Towns of Gray, Windham and Cumberland. The lake serves as the headwaters of the Piscataqua River, which then flows in to the Presumpscot River. Local volunteers and DEP staff have monitored the lake since 1974, and data shows moderate dissolved oxygen depletion in the bottom waters of the lake in late summer.

Since 2002 Forest Lake Association (FLA), Cumberland County SWCD, and Maine DEP have worked collaboratively to assess and address NPS pollution. In 2002 the Forest Lake Watershed Management Plan Project (#2002-04) conducted a watershed survey and developed a watershed management plan. A Phase I project (#2004R-01) fixed 15 high priority NPS sites and provided technical assistance to 27 landowners, and a Phase II project (#2007RR05) addressed three high impact road sites, and the Presumpscot River Youth Conservation Corps (YCC) provided labor to install BMPs on another 17 residential sites. In 2017, FLA conducted another watershed survey that identified 33 low, 31 medium, and 13 high impact sites. Residential sites made up the largest number of sites identified (33, 43 including driveways) followed by private roads with 25 sites identified. However, private roads had the largest number of high and medium impact sites (20 total). In 2018, the Forest Lake Watershed Protection Plan was completed to guide NPS pollution mitigation over the next 10 years.

PROJECT DESCRIPTION:

The project purpose was to reduce phosphorus entering Forest Lake by installing BMPs at up to 25 of the highest priority sites and foster long-term lake stewardship. Due to pandemic-related difficulties addressing residential sites, the project steering committee adjusted project targets and funding allocations. Ultimately, the project fixed 6 priority road sites and 1 residential site and made 17 other site visits that resulted in recommendations for future BMP installation. Small residential matching grants were provided to 15 of 18 identified sites. A gravel road workshop was held and CCSWCD created a five-year Operation and Maintenance Plan for a road in the watershed. Project outreach included informational “Lakeside Living” packets were distributed to shorefront



Aerial view of Forest Lake

owners, newsletter articles, presentations at FLA meetings, and a summary of this project was posted on the FLA website.

PROJECT OUTCOMES:

- The project fixed 7 significant erosion problems in the watershed including 6 major road sites and 1 residential site.
- 15 watershed residents took advantage of small matching grants (up to \$250) to plant buffers and apply erosion control mulch.
- The project reduced pollutant loading to Forest Lake by an estimated 16.37 tons of sediment and 13.91 pounds of phosphorus per year (Region 5 Method and WEPP Model).
- The Road O&M Plan for the Lakeside Drive Homeowners Association includes a list of BMPs, an inspection schedule, and a maintenance plan. It will help the Association with long term maintenance of their BMPs.



Before and after photos of a culvert replacement

PROJECT PARTNERS:

Forest Lake Association
Town of Cumberland
Town of Gray
Town of Windham

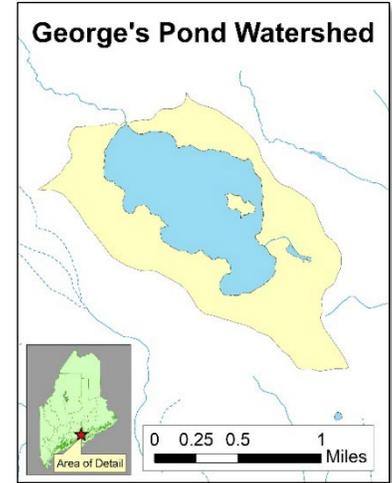
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Heather Hunt, Cumberland County SWCD – (207) 892-4700, hhunt@cumberlandsxcd.org

Georges Pond Watershed Protection Project, Phase I

#20190015

Waterbody Name:	Georges Pond
Location:	Franklin - Hancock County
Waterbody Status:	Most at Risk from New Development, Watch List
Project Grantee:	Georges Pond Association
Project Duration:	April 2020 – January 2022
319 Grant Amount:	\$45,960
Local Match:	\$40,525



PROBLEM:

Georges Pond is a 358 lake that outlets into Georges Brook, which flows north into Webb Pond. The 1.0 square mile watershed is characterized by a mix of forest land, wetlands, scenic ledges, blueberry agriculture, and residential development. The pond is developed with about 145 shorefront properties, and there is a popular public beach and boat ramp located on the northern end of the pond.

Georges Pond water quality data has been collected intermittently since 1977 with an increase in monitoring frequency since the first documented cyanobacteria bloom occurred in 2012. Since 2012, blooms of varying intensities have occurred in the pond, particularly in 2015 and 2018. Georges Pond's water quality is considered below average and the potential for annual nuisance algal blooms is high. Average annual Secchi Disk Transparency has been reduced by 1.5 m since 2012. Phosphorus concentrations result from external loading and internal recycling within the lake. A locally-funded watershed survey was conducted in 2013 and a watershed-based protection plan was completed in 2018. A more detailed nine-element plan was completed in 2020, and the GPA completed a two-part alum treatment (funded separately from this project).

PROJECT DESCRIPTION:

The purpose of this project was to significantly reduce pollutant load by addressing erosion and stormwater runoff that delivers excess nutrients to the pond protecting water quality and reducing the probability of nuisance algal blooms. This was accomplished through targeted implementation of BMPs at high priority NPS sites. The project work plan called for installation of BMPs at 20 NPS sites and LakeSmart evaluations at an additional 20 properties. The project also aimed to raise awareness about the need for lake protection and restoration by utilizing targeted outreach strategies including four press releases, five newsletter articles, a native plant brochure and buffer planting workshop.



Buffer workshop attendees learned about the benefits of planting native plants and helped with a residential buffer installation on Georges Pond Road.

PROJECT OUTCOMES:

- A total of 2.2 tons of sediment, 1 pound of phosphorus and 3.5 pounds of nitrogen are estimated to have been prevented from entering Georges Pond.
- 40 feet of shoreline protected.
- Water clarity readings in Georges Pond exceeded 6 m compared to the historical average of 3.9 m (1977 – 2019), and total phosphorus concentrations in late August, when the pond is at greatest risk, decreased from 24 ppb to just 9 ppb, even lower than the 10 ppb goal set in the 2020 WBMP.
- (Region 5 Method)The GPA undertook a live-stake pilot project using three different varieties of dogwoods and native willow. 100 stakes were planted at 10 locations on shoreline residential properties around the pond. The intent is to grow a local stock of hardy live-stakes that can be used by landowners in the future to stabilize steep slopes along the shoreline
- Georges Pond Association’s LakeSmart team completed 31 LakeSmart assessments, resulting in nine new LakeSmart Awards and more than 50% of all shoreline properties now assessed through the program.
- Addressed erosion and stormwater problems through the implementation of 32 BMPs installed at 12 NPS sites. This includes 10 residential projects (including 1 steep slope site), and 2 private road projects.



Conservation practices were installed at 10 residential properties and two private gravel roads.

PROJECT PARTNERS:

Town of Franklin
Ecological Instincts

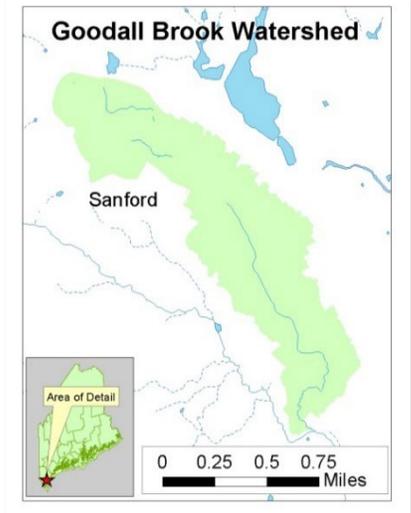
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Goodall Brook Watershed Restoration Project, Phase II

#20200004

Waterbody Name:	Goodall Brook
Location:	Sanford – York County
Waterbody Status:	Impaired, NPS Priority Watershed
Project Grantee:	City of Sanford
Project Duration:	April 2020 – March 2022
319 Grant:	\$79,174
Local Match:	\$104,671



PROBLEM:

Goodall Brook is a small, 1.5 mile long stream that flows into the Northern Great Works River and Bauneg Beg Lake. The 0.76 square mile (489 acres) watershed includes forested areas in the upper and lower watershed. However, the watershed is also developed with high density residential and commercial land uses, which contribute to the watershed's high impervious area (23.7%). Sections of the stream have also been channelized, straightened, and widened.

Although water quality in the lower segments meets Class B standards, Goodall Brook is listed as impaired because an upstream monitoring station does not meet aquatic life standards. Past monitoring by local groups also found elevated bacteria levels in the stream. In 2012 Goodall Brook was included in the DEP's Impervious Cover TMDL. A buffer restoration project was completed along 300 feet of the brook in 2008 as part of the Northern Great Works River 319 project (#2006R02), and in 2009 the Goodall Brook survey project (#2007PP09) assessed potential pollution sources and restoration opportunities. The *Goodall Brook Watershed Management Plan* project (#2012RT17) was completed in 2014 with Clean Water Act (CWA) funding under Section 604(b). In 2015, the City of Sanford received CWA funding under Section 319(h) for the Goodall Brook Watershed Restoration Project, Phase I (2016RT08). This project focused on water quality monitoring, watershed outreach and education, local ordinance development, and the installation of 5 high and medium priority stormwater retrofits and habitat improvement projects as identified in the Watershed Based Plan.

PROJECT DESCRIPTION:

The overall purpose of the project is to restore the water quality and stream habitat in Goodall Brook. The Phase II project planned to address two remaining high priority habitat restoration sites from the watershed-based plan that were not addressed in Phase I, install stormwater treatment BMPs to treat runoff from West Side Village, continue to collect water quality monitoring data, and create a Technical Manual that includes stormwater standards reflecting elements of Maine's Chapter 500 Rules.



“Chop & drop” to realign the Goodall Brook

PROJECT OUTCOMES:

- Two habitat restoration projects were completed, utilizing woody debris to redirect a misaligned culvert flow and to improve aquatic habitat on a total of 560 feet of Goodall Brook.
- A tree box filter was added to Kimball Street, a residential area of high impervious cover and little stormwater.
- The City of Sanford successfully developed a Technical Manual that will provide guidance to landowners, contractors, and others on the latest acceptable standards in a variety of construction and planning topics.
- A total of 0.19 tons/year of sediment, 0.1 pounds/year of phosphorus, and 0.3 pounds/year of nitrogen will be reduced annually from Goodall Brook (Region 5 Method). Additionally, a total of 560 feet of streambank was protected as a result of the in-stream work completed as part of this project.
- A stream cleanup was held with members of Sanford High School and the Sanford community at both of the in-stream restoration sites to clear them of trash and debris before restoration.



Woody debris installed at the Seneca Ave site. Before photo (left) shows an artificially straightened stream with stagnant flows and low levels of dissolved oxygen. After photo (right) shows conditions after addition of woody debris.

PROJECT PARTNERS:

Bauneg Beg Lake Association
 Sanford High School
 Sanford Sewerage District
 York County SWCD

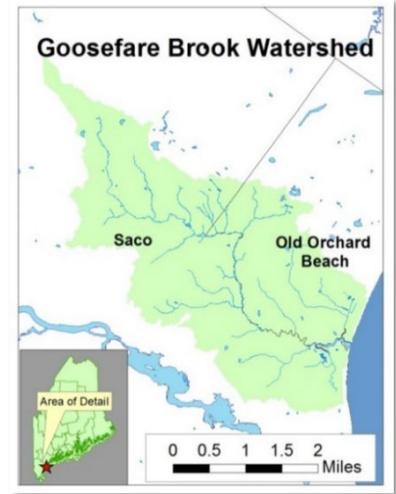
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 Melissa Brandt, YCSWCD -(207) 324-0888, melissabrandt@yorkswcd.org

Goosefare Brook Restoration Project, Phase II

#20190008

Waterbody Name:	Goosefare Brook
Location:	Saco and Old Orchard Beach - York County
Waterbody Status:	Urban Impaired Stream
Project Sponsor:	Town of Old Orchard Beach
Project Duration:	February 2019 - December 2022
319 Grant Amount:	\$78,306
Local Match:	\$72,827



PROBLEM:

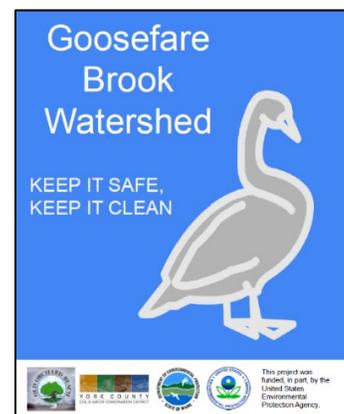
Goosefare Brook flows directly into Saco Bay mid-way between Old Orchard Beach and Ferry Beach State Park, two major beaches on the longest recreational sand beach in the State of Maine. Much of the estuary is part of the Rachel Carson National Wildlife Refuge. The watershed covers 9.2 square miles and includes a mix of residential, commercial, and recreational land uses. Goosefare Brook does not meet its statutory Class B classification for aquatic life use, based on non-attainment for macroinvertebrates, and toxic metals. The stream and its main tributary, Bear Brook, are impaired for bacteria. Beyond its impairment status, five stressors (nutrients, toxics, chloride, bacteria and stream habitat) were identified as contributors to existing and potential future impairments in Goosefare Brook. Portions of the stream that are not meeting Class B standards are downstream of major development, highlighting the need to minimize stormwater runoff.

The City of Saco received a Section 319-funded watershed planning grant (#2013RT25) to develop the Goosefare Brook Watershed-based Plan (May 2016). The Phase I implementation project (#2017RT06) carried out priority actions in the plan including the construction of five stormwater retrofit projects and one private property matching grant to install a gravel wetland. Other activities included stormdrain stenciling and stream cleanups.

PROJECT DESCRIPTION:

The overall purpose of the Goosefare Brook Watershed Management Plan is to improve conditions in Goosefare Brook so that it meets Class B water quality standards, prevents future water quality impacts to the brook and downstream waters, and builds community awareness and support for the restoration and protection of Goosefare Brook.

The specific purpose of this project was to continue to address the stressors identified in the WBMP and reduce nutrients to the stream and improve habitat. This project included installation of BMPs at **two** stormwater retrofit projects in Saco, **three** stormwater retrofit projects in the Town of Old Orchard Beach and **two** erosion sites; installation of **one** rain garden and **one** stream bank stabilization project; and public engagement through outreach initiatives.



Winning design for new watershed boundary sign - Loranger Middle School

PROJECT OUTCOMES:

- A total of nine NPS projects were completed throughout the watershed.
- As a result of these NPS abatement projects performed, a total of 5.18 tons/year of sediment, 6.31 pounds/year of phosphorus and 32.44 pounds/year of nitrogen were reduced to the Goosefare Brook watershed, and a total of approximately 100 square feet of stream bank was protected (Region 5 Method).
- Despite COVID-19 pandemic challenges, this project successfully engaged volunteer and students. Four Goosefare Brook clean-up days occurred in both the Town of Old Orchard Beach and the City of Saco, approximately 20 volunteers attended these events in 2019 and 2020. A planting workshop was held at Loranger Middle School and Jameson Elementary School with forty-five students participating. Additionally, an art contest was held with Loranger Middle School students to design a new watershed boundary sign. One winner was selected; however, many students were educated on the on-going efforts in the watershed.
- The project accrued 48% of the total project costs through match.



Before: Severe gully erosion on slopes adjacent to tennis courts (looking up slope).



After – A drip edge filter with riprap was installed to slow and filter runoff from the tennis courts. Eroding slope was regraded and planted (looking across top of slope).

PROJECT PARTNERS:

York County SWCD
City of Saco
Maine Turnpike Authority
Loranger Middle School

Thornton Acadamey
Jameson Elementary School
Biddeford Saco Country Club
Ocean Park Landowners
Maine DOT

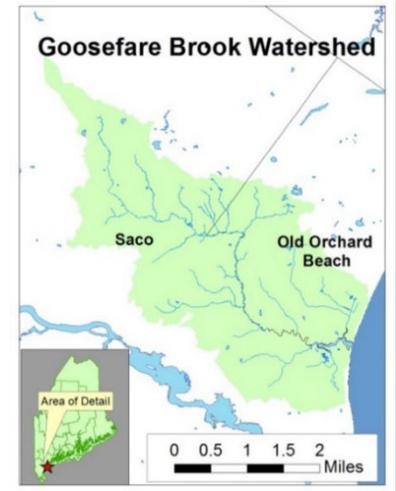
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Shri Verrill, York County SWCD – (207) 432-3516, sverrill@ycswcd.org

Goosefare Brook Restoration Project, Phase III

#20200008

Waterbody Name:	Goosefare Brook
Location:	Saco and Old Orchard Beach - York County
Waterbody Status:	Urban Impaired Stream
Project Sponsor:	City of Saco
Project Duration:	October 2020 – December 2022
319 Grant Amount:	\$69,028
Local Match:	\$59,698



PROBLEM:

Goosefare Brook flows directly into Saco Bay mid-way between Old Orchard Beach and Ferry Beach State Park, two major beaches on the longest recreational sand beach in the State of Maine. Much of the estuary is part of the Rachel Carson National Wildlife Refuge. The watershed covers 9.2 square miles and includes a mix of residential, commercial, and recreational land uses. Goosefare Brook does not meet its statutory Class B classification for aquatic life use, based on non-attainment for macroinvertebrates, and toxic metals. The stream and its main tributary, Bear Brook, are impaired for bacteria. Beyond its impairment status, five stressors (nutrients, toxics, chloride, bacteria and stream habitat) were identified as contributors to existing and potential future impairments in Goosefare Brook. Portions of the stream that are not meeting Class B standards are downstream of major development, highlighting the need to minimize stormwater runoff.

The City of Saco received a Section 319-funded watershed planning grant (#2013RT25) to develop the Goosefare Brook Watershed-based Plan (May 2016). The Phase I implementation project (#2017RT06) carried out priority actions in the plan including the construction of five stormwater retrofit projects and one private property matching grant to install a gravel wetland. The Phase II implementation project (#20190008) installed conservation practices at nine NPS sites in the watershed and conducted extensive outreach through stream cleanups, student workshops and a student art contest.

PROJECT DESCRIPTION:

The overall purpose of the Goosefare Brook Watershed Management is to improve conditions in Goosefare Brook so that it meets Class B water quality standards, prevents future water quality impacts to the brook and downstream waters, and builds community awareness and support for the restoration and protection of Goosefare Brook.

The specific purpose of this project was to install **two** stormwater retrofits, **six** buffer restoration projects and **one** in-stream restoration project that will work towards improving conditions in Goosefare Brook and reducing stressors., collect water quality monitoring data to assess the effects of BMPs installed in Phase I, II and III, cost-share with private property landowners to install stormwater retrofits, and engage and educate the public through press releases, a buffer workshop, and annual clean-up days with local students.



Buffer workshop at the Biddeford Saco Country Club. Twelve volunteers planted over 200 plants.

PROJECT OUTCOMES:

- BMPs were installed at a total of six sites. Buffer plantings were installed at a golf course and along segments of Bear Brook. Stormwater retrofit projects were installed at two locations at the Burns School to provide treatment to a total area of 0.58 acres of high-use impervious area. Two landowners participated in the private property stormwater retrofit match grant opportunity, combined total of 35,994 square feet of impervious surface.
- As a result of these NPS abatement projects performed, a total of 1.95 tons/year of sediment, 3.50 pounds/year of phosphorus and 14.1 pounds/year of nitrogen were reduced to the Goosefare Brook watershed, and a total of approximately 2,250 square feet and 235 linear feet of stream bank or shoreline has been protected (Region 5 Method).
- Despite COVID-19 pandemic challenges, this project successfully engaged volunteers. Twelve volunteers attended a buffer workshop at the Biddeford Saco Country Club and planted over 200 plants, an additional 17 students help complete the plantings and mulching, a Bear Brook clean-up event was attended by four students, 1 teacher and 3 DPW staff.
- This project exceeded the match requirement, for a total of 46% of the project being funded through match, and an extra \$10,440.54 than anticipated.



Before: Untreated impervious surface,
private property matching grant



After: A FocalPoint Biofiltration System
was installed to treat the runoff from
impervious cover

PROJECT PARTNERS:

Biddeford Saco Country Club
Loranger Middle School
Private Property Landowners
Thornton Academy
York County SWCD

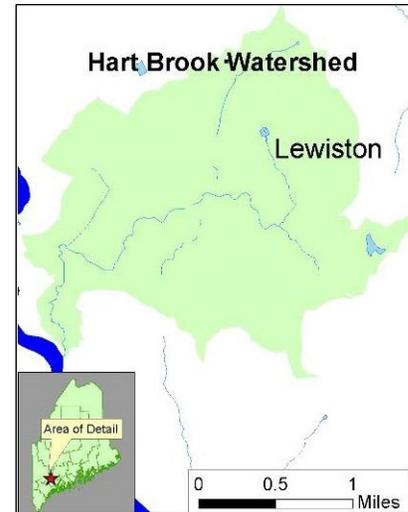
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Hart Brook Restoration Project Phase II

#20200012

Waterbody Name:	Hart Brook
Location:	Lewiston - Androscoggin County
Waterbody Status:	Urban Impaired Stream
Project Grantee:	City of Lewiston
Project Duration:	January 2021 – December 2022
319 Grant Amount:	\$150,000
Local Match:	\$193,865



PROBLEM:

Hart Brook (also known as Dill Brook) is a small Class B urban stream located in Lewiston. The brook is approximately 3.7 miles long with a watershed of 2200 acres and flows into the Androscoggin River. The watershed is comprised of residential, commercial, industrial, and undeveloped land and is approximately 22% impervious. The watershed also includes the area around the Maine Turnpike Exit 80, which is a commercial development area of the City of Lewiston.

Hart Brook is listed in the Maine Integrated Report as non-attaining due to benthic macroinvertebrate bioassessments, habitat assessment, dissolved oxygen, periphyton indicator bioassessments, and *E. coli*. Hart Brook impairments have been included in the Statewide Bacteria TMDL (2009) and Impervious Cover TMDL (2012). The City has undertaken several projects to reduce NPS to the stream, including the EPA CWA Section 319 Phase I project (#2016RT04) construction of a sub-surface stormwater treatment filter basin in the Industry sub-watershed. The Hart Brook Watershed Management Plan (2008) was updated in 2019 and identified the Industry and Lower watersheds as priority catchments due to having the greatest area of impervious cover and NPS nutrient sources to the stream.

PROJECT DESCRIPTION:

The purpose of this project was to continue restoration efforts of the brook through construction of biofiltration structural Best Management Practices (BMPs) along two streets and installation of shade trees in the Industry Subwatershed of Hart Brook. Lewiston's Engineering Department staff provided design and project oversight services and contractors designed and constructed the bioretention cells. The cells consisted of underdrained soil filters and storage tanks along Forrester Street and Saratoga Street. The filters treat polluted runoff from the road and private industrial lots in the Industrial Park. The benefit to the brook is reduction of high concentration pollutants in the first flush of rain events and cooler and less flashy runoff hitting the brook. The City Arborist designed and planted shade trees along the concrete-lined stream channel in the Industrial Park. Hardy trees, such as crab apples and homestead elms, were planted for their resiliency to road salting and ideal height for shading while not impacting existing powerlines.



Installation of
bioretention cell on
Saratoga St.

PROJECT OUTCOMES:

- Installation of a total of eleven bioretention cells, treating 0.78 acres of road in the Lewiston Industrial Park, along with additional runoff from private industrial lots.
- Planting of 30 shade trees along Hart Brook in the Industrial Park. These trees will provide shade to help cool approximately 1000 feet of this concrete-lined section of Hart Brook.
- Reduction of an estimated 2.05 tons/year of sediment, 0.7 pounds/year of phosphorus, and 3.6 pounds/year of nitrogen to Hart Brook (estimated using STEPL and DEP Stormwater BMP Manual).
- Project match from the City of Lewiston totaled \$193,865, exceeded the planned match amount by \$36,520.



Location of BMPs



Completed bioretention cell on Forrestral St.

PROJECT PARTNERS:

Lewiston Public Works
Lewiston Planning Department

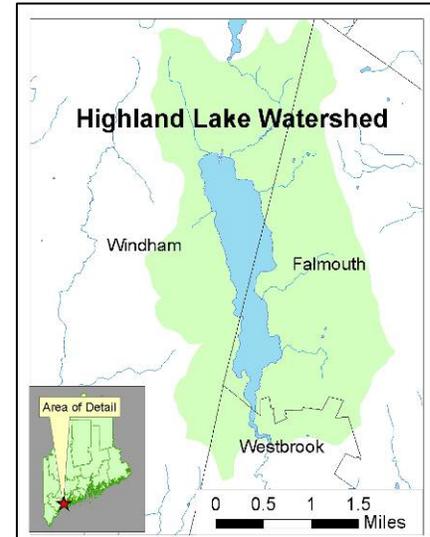
CONTACT INFORMATION:

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Highland Lake Watershed Protection Project, Phase IV

#20200010

Waterbody Name:	Highland Lake
Location:	Falmouth, Windham, Westbrook - Cumberland County
Waterbody Status:	NPS Priority Watershed, Most at Risk
Project Grantee:	Cumberland County SWCD
Project Duration:	October 2020 – December 2022
319 Grant Amount:	\$102,318
Local Match:	\$57,737



PROBLEM:

Highland Lake covers 623 acres and its 8.4 square mile watershed is part of the Presumpscot River watershed. DEP staff and Highland Lake Association (HLA) volunteers have monitored Highland Lake's water quality since 1974. After three phases of successful 319 grant-funded implementation projects, Highland Lake was removed from Maine DEP's impaired list in 2010. Despite this success, overall phosphorus levels have been gradually increasing. The HLA updated the watershed survey in 2018, conducted a road BMP survey in 2019, and subsequently updated the watershed-based management plan in 2020.

In addition to increased phosphorus readings, the lake has experienced late summer bloom of the picocyanobacteria *Cyanobium* over the past 6 years in which the clarity of the water drops to 2-3 meters. This type of bloom occurring near the surface of a lake is highly unusual and has not been documented elsewhere in North America to our knowledge. Causal pathways for the bloom are currently being investigated, however experts agree that reducing phosphorus input into Highland Lake is of great need.

PROJECT DESCRIPTION:

The purpose of this project was to fulfill the goals and objectives of the 2020-2030 Highland Lake Watershed-Based Management Plan in addressing the highest known water quality Nonpoint Source (NPS) impact sites at the Overlook Road in Windham and two horse farms in Falmouth. The project also convened a private road collaborative and hosted two roundtables to develop recommendations for reducing water quality impacts from private roads; started implementing strategies of the watershed's Education and Outreach Plan targeting outreach to private road residents and shorefront property owners to increase road maintenance, stabilize areas of bare soil, and install native plant vegetative buffers; and publicly promote this grant project and its accomplishments.



Highland Lake

PROJECT OUTCOMES:

- Mitigated 3 sites preventing approximately 56.8 tons of sediment and 48.3 pounds of phosphorus from entering the lake annually (Region 5 Method).
- Property on which the agriculture NPS site was located (horse farm) was sold and agricultural use discontinued. Therefore, the agricultural outreach task was eliminated.
- Technical assistance recommendations were provided for 10 additional residential sites.
- Developed Private Road Collaborative that joined road commissioners and association officers from around the lake. Held 6 planning meetings; updated all private road information; performed needs assessment; held a webinar training for private road leaders. Bulk discounts on materials and services were also explored.



Work completed Percy Hawkes Rd.

PROJECT PARTNERS:

Highland Lake Association
Highland Lake Leadership Team
Town of Falmouth
Town of Windham

CONTACT INFORMATION:

Heather Hunt, Cumberland County SWCD - (207) 892-4700, hhunt@cumberlandswcd.org
Alex Wong, Maine DEP - (207) 694-9533, alex.wong@maine.gov

Meduxnekeag River Watershed Restoration Project, Phase II

#20200001

Waterbody Name: Meduxnekeag River

Location: New Limerick, Linneus, Hodgdon, Houlton, Ludlow, Littleton, and Hammond - Aroostook County

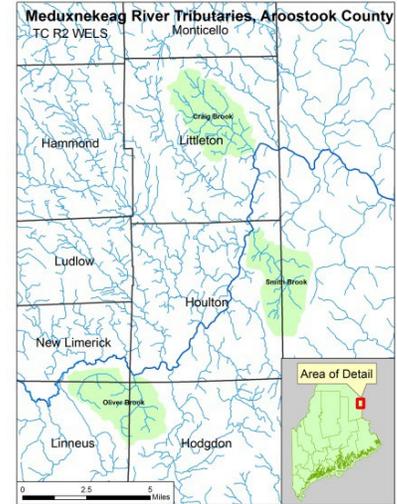
Waterbody Status: Impaired, NPS Priority Watershed

Project Grantee: Southern Aroostook SWCD

Project Duration: January 2020 – December 2022

319 Grant Amount: \$33,591

Local Match: \$24,997



PROBLEM:

The major land use below the confluence of the South Branch of the Meduxnekeag River to the Canadian border is row crop agriculture. The small tributaries Smith and Craig Brooks are 25% agriculture, while Oliver Brook is 50%. Due to the short growing season and limited acres for crop rotation thousands of acres are bare for greater than 6 months of the year which results in a significant phosphorous load to the Meduxnekeag and its tributaries. Additionally, potatoes are harvested September and October often leaving little if any growing season remaining to establish a green cover crop.

In 2015, the Southern Aroostook SWCD developed the Meduxnekeag River Watershed Management Plan (#2012RT19) funded by EPA through CWA §319, which focused on agricultural land in three subwatersheds as representative of the pollutant issues and types of farming on all agricultural land within the watershed. Starting in 2013, the watershed received additional funding for conservation practices through the NRCS-EPA National Water Quality Initiative. Local efforts have been bolstered by national soil health efforts to build soil and keep it and associated nutrients in the field. Most recent CWA 319 funded work includes the Meduxnekeag River Watershed Restoration Project, Phase I (#2017RT09), which focused on reducing pollutant loads from agricultural sources in the lower section by striving to improve soil biology, thus improving water holding capacity, increasing organic matter and sequestering carbon.

PROJECT DESCRIPTION:

The purpose was to work with local farmers to reduce soil erosion by improving soil health in the lower Meduxnekeag watershed and work with small livestock or hobby farms to reduce nutrient loads through better barnyard and manure management. The goal was to provide technical assistance to at least 12 landowners and cost-sharing assistance to install BMPs on at least 10 NPS sites and conduct public outreach including two workshops.

PROJECT OUTCOMES:

- One structural BMP and eight agricultural BMP sites were addressed resulting in a reduction of 109.5 tons of sediment, 96.9 pounds of phosphorus and 193.2 pounds of nitrogen discharged to the Meduxnekeag and its tributaries.
- BMP adoption has spread from the grant assisting 5 growers with 6 fields in phase I to 11 growers totaling 302 acres.
- Three growers utilized SASWCD's no-till seeder, resulting in less tillage that in turn enhances soil carbon.
- Hosting two virtual workshops "Managing Irrigation for Crop Improvement, Soil Health, and Water Source Conservation" and "Healthy Soils, Healthy Farms" with 96 attendees.
- A workshop with national soils and crop experts allowed local producers firsthand access to important soil health information overcoming the areas remote location.
- Exclusion fencing was installed for one small livestock producer removing cow access from a tributary in addition to a livestock crossing.



Duff Farm, Site 2: 3-species mix for livestock feed (no-till).
Left photo taken on June 16, 2021, Middle July 15, 2021, and Right July 28, 2021.

PROJECT PARTNERS:

Houlton Band of Maliseet Indians (HBMI)
Maine Farmland Trust
UMaine Cooperative Extension
USDA Natural Resource Conservation Service

CONTACT INFORMATION:

Angela Wotton, Southern Aroostook SWCD – (207) 532-2087, angela.wotton@me.nacdnet.net
Kirsten Thompson, Maine DEP – (207) 530-3960, kirsten.m.thompson@Maine.gov

Lake Penneesseewassee Watershed Protection Project, Phase I #20200009

Waterbody Name: Lake Penneesseewassee

Location: Norway and Greenwood – Oxford County

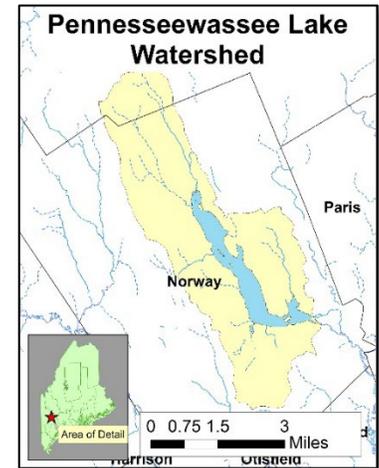
Waterbody Status: NPS Priority Watershed

Project Grantee: Oxford County SWCD

Project Duration: October 2020 – December 2022

319 Grant Amount: \$77,282

Local Match: \$91,079



PROBLEM:

Lake Penneesseewassee is an unimpaired water body that is on the MDEP’s NPS Priority Watersheds list as a “Threatened” water body. It has a maximum depth of 48 feet (14.6 meters) and an average depth of 18 feet (5.5 meters), which is maintained by a dam on the outlet of the lake. Though Secchi Disk Transparency indicate moderate clarity (5.7 meters average depth), dissolved oxygen levels towards the bottom of the lake are a concern. In most years the bottom 6 meters of the lake are anoxic by August resulting from decomposition of organic matter. The bottom contours of the lake may also make it susceptible to a certain level of “natural” oxygen loss, which may be exacerbated by excess organic matter decomposition. Phosphorus, entering the lake via runoff, impacts this process by accelerating the growth of algae, which then dies and adds to organic material on the bottom. Total grab sample phosphorus concentrations have averaged 12.3 µg/L in Lake Penneesseewassee over the last 10 years and recent data may suggest a slight increase of levels in recent years, particularly in the bottom layer, as this nutrient is released from sediment. Sediment chemistry suggests that Lake Penneesseewassee is vulnerable to internal phosphorus release with an Al:Fe ratio of 2.6:1. However, Al:P ratios are favorable and offer some protection against internal loading from the sediments. Chlorophyll concentrations, an indicator of algae growth, typically are approximately 4.6 ppb in Lake Penneesseewassee and are considered higher than average for a Maine lake. Lakes Association of Norway surveyed the watershed of in 2019 and subsequently developed a watershed-based protection plan in 2020.

PROJECT DESCRIPTION:

The primary purpose of the Lake Penneesseewassee Watershed Protection Project-Phase I was to significantly reduce erosion and the export of sediment and phosphorus into Lake Penneesseewassee by targeted implementation of BMPs at 24 high and medium impact NPS sites identified in the Lake Penneesseewassee Watershed Protection Plan. In addition to pollutant reductions, the project aimed to raise awareness about the need for lake protection through targeted outreach strategies. These included a buffer planting workshop, a gravel road workshop, LAON outreach (newsletter, website, mailings, email and meetings), and press releases aimed at encouraging landowners to address NPS sites through the grant and beyond.



Lake Penneesseewassee, photo by Steven Ralsler

PROJECT OUTCOMES:

- The BMP implementation goal of 24 sites was surpassed by 30% and a total of 32 NPS sites were addressed with BMPs. In addition, 13 Residential Matching Grant project sites were completed.
- 90 feet of shoreline was enhanced and protected with vegetative buffer and a rain garden.
- Sediment load was reduced by 65.57 tons/year, and phosphorus load was reduced by 55.73 pounds/year (Region 5 Method).



Site #1-14 just south of the culvert crossing shown above. West side is shown on the left and East side is shown on right. Both photos demonstrate the after condition. Note terracing ECM and staked ECM filled socks.

PROJECT PARTNERS:

Lakes Association of Norway (LAON)
Town of Norway

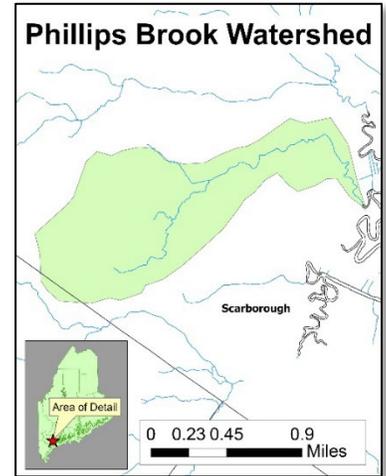
CONTACT INFORMATION:

Alex Wong, Maine DEP – (207) 694-9533, alex.wong@maine.gov

Michele Windsor, Oxford County SWCD – (207) 744-3111, oxfordcountyswcd@outlook.com

Phillips Brook Restoration Project, Phase I #20190007

Waterbody Name: Phillips Brook
 Location: Scarborough - Cumberland County
 Waterbody Status: Impaired, Urban Impaired Stream
 Project Grantee: Town of Scarborough
 Project Duration: January 2019 – December 2022
 319 Grant Amount: \$95,070
 Local Match: \$71,388



PROBLEM:

The Phillips Brook Watershed covers 838 acres (1.3 square miles) in the Dunstan Corner area of Scarborough. The brook runs 2.77 miles from primarily forested land, through a residential area, across Broadturn Road and Payne Road, and then behind commercial development along US Route 1 before entering Scarborough Marsh. The watershed is in a designated growth area, with the build-out analysis estimating up to 400 new households and 150,000 square feet of additional commercial development. Phillips Brook does not currently meet its designated Class C water quality standards for aquatic habitat use and dissolved oxygen and has been listed on the 303(d) list of impaired waters. The Phillips Brook watershed is 9% impervious cover and was included in the Impervious Cover TMDL (2012). With support of federal CWA 604b funding, the Town developed the Phillips Brook Watershed Management Plan in 2018. A principal issue affecting watershed health is altered hydrology resulting in severe bank erosion and excessive sedimentation within the stream channel creating unsuitable habitat and further reducing already depleted dissolved oxygen.

PROJECT DESCRIPTION:

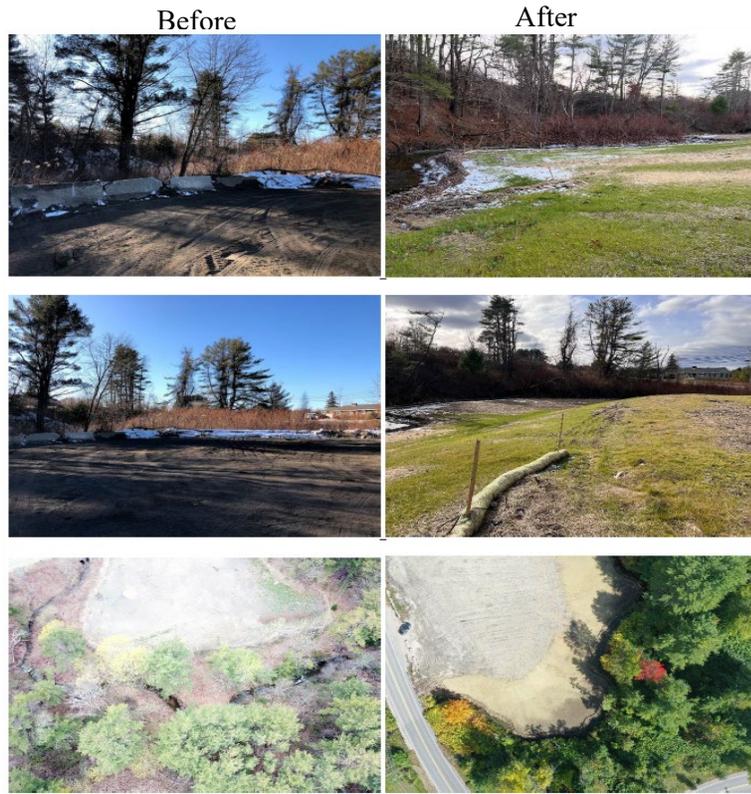
The purpose of this project was to implement priority action items to restore Phillips Brook by reducing pollutants causing low dissolved oxygen conditions and addressing high priority sites. An engineering consultant designed the stream restoration at the previously identified high priority site at the Scarborough Public Works laydown yard on Payne Road. Covid-related staff time reductions, scheduling delays and construction estimates nearly \$100,000 over budget resulted in design modification by removal of the in-stream portion of the work. Invasive plants and excessive fill were removed from the streambank and floodplain and the area was graded and stabilized to reconnect the stream with its floodplain. The work resulted in an approximately 300-foot section of the stream being reconnected to its floodplain. Watershed outreach built stream identity by installing stream crossing signs on major roadways, reducing the impact of fertilizer and weed and bug killers by providing healthy lawn care outreach in conjunction with the Friends of Scarborough Marsh, and addressing streamside dumping by providing information to stream abutters about proper disposal of yard waste.



Yard waste postcard sent to stream abutters.

PROJECT OUTCOMES:

- Improvement of a high priority restoration site. Approximately 300 feet of the brook was reconnected to restored floodplain through removal of excessive fill and invasive plants and grading to a stable slope. The Town will enhance approximately 7,500 square feet of the riparian buffer with 2,120 native live stakes, trees, and shrubs in the spring of 2023, continuing work beyond the grant project.
- Building of stream identity through installation of stream crossing signs on major roadways.
- Outreach to watershed residents and streamside abutters on healthy lawn practices and the impact of streamside dumping of yard waste and its proper disposal.
- Reduction of an estimated 1.99 tons/year of sediment, 1.99 pounds/year of phosphorus, and 3.98 pounds/year of nitrogen to Phillips Brook (Region 5 Method).



Scarborough Public Works laydown yard stream restoration site.

PROJECT PARTNERS:

Acorn Engineering
 Friends of Scarborough Marsh
 Maine Audubon
 Scarborough Public Works

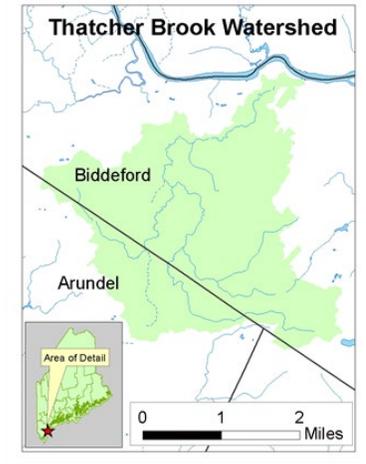
CONTACT INFORMATION:

Jami Fitch, Town of Scarborough – (207) 730-4035, jfitch@scarboroughmaine.org
 Kristin Feindel, Maine DEP – (207) 215-3461, kristin.b.feindel@maine.gov

Thatcher Brook Watershed Restoration Project, Phase III

#20200011

Waterbody Name:	Thatcher Brook
Location:	Biddeford and Arundel – York County
Waterbody Status:	Impaired Stream, NPS Priority
Project Grantee:	City of Biddeford
Project Duration:	January 2021 – December 2022
319 Grant:	\$95,492
Local Match:	\$24,377



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. In 2012, the City of Biddeford received funding through Section 604(b) of the Clean Water Act (CWA) to develop the Thatcher Brook Watershed Management Plan (WMP). Phases I and II of the Thatcher Brook Restoration Project (2017RT11 completed in 2019, and 20190004 completed in 2021), funded in part through CWA Section 319, focused on installing new stormwater treatment facilities, retrofitting existing stormwater facilities, and in-stream habitat restoration.

PROJECT DESCRIPTION:

The City of Biddeford worked with York County SWCD 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 an underdrain soil filter, a tree box filter, a level lip spreader and a ditch stabilization project at four sites in the City's Industrial Park, and an in-stream habitat enhancement project. The project also included education and outreach tasks to educate and inform the public on the on-going efforts to restore Thatcher Brook.

PROJECT OUTCOMES:

- The City of Biddeford in collaboration with York County SWCD successfully partnered with private property landowners in the City's Industrial Park on Morin St to design and install a soil filter, a no-cut meadow buffer, and reseeded and restabilize a swale to mitigate erosion issues. The City of Biddeford installed a treebox filter along Drapeau Street. These projects combined treated runoff of at least 72,514 square feet of impervious area and 11,762 square feet of pervious area before it entered Richardson Brook.
- The City and YCSWCD also partnered with a private property landowner to improve the in-stream habitat of a segment of the main stem through selective tree dropping that occurred every 100 feet in three locations within the brook, which helps improve aquatic habitat, flow complexities and dissolve oxygen levels.
- The City of Biddeford in collaboration with YCSWCD and the Saco Watershed Collaborative hosted a Chop and Drop site walk for the public to learn from a Fluvial Geomorphologist the benefits of strategically placed woody debris in streams to enhance stream habitat. Additional outreach included the stenciling of inlets adjacent to BMPs on Morin Street.
- Pollutant load reductions totaled 0.08 tons of sediment, 4.18 pounds of phosphorus and 14.56 pounds of nitrogen.



Before and after image of the selective felling of trees in the main stem of Thatcher Brook to improve in-stream habitat, dissolved oxygen and flow complexities.

PROJECT PARTNERS:

Saco Watershed Collaborative
 University of New England
 York County SWCD
 Biddeford Conservation Commission
 Biddeford Climate Task Force
 Private Property Landowner

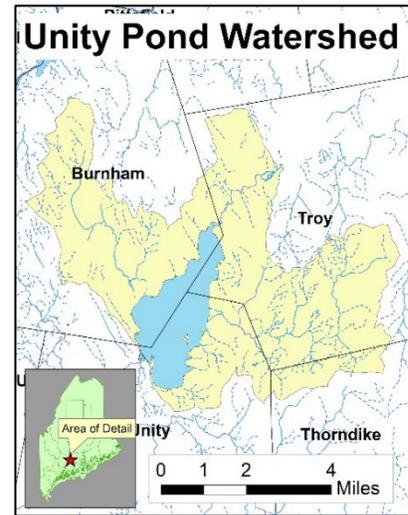
CONTACT INFORMATION:

Tom Milligan, City of Biddeford – (207) 284-9115, tmilligan@biddefordmaine.org
 Shri Verrill, York County SWCD – (207) 432-3516, sverrill@ycswcd.org
 Addie Halligan, DEP – (207) 441-9057, addie.halligan@maine.gov

Unity Pond Watershed-based Management Plan Update

#20200006

Waterbody Name:	Unity Pond
Location:	Unity, Burnham, Troy & Thorndike - Waldo County
Waterbody Status:	Impaired
Project Grantee:	Waldo County SWCD
Project Duration:	November 2020 – December 2022
604b Grant Amount:	\$45,508
Local Match:	\$29,688



PROBLEM:

Unity Pond (also known as Lake Winnecook) is a 2,423 acre waterbody with a mean depth of 22 feet that is valued for fishing, swimming, boating and wildlife. The 32.7 square mile watershed is mostly forested with only about 7% agricultural and 6% developed lands. Unity Pond is on Maine DEP's 303d list of impaired waters under Category 4-A due to changes in water quality over time because of algal blooms that occur almost annually. Unity Pond's water quality is considered below average and the probability for nuisance algal blooms is high as a result of low dissolved oxygen in deep areas of the pond resulting in internal recycling of phosphorus. Water quality data have been collected by Maine DEP, volunteer water quality monitors, and Unity College since 1977. SDT readings collected during this historic sampling period range from a low of 0.8 m (2011 & 2014) to a high of 6.1 m (1978), and average annual SDT ranges from 1.0 m to 4.8 m. A significant decrease in SDT was documented starting in the mid-late 1980s, but is currently considered stable, though below average.

A Phase I 319 grant (#2003R-19A) developed a Watershed Plan and installed BMPs at 20 high priority sites, and a Phase II grant (#2006R-21) provided technical assistance at 11 NPS sites and installed BMPs at two public access sites and two shoreline properties.

PROJECT DESCRIPTION:

The purpose of this project was to develop an updated watershed-based management plan (WBP) for Unity Pond that includes EPA's nine minimum planning elements. The project collected information about lake water quality and watershed hydrology, inventoried NPS problems, evaluated septic systems, assessed the external and internal phosphorus load, and brought together a diverse group of watershed stakeholders to develop locally-supported water quality targets and watershed goals, objectives and action strategies for restoring the pond. The project integrated project findings into an updated WBP which will be used to guide watershed restoration efforts over the next 10-year planning period (2022-2032).



Unity Pond, Photo by FOLW

PROJECT OUTCOMES:

- Resulted in the development of a scientifically-sound, community-led WBP for Unity Pond resulting in a strong commitment to lake restoration among the many project partners.
- The project set the stage for addressing NPS pollution in both the direct and indirect watersheds by updating education and outreach efforts, re-invigorating the FOLW LakeSmart program, and jumpstarting a fundraising campaign for addressing internal loading. Project partners have a clear plan by which to reduce phosphorus concentrations in the lake and improve water quality in the lake over the next 10 years.
- Numerous assessments were conducted to help develop the WBMP including water quality monitoring to better understand phosphorus dynamics and set water quality targets for the plan; a watershed survey to document the location and impact of NPS sites and the current state of agriculture and forestry in the watershed, a backflushing study to better understand the contribution of phosphorus loading from Sandy Stream, bathymetric mapping to inform watershed modeling and in-lake treatment recommendations, nutrient modeling to estimate phosphorus loads and reduction targets, and a water quality analysis to examine water quality trends.
- The project resulted in an updated water quality restoration goal for Unity Pond, which includes improving water quality trends and reduced frequency of nuisance algal blooms at the end of the 10-year planning period. This will require reducing the phosphorus load in the direct watershed by 704 kg/yr by addressing both watershed runoff (690 kg/yr) and septic systems (14 kg/yr), reducing the phosphorus load from the indirect watersheds of Carlton Pond (110 kg/yr) and Sandy Stream (11 kg/yr), and reducing the internal P load by 90% (731 kg/yr).



2021 cyanobacterial bloom in Unity Pond, photo by Dan Mcleod

PROJECT PARTNERS:

Friends of Lake Winnecook
Towns of Unity, Burnham, Troy & Thorndike

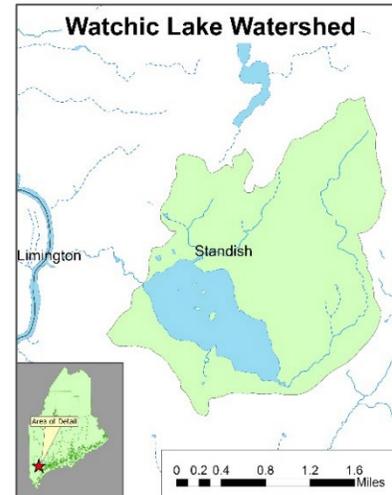
CONTACT INFORMATION:

Greg Beane, Maine DEP – (207) 299-4703, greg.e.beane@maine.gov
Medea Steinman, Waldo County SWCD – (207) 218-5311, www.waldocountysoilandwater.org

Watchic Lake Protection Project, Phase I

#20210007

Waterbody Names:	Watchic Lake
Location:	Standish - Cumberland County
Waterbody Status:	NPS Priority Watershed, Most at Risk
Project Grantee:	Watchic Lake Association
Duration:	January 2022 – December 2022
319 Grant Amount:	\$74,632
Local Match:	\$75,738



PROBLEM:

Watchic Lake (0.75 miles wide and 1.4 miles long) has two main inlet tributaries, Page Brook and Paine Brook. The lake outlets at the northwest corner of the lake at Watchic Brook, a dam-controlled outlet, which drains to the Saco River. Development around the lake has been extensive in recent years and the lake is currently listed as a NPS Priority Watershed Most at Risk from New Development. Subsequently, the greatest concern for Watchic Lake water quality is polluted runoff (containing phosphorus) from both existing and new development as well as stormwater runoff. Increased phosphorus inputs into the lake may cause the waterbody to not attain water quality standards in the future.

Temperature, dissolved oxygen, phosphorus, and chlorophyll-a measurements have been taken intermittently since 1974. Low dissolved oxygen (< 5 ppm) in the bottom waters of Watchic Lake during the summer months have been frequently observed. Persistent oxygen depletion in bottom waters can release phosphorus from bottom sediments further contributing to the lake's overall phosphorus load.

Previous protection work at Watchic Lake includes the Watchic Lake Demonstration project (2000-2004) funded in part by USEPA under Section 319 of the Clean Water Act. This project installed BMPs at 13 sites. The installation of these BMPs were estimated to reduce the amount of sediment reaching the lake by 38 tons annually. In 2019, WLA conducted a locally-funded watershed survey which identified 26 NPS sites in the Watchic Lake watershed and a subsequent Watershed-Based Protection Plan was completed.

PROJECT DESCRIPTION:

The overall goal of this Phase I project was to protect Watchic Lake by reducing the pollutant load into the lake by addressing 5 priority NPS road sites and at least 6 and up to 10 residential shorefront NPS sites. Public outreach for the project included direct landowner contact, a buffer planting workshop, three press releases, two presentations at the WLA annual meeting, webpage updates and numerous emails and newsletters



Aerial view of Watchic Lake

PROJECT OUTCOMES:

- The Watchic Lake Association, with assistance from CCSWCD and FB Environmental, completed projects on three high-impact private roads NPS Sites, one town road, and four residential properties. The BMPs included inlet and outlet culvert stabilization, installation of catch basins, resurfacing and regarding a gravel road, native shoreline plantings and many additional BMPs.
- Through this project, an estimated 2.33 tons of sediment and 1.99 pounds of phosphorus, and 4.19 pounds of nitrogen will be prevented from washing into Watchic Lake each year. 112.5 feet of streambank or shoreline will be protected.
- The wider Watchic Lake audience (250 properties and about 500 people), learned about ways to help protect the lake, and how the Maine DEP and US EPA supports those efforts through updates on a webpage, press releases and public presentations. LakeSmart volunteers evaluated 11 properties, technical assistance reports were written for 6. WLA hosted a buffer planting workshop
- The project resulted in \$75,738 in local match (exceeding the original work plan match by \$25,936)



New sediment basin and culvert on Road 3.



Infiltration and native planting installed at a residential site.

PROJECT PARTNERS:

Town of Standish
 FB Environmental
 Cumberland County SWCD
 Watchic Rd 3 /Hartford Lane Residents
 Watchic Rd 15 Residents
 Hi-Vu Rd Residents

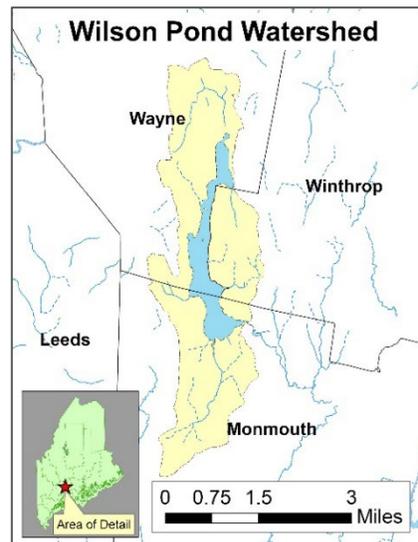
CONTACT INFORMATION:

Paul McNulty, Watchic Lake Association – p3mcnulty@gmail.com
 Margaret Mills, FB Environmental – maggiem@fbenvironmental.com
 Addie Halligan, DEP – (207) 441-9057, addie.halligan@maine.gov
 Alaina Chormann, DEP – (207) 719 – 8086, alaina.g.chormann@maine.gov

Wilson Pond Watershed-based Plan Update

#20190016

Waterbody Name:	Wilson Pond
Location:	Monmouth, Wayne & Winthrop - Kennebec County
Waterbody Status:	Most at Risk from New Development
Project Grantee:	Cobbossee Watershed District
Project Duration:	October 2020 – December 2022
604b Grant Amount:	\$22,692
Local Match:	\$13,135



PROBLEM:

Wilson Pond is a 551 acre lake with a watershed area of 6.7 square miles. The pond has a maximum depth of 43 feet, a mean depth of 23 feet, and a flushing rate of approximately 1.8 times per year. The Cobbossee Watershed District (CWD) has monitored Wilson Pond for over forty years, and based on the CWD's data, the Maine DEP has classified the pond as having moderate/sensitive water quality. The classification, and concern, is due in large part to increases in total phosphorus concentration, reduced water clarity, and depletion of dissolved oxygen in bottom waters. The pond was listed on Maine's 303(d) (TMDL) list in 2006 designating it as a lake that does not meet State water quality standards. The CWD has received Clean Water Act Section 319 funding for Phases I and II of the Wilson Pond NPS Watershed Restoration Project. Both Phases focused on BMP installation on private properties and roads in the direct watershed.

PROJECT DESCRIPTION:

The project was undertaken to position the CWD, Towns of Monmouth, Wayne and Winthrop, Berry/Dexter/ Wilson Watershed Association and other interested parties to reduce NPS phosphorus from the watershed and create an action plan for reducing in-lake phosphorus recycling. The goals of the Plan are two-fold; first, the stabilization of Wilson Pond water quality such that there is no further decline in trophic state, and second, to restore the pond's water quality to pre-1990 condition. As noted in the 2009 plan, water quality data collected by CWD indicated that internal loading for phosphorus from the lake's sediments approximated 90 kg/yr.



Wilson Pond

To gain an understanding of the current internal load component and whether a future alum treatment is warranted, CWD increased its monthly water quality monitoring program to semi-monthly in 2021. To assess current land use patterns and contributing sources of NPS pollution in the watershed, CWD reviewed historic land use information from the 2007 TMDL-PCAP and 2009 watershed plan relative to newly gathered information. A watershed survey of the direct watershed was also conducted in May 2022.

PROJECT OUTCOMES:

- Completed the Wilson Pond Watershed-Based Plan (2023-2032). The Plan establishes a water quality goal for Wilson Pond, the phosphorus load reductions necessary to achieve this goal, what measures need to be accomplished and a schedule of related activities, anticipated funding sources, and the parties responsible to implement the Plan.
- Wilson Pond Watershed Survey Report. The report describes the results of the May 2021 watershed survey including a map of all identified NPS sites and Wilson Pond Septic System Soils Vulnerability Analysis.
- Wilson Pond Water Quality Summary Report (2021). The Report summarizes the current status of Wilson Pond water quality, a review of historical data to identify trends, and an estimate of the current internal loading of phosphorus from bottom sediments to the water column.
- Updated NPS Site-Tracker spreadsheet. The Site-Tracker contains a list of all documented NPS sites, complete with description, location (GPS coordinates) and the severity, or priority ranking of the problems as well as those sites identified in previous related projects including some that have been mitigated.



Aerial view of Wilson Pond under bloom conditions
Sep 2018

PROJECT PARTNERS:

Friends Of Cobbossee Watershed
Barry/Dexter/Wilson Watershed Association
Towns of Monmouth, Wayne and Winthrop

CONTACT INFORMATION:

Greg Beane, Maine DEP – (207) 299-4703, greg.e.beane@maine.gov
William Monagle, CWD – (207) 377-2234, WMONAGLE@roadrunner.com

Appendix A. NPS Grant Projects Closed in 2022

Project Title	Project ID#	Grantee	Grant Funds	Non-federal Match	Completion Date
Abrams Pond Protection Project Phase II	20210006	Town of Eastbrook	\$68,349	\$65,305	12/31/2022
Bauneg Beg Lake Protection Project Phase I	20200005	York County SWCD	\$52,601	\$54,264	12/31/2022
Black Brook Watershed Management Plan Project	20190017	Cumberland County SWCD	\$17,862	\$20,605	12/31/2022
China Lake Watershed based Plan Development	20190013	Kennebec County SWCD	\$27,590	\$53,329	3/11/2022
Forest Lake Protection Project Phase III	20200002	Cumberland County SWCD	\$78,829	\$78,477	12/31/2022
Georges Pond Watershed Protection Project Phase I	20190015	Georges Pond Association	\$45,960	\$40,525	January 2022
Goodall Brook Restoration Project Phase II	20200004	City of Sanford	\$79,174	\$104,671	3/31/2022
Goosefare Brook Restoration Project Phase III	20200008	City of Saco	\$69,028	\$59,698	12/31/2022
Goosefare Brook Watershed Restoration Project, Phase II	20190008	Town of Old Orchard Beach	\$78,306	\$72,827	12/31/2022
Hart Brook Restoration Project, Phase II	20200012	City of Lewiston	\$150,000	\$193,865	12/31/2022
Highland Lake Protection Project Phase IV	20200010	Cumberland County SWCD	\$102,318	\$57,737	12/31/2022
Lake Penesseewassee Watershed Protection Project Phase I	20200009	Oxford County SWCD	\$77,282	\$91,079	12/31/2022
Meduxnekeag River Watershed Restoration Phase II	20200001	Southern Aroostook SWCD	\$33,591	\$24,997	10/31/2022
Phillips Brook Restoration Project, Phase I	20190007	Town of Scarborough Maine	\$95,070	\$71,388	12/31/2022
Thatcher Brook Restoration Project, Phase III	20200011	City of Biddeford	\$95,492	\$24,377	12/31/2022
Unity Pond Watershed-based Plan Update Project	20200006	Waldo County SWCD	\$45,508	\$29,688	12/31/2022
Watchic Lake Protection Project Phase I	20210007	Watchic Lake Association	\$74,632	\$75,738	12/31/2022
Wilson Pond Watershed-based Plan Update Project	20190016	Cobbossee Watershed District	\$22,692	\$13,135	12/31/2022

Appendix B. Active NPS Grant Projects

Project Title	Project ID#	Grantee	Grant Amount	Non-federal Match	Planned Completion Date
Lake Anasagunticook Watershed Protection Project, Phase II	20210001	Oxford County SWCD	\$51,655.00	\$34,444.00	12/31/2023
Pleasant River Restoration Project Phase II	20210005	Cumberland County SWCD	\$63,421.00	\$60,321.00	12/31/2023
Square Pond Protection Project Phase III	20210002	York County SWCD	\$93,661.00	\$62,539.00	12/31/2023
Sebago Lake Watershed Protection Project - Phase IV	20210004	Portland Water District	\$79,043.32	\$94,407.00	12/31/2023
Mousam Lake Watershed Protection Project - Phase II	20210003	York County Soil and Water Conservation District	\$65,994.00	\$47,533.00	12/31/2023
Damariscotta Lake Watershed Protection Project, Phase II	20210009	Midcoast Conservancy	\$31,535.00	\$25,330.00	12/31/2023
Cross Lake Watershed Restoration Project, Phase I	20210012	County of Aroostook	\$212,300.00	\$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
North Pond Watershed Based Management Plan	20210010	Kennebec County SWCD	\$49,600.00	\$34,908.00	12/31/2023
Trickey Pond Watershed Protection Project	20220006	Cumberland County SWCD	\$75,811.26	\$52,599.28	12/31/2023
Trout Brook Watershed Restoration Project, Phase IV	20220002	Cumberland County Soil and Water Conservation District	\$45,801.00	\$31,081.00	12/31/2023
Georges Pond Watershed Protection Project, Phase II	20220004	Georges Pond Association	\$84,265.00	\$56,622.00	12/31/2023
Great Pond Watershed Restoration Project, Phase I	20220001	Belgrade Regional Conservation Alliance dba 7 Lakes Alliance	\$109,430.00	\$140,250.00	12/31/2023

Kennebunk River Watershed Restoration Project, Phase I	20220007	York County Soil & Water Conservation District	\$88,248.00	\$59,192.00	12/31/2023
Topsham Fair Mall Stream Restoration Project, Phase III	20220008	Town of Topsham	\$153,479.00	\$102,629.00	12/31/2023
McGrath Pond - Salmon Pond Lake Watershed Protection Project, Phase V	20220003	Belgrade Regional Conservation Alliance dba 7 Lakes Alliance	\$94,270.00	\$86,955.00	12/31/2023
Long Pond Watershed Protection Project, Phase I	20210008	York County Soil & Water Conservation District	\$70,610.00	\$47,128.00	12/31/2022
Cobbosee Lake Watershed Protection Project, Phase III	20220005	Cobbosee Watershed District	\$93,847.00	\$63,800.00	12/31/2023
Lower Aroostook River Tributaries Assessment and Watershed-based Plan for Amsden, Gray, Hacker, and McHugh Brooks	20210011	Central Aroostook Soil & Water Conservation District	\$42,274.00	\$17,339.00	12/31/2023
Long Pond Watershed Restoration Project, Phase V	20230001	Belgrade Regional Conservation Alliance dba 7 Lakes Alliance	\$112,550.00	\$126,498.00	12/31/2024
Messalonskee Lake Watershed Protection Project, Phase II	20230002	Belgrade Regional Conservation Alliance dba 7 Lakes Alliance	\$111,884.00	\$123,795.00	12/31/2023
Mare Brook Watershed Restoration Project, Phase I	20230003	Town of Brunswick	\$149,850.00	\$137,489.00	12/31/2024
Torsey Pond Watershed Protection Project, Phase I	20230004	Cobbosee Watershed District	\$80,391.00	\$53,721.00	12/31/2024
Branch Lake Watershed Protection Project, Phase III	20230005	Hancock County Soil & Water Conservation District	\$112,483.00	\$100,709.00	12/31/2024
Hogan-Whitney Ponds Watershed Protection Project, Phase II	20230006	Oxford County Soil & Water Conservation District	\$77,910.00	\$55,500.00	12/31/2024
Goodall Brook Watershed Restoration Project, Phase III	20220013	City of Sanford	\$61,870.00	\$81,761.00	12/31/2024

Biddeford Pool Watershed-based Plan	20220009	York County Soil & Water Conservation District	\$49,962.00	\$30,966.00	12/31/2023
Sebasticook Lake Watershed-based Management Plan	20220010	Town of Newport	\$49,908.00	\$47,196.00	12/31/2023
Spruce Creek Watershed-based Management Plan Update	20220011	Town of Kittery	\$34,324.00	\$31,625.00	12/31/2024
Goosefare Brook Watershed Restoration Project, Phase IV	20220012	City of Saco	\$147,740.00	\$180,946.00	12/31/2024

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 (✓ #)		2022 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. 	Alaina Chormann, DEP	1. Update NPS priority watershed list and map.	X ✓		X		X	Revised list to include critical Atlantic Salmon habitat in Disadvantaged Communities, updated Decision Tree to reflect additions.		
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. 	Alaina Chorman, DEP	2. Develop Most Vulnerable Lakes list.		X				FFY2021 milestone not yet complete, though work continues on the model.		

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)				
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	2022 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. Conduct Supplemental monitoring in at least three watersheds/yr.	3 6	3 3	3 4	3	3	Conducted monitoring in Biddeford Pool, Alder Brook, Red Brook, and Black 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. Develop MST storage and transport SOP in 2020 and start using by 2021.	X	X				DELAYED. No activity in 2022.				
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. 	Addie Halligan, 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 four watershed surveys in 2022: Androscoggin Lake, Beech Hill Pond, Clemons Pond, and Wilson Lake All four 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	2022 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	WBP Planning Request for Applications include requirement to consider climate change impacts in funded projects. Stream culvert assessment piloted in 2022. Black Brook WBMP, Wilson Pond WBMP, Unity Pond WBMP, Long Pond – Belgrade WBMP, Long Pond – Parsonsfield WBMP, and China Lake 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. Approve ten nine-element WBPs.	2 3	2 3	2 6	2	2	Nine-element plans approved for Black Brook WBMP, Wilson Pond, Unity Pond, Long Pond – Belgrade, Long Pond – Parsonsfield and China Lake				
8. <u>Protection Planning</u> : Approve alternative WBPs (new or updates) that guide	<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. 	Alex Wong, DEP	8. Approve 15 alternative WBPs.	3 7	3 2	3 3	3	3	Three alternative plans accepted: Branch Lake, Great East Lake, and Messalonskee Lake.				

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024						
protection of unimpaired waters.														
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. Develop Stream Protection Strategy 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						DEP convened coastal work group meeting in Feb 2022.
11. <u>Protection:</u> Focus NPS program on watershed	<ul style="list-style-type: none"> Work proactively with partners to protect lakes on DEP’s Watch List and Most Vulnerable Lakes 	Alex Wong, DEP	11. Incorporate summary of work on		X	X	X	X						Summary of lake protection work on DEP’s Watch List

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024						
protection priorities and highlight the value of these protection efforts.	list (see #2 above) with the goal of keeping off the impaired list. <ul style="list-style-type: none"> Report to EPA annually on Maine’s protection efforts including work on Most Vulnerable Lakes. 		protection priorities into NPS Annual Report.							incorporated into Annual Report (see page 14).				
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	DELAYED. No activity in 2022. 2018/2020/2022 Integrated Report did not de-list any lakes due to data transmission issues					
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		1		Milestone met.					

Table 10. Watershed Approach				Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024						
14. <u>Restoration/Protection</u> : Promote local efforts to maintain open shellfish harvesting areas or restore closed shellfish harvesting areas.	<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). DEP creates Medomak River case study and guidance for investigating and addressing bacteria sources. Materials incorporated into electronic version of Maine Shellfish Handbook. 	Addie Halligan, DEP	14. Create Medomak River case study and bacteria investigation/mitigation guidance.		X				DELAYED. Work has not begun in 2022.					

Table 11. Developed Areas Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
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			DELAYED. Given current staffing shortages, DEP’s Land Bureau did not undertake this effort in 2022. Current standards and BMP Manual remain in effect.	
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					DELAYED. A Given current staffing shortages, DEP’s Land Bureau did not undertake this effort in 2022.	
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. 	Kerem Gugnor, DEP	3. Stakeholder process completed in 2021 and Revised rules adopted in 2023.		X	X			DELAYED. No work occurred in FFY2022.	
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	The StormTree proprietary BMP and PhosphoSorb media for StormFilter were approved for Chapter 500 Standards.	

Table 11. Developed Areas Lead Agency: Maine DEP					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
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. Create an appendix for Stormwater Manual.		X				DELAYED. No work occurred in FFY2022.	
6. Provide guidance to State and local regulators, developers, and other partners about BMP selection to target specific localized resource concerns.	<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 development, nitrogen removal BMPs for coastal watersheds). Incorporate crosswalk into BMP manual and share with partners for use in WBPs and project reviews. 	Jeff Dennis, DEP	6. Complete Crosswalk table in 2020. Provide training to DEP Land Bureau on using crosswalk for project reviews in 2021.	X	X				DELAYED. No work occurred in FFY2022.	
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. Train at least 500 people and at least 2,500 people with program certification/yr.			500 trained/yr 2,500 certified/yr			Trained 486 and with 2,959 individuals certified in the program for 2022. See Section IV.B. for more details.	
8. Develop additional trainings and supplemental training materials to	<ul style="list-style-type: none"> Develop additional online trainings and approve/add third-party trainings to facilitate recertification process. 	John Maclaine, DEP	8. Add one course per year and create	1 10 3	1 1 3	1 5 3	1	1	Created specialized courses in inland shoreline stabilization, winter BMPs, Land Use Regulations, Stream Crossing	

Table 11. Developed Areas Lead Agency: Maine DEP				Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024	
enhance contractor and installer understanding and ability to properly install BMPs.	<ul style="list-style-type: none"> • Create and post short instructional, demonstration videos about BMPs and NPS-related issues (e.g., silt fence installation). 		three videos in 2020 and 2023.	0	4	2			Installation Techniques, and BMPs for Landscapers. See Section IV.B. for more details.
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. Develop Certification program in 2020. At least 20 municipal officials certified/year beginning in 2021.	X ✓	20 32	20 24	20 28	20	Partnered with Maine CEO Training Program trained 28 CEOs with 7 re-certifications and 6 new certifications.
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 provides feedback on at least four comp plans/year.	4 9	4 10	4 9	4	4	Completed reviews of 9 comprehensive plans for Auburn, Brooksville, Kennebunk, Newcastle, Nobleboro, Orland, Presque Isle, and Swans Island.

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2022 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 57	90	90	<p>298 active Nutrient Management Plans (NMPs) and 49 needed renewal. 57% were updated or received variances. 15 variances issued.</p> <p>8 new farm NMPs developed covering 1180 acres and 1067 animal units – 8 were Comprehensive Nutrient Management Plans (CNMPs).</p> <p>28 NMP updates completed covering 12,344 acres and 81028,102 animal units – 17 were CNMPs.</p> <p>4 Compost Management Plans updated (CMPs). 1 new CMP developed. 5 CMPs pending development or partially completed.</p>	
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. Update NMP test in 2021 and update NMP training manual by 2024.	✓	X			X	Both nutrient planner tests updated in 2020. Training manual scheduled to be updated in 2024.	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
3. Monitor livestock agricultural operations to ensure compliance with requirement to operate according to a Livestock Operations Permit (LOP).	<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. 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. 	Mark Hedrich, DACF	3. 75% of farms needing LOPs are developed within nine months.	75 63	75 40	75 50	75	75	18 active LOPs, 1 provisional LOP. 3 LOP updates. 3 LOP updates pending. 1 provisional LOP updates in progress. 4 farms need follow-up as potential CAFOs. Two CAFO inspections done. Most CAFO inspections not held due to 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. Complete 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. 	Matt Randall, DACF	5. Resolve 25% of sites with water quality issues within 30 days; 50% within 90 days; and 75% within 180 days.	X ✓	X n/a	X n/a	X	X	There were 0 complaints related to water quality issues in and 2022. DACF provided 6 proactive technical assistance visits in 2022.	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
	<ul style="list-style-type: none"> DEP prepares annual summary of water quality complaints received, investigated and resolved and shares with DMR, DEP, NRCS, NMRB. 									
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. Implement at least one identified strategy. 	Alex Wong, DEP	6. Hold stakeholder meeting held in 2020. Pursue at least one stakeholder-recommended outreach strategy by 2022.	X ✓		X			DELAYED. Land ownership has changed and hobby farm was closed. Alternative site has not been identified. DEP has proposed discontinuing this milestone.	
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. Prepare Oliver Brook water quality summary (post implementation) in 2020. Develop monitoring plan for one Readiness Phase watershed in 2020 and conduct water quality monitoring in 2021.	X ✓	X ✓				Milestones met.	

Table 12. Statewide Approach - Agriculture Lead Agency: Maine DACF					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
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 issues related to their industry including nonattainment watersheds. 	Alex Wong, DEP	8. Attend at least five local working group meetings/year in a variety of regions in the state and meet with at least one industry group/year.	X ✓	X ✓	X ✓	X	X	DEP participated in State Technical Committee meeting and attended five local working group meetings in 2022: Cumberland/York, Penobscot, Kennebec/Lincoln-Knox and Southern Aroostook, Central Aroostook.	
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. Hold meeting held between DEP, DACF and NRCS to discuss agriculture and water quality impacts.	X	✓				Milestones met. The Maine Legislature passed LD 437, “An Act to Establish the Maine Healthy Soils Program”, which was signed into law by Gov. Mills on June 10, 2021. The law creates the Healthy Soils Program in the Department of Conservation, Agriculture, and Forestry 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.	

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. 	Cindy Dionne, Maine DOT	1. Train at least 25 contractors/year and 100 DOT employees/year	25 contractors & 100 employees trained/yr 62 employees trained	64 employees trained	41 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 3/25/2022(30 employees) and on 9/29/2022 (11 employees).</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	5 110	5	5	91 Public Works employees trained and 7 other municipal employees, with 51 new certifications during in-person training sessions. 12 other municipal officials trained in the online course.	
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. Maine DOT will continue to investigate new products, technologies, or efficiencies to reduce the use of chlorides. 	Peter Coughlin, Maine DOT	3. Hold at least 30 workshops/year, covering 4 different	30 10	30 21	30 20	30	30	MLRC provided 20 in-person workshops with a total of 473 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.			subjects for 150 different towns.							
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. Develop chloride-impacted and threatened streams list.	X ✓					Milestone met.	
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. Draft Limited liability legislation (if supported).	X					Portland Area MS4 communities incorporated Green Snow Pro and liability promotion legislation into their new five-year permit, which started in 2022. Legislative outreach materials developed by the Interlocal Stormwater Working Group.	
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. 	Cindy Dionne, Maine DOT	6. Maine DOT removes two sand/salt piles per year.	2 0	2 2	2 9	2	2	Nine outdoor sand/salt piles were eliminated in 2022. Two additional piles are scheduled for 2023.	
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- 	Cindy Dionne, Maine DOT	7. Maine DOT completes at least one NPS project/year.	1 2	1 0	1 1	1	1	Maine DOT regional staff reviewed and prioritized sites to be addressed during the future work plans.	

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.									
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. Hold at least two NPSTC-approved workshops/year.	2 1	2 2	2 2	2	2	Conducted 2 workshop in 2022, with 44 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	✓				Milestone met.	

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				
1. Increase overall effective BMP application on harvests from 76% to 85% or greater. Effective BMPs include all appropriately applied BMP practices, effective planning, and avoiding waterbody crossings.	<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 areas when identified by monitoring, compliance inspections and industry consultation. 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. Apply northeast regional forestry BMP monitoring protocol on a biennial basis to assess use & effectiveness of forestry BMPs.	Tom Gilbert, MFS	1. Maine Forestry BMPs Use and Effectiveness report documents effective BMP application on 85% of sites inspected	85 78		85 68		85	The biennial Maine Forestry BMP Use and Effectiveness report for the 2020-21 BMP monitoring seasons includes data from 175 sites and was released in the spring of 2022. It is reported that 68% of sites 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 97	90 96	90	90	MFS Rangers conducted 1,564 water quality related inspections. Of those, 63 required on site mitigation measures or other regulatory intervention.				
3. Ensure agencies and staff responsible for protecting Maine’s water resources	<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. 	John Maclaime, NPSTC	3. Hold interagency meeting in 2020 and hold joint timber	X	X ✓				Milestone met. MFS developed 2 new guidance documents detailing the NRPA permitting process as it relates to stream crossings and				

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						
from potential degradation have a clear understanding of each’s roles and responsibilities including enforcement procedures.	<ul style="list-style-type: none"> • 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 (CLP), Master Logger Program (MLP), and BMP monitoring program. 		harvest NRPA (stream crossing) training event in 2021.										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.	
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 7	5	5					Seven new towns adopted statewide standards for timber harvesting in 2022.	

Table 15. Statewide Approach – Subsurface Wastewater Disposal Lead Agency: Maine DHHS, Environmental Health					Schedule Planned (X #) Actual (✓ #)					2022 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.			200 visits/yr 38	20	170		Training was provided at 14 scheduled town training sessions.
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. Submit report submitted to Legislature and adopt revised rules in 2020.	X		X			After delays, work resumed in FFY2022 and rules were drafted.	
4. Conduct public outreach about new	<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. Conduct one realtor	1 0	1 0	1 0	1	1	DELAYED. No realtor workshops held in 2022.	

Table 15. Statewide Approach – Subsurface Wastewater Disposal Lead Agency: Maine DHHS, Environmental Health					Schedule Planned (X #) Actual (✓ #)					2022 Accomplishments and Outputs
Five-Year Objectives	Actions	Lead Contact	Milestones	2020	2021	2022	2023	2024		
requirements in shoreland zone.			workshop per year.							
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. 	Alex Wong, DEP	5. Develop guidance document in 2020. Develop draft advanced inspection standards by 2020 and test by 2022.	X	✓	X			DELAYED. Milestones partially met, DEP considering next steps.	
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. Evaluate septic system threat in all watershed-based management plans starting in 2021.	✓	✓	✓	X	X	All WBMPs, except those in fully sewerred watersheds, addressed nutrient loading from groundwater from septic systems or otherwise.	

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. Legislature adopts revised standards.	X					DELAYED. Due to staffing shortages, DEP’s Land Bureau will be reevaluating program and rulemaking priorities and timeline.	
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. Develop curriculum in 2020 and hold one multi-agency workshop /year starting in 2021.	X ✓	1 1	1 1	1	1	Created more specialized course in Stream Crossing Installation Techniques.	

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 51	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. Develop shoreline riprap policy for NPS watershed projects in 2021.		X				In FFY2022, first draft of policy extensively revised based on comments from stakeholders. Second draft comments received and being incorporated.	

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. EPA approves Maine NPS Management Program Plan by 10/1/24.					X	Milestone planned for 2024	
3. <u>Education & Outreach:</u> Promote more effective awareness and behavior change methods and tools for DEP programs	<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 3	1		3 2-hr online Social Marketing workshops presented by Eric Eckl from Water Words That Work! (Total attendance for the 3 workshops was 39 people).	

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		
and NPS projects and partners.										
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. Hold meeting of NPS Plan lead agencies and partners in 2020. Send NPS Plan status update to lead agencies annually.	X ✓	X ✓	X ✓	X	X	DEP met individually with each lead agency in 2022. 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 hybrid Watershed Roundtable with 77 participants from municipalities, NGOs, SWCDs and other state agencies. 182 people in contained in direct email database, 215 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, 	Alex Wong, DEP	7. Develop list of funding options.			X			DEP met internally; preliminary funding options discussed.	

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		
	connect to public sewer, or extend sewer lines). <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. Include summary of CWSRF-funded NPS projects in the annual NPS Program Report. Develop one new NPS program area using CWSRF by 2023.	X	X	X	X	X	CWSRF funding for NPS projects in 2022 totaled \$1.8 million. Projects described in Section IV.D. Started exploring amending the Nutrient Management Pass-through Loan Program, expected revision by end of 2023/beginning of 2024.	



Messalonskee Lake Watershed
Survey/Sebastitcook Lake Watershed Survey



Clean water starts with you!

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

