

**WALDO COUNTY SOIL AND WATER CONSERVATION DISTRICT
REQUEST FOR QUALIFICATIONS (RFQ)
PLANNING CONSULTANT SERVICES
FOR IMPAIRED LAKE WATERSHED PLAN DEVELOPMENT**

The Waldo County Soil and Water Conservation District (District) is requesting Statements of Qualifications from interested and qualified Consultants for Professional Planning Consultant Services in order to assist in the development of an update to the Unity Pond (Lake Winnecook) Watershed-Based Management Plan. The purpose of the Unity Pond (Lake Winnecook) Watershed-Based Management Plan Project is to create a comprehensive plan for Unity Pond (Lake Winnecook) with well-developed implementation strategies that effectively improve the water quality of the lake over the next 10 years

Overview

The District has been awarded a grant and is under contract with the Maine DEP to develop a watershed-based plan for the Pond (Lake). Funds for this project were provided by the USEPA under Section 319 of the Clean Water Act. Unity Pond sits at 175 feet above sea level. The pond has a maximum depth of 12 meters (41 feet), an average depth of 6 meters (19 feet), and an estimated volume of 57,959,154 m³. The pond flushes 1.23 times per year.ⁱ The watershed is drained by three major tributaries- Meadow Brook, Bithers (bog) Brook, and Carlton Stream. Meadow Brook originates in the western watershed in a large tamarack bog complex, Bithers Brook flows from the east, and Carlton Stream flows from the north at the outlet of Carlton Pond (a.k.a. Carlton Bog). A single outlet, Sandy Stream, is located at the southern end of the pond. A railroad bed follows the shoreline of Unity Pond on the southwestern shore, where a railway trestle crosses over the pond's outlet as it becomes Sandy Stream. Sandy Stream drains to a wetland area to the south, then continues into Twenty-five Mile Stream, flowing into the Sebasticook River in Burnham, and eventually draining to the Kennebec River in Winslow.

At one time, Sandy Stream was considered the major inlet to Unity Pond, located adjacent to the pond's outlet, Twenty-five Mile Stream. The outlet has been a source of concern over the years, as locals have historically suggested that a poorly designed railway bed and trestle dramatically altered the natural flow to Unity Pond. Prior to the construction of the railway trestle in 1870, the Sandy Stream Watershed (~65 sq. mi.) that includes Freedom Pond (a.k.a. Sandy Pond) and Halfmoon Stream, flowed from the south directly into Unity Pond. Construction of the railway and trestle altered the natural flow of Sandy Stream and Twenty-five Mile stream and created the wetland complex to which Unity Pond now drains. Stream flow modifications are believed to be causing backflushing at the Unity Pond outlet. Typically, Sandy Stream flows into the wetland area southwest of the Unity Pond outlet and continues into Twenty-five Mile Stream. However, during significant rain events, and when water levels are low in the pond, it is possible that Sandy Stream may bypass the wetland and flow into Unity Pond. When backflushing occurs, the Unity Pond watershed increases in size by about 65 square miles.ⁱⁱ

Sixteen percent of the watershed is categorized as urban development. This includes shoreline development (0.8%), non-shoreline development (5.5%), agricultural land (7%), and operated forest lands (2.9%). Undeveloped land (undisturbed/unmanaged forest, grassland, scrub shrub, and wetland) make up 72% of the watershed, and surface water accounts for the remaining 12% of the watershed land area. Historically, agriculture has had a relatively large impact on Unity Pond's water quality. In 1974

there were about 420 farms in the watershed averaging 200 acres in size.¹ Today, agriculture continues to play an important role in the local economy, although the amount of land used for agricultural purposes in the direct watershed has declined since the 1970's; the number of farming operations has declined, while remaining farms have increased in intensity and production.

PURPOSE AND SCOPE OF WORK

Purpose

The purpose of this project is to develop an updated watershed-based management plan (WBMP) for Unity Pond that includes EPA's nine minimum planning elements. The project will collect information about lake water quality and watershed hydrology, inventory NPS problems, evaluate septic systems, assess the external and internal phosphorus load, and bring 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 will integrate project findings into an updated WBMP which will be used to guide watershed restoration efforts over the next 10-year planning period (2022-2032).

Partner Coordination, Roles and Responsibility

Waldo County Soil & Water Conservation District (District) will serve as the sponsoring grantee for the project, will serve on the steering committee, will lead the agricultural and forestry survey and agricultural landowner meetings, and will work with FOLW to assist with the NPS watershed survey including writing up the watershed survey report.

Friends of Lake Winnecook (FOLW) will participate on the steering committee, advertise project activities in their newsletter and provide \$5,800 in cash match and \$1,807 in-kind match. FOLW will lead the NPS watershed survey and the septic brochure/online septic survey, and assist CWS with in-lake assessment and the backflushing study. FOLW provide long-term plan implementation with support from other partners.

The **Center for Wildlife Studies (CWS)** will serve as a subgrantee to assist with baseline monitoring and the backflow study at Sandy Stream, and will serve on the Technical Advisory Committee. CWS will provide \$2,541 of in-kind match for the project.

The **Towns of Unity and Burnham** will advertise project activities on their websites, serve on the project Steering Committee, and combined, will provide \$3,200 in cash match.

The **University of Maine Cooperative Extension Service**- Will assist with the agricultural land survey and serve on the technical advisory committee.

A **managing environmental consultant** will be hired (following procurement procedures in the DEP’s NPS Grant Administrative Guidelines) to manage the overall project, complete a historical water quality analysis, develop a watershed nutrient loading model, assess the internal load and provide a management options analysis, provide technical leaders for the watershed survey, organize and facilitate SC and TAC meetings, and write the WBMP.

Maine Department of Environmental Protection (Maine DEP) will administer project funding, serve as the project advisor, and provide project and technical support. DEP will play a large role in coordinating the watershed and septic survey and provide three technical leaders for the survey.

The **USDA/NRCS** will assist the WCSWCD with the Ag survey and landowner meetings.

The **US Environmental Protection Agency (US EPA)** will provide project funding and work plan guidance.

Tasks, Schedules and Estimated Costs

All press releases, outreach materials, project signs, and plans will acknowledge that the project is funded in part by the United States Environmental Protection Agency under Section 604(b) of the Clean Water Act. Project staff will consult with DEP on EPA’s public awareness terms and conditions for Section 604(b) grants before the project commences. In addition, project staff will consult with DEP and EPA before project signs are designed. Refer to the Service Contract, Rider A. Section IV. D. Acknowledgement.

Task 1 – Project Administration

The District will administer the project according to the service contract with DEP, prepare a subagreement with CWS, and develop an RFQ for consulting services. This task includes tracking project progress, expenses, matching funds, and submitting reports (semi-annual progress reports and final project report) and other deliverables. The district and FOLW will establish an NPS Site Tracker spreadsheet tool to efficiently accumulate and record information about NPS sites observed during this project (Task 6) to enable continued activity in future years to maintain existing BMPs and address new NPS sites.

Start and Completion Dates	October 2020 – December 2022	
Grant Cost: \$4,613.80	Match Cost: \$0	Total Cost: \$4,613.80
Breakdown of Grant by Cost Category: \$840.00 (Salary & Fringe); \$3,773.80 (Contractual)		
Breakdown of Match by Cost Category: n/a		

Task 2 – Water Quality Analysis

A Water Quality Analysis will result in a thorough review of available water quality data (including any secondary data) for Unity Pond, in addition to any new water quality data collected by CWS under Task 3. Data will be analyzed to determine water quality trends, and any statistically significant changes in water quality over the historical time period and within the past 10 years. A water quality memo will summarize the water quality data and findings, identify any additional data needs, and provide future monitoring recommendations. The technical review committee will assist with the evaluation of secondary data to determine if the data is acceptable to use for this project. The qualified consultant will prepare a brief Secondary Data Quality Assurance Guide with selection criteria appropriate for the project that will ensure that secondary data adequately support project conclusions, decisions and/or actions. Project staff will document the following secondary data evaluations in a table: data type; data source (originating organization, report title, date); how data will be used for the project; and limitations on data use, if any.

Start and Completion Dates	January 2021 – December 2021	
Grant Cost: \$3,834.00	Match Cost: \$601.12	Total Cost: \$4,435.12
Breakdown of Grant by Cost Category: \$154.00 (Subgrant); \$3,680.00 (Contractual)		
Breakdown of Match by Cost Category: \$601.12 (Donated Services-Labor)		

Task 3 – Water Quality Monitoring & In-Lake Assessment

Following the results of the water quality data analysis in Task 2, the technical advisory committee will determine if additional sampling or in-lake assessment is needed to better inform the watershed loading model and the internal recycling analysis (Task 4). CWS will develop and submit a Sampling and Analysis Plan (SAP) for the monitoring following ME DEP’s Lake Assessment Quality Assurance Program Plan (QAPP). Analyses or assessments that may be recommended include bi-monthly TP profile sampling, DO/temperature profiles, and SDT measurements, and a backflushing study at the Unity Pond outlet. This study will utilize an acoustic doppler current profiler (ADCP) to determine the extent to which Sandy Stream reverses its normal flow and backflushes into Unity Pond. WCSWCD and CWS will work with DEP to perform this work under an appropriate QAPP or other quality assurance guidelines. CWS has committed to providing assistance for sampling and/or assessment under this task with support from FOLW. A summary of monitoring and assessment work and copy of all water quality data collected in MS Excel or similar electronic format will be produced by CWS and submitted as a deliverable.

Start and Completion Dates	April 2021 – November 2021	
Grant Cost: \$10,366.00	Match Cost: \$4,447.28	Total Cost: \$14,813.28
Breakdown of Grant Cost by Cost Category: \$5,236.00 (Subgrant); \$2,175.00 (Contractual); \$2,955.00 (Supplies)		
Breakdown of Match by Cost Category: \$2,310.00 (Subgrant); \$1,017.28 (Donated Services-Labor); \$600.00 (Supplies); \$520 (Other)		

Task 4 – Watershed Modeling & Internal Recycling Analysis

The trend of increasing dissolved oxygen loss and internal phosphorus recycling has been identified as a major water quality concern in Unity Pond. Additional monitoring under Task 3 of this project will provide the information needed to quantify internal loading and make specific recommendations for alternative restoration strategies and provide project partners with options for treatment. Project technical advisors and consultants will work together in the development of these revised internal recycling estimates.

Watershed modeling will include a detailed land-cover update in GIS, delineating the subwatersheds of major tributaries in the watershed,² pollutant load modeling using an appropriate in-lake response model such as the Lake Loading Response Model (LLRM), and conducting field estimates of phosphorus and sediment loading from high impact/priority sites identified during the planned NPS surveys and recent unpaved road survey. The model will utilize the updated land-cover data, the water quality analysis from Task 2, the internal recycling analysis, and pollutant loading reduction estimates from past 319 efforts. Modeling results will be presented to the technical review committee, calibrated, revised to update the lake’s assimilative capacity analysis, and used to help set water quality goals and thresholds for the plan. Watershed modeling will also account for climate change, by estimating pollutant loading under different hydrological conditions representative of increased rainfall.

With additional water quality data collection and analysis in 2021, the project team will quantify internal

² Inclusion of the Sandy Stream watershed into the watershed model will be determined following completion of the backflushing study (Task 3).

loading and make specific recommendations for treatment options and alternatives. The team will work together in the development of revised internal recycling estimates and will develop an internal recycling and alternative restoration feasibility analysis report, updated GIS land-cover layer, watershed modeling memo and model spreadsheet, and NPS phosphorus loading estimate spreadsheet.

Start and Completion Dates	November 2020 – March 2022	
Grant Cost: \$7,075.00	Match Cost: \$1,262.20	Total Cost: \$8,337.20
Breakdown of Grant Cost by Cost Category: \$7,075.00 (Contractual)		
Breakdown of Match by Cost Category: \$231.00 (Subgrant); \$800.00 (Contractual); \$231.20 (Donated Services-Labor)		

Task 5 – Septic Systems

The Maine DEP will complete a septic system vulnerability analysis for the Unity Pond watershed using information about watershed soils and hydrology, location of development, and local stakeholder knowledge to create a septic vulnerability map. FOLW will prepare a septic system brochure to include information about the results of the vulnerability analysis and include a link to an online septic system survey to help inform the watershed model. The brochure will be mailed to shoreline landowners.

Start and Completion Dates	June 2021 – August 2021	
Grant Cost: \$491.30	Match Cost: \$554.88	Total Cost: \$1,046.18
Breakdown of Grant Cost by Cost Category: \$491.30 (Other)		
Breakdown of Match by Cost Category: \$554.88 (Donated Services-Labor)		

Task 6 – Watershed NPS Surveys

With assistance from the District and DEP, FOLW will organize and facilitate an NPS watershed survey for the direct watershed³ of Unity Pond using methods outlined in *A Citizen’s Guide to Volunteer Lake Watershed Surveys* (DEP, 2011) and working under the DEP’s Maine Lake and Stream Watershed Survey Generic QAPP (2020). The District/FOLW will prepare a Survey Implementation Plan (SIP), to be approved by DEP prior to commencing survey efforts, which will guide survey implementation for quality assurance. FOLW will recruit local volunteers, assist DEP with a volunteer survey training session, and enter all survey data into an NPS Site-Tracker, or similar Excel spreadsheet. DEP will assist with delineating survey sectors, helping prepare the landowner list, and prepare maps. The District will summarize survey results and prepare the survey report. The survey will assess any culverts that were not assessed in the 2019 road survey to ensure they are properly sized to accommodate changes in precipitation resulting from climate change.

Ag and Forestry Surveys – In partnership with the USDA/NRCS and UMaine Cooperative Extension, the District will assess agricultural lands and active forestry operations throughout the watershed and provide a summary memo of survey results. The survey approach will be described in the watershed survey SIP. The preliminary approach includes conducting a land cover review, identifying current farming operations, reviewing or mapping locations of existing and proposed (last 5-10 years) agricultural BMPs, identify potential properties for future conservation projects, a day of field reconnaissance, if needed, and review of extent and impact of recent forestry activities. The District will coordinate up to two days of meetings with willing agricultural landowners with high priority properties identified during the survey. While the

³ The 2021 survey will not include the Sandy Stream watershed. Results of the backflushing study (Task 3) will help determine if follow-up survey work will be needed in the Sandy Stream watershed in the future.

total area of agricultural land in the watershed is small (10%), 24% of the total P load was estimated to come from this source (Maine DEP, 2004).

Start and Completion Dates	March 2021 – November 2021	
Grant Cost: \$6,757.70	Match Cost: \$6,103.12	Total Cost: \$12,860.82
Breakdown of Grant Cost by Cost Category: \$5,610.00 (Salary & Fringe); \$147.70 (Travel); \$1,000.00 (Contractual)		
Breakdown of Match by Cost Category: \$1,600.00 (Salary & Fringe); \$3,303.12 (Donated Services-Labor); \$1,200.00 (Other)		

Task 7 – Meetings, Stakeholder Engagement, & Public Outreach

Stakeholder & Steering Committee Meetings – The Unity Pond WBP Steering Committee will include representatives from the District, FOLW, Unity Barn Raisers, Sebec Regional Land Trust, the Towns of Unity and Burnham, and project consultants (see confirmed list, last page of attachments). The Steering Committee will meet via online meetings three times to help guide the development of the WBMP and will convene one stakeholder meeting, which will be open to the public, to garner input and support for the project and to also help guide the development of the WBMP. Project information will be posted on the District, FOWL, Town(s), and CWS web sites, and two press releases will be written and distributed to local news outlets: Kennebec Journal, Morning Sentinel and Town Line.

Water Quality Technical Review Committee Meetings – This committee will include representatives from the District, FOLW, Maine DEP, CWS, and project consultants and will meet two times over the course of the project to review the key plan components, including the water quality analysis summary, internal loading/alternative restoration analysis, modeling results and load analysis, and action plan with an emphasis on developing current and achievable restoration strategies.

Start and Completion Dates	January 2021- October 2022	
Grant Cost: \$7,891.50	Match Cost: \$971.04	Total Cost: \$8,862.54
Breakdown of Grant Cost by Cost Category: \$560.00 (Salary & Fringe); \$462.00 (Subgrant); \$45.00 (Travel); \$6,824.50 (Contractual)		
Breakdown of Match by Cost Category: \$971.04 (Donated Services-Labor)		

Task 8 – Develop Watershed-Based Plan

The Unity Pond WBMP will be completed using information developed in Tasks 2–6 (above). The plan will contain EPA’s required 9-elements including a detailed, stakeholder-driven 10-year action plan to improve water quality in Unity Pond and help answer ongoing questions about backflushing from Sandy Stream and the relative contribution of internal loading and how to address it along with the external phosphorus load. Factors such as increased water temperatures, more intense storms, and increase in invasive species related to climate change will be factored into the watershed action plan. A draft plan will be reviewed by both committees and sent to the DEP for review at least two months before project completion. The final plan will be reviewed and approved by DEP. Any comments on the final plan must be addressed for the plan to be accepted.

Start and Completion Dates	January 2022 – October 2022	
Grant Cost: \$4,479.00	Match Cost: \$4,216.16	Total Cost: \$8,695.16
Breakdown of Grant Cost by Cost Category: \$140 (Salary & Fringe); \$154.00 (Subgrant); \$4,185.00 (Contractual)		
Breakdown of Match by Cost Category: \$3,800 (Contractual); \$416.16 (Donated Services-Labor)		

VIII. Deliverables

An electronic copy of each deliverable will be provided to the DEP Contract Administrator. Each deliverable will be labeled according to procedures described in DEP document *NPS Grant Administrative Guidelines*:

<http://www.maine.gov/dep/water/grants/319-documents/2016GrantAdminGuidelinesFinal2.docx>.

1. Sub-agreement with CWS, semi-annual progress reports, final project report (Task 1)
2. Water quality analysis memo including future monitoring plan, Secondary Data Quality Assurance Guide (Task 2)
3. Alternative restoration feasibility analysis, updated GIS land-cover layer, watershed modeling memo and model spreadsheet, NPS P loading estimate spreadsheet (Task 4)
4. Summary of monitoring and assessment work, water quality data in MS Excel or similar electronic format, and monitoring SAP (Task 3)
5. Septic vulnerability map and septic brochure/septic survey (Task 5)
6. NPS site spreadsheet, Ag & Forestry Survey Summary memo, approved SIP (Task 6)
7. Meeting minutes, press releases (Task 7)
8. Final Watershed Plan (Task 8)

IX. Project Coordinator

Name	Andrew Reed/Tom Mullin
Organization	Waldo County Soil & Water Conservation District
Mailing Address	46 Little River Drive, Belfast, ME 04915
Telephone Number	(207) 218-5311
Email Address	areed@uninets.net
Federal DUNS #	82-513-9368

PROPOSAL FORMAT

To facilitate review, submissions should conform to the following format:

1. **Experience of the Firm:** Provide a description of your firm's prior experience and qualifications in developing and updating watershed management plans for impaired lakes. Also, please reference the experience of the firm in working with the State and EPA regulation and procedure, in particular those specified in the 319 program.
2. **Project Team (Key Staff):** Identify the proposed Project Manager and key project team members and responsibilities. Provide an itemized rate per hour for identified team. Provide a brief resume for each person outlining their credential and experience. Describe your team's experience working in the Belgrade Lakes region, and/or the Great Pond watershed.
3. **References:** Provide the name and contact information for at least three (3) references familiar with the quality of work by your team of similar nature as contained in the above Scope of Work.

4. **Project Understanding:** Provide your general understanding of the watershed, project, and issues regarding the identified project(s). Identify any potential challenges or special concerns that may be encountered.
5. **Other Supporting Data:** Include any other information you feel to be relevant to the selection of your firm or the makeup of the project team including sub-consultants.

The entire Statement of Qualifications shall not exceed thirty (30) pages; excluding the front and back covers, dividers, coversheet, table of contents, and letter of introduction (maximum 2 pages)

CRITERIA FOR REVIEW OF STATEMENT OF QUALIFICATIONS

The following criteria will be used in screening, ranking and selection of the successful firm:

1. **Qualifications of the Firm (20-30 points):** Preference shall be given to those firms with experience in watershed management planning related to the scope of services.
2. **Qualifications of the Project Team (Key Staff) (30-40 points):** Preference shall be given to those with key staff experience in items listed in the above scope of services and any familiarity with the region.
3. **Experience in Working with State and EPA Regulations and 319 Project Procedures (20-30 points):** Preference shall be given to project teams whose personnel have a demonstrated working relationship with the State and EPA, and possess a thorough understanding of the rules and regulations regarding watershed management planning, particularly impaired lakes.
4. **Project Understanding (25-35 points):** Preference shall be given to those firms which have a comprehensive understanding of the project requirements and environment.

SELECTION OF THE CONSULTANT

It is the intent of the District to appoint a committee to review the Statements of Qualifications submitted and rank the qualified firms. All unsuccessful firms will be notified in writing no later than 10 days after selection of the Consultant. The District reserves the right to reject any and all submissions to this RFQ, request clarification, or waive informalities/technicalities, if it is deemed in the best interest of the project. The District assumes no responsibility for costs incurred in responding to the RFQ.

SUBMISSION OF QUALIFICATIONS STATEMENT AND CONTACT PERSON

An electronic copy of the Qualifications Statement must be submitted no later than 4 p.m. on December 1, 2020 to:

Tom Mullin, Administrative Director, Waldo County Soil and Water Conservation District, 46 Little River Drive, Belfast, ME 04915 tmullin@maineconservationdistricts.com

The Waldo County Soil and Water Conservation District is an equal opportunity employer. We will not discriminate and will take affirmative action measures to ensure against discrimination in employment, recruitment, advertisements for employment, compensation, termination, upgrading, promotions, and other conditions of employment against any employee or job applicant on the bases of race, color, gender, national origin, age, religion, creed, disability, veteran's status, sexual orientation, gender identity or gender expression.

BELOW IS THE FULL WORK PLAN WITH ALL TASKS IDENTIFIED.

Project Title	#20200006 Unity Pond (Lake Winnecook) Watershed-Based Management Plan Update
Organization	Waldo County Soil & Water Conservation District
Start Date	October 1, 2020
Completion Date	December 31, 2022

I. Waterbody and Watershed Information

a. Background

Waterbody Name	Unity Pond (a.k.a. Lake Winnecook)
Waterbody Size (e.g., lake acres, stream miles)	4 sq. mi. (2,558 acres)
Watershed Area (in acres or square miles)	29 sq. mi.
Watershed Location (town(s), county(s))	Burnham, Thorndike, Troy & Unity – Waldo Co.
Title and Date of Existing or Past Watershed-based Management Plan	Unity Pond (Lake Winnecook) Watershed Based Plan, March 2007
Public Access to Waterbody	2 public beaches (Unity & Burnham), 2 public launches (Unity & Burnham).

b. Waterbody and Watershed Physical Characteristics

Unity Pond sits at 175 feet above sea level. The pond has a maximum depth of 12 meters (41 feet), an average depth of 6 meters (19 feet), and an estimated volume of 57,959,154 m³. The pond flushes 1.23 times per year.⁴ The watershed is drained by three major tributaries- Meadow

⁴ Maine DEP & Lake Stewards of Maine, 2019. Unity Pond (Lake Winnecook) 2018 Lake Reports, Stations 1 & 2.

Brook, Bithers (bog) Brook, and Carlton Stream. Meadow Brook originates in the western watershed in a large tamarack bog complex, Bithers Brook flows from the east, and Carlton Stream flows from the north at the outlet of Carlton Pond (a.k.a. Carlton Bog). A single outlet, Sandy Stream, is located at the southern end of the pond. A railroad bed follows the shoreline of Unity Pond on the southwestern shore, where a railway trestle crosses over the pond's outlet as it becomes Sandy Stream. Sandy Stream drains to a wetland area to the south, then continues into Twenty-five Mile Stream, flowing into the Sebasticook River in Burnham, and eventually draining to the Kennebec River in Winslow.

At one time, Sandy Stream was considered the major inlet to Unity Pond, located adjacent to the pond's outlet, Twenty-five Mile Stream. The outlet has been a source of concern over the years, as locals have historically suggested that a poorly designed railway bed and trestle dramatically altered the natural flow to Unity Pond. Prior to the construction of the railway trestle in 1870, the Sandy Stream Watershed (~65 sq. mi.) that includes Freedom Pond (a.k.a. Sandy Pond) and Halfmoon Stream, flowed from the south directly into Unity Pond. Construction of the railway and trestle altered the natural flow of Sandy Stream and Twenty-five Mile stream and created the wetland complex to which Unity Pond now drains. Stream flow modifications are believed to be causing backflushing at the Unity Pond outlet. Typically, Sandy Stream flows into the wetland area southwest of the Unity Pond outlet and continues into Twenty-five Mile Stream. However, during significant rain events, and when water levels are low in the pond, it is possible that Sandy Stream may bypass the wetland and flow into Unity Pond. When backflushing occurs, the Unity Pond watershed increases in size by about 65 square miles.⁵

Sixteen percent of the watershed is categorized as urban development. This includes shoreline development (0.8%), non-shoreline development (5.5%), agricultural land (7%), and operated forest lands (2.9%). Undeveloped land (undisturbed/unmanaged forest, grassland, scrub shrub, and wetland) make up 72% of the watershed, and surface water accounts for the remaining 12% of the watershed land area. Historically, agriculture has had a relatively large impact on Unity Pond's water quality. In 1974 there were about 420 farms in the watershed averaging 200 acres in size.⁶ Today, agriculture continues to play an important role in the local economy, although the amount of land used for agricultural purposes in the direct watershed has declined since the 1970's; the number of farming operations has declined, while remaining farms have increased in intensity and production.⁷

c. Description of Waterbody Uses and Value

Unity Pond is utilized heavily for recreation, including boating, fishing, and swimming. There are two public swimming beaches at Unity Pond- Kanokolus Beach on the southwest shore in Unity,

⁵ Maine DEP, 2004. Unity Pond (Lake Winnecook) Phosphorus Control Action Plan and TMDL Report. P. 9

⁶ US Dept. of Agriculture, Soil Conservation Service, 1974. Work Plan for Twenty-five Mile Stream Watershed. Watershed Protection and Flood Prevention, 1974. P. 1.

⁷ Personal Communication, Rick Kersbergen, University of Maine Cooperative Extension. April 2, 2020.

and the Burnham Town Beach south of Reynolds Corner. Public access is provided by two public boat launches- at Kanokolus Beach in Unity and a public launch on the western shore in Burnham. Private access is possible via a private launch located on Windmere Drive in Unity, and at numerous private roads and residences along the shoreline. Three boat launches provide access via Sandy Stream- Route 139 in Unity, the intersection of Route 202 and Quaker Hill Road (CWS), and on Halfmoon Stream at the Route 220 bridge in Thorndike.⁸ CWS maintains a recreational area on Unity Pond known as 'The Field of Dreams' located on Bangor Road in Unity. The property provides water access for canoes and kayaks, jogging and walking paths, a playground, picnic area, tennis courts and ball fields. CWS students, staff, and visitors not only utilize the pond for recreation, but for study as well. CWS began working collaboratively with watershed stakeholders in 1997 to incorporate a service-learning curriculum that would enhance lake restoration efforts.

About 60% of Unity Pond's shoreline is developed with residential properties. There are 286 shoreline housing units (57% seasonal, 43% year-round). In 2004, it was estimated that the Unity Pond shoreline supports about 500 year-round residents. Septic systems in areas with high groundwater tables in flood-prone areas of the watershed have been a concern for water quality in the past.³

Unity Pond is currently managed as both a warm and coldwater fishery with a total of 20 fish species- 12 native indigenous fishes (American eel, golden and common shiner, fallfish, white sucker, brown bullhead, chain pickerel, banded killifish, burbot, redbreast sunfish, pumpkinseed, and yellow perch), four introduced fishes (landlocked white perch and rainbow smelt, smallmouth and largemouth bass), three annually stocked managed fishes (sea-run alewife, brook trout, and brown trout), and one illegally introduced species (black crappie).

The watershed contains over 100 miles of perennial and intermittent streams connecting dozens of small ponds and over five square miles of wetlands to the lake. The watershed also contains inland wading bird and waterfowl habitat in several areas surrounding Meadow Brook, Bithers Brook, Carlton Stream, and the Unity Pond outlet. Four square miles of deer wintering area are located within the direct watershed. Great Blue Heron (*Ardea Herodias*), a priority 2 Species of Greatest Conservation Need (SGCN), has been documented within wetland areas on both Meadow Stream and Bithers Brook. A nesting pair of Bald Eagles (*Haliaeetus leucocephalus*), a Species of Special Concern (SSC), have been identified on the eastern shoreline of the pond. This pair is one of 22 total eagle pairs in all of Waldo County.⁹ The Yellow Lampmussel (*Lampsilis cariosa*), a Priority 1 SGCN, has also been identified in the southern area of the pond. Of Maine's ten native mussel species, the Yellow Lampmussel is one of three species currently listed as Threatened under the Maine Endangered Species Act, and is only found in the Penobscot, St. Georges and lower Kennebec River watersheds.¹⁰ The rare plant (SSC) Water Stargrass (*Zosterella dubia*) is documented in several locations in the pond. Water Stargrass has been documented in

⁸ Maine DEP, 2004. Unity Pond (Lake Winnecook) Phosphorus Control Action Plan and TMDL Report. P. 10

⁹ Maine DIFW, 2009. Maine's 2018 Survey of Nesting Bald Eagles.

https://www.maine.gov/ifw/docs/2018MaineBaldEagleNestInventory_MOHF_report.pdf

¹⁰ Lakes of Maine. Freshwater Mussels webpage: <https://www.lakesofmaine.org/conservation-mussels.html>

only ten towns statewide. Fall Fimbry (*Fimbristylis autumnalis*) is also a rare plant (SSC) and is documented in the southern end of Unity Pond. Fall Fimbry has been identified in 22 towns in Maine.¹¹

The indirect watershed of Carlton Pond (a.k.a. Carlton Bog) to the north of Unity Pond, drains to Carlton Stream. A dam structure is currently in place at the outlet of Carlton Pond. Carlton Pond water levels and the dam structure are managed and maintained by the US Fish and Wildlife Service (US FWS) as Carlton Pond is a designated wildlife refuge and Wildlife Production Area (WPA). The pond and surrounding wetlands are one of the few areas remaining in the state which provides nesting habitat for Black Terns (*Chlidonias niger*), which are on Maine’s endangered species list. The refuge is also home to several other rare plant and animal species.

A large expanse of wetlands and uplands centered on Unity Township extends east abutting Unity Pond and west to the Sebasticook River. The Maine Natural Areas Program (MNAP) and Maine DIFW have identified this region as a ‘Focus Area of Statewide Ecological Significance’ (known as the ‘Unity Wetlands’) and is a remarkable complex of streams, floodplain forests, bogs, and unfragmented woodlands. The area is one of the largest remaining unfragmented blocks of land in central Maine. Portions of this wetland and abutting grasslands to the immediate south of Unity Pond are also designated as the Sandy Stream Division of the Sunhaze National Wildlife Refuge, a 58-acre parcel managed by the US FWS that protects habitat of the endangered Sedge Wren and numerous other rare plant and animal species, and exemplary natural communities.

a. Water Quality Listing Status

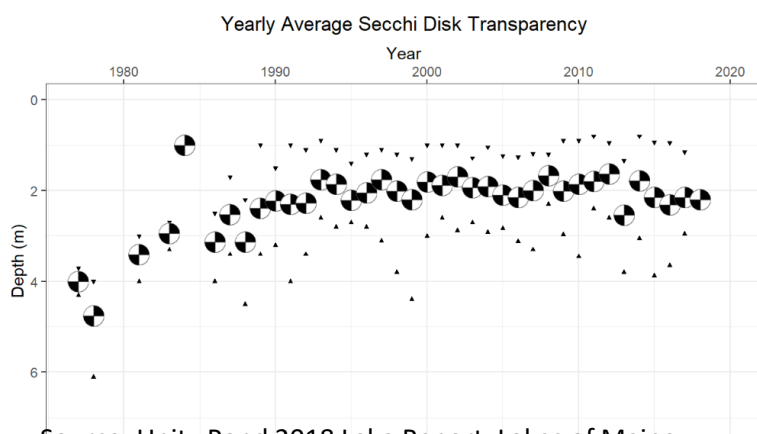
Is water quality listed as impaired?	Yes
If impaired, listed cause(s) and/or impaired use?	Persistent algal blooms
Name and date of any DEP TMDL report(s) for the waterbody.	Unity Pond (Lake Winnecook) Phosphorus Control Action Plan and TMDL Report, 2004

b. Water Quality Overview

¹¹ Maine Natural Areas Program Rare Plant Fact Sheets: <https://www.maine.gov/dacf/mnap/features/zosdub.htm>, <https://www.maine.gov/dacf/mnap/features/fimaut.htm>

Unity Pond is on Maine DEP's 303d list of impaired waters under Category 4-A due to changes in water quality over time and specifically because of persistent, nuisance summer-time algal blooms that occur near annually in Unity Pond. Unity Pond's water quality is considered below average and probability for nuisance algal blooms is high as a result of low dissolved oxygen in deep areas of the pond, and internal recycling of phosphorus. Water quality data have been collected by Maine DEP, volunteer water quality monitors, and CWS since 1977 at the deep hole station (Station 1). This includes 38 years of data collected over the past 42-year monitoring period. Secchi disk transparency (SDT) measurements in Unity Pond have been collected over 38 years between 1977 and 2018. 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, and impaired by Maine DEP.

Total phosphorus (TP) has been collected sporadically from the epilimnion of Unity Pond since 1977 with 23 years of data collected over the past 42 years. Epilimnetic TP concentrations range between 12 ppb (1978) and 40 ppb (2016) with an annual average or mean of 23 ppb over the historical sampling period (1977 - 2018). TP surface grab samples were collected during nine years between 2000 and 2013. Results



Source: Unity Pond 2018 Lake Report. Lakes of Maine:

https://www.lakesofmaine.org/data/2018_Lake_Reports/517

are just slightly less than epilimnetic concentrations, with an average annual concentration of 21 ppb. TP bottom grab samples were collected during 16 years between 1978 and 2016 with an average annual concentration of 79 ppb. Between 1990 and 2017, minimum SDT transparencies have not been above 1.5 m and algal blooms occur every year often beginning in June in select coves, and lake-wide by late July (exception was 2019), persisting until fall turnover. Lack of oxygen in the bottom 4 to 5 meters of the lake in late summer and early fall before the lake turns over is likely driving these blooms. A sediment analysis conducted by Maine DEP assessed the Al:Fe and Al:P ratios and found that both indicated conditions that promote internal release of phosphorus under anoxic conditions.¹²

Chlorophyll-a (Chl-a) was measured in 24 years between 1977 and 2018. Prior to 1986, Chl-a ranged from 2.9 ppb to 7.2 ppb with an annual average concentration over that time period of 4.5 ppb. After 1986, Chl-a ranged from 4.9 (1988) to 61 ppb (2011) with an annual average of 22 ppb; over four times greater than the pre-1986 average.

II. Watershed Nonpoint Pollution Sources and NPS Mitigation Activities

a. Summary of Watershed Assessments and Priority Nonpoint Pollution Sources

¹² Personal communication, Linda Bacon, Maine DEP, April, 2020.

The following assessments and surveys have been completed in the Unity Pond watershed since 2000:

Unity Pond Watershed Inventory and NPS Pollution Survey (2001)- Maine Cooperative Extension Service's 'Watershed Stewards Program' provided training to members of FOLW, CWS students, and members of the community to identify sources of NPS pollution in the Unity Pond Watershed.

Unity Pond (Lake Winnecook) Phosphorus Control Action Plan and TMDL Report (2004)- Funded in part by USEPA under Section 319 of the Clean Water Act, this project was administered by Maine DEP under contract with CWS and the Maine Association of Conservation Districts (MACD) from 2000-2004. The project resulted in a comprehensive land use inventory, Phosphorus Control Action Plan and a TMDL report in addition to an assessment of the Unity Pond shoreline and a septic evaluation. The report estimated that 1,728 kg of phosphorus is exported to Unity Pond from the direct watershed, and an additional 542 kg from upstream Carlton Pond annually. The goal in-lake TP concentration of 15 ppb was selected with a target phosphorus reduction of 759 kg annually to attain water quality standards and bloom-free conditions.

Unity Pond and Sandy Stream NPS Watershed Survey II, #2005R-06 (2005-2006)- This project, also funded in part by USEPA under Section 319 of the Clean Water Act, assessed the Sandy Stream watershed and included a Stream Habitat Survey and Rapid Geomorphic Assessment of the lower reaches of Sandy Stream. Maine Stream Team provided training and support to conduct field work with assistance from CWS faculty and student volunteers. Additionally, a watershed survey of state and town roads was completed to identify, evaluate, and prioritize NPS sites. The survey identified 29 high priority sites, prioritized for the Unity Pond Watershed Restoration Phase II project. Most sites were associated with Town roads, and the most common problems included eroding road shoulders, poor road maintenance practices and failing or improperly sized and installed culverts. The stream and watershed surveys project found that agriculture, forestry, new construction, roads and residential development all impact the Unity Pond and Sandy Stream.

Unity Pond (Lake Winnecook) Watershed-Based Plan (2006)- The District utilized the data and recommendations from the 2004 Phosphorus Action Plan and TMDL Report to prepare a Watershed-Based Management Plan that included EPA's required 9 elements. The plan focused on addressing only external sources of phosphorus to the lake with an interim goal of addressing 15% of the load (225 kg phosphorus/year). The plan aimed to address 100% of farmland in row crops, tillage or corn; 30% of forestry land uses; 193 residential and 37 road NPS sites. The plan did not address internal loading, nor did it set a timeline or goal for long-term restoration of the lake.

Unity Pond Watershed Road Surveys #2006R-21 (2007-2008)- These surveys were conducted during the Unity Pond Restoration Phase II Project to identify NPS sites not included in the 2001 Watershed Survey. The surveys, which were funded in part by a CWA Section 319 grant, were completed by the grant project coordinator and CWS faculty and student volunteers to update the list of NPS sites for future implementation work in the watershed. 23 road sites were identified at priority NPS issues.

Lake Winnecook Non-paved Road Survey and Assessment (2019)- In April 2019, technical staff and supervisors of the District conducted a field survey of non-paved roads near Lake Winnecook. Volunteers from FOLW assisted in the survey. A total of 54 roads were surveyed with 20 roads identified as needing improvements. Nine of these roads were identified as high priorities. Culverts were assessed for appropriate sizing as part of this project, and three culverts were recommended for replacement and enlargement. A follow-up watershed survey was planned for the spring of 2020 but was postponed until the spring of 2021 as stakeholders felt the need to focus attention on funding and adequate technical support by applying for a planning grant.

b. Description of Watershed Activities to Address NPS Pollution

1991: The District and the University of Maine Cooperative Extension received a USEPA grant under Section 319 of the Clean Water Act to fund the implementation of agricultural BMPs and make improvements to camp roads with the goal of reducing the nutrient load to Unity Pond. Nearly all farms cooperated, and the water quality data collected to gauge BMP effectiveness showed indications for improvement.¹³

2001: More than 200 community members, college students, FOLW members, and watershed stakeholders concluded the 2001 watershed survey with a 'Day of Service'; completing 16 erosion control projects identified during the survey.

2000-2002: CWS Service-Learning Projects- included the installations of BMPs at identified NPS sites in the Unity Pond and Sandy Stream watersheds.

2004-2006: Unity Pond Watershed Restoration, Phase I (#2003R-19A WIFAP)- Guided by the 2004 TMDL report, this project aimed to build local support for watershed restoration and install BMPs at high priority sites in the watershed. BMPs were installed at 20 NPS sites (4 agricultural, 2 town roads, 3 public access, and 11 residential shoreline properties), technical assistance was provided to 34 individuals, camp road associations, and town officials. Funding for this project was provided in part by USEPA under Section 319 of the Clean Water Act. Supplemental funding was secured through MBNA Historical and Conservation grant Program to install BMPs at medium priority shoreline properties

¹³ Maine DEP, 2004. Unity Pond (Lake Winnecook) Phosphorus Control Action Plan and TMDL Report. P. 21

2007-Present: The Friends of Lake Winnecook (FOLW) initiated a septic tank rebate program for qualifying landowners in the shoreland zone. This program has awarded over \$5,500 since it began, with three grants distributed in 2018-2019.

2007-2008: Unity Pond Watershed Restoration, Phase II (#2006R-21 WIFAP)- Guided by both the 2004 TMDL report and the 2006 WBP, this project continued to build local support and implement actions to control the export of phosphorus and sediment to Unity Pond. Funding for this project was provided in part by USEPA under Section 319 of the Clean Water Act. Project outcomes included BMP installations at two public access sites and two shoreline properties. Technical assistance was provided at 11 sites including two camp road associations and nine private landowners.

2014-2019: USDA NWQI Agricultural Best Management Practices- Over the last six-year period, \$1.27 million was contracted in the Unity Pond watershed to install agricultural BMPs including livestock waste management (\$1,147,608 contracted), soil health & erosion related BMPs (\$74,792 contracted), grazing systems (\$22,752 contracted), and comprehensive nutrient management plan development (\$24,159 contracted).¹⁴

2015-Present: FOLW started a LakeSmart program on Unity Pond in 2015 in cooperation with the Maine Lakes Society (MLS). To date more than ten properties have been evaluated. In 2019, six new evaluators were certified by MLS.

There have been many changes in the watershed since the completion of the 2004 TMDL and 2006 WBP, and local project partners have made good progress on addressing NPS pollution through two phases of 319 implementation and USDA/NRCS agricultural BMP projects. The 2006 plan focused heavily on addressing external sources of phosphorus in the watershed based primarily on watershed conditions provided in the 2004 TMDL– a report that is now outdated. It is critical that watershed stakeholders evaluate the effectiveness of past efforts and revise their current management strategies to effectively address water quality concerns. Reassessment of watershed NPS sources, a comprehensive analysis of in-lake conditions and both external and internal phosphorus loading, determination of the potential effects of backflushing from the Sandy Stream watershed, and a thorough study of historical water quality data and trends is now needed to determine the appropriate strategies moving forward. A new plan will provide specific and current recommendations for addressing both the external and internal phosphorus load, and establish a robust framework prepared by key stakeholders working together across municipal, political, and social boundaries toward the common goal of restoring Unity Pond.

Purpose

The purpose of this project is to develop an updated watershed-based management plan (WBMP) for Unity Pond that includes EPA’s nine minimum planning elements. The project will collect information about lake water quality and watershed hydrology, inventory NPS problems, evaluate septic systems, assess the external and internal phosphorus load, and bring together a

¹⁴ Personal Correspondence – Ron Desrosiers, USDA/NRCS, Belfast, ME. Email dated March 12, 2020 to Andy Reed, Waldo County SWCD.

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 will integrate project findings into an updated WBMP which will be used to guide watershed restoration efforts over the next 10-year planning period (2022-2032).

III. Partner Coordination, Roles and Responsibility

Waldo County Soil & Water Conservation District (District) will serve as the sponsoring grantee for the project, will serve on the steering committee, will lead the agricultural and forestry survey and agricultural landowner meetings, and will work with FOLW to assist with the NPS watershed survey including writing up the watershed survey report.

Friends of Lake Winnecook (FOLW) will participate on the steering committee, advertise project activities in their newsletter and provide \$5,800 in cash match and \$1,807 in-kind match. FOLW will lead the NPS watershed survey and the septic brochure/online septic survey, and assist CWS with in-lake assessment and the backflushing study. FOLW provide long-term plan implementation with support from other partners.

The **Center for Wildlife Studies (CWS)** will serve as a subgrantee to assist with baseline monitoring and the backflow study at Sandy Stream, and will serve on the Technical Advisory Committee. CWS will provide \$2,541 of in-kind match for the project.

The **Towns of Unity and Burnham** will advertise project activities on their websites, serve on the project Steering Committee, and combined, will provide \$3,200 in cash match.

The **University of Maine Cooperative Extension Service**- Will assist with the agricultural land survey and serve on the technical advisory committee.

A **managing environmental consultant** will be hired (following procurement procedures in the DEP's NPS Grant Administrative Guidelines) to manage the overall project, complete a historical water quality analysis, develop a watershed nutrient loading model, assess the internal load and provide a management options analysis, provide technical leaders for the watershed survey, organize and facilitate SC and TAC meetings, and write the WBMP.

Maine Department of Environmental Protection (Maine DEP) will administer project funding, serve as the project advisor, and provide project and technical support. DEP will play a large role in coordinating the watershed and septic survey and provide three technical leaders for the survey.

The **USDA/NRCS** will assist the WCSWCD with the Ag survey and landowner meetings.

The **US Environmental Protection Agency (US EPA)** will provide project funding and work plan guidance.

VII. Tasks, Schedules and Estimated Costs

All press releases, outreach materials, project signs, and plans will acknowledge that the project is funded in part by the United States Environmental Protection Agency under Section 604(b) of the Clean Water Act. Project staff will consult with DEP on EPA’s public awareness terms and conditions for Section 604(b) grants before the project commences. In addition, project staff will consult with DEP and EPA before project signs are designed. Refer to the Service Contract, Rider A. Section IV. D. Acknowledgement.

Task 1 – Project Administration

The District will administer the project according to the service contract with DEP, prepare a subagreement with CWS, and develop an RFQ for consulting services. This task includes tracking project progress, expenses, matching funds, and submitting reports (semi-annual progress reports and final project report) and other deliverables. The district and FOLW will establish an NPS Site Tracker spreadsheet tool to efficiently accumulate and record information about NPS sites observed during this project (Task 6) to enable continued activity in future years to maintain existing BMPs and address new NPS sites.

Start and Completion Dates	October 2020 – December 2022	
Grant Cost: \$4,613.80	Match Cost: \$0	Total Cost: \$4,613.80
Breakdown of Grant by Cost Category: \$840.00 (Salary & Fringe); \$3,773.80 (Contractual)		
Breakdown of Match by Cost Category: n/a		

Task 2 – Water Quality Analysis

A Water Quality Analysis will result in a thorough review of available water quality data (including any secondary data) for Unity Pond, in addition to any new water quality data collected by CWS under Task 3. Data will be analyzed to determine water quality trends, and any statistically significant changes in water quality over the historical time period and within the past 10 years. A water quality memo will summarize the water quality data and findings, identify any additional data needs, and provide future monitoring recommendations. The technical review committee will assist with the evaluation of secondary data to determine if the data is acceptable to use for this project. The qualified consultant will prepare a brief Secondary Data Quality Assurance Guide with selection criteria appropriate for the project that will ensure that secondary data adequately support project conclusions, decisions and/or actions. Project staff will document the following secondary data evaluations in a table: data type; data source (originating organization, report title, date); how data will be used for the project; and limitations on data use, if any.

Start and Completion Dates	January 2021 – December 2021	
Grant Cost: \$3,834.00	Match Cost: \$601.12	Total Cost: \$4,435.12
Breakdown of Grant by Cost Category: \$154.00 (Subgrant); \$3,680.00 (Contractual)		
Breakdown of Match by Cost Category: \$601.12 (Donated Services-Labor)		

Task 3 – Water Quality Monitoring & In-Lake Assessment

Following the results of the water quality data analysis in Task 2, the technical advisory committee will determine if additional sampling or in-lake assessment is needed to better inform the watershed loading model and the internal recycling analysis (Task 4). CWS will develop and

submit a Sampling and Analysis Plan (SAP) for the monitoring following ME DEP’s Lake Assessment Quality Assurance Program Plan (QAPP). Analyses or assessments that may be recommended include bi-monthly TP profile sampling, DO/temperature profiles, and SDT measurements, and a backflushing study at the Unity Pond outlet. This study will utilize an acoustic doppler current profiler (ADCP) to determine the extent to which Sandy Stream reverses its normal flow and backflushes into Unity Pond. WCSWCD and CWS will work with DEP to perform this work under an appropriate QAPP or other quality assurance guidelines. CWS has committed to providing assistance for sampling and/or assessment under this task with support from FOLW. A summary of monitoring and assessment work and copy of all water quality data collected in MS Excel or similar electronic format will be produced by CWS and submitted as a deliverable.

Start and Completion Dates	April 2021 – November 2021	
Grant Cost: \$10,366.00	Match Cost: \$4,447.28	Total Cost: \$14,813.28
Breakdown of Grant Cost by Cost Category: \$5,236.00 (Subgrant); \$2,175.00 (Contractual); \$2,955.00 (Supplies)		
Breakdown of Match by Cost Category: \$2,310.00 (Subgrant); \$1,017.28 (Donated Services-Labor); \$600.00 (Supplies); \$520 (Other)		

Task 4 – Watershed Modeling & Internal Recycling Analysis

The trend of increasing dissolved oxygen loss and internal phosphorus recycling has been identified as a major water quality concern in Unity Pond. Additional monitoring under Task 3 of this project will provide the information needed to quantify internal loading and make specific recommendations for alternative restoration strategies and provide project partners with options for treatment. Project technical advisors and consultants will work together in the development of these revised internal recycling estimates.

Watershed modeling will include a detailed land-cover update in GIS, delineating the subwatersheds of major tributaries in the watershed,¹⁵ pollutant load modeling using an appropriate in-lake response model such as the Lake Loading Response Model (LLRM), and conducting field estimates of phosphorus and sediment loading from high impact/priority sites identified during the planned NPS surveys and recent unpaved road survey. The model will utilize the updated land-cover data, the water quality analysis from Task 2, the internal recycling analysis, and pollutant loading reduction estimates from past 319 efforts. Modeling results will be presented to the technical review committee, calibrated, revised to update the lake’s assimilative capacity analysis, and used to help set water quality goals and thresholds for the plan. Watershed modeling will also account for climate change, by estimating pollutant loading under different hydrological conditions representative of increased rainfall.

With additional water quality data collection and analysis in 2021, the project team will quantify internal loading and make specific recommendations for treatment options and alternatives. The team will work together in the development of revised internal recycling estimates and will develop an internal recycling and alternative restoration feasibility analysis report, updated GIS

¹⁵ Inclusion of the Sandy Stream watershed into the watershed model will be determined following completion of the backflushing study (Task 3).

land-cover layer, watershed modeling memo and model spreadsheet, and NPS phosphorus loading estimate spreadsheet.

Start and Completion Dates	November 2020 – March 2022	
Grant Cost: \$7,075.00	Match Cost: \$1,262.20	Total Cost: \$8,337.20
Breakdown of Grant Cost by Cost Category: \$7,075.00 (Contractual)		
Breakdown of Match by Cost Category: \$231.00 (Subgrant); \$800.00 (Contractual); \$231.20 (Donated Services-Labor)		

Task 5 – Septic Systems

The Maine DEP will complete a septic system vulnerability analysis for the Unity Pond watershed using information about watershed soils and hydrology, location of development, and local stakeholder knowledge to create a septic vulnerability map. FOLW will prepare a septic system brochure to include information about the results of the vulnerability analysis and include a link to an online septic system survey to help inform the watershed model. The brochure will be mailed to shoreline landowners.

Start and Completion Dates	June 2021 – August 2021	
Grant Cost: \$491.30	Match Cost: \$554.88	Total Cost: \$1,046.18
Breakdown of Grant Cost by Cost Category: \$491.30 (Other)		
Breakdown of Match by Cost Category: \$554.88 (Donated Services-Labor)		

Task 6 – Watershed NPS Surveys

With assistance from the District and DEP, FOLW will organize and facilitate an NPS watershed survey for the direct watershed¹⁶ of Unity Pond using methods outlined in *A Citizen’s Guide to Volunteer Lake Watershed Surveys* (DEP, 2011) and working under the DEP’s Maine Lake and Stream Watershed Survey Generic QAPP (2020). The District/FOLW will prepare a Survey Implementation Plan (SIP), to be approved by DEP prior to commencing survey efforts, which will guide survey implementation for quality assurance. FOLW will recruit local volunteers, assist DEP with a volunteer survey training session, and enter all survey data into an NPS Site-Tracker, or similar Excel spreadsheet. DEP will assist with delineating survey sectors, helping prepare the landowner list, and prepare maps. The District will summarize survey results and prepare the survey report. The survey will assess any culverts that were not assessed in the 2019 road survey to ensure they are properly sized to accommodate changes in precipitation resulting from climate change.

Ag and Forestry Surveys – In partnership with the USDA/NRCS and UMaine Cooperative Extension, the District will assess agricultural lands and active forestry operations throughout the watershed and provide a summary memo of survey results. The survey approach will be described in the watershed survey SIP. The preliminary approach includes conducting a land cover review, identifying current farming operations, reviewing or mapping locations of existing

¹⁶ The 2021 survey will not include the Sandy Stream watershed. Results of the backflushing study (Task 3) will help determine if follow-up survey work will be needed in the Sandy Stream watershed in the future.

and proposed (last 5-10 years) agricultural BMPs, identify potential properties for future conservation projects, a day of field reconnaissance, if needed, and review of extent and impact of recent forestry activities. The District will coordinate up to two days of meetings with willing agricultural landowners with high priority properties identified during the survey. While the total area of agricultural land in the watershed is small (10%), 24% of the total P load was estimated to come from this source (Maine DEP, 2004).

Start and Completion Dates	March 2021 – November 2021	
Grant Cost: \$6,757.70	Match Cost: \$6,103.12	Total Cost: \$12,860.82
Breakdown of Grant Cost by Cost Category: \$5,610.00 (Salary & Fringe); \$147.70 (Travel); \$1,000.00 (Contractual)		
Breakdown of Match by Cost Category: \$1,600.00 (Salary & Fringe); \$3,303.12 (Donated Services-Labor); \$1,200.00 (Other)		

Task 7 – Meetings, Stakeholder Engagement, & Public Outreach

Stakeholder & Steering Committee Meetings – The Unity Pond WBP Steering Committee will include representatives from the District, FOLW, Unity Barn Raisers, Sebasticook Regional Land Trust, the Towns of Unity and Burnham, and project consultants (see confirmed list, last page of attachments). The Steering Committee will meet via online meetings three times to help guide the development of the WBMP and will convene one stakeholder meeting, which will be open to the public, to garner input and support for the project and to also help guide the development of the WBMP. Project information will be posted on the District, FOWL, Town(s), and CWS web sites, and two press releases will be written and distributed to local news outlets: Kennebec Journal, Morning Sentinel and Town Line.

Water Quality Technical Review Committee Meetings – This committee will include representatives from the District, FOLW, Maine DEP, CWS, and project consultants and will meet two times over the course of the project to review the key plan components, including the water quality analysis summary, internal loading/alternative restoration analysis, modeling results and load analysis, and action plan with an emphasis on developing current and achievable restoration strategies.

Start and Completion Dates	January 2021- October 2022	
Grant Cost: \$7,891.50	Match Cost: \$971.04	Total Cost: \$8,862.54
Breakdown of Grant Cost by Cost Category: \$560.00 (Salary & Fringe); \$462.00 (Subgrant); \$45.00 (Travel); \$6,824.50 (Contractual)		
Breakdown of Match by Cost Category: \$971.04 (Donated Services-Labor)		

Task 8 – Develop Watershed-Based Plan

The Unity Pond WBMP will be completed using information developed in Tasks 2–6 (above). The plan will contain EPA’s required 9-elements including a detailed, stakeholder-driven 10-year

action plan to improve water quality in Unity Pond and help answer ongoing questions about backflushing from Sandy Stream and the relative contribution of internal loading and how to address it along with the external phosphorus load. Factors such as increased water temperatures, more intense storms, and increase in invasive species related to climate change will be factored into the watershed action plan. A draft plan will be reviewed by both committees and sent to the DEP for review at least two months before project completion. The final plan will be reviewed and approved by DEP. Any comments on the final plan must be addressed for the plan to be accepted.

Start and Completion Dates	January 2022 – October 2022	
Grant Cost: \$4,479.00	Match Cost: \$4,216.16	Total Cost: \$8,695.16
Breakdown of Grant Cost by Cost Category: \$140 (Salary & Fringe); \$154.00 (Subgrant); \$4,185.00 (Contractual)		
Breakdown of Match by Cost Category: \$3,800 (Contractual); \$416.16 (Donated Services-Labor)		

VIII. Deliverables

An electronic copy of each deliverable will be provided to the DEP Contract Administrator. Each deliverable will be labeled according to procedures described in DEP document *NPS Grant Administrative Guidelines*:

<http://www.maine.gov/dep/water/grants/319-documents/2016GrantAdminGuidelinesFinal2.docx>.

9. Sub-agreement with CWS, semi-annual progress reports, final project report (Task 1)
10. Water quality analysis memo including future monitoring plan, Secondary Data Quality Assurance Guide (Task 2)
11. Alternative restoration feasibility analysis, updated GIS land-cover layer, watershed modeling memo and model spreadsheet, NPS P loading estimate spreadsheet (Task 4)
12. Summary of monitoring and assessment work, water quality data in MS Excel or similar electronic format, and monitoring SAP (Task 3)
13. Septic vulnerability map and septic brochure/septic survey (Task 5)
14. NPS site spreadsheet, Ag & Forestry Survey Summary memo, approved SIP (Task 6)
15. Meeting minutes, press releases (Task 7)
16. Final Watershed Plan (Task 8)

IX. Project Coordinator

Name	Andrew Reed
Organization	Waldo County Soil & Water Conservation District
Mailing Address	46 Little River Drive, Belfast, ME 04915
Telephone Number	(207) 218-5311
Email Address	areed@uninets.net
Federal DUNS #	82-513-9368

X. Project Budget

Federal Funds:	\$45,508.30
Non-Federal Match:	\$18,155.80
Proposed Total Cost:	\$63,664.10

Part 1. Estimated Personnel Expenses:

Position Name & Title	Hourly Rate	Number of Hours	Salary & Fringe	Total Applicant Personnel Expenses
Admin. Director	\$70.00	12		\$840.00
Aleta McKeage, Proj. Mgr.	\$70.00	113		\$7,910.00
Totals		125		\$8,750.00

Part 2. Budget Estimates by Cost Category

Cost Category	Federal Funds	Non-Federal Match	Total Cost
Salary & Fringe (from Part 1)	\$7,150.00	\$1,600.00	\$8,750.00
Subgrant	\$6,006.00	\$2,541.00	\$8,547.00
Contractual	\$28,713.30	\$4,600.00	\$33,313.30
Donated Services – Labor		\$7,094.80	\$7,094.80
Travel	\$192.70	\$0.00	\$192.70
Supplies	\$2,955.00	\$600.00	\$3,555.00
Other	\$491.30	\$1,720.00	\$2,211.30
Indirect Costs	\$0.00	\$0.00	\$0.00
Totals	\$45,508.30	\$18,155.80	\$63,664.10

Part 2 Notes: Include the following, as needed:

Subgrant – CWS bi-monthly in-lake sampling (2 scientists x 5 hrs./wk. x 6 weeks X \$38.50/hr.), backflushing study (2 scientists x 35 hours x \$38.50/hr.); 6 hrs. @ \$38.50 for SAP; and 20 hours x \$38.50 for assistance with tasks 2, 7, and 8. Subgrant match- Water

quality monitoring CWS staff (May, Sept, Oct), (2 scientists x 5 hrs./week x 6 weeks @ \$38.50/hr. May, Sept, Oct for monitoring; CWS staff 6 hrs. @ \$38.50/hr. for input on Task 2.

Contractual – Environmental Consultant (Project Scientist 225 hrs. @ \$65/hr., Sr. Scientist 167 hrs. @ \$75/hr., Sr. Modeler 33 hrs. @ \$175/hr., travel 574 miles @ \$0.45/mi).

Contractual match- \$3,000 FOLW cash match, \$1,600 Town of Unity.

Donated Services-Labor – Watershed NPS Survey volunteers (15 volunteers @ \$23.12/hr. x 8 hours each), Rick Kersbergen, UMaine Coop. Extension to assist with Ag survey (6 hrs. @ \$65/hr.), in-kind match from SC and TAC members for 3 Steering Committee & 2 TAC meetings (26 hrs. @ \$23.12 for 6 SC members & 4 TAC members, plus additional hours for review and input on project deliverables (all tasks except Task 1 and 7, 68 hrs. @ \$23.12/hr.), and FOLW volunteers for multiple tasks including septic brochure, baseline monitoring & backflushing study, and public meeting (71 hrs. @ \$23.12/hr.).

Travel – WCSWCD (428 miles @ \$0.45/mi).

Supplies – Lab fees for bi-monthly in-lake monitoring. Supplies Match- FOLW cash match for lab fees.

Other – FOLW printing & postage for septic brochure & septic survey (300 copies @ \$1/copy and \$191.30 for postage). Other Match- FOLW \$1,200 cash match for watershed survey technical leaders; \$520 for use of volunteer boats and gas for boats (1 hr./sampling event x 12 events x \$35/hr. + \$100 for gas).

Part 3. Sources of Non-federal Match and Estimated Amounts

Sources of Non-federal Match	Amount
Friends of Lake Winnecook (Cash Match)	\$4,800.00
Friends of Lake Winnecook (In-Kind Match)	\$1,757.12
Center for Wildlife Studies (In-Kind Match)	\$2,541.00
Town of Unity (Cash Match)	\$1,600.00
Town of Burnham (Cash Match)	\$1,600.00
WBMP Steering Committee & Technical Advisory Committee (In-Kind Match)	\$2,173.28
Watershed Survey Volunteers & Boat/Gas (In-Kind Match)	\$3,684.40

Total	\$18,155.80
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