

**TOWN OF PLYMOUTH CAPITAL IMPROVEMENT PLAN REQUEST  
FY24 FALL ANNUAL TOWN MEETING**

<b>Department:</b> Marine and Environmental Affairs	<b>Priority #:</b> 3
<b>Project Title and Description:</b> Herring Ponds Management Plan Implementation	<b>Total Project Cost:</b> \$32,800

**Department/Division Head:** David Gould

Check if project is: New  Resubmitted  Cost estimate was developed: Internally  Externally

For project re-submittals, list prior year(s):

List any funding sources and amounts already granted: Environmental Affairs Fund

Basis of Estimated Costs (attach additional information if available)			If project has impact on 5 Year Plan and future operating budgets, insert estimated amounts.		
Capital:	Cost	Comments	Fiscal Year:	Capital	Operations & Maintenance
<i>Planning and Design</i>	\$32,800		<i>FY23</i>		
<i>Labor and Materials</i>			<i>FY24</i>		
<i>Administration</i>			<i>FY25</i>		
<i>Land Acquisition</i>			<i>FY26</i>		
<i>Equipment</i>			<i>FY27</i>		
<i>Other</i>					
<i>Contingency</i>					
<b>Total Capital</b>	<b>\$32,800</b>				

**Project Justification and Objective:** \_\_\_\_\_

One of the key findings in the Management Plan was that streamflow from Little Herring Pond (LHP) to Great Herring Pond (GHP) was the largest source of phosphorus to GHP.2 In order to continue to move toward long-term management, Town DMEA staff have asked CSP/SMART and TMDL Solutions to prepare this scope to collect ongoing key targeted data, evaluate an in-stream PRB potential phosphorus reduction option, and develop an annual update as the town considers other management options

**For Capital Project Requests:**

Will this project be phased over more than one fiscal year? If yes, enter it on the 5 Year Plan

Can this project be phased over more than one fiscal year?

Yes  No

Yes  No

**For Capital Equipment Requests:**

Check if equipment requested is replacement and enter the year, make & model, VIN and present condition of existing equipment

N/A

**What is the expected lifespan of this new/replacement equipment:** \_\_\_\_\_

**Attach backup information, estimates, or justification to support this request.**

David Gould, Department Head  
Department of Marine and Environmental Affairs  
Town of Plymouth  
26 Court Street  
Plymouth, MA 02360

Dear David:

The Herring Ponds Watershed Association (HPWA) has worked closely with your department and with consultant Ed Eichner to develop a Watershed Management Plan that can potentially reduce watershed pollution and eliminate toxic cyanobacteria blooms from the Herring Ponds Watershed. This is not just a "quality of life" issue – it is also a public health issue since the 2020 bloom sent several dogs to the veterinarian and one resident to the hospital. Indeed, it is a growing and serious town-wide issue.

We understand that the DMEA is submitting a warrant Article for the upcoming Fall Town Meeting, and that this proposal seeks funds needed for the Town and for HPWA to begin baseline studies needed to support specific recommendations of the HPWA Management Plan. Specifically, it will provide funds to explore the potential of a Permeable Reactive Barrier (PRB) to remove phosphorus pollutants from our water. Excess phosphorus is associated with cyanobacteria blooms whose toxins threaten the health of our Association residents (and potentially all other Town residents). The DMEA proposal seeks money to collect baseline data needed to explore the possible utility/benefits of a PRB and pay for permits, design, and construction.

The Directors of the HPWA believe that the presence of cyanobacteria blooms in our lakes and ponds is a growing, serious issue for Plymouth, we are eager to work with the Town to seek remedies. Moreover, we are prepared to contribute a \$5,000 match to help in this effort.

Thank you for your consideration and help with this issue.

For the Herring Pond Watershed Association,

Don Williams  
President



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Marine Science  
and Technology

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University of  
Massachusetts  
Dartmouth

## Scope of Work

# Technical Support of the Town of Plymouth Great Herring Pond and Little Herring Pond Monitoring

August 9, 2023

### Overview

During 2022/2023 and working together with the Town Department of Marine & Environmental Affairs (DMEA), the Coastal Systems Program from the School for Marine Science and Technology at UMass-Dartmouth (CSP/SMAST) and TMDL Solutions LLC prepared a Great Herring Pond and Little Herring Pond Management Plan and Diagnostic Assessment.<sup>1</sup> The diagnostic assessment portion of the Management Plan relied in large part on data collected by CSP/SMAST staff, including water column and stream flow readings. Management recommendations suggested that the Town consider evaluating management options, while continuing water quality monitoring. One of the key findings in the Management Plan was that streamflow from Little Herring Pond (LHP) to Great Herring Pond (GHP) was the largest source of phosphorus to GHP.<sup>2</sup> In order to continue to move toward long-term management, Town DMEA staff have asked CSP/SMAST and TMDL Solutions to prepare this scope to collect ongoing key targeted data, evaluate an in-stream PRB potential phosphorus reduction option, and develop an annual update as the town considers other management options. Scope tasks are:

### Task 1: Streamflow and WQ Measurements: LHP outflow & GHP outflow

CSP/SMAST staff will collect monthly instantaneous flow readings and water quality samples at the GHP and LHP outflows year-round for 12 months. Town staff, in coordination with CSP/SMAST staff, will install and maintain Town-owned continuous water level monitoring devices at the sampling locations. Duplicate samples will be collected randomly for a minimum of 10% of the total samples. All collected samples will be assayed for standard PALS parameters (TP, TN, pH, alkalinity, chlorophyll a/pheophytin) plus ortho-P at the Coastal Systems Analytical Facility at SMAST.

#### **TASK 1 Cost: \$16,184**

**Deliverable: Summary water quality results in an Excel spreadsheet provided to the Town with Project Technical Memorandum (Task 3).**

### Task 2: Stream PRB Testing in Carter's River: Design, Permitting, Installation, Monitoring

CSP/SMAST and TMDL Solutions staff will coordinate with Town staff to design, permit, install, and monitor an experimental, temporary in-stream PRB to remove phosphorus (P) at one location

<sup>1</sup> Eichner, E., B. Howes, and D. Schlezinger. 2022. Great Herring and Little Herring Ponds Management Plan and Diagnostic Assessment. Town of Plymouth, Massachusetts. TMDL Solutions LLC and Coastal Systems Program, School for Marine Science and Technology, University of Massachusetts Dartmouth. Centerville, MA and New Bedford, MA. 134 pp.

<sup>2</sup> Eichner, E., B. Howes, and D. Schlezinger. 2022. Figure V-32.

in Carter's River between LHP and GHP. Project staff will design a temporary in-stream PRB with P removal materials that will allow herring passage. Project staff will support a Town application to the Conservation Commission for the PRB installation. Pending any Conservation Commission conditions, the PRB will be installed in July and August. Water quality and flow readings will be monitored upstream and downstream, near field and far field, weekly for the two months. Duplicate samples will be collected randomly for a minimum of 10% of the total samples. All collected samples will be assayed for standard PALS parameters plus ortho-P at the Coastal Systems Analytical Facility at SMAST.

### **TASK 2 Cost: \$15,524**

#### **Deliverables:**

- 1) Preparation of Notice of Intent for Town submittal to Conservation Commission, including 1 meeting with Conservation Agent and 1 meeting with Commission.**
- 2) Design of in-stream P removal PRB, including PRB materials and provisions to allow herring passage (discussions with MassDMF are anticipated and outcomes will be included in NOI submittal)**
- 3) Summary water quality and flow monitoring results in an Excel spreadsheet provided with Project Technical Memorandum (Task 3).**

#### **Task 3: Project Reporting: Technical Memorandum**

CSP/SMAST and TMDL Solutions staff will prepare a final Technical Memorandum reviewing and summarizing data collected in Tasks 1 and 2 and comparing these data to information summarized in the GHP and LHP Diagnostic Assessment and Management Plan. The Technical Memo will also include recommendations for future monitoring and management. No presentation of the Technical Memorandum is included.

### **TASK 3 Cost: \$6,091**

**Deliverable: Technical Memorandum (final) summarizing Task 1 and Task 2 findings, as well as recommendations for future monitoring and management activities.**

### **TOTAL PROJECT COSTS: \$37,800**

#### **PROJECTED SCHEDULE:**

Task 1 monitoring can begin at any time during the year, but Task 2 will need to occur in July and August to match potential worst case conditions and water quality management priority timing. The Technical Memorandum will be delivered to the Town by TMDL Solutions and CSP/SMAST four months following the collection of the final monthly readings and sampling in Task 1.

#### **EXPECTED FUNDING/BILLING:**

This is a joint project between the Coastal Systems Program from the School for Marine Science and Technology at UMass-Dartmouth and TMDL Solutions LLC.